JUNE 2022

Environmental Social and Impact Assessment Project Report

PROPOSED KITENGELA PRESBYTERIAN JUNIOR HIGH SCHOOL ON LAND REFERENCE NO KAJIADO/KITENGELA/32496, ENKASITI, KAJIADO COUNTY.

1°49'32.40"S 36°45'51.30"E.

Firm of Experts

Greenspace Planning Environmental Consultants Limited
P.O. Box 27674 – 00100,
Nairobi.
Tel: +254 711135157
info@greenspacelimited.org

Proponent:

P.C.E.A Kitengela Township Church
P.O Box 228-00242,
Kitengela.

.

CERTIFICATION

Certification by Lead Expert

I hereby certify that this Comprehensive Environmental Social Impact Assessment project report (ESIA) has been done under my supervision and that the assessment criteria, methodology and content reporting conform to the requirements of the Environmental Management and Coordination Act Cap 387 of the Laws of Kenya.

Signed _____

Contact Details

Greenspace Planning and Environmental Consultants Limited,
P.O. Box 27674-00100, Nairobi.
Tel: +254 711135157
Email: paulwambua82@gmail.com

Certification by Proponent,

P**.C.E.A Kitengela Township**, confirm that the following Comprehensive project report has been submitted to NEMA with my authority as the project proponent.

Signed for and on behalf of the Proponent.

P.C.E.A Kitengela Township

P.O. Box 228-00242

Kitengela

Disclaimer:

This Comprehensive Environmental Social and Impact Assessment Project Report is confidential to **PCEA Kitengela Township** and any use of the materials hereof should be strictly in accordance with the contractual agreement between the Lead Expert and the proponent. It is however subject to conditions spelt out in the Environmental (Impact Assessment and Audit) Regulations of 2003.

ACKNOWLEDGEMENTS

The EIA experts wish to acknowledge several people who contributed to this EIA process that culminated in the preparation of this ESIA project report as follows.

- **P.C.E.A Kitengela Township Church**, who provided project facilitation, documentation, coordinated site visits and provided the resources required by the consultants to undertake the EIA process.

- The adjacent property owners and neighbours who supported the public consultative process by accepting to respond to questionnaires and participating in semi-structured interview sessions

- Use of baseline information of the area from the County Government of Kajiado.

- Use of reference material for other project proposals prepared by the Environmental Consultants.

- We acknowledge all employees of ***Greenspace Planning and Environmental Consultants Limited*** who were involved in the execution of the public consultative process and assisting in the preparation of this EIA report.

- We also acknowledge every other person who participated in this process in one way or another and has not been mentioned elsewhere.

LIST OF ACRONYMS

°C	Degrees Celsius
EHS	Environmental Health and safety
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
NEC	National Environmental Council
CGK	County Government of Kajiado
OHSO	Occupational Health and Safety
PCs	Private Companies
PPE	Personal protective equipment
SWM	Solid Waste Management
TOR	Terms of Reference
WRMA	Water Resources Management Authority
ERC	Energy Regulatory Commission
CFB's	Compact Fluorescent Bulbs
CBC	

EIA STUDY TEAM

NAME	SPECIALIZATION	EDUCATION
PAUL WAMBUA	**PHYSICAL PLANNER,** **EIA/EA LEAD EXPERT**	**B.A URBAN & REGIONAL PLANNING**
CALEB MIRERI	**EIA/EA LEAD EXPERT** **ACADEMIA AND SENIOUR LECTURER.**	**ENVIRONMENTAL PLANNING AND MANAGEMENT.**
KISILU ELIZABETH	**SOCIOLOGIST.**	**B.A SOCIAL STUDIES.**

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Government of Kenya, through the Ministry of Education, introduced Competency Based Curriculum (CBC) in 2019, in preparation for the smooth transition of learners into Junior Secondary school in 2023, However, an assessment by the Education ministry indicates that the institutions suffer from inadequate resources and have lagged in infrastructure thus the Government of Kenya called for the CBC infrastructure Development programme to upscale the current infrastructure for smooth transition and adequate classrooms.

Section 58 of the Environmental Management and Coordination Act (EMCA,1999)-Amended 2015, stipulates that any development proponent must undertake an Environmental Impact Assessment (EIA) not withstanding any approval/ permit or license granted under this Act or any other law in force in Kenya. The requirement for an EIA license applies to all projects listed in the Second Schedule of the Act; particularly, those out of character with the surrounding development and land use. Therefore, the purpose of EIA study is to identify potential positive and negative environmental impacts associated with the proposed project and provide recommendations on how to take advantage of the positive impacts on one hand and how to mitigate the negative environmental impacts on the other.

This report provides a description of the activity, description of property and location and a description of environment, legislation, need and desirability, significant impacts and management as well as mitigation. Comprehensive, independent environmental studies elaborated by specialists are required in accordance with the EIA Regulations to inform the Authority of its comprehensive recommendation with sufficient information in order to make an informed decision.

The project proponent, **PCEA Kitengela Township Church** identified the EIA experts under an EIA lead expert registered with the National Environment Management Authority (NEMA) to conduct an EIA project report for the proposed Junior Secondary School and prepare a project report for submission to NEMA. This is in line with section 58 of the EMCA, 1999- amended 2015 and its subsidiary legislation, Environmental (Impact Assessment and Audit) regulations, 2003 contained in the Kenya gazette supplement No. 56, legislative supplement No. 31 Legal notice No. 101 of 13th June, 2003.

Introduction

This EIA Report was prepared for the proposed Kitengela Presbyterian Junior High School on Land Ref No Kajiado/Kitengela/32496, Enkasiti *area* of Kitengela Township within Kajiado County. In this proposal, we present the results of assessing the environmental impacts associated with the proposed project.

Site Location

The proposed site, lies on Latitude 01º33´03.80´´S and Longitude 36º55´44.90´´E. The site is gently sloping and at an altitude of 1590 m above the sea level. The property is located adjacent to Enkasiti Plains Resort opposite P.C.E.A Ebenezer Church off Namanga road, Kajiado County.

Project Design and Description

The proposed Educational facility will host an Administration block, tuition blocks ,dormitories, teachers quarters, entertainment arena and other onsite facilities and amenities, on approximately 1.23 Ha plot of land. Other components include Entry, Plot boundary, Walkways, driveways and Parking area. The project activities will include excavation, levelling, compacting and construction of the other onsite facilities and amenities using environmental resources such as sand, aggregates, iron roofing sheets among others. This process will be done in phases.

Policy, Legal and Regulatory Framework

This Project Report has been developed to ensure that the proposed construction of Junior High School is in conformity with national policy aspirations towards securing sustainable development. Specifically, this report has been developed to ensure compliance with requirements of the Environmental Management and Coordination Act (EMCA) 2015-Kenya's supreme environmental law, Ministry of Education and the National Constitution. Section 58 of EMCA requires that all proposed development in Kenya to be subjected to environmental impact assessment and to be conducted in line with the Second Schedule (of EMCA) and the Legal Notice 101 (Regulations for Environmental Assessment and Audit) 2003.

CHAPTER ONE: INTRODUCTION

1.1. Background and rationale for the EIA

The proponent (PCEA Kitengela Township) intends to put up an Educational Facility (Junior High school). Developed on 1.70 Ha land parcel under the LR. No. Kajiado/Kitengela /32496. The property is located in Enkasiti area in Kitengela within Kajiado County. The property is located adjacent to Enkasiti Plains Resort opposite P.C.E.A Ebenezer Church off Namanga road, Kajiado County, off Nairobi-Namanga Highway. Upon completion the facility will host Administration block, Tuition blocks, dormitories, teacher's quarters and sanitary facilities for both gender, with other onsite facilities and amenities. Other components include Entry, Plot boundary, Staircases, Walkways, Drainage pipes, and Parking area.

The proposed project has a bearing on environmental quality including destroying biological and physical environment. According to the National Environmental Management Authority (NEMA), Section 58 of the Environmental Management and Co-ordination Act (1999), and the Environmental (Impact Assessment and Audit) Regulations (2003), an EIA has to be done for such projects to ensure that adverse impacts associated with the project are minimized to promote an eco-friendly environment within the project area.

1.2. Scope objective and Criteria of Environmental Impact Assessment Study Report

The Kenya Government policy on all new project, programmes or activities requires that an Impact Assessment (EIA) is carried out at the planning stages of the proposed project to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the proposed development. The scope of this full project include:

- The Baseline environmental condition of the area
- Description of the proposed project.
- Provision of Relevant legislative frameworks.

- ❖ Identification and discuss of any adverse impacts to the environment anticipated from the proposed project,
- ❖ Appropriate Mitigation Measures
- ❖ Provision of Environmental Management Plan (EMP) Outline.

1.3. Objectives and Scope of the Proposed Project

The main objective of this EIA project report is four fold and includes the following:

- To identify potential negative impacts occasioned by implementation of the proposed project. This is based on analysis of baseline conditions of the proposed site, evaluation of the construction process and projecting of envisaged impacts.
- To provide mitigation measures to ameliorate potential negative impacts.
- To make appropriate recommendations for legislative compliance for the development.
- To ensure that issues raised by neighbours and property owners are mainstreamed into the EMP proposed for the project cycle.

1.4. Terms of Reference (TORs)

In working to achieve the objectives, the following areas shall be our points of consideration:

- Present a socio-economic evaluation of the proposed development area and its surroundings.
- Identify and assess the potential impacts of the project on the surrounding area, Assess the drainage structure, particularly with respect to existing natural drainage channels, proposed man-made drainage/water features or any proposed changes in topography.
- Give the timelines/scheduling for individual tasks to be undertaken.
- Provide a detailed Environmental Monitoring and Management Plan.

CHAPTER TWO: EIA STUDY AND METHODOLOGY

2.1. The Approach.

At beginning of the assignment inception meetings were held between the Proponent (PCEA Kitengela) and the Consulting Team Leader both in the Enkasiti (Proposed site) and at Church. The meetings served as formal introduction for clarification of Terms of Reference (TOR) for the study team and physically show the team the proposed project site.

The methodology followed during the ESIA study involved site visits, photographing, interviews, literature review and consultations with stakeholders such as the County Government of Kajiado, neighbours and the wider public. Those consulted were generally supportive of the Project. They highlighted the likely benefits of the project e.g. Improved development of the area, employment opportunities.

In order to address all the likely negative impacts that may arise as a result of the proposed development, mitigation measures and specific strategies have been prescribed. Other aspects that have been highlighted include main actors, likely costs and appropriate implementation time frames.

2.2. Screening.

As best practice the proposal was screened based on its characteristics and listed projects in the 2nd schedule EMCA CAP 387. Whereas the project is deemed not to be out of character within the already build environment and the activity falls under second schedule of EMCA amendment 2015, ESIA would be necessary for the proposed project in line with NEMA's initiative to inculcate the culture of environmental considerations in the many emerging developments especially in the construction industry and manufacturing sector and for specific use.

2.3. Scoping.

In scoping, focus was on environmental impacts of great concern. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects. Impacts

were also classified as immediate and long-term impacts. A scooping survey was undertaken in the initial phases of the study and it involved the following:

- Project Background this will give the brief history of the proposed project site, the parties involved and justification of the project in terms of demand or lack of the same, the project area, relevant policy and legislation, the project including products, by-products, processes both at implementation and operational level, resources required for successful implementation and operation of the project and the different options considered.
- Present environmental conditions; description of the project site, ecological zoning as well as the state of the environment and its surroundings. Attempts will state if it is already suffering from degradation, causes of the original degradation if any established.
- Identification of Environmental Impacts; the report will distinguish between significant positive and negative impacts, direct and indirect impacts and immediate and long term impacts which are unavoidable and / or irreversible.
- Community/ Stakeholder Consultations: these will be undertaken to determine how the project will affect the local people / various stakeholders.
- Development of an Environmental Management Plan (EMP); to mitigate negative impacts, recommending feasible and cost effective measures to prevent or reduce significant negative impacts to acceptable levels,
- Development of a Monitoring Plan; this will be used in monitoring the implementation of the mitigation measures and the impacts of the project during construction and operational phases, including an estimate of capital and operational costs, and Make necessary recommendations pertaining to the proposed development.

2.4. Literature Review & Desktop Studies.

A literature review was undertaken based on the findings of the scoping process, and it involved reviewing legal frameworks, policies, development plans and past studies carried out in the area. It also informed the ESIA study on the baseline conditions and solidified the legal, institutional and environmental setting of the proposed project. In particular the study reviewed the following.

- Review of the Architectural Design or Drawings of the proposed steel plant including site layout and spacing.
- Review of relevant legislations applicable to this project including the Environmental Management and Conservation Act 2015, the Environmental Impact Assessment and Audit Regulations 2003; legal notice No. 31 of 2019, and other related pieces of legislations.
- Assembly and review of baseline data, maps, reports and any relevant information on the existing environmental and social conditions of the Project Area influenced by the proposed development.
- Preparation of checklists that consist of a simple catalogue of environmental factors
- Early meetings with the Client to deliberate on the proposed project, keeping in mind the site and activity options under consideration;

2.5. Proponent/Ownership Verification.

This was done to review the history of land ownership and documents regarding the proposed project. The land ownership document (Title Deed) certifies that the proponent is registered as the absolute proprietor of the land comprised in the title (Appended). This exercise also included plans and drawings review.

2.6. Field Investigation

Activities implemented during field investigations involved:

- Site visits to the Project Area and the neighbouring areas within the zone of influence of the project to collect primary baseline environmental and socio-economic data.
- Photographing the significant aspects to aid in describing baseline environmental and social conditions of the Project area and its influence zone.
- Acquisition of relevant documents from the authority such as County government departments
- Public consultation in form of onsite key informant interviews with various departments within the county government, questionnaires distributed randomly to the residents.
- Identification of sensitive receptors including health facilities, religious facilities, educational institutions among others along the project route.

- The main purpose of the field investigation was to verify information and data collected during the desktop study and collection of any new information that may assist in the assessment of impacts and design mitigation measures as well as undertake stakeholder consultations with the communities within the Area of Influence (AoI).

2.7. Public Consultation

The project site is situated in relatively low developed area with low density build environment. Stakeholders were however consulted including neighbours to the project site. The methods used included Focus Group Discussion of about 40 stakeholders including representatives of line departments of the Kajiado county government, local administration among others, questionnaires (Appended) key informant interviews. The questionnaire interviews were mainly for neighbours in the area surrounding the proposed project. The information obtained from the interviews was used to identify impacts and develop mitigation measures.

2.8. Reporting

In the entire exercise, the proponent and ESIA experts contacted each other on the progress of the study and signing of various documents. The proponent will have to submit 10 copies of this report alongside a soft copy to the National Environment Management Authority for review and issuance of an EIA license. All the materials and workmanship used in the execution of the work shall be of the best quality and description.

Terms of Reference Report was submitted to NEMA as specified in Regulation 11 (1) and 11(2) of the Environmental (Impact Assessment and Audit) Regulations, 2003.The Environmental Impact assessment (EIA) Study Report was prepared as specified in Regulation. 8 of the Environmental (Impact Assessment and Audit) Regulations, 2003 and submitted to NEMA as specified in Regulation 19 of the Environmental (Impact Assessment and Audit) Regulations, 2003. Any material condemned by the architect shall be removed from the site at the contractors cost. Environmental concerns need to be part of the planning and development process and not an afterthought.

CHAPTERTHREE: LEGAL, POLICY &INSTITUTIONAL FRAMEWORK

3.1 Introduction

The Third Schedule of the Environmental Management and Coordination (Impact Assessment and Audit) Regulations, 2003 requires that environmental guidelines and standards which include the Kenyan government policies and strategies, National legislation and the Institutional arrangements to render them, should be incorporated in an EIA report. The legal and institutional frameworks provide important precautions for protection and conservation of the environment and ensuring community health and safety. Under this section, the EIA will therefore review the applicable sets of laws and institutions which are tasked with the protection and conservation of the environment at the proposed project site.

3.2 Legal and Policy Framework

The following legislative provisions and regulations are considered key to management of the environmental, health and safety aspects related to the proposed development.

3.2.1. The Constitution of Kenya, 2010

The Constitution of Kenya 2010 is the supreme law of the land. Any other law that is inconsistent with the Constitution is null and void to the extent of its inconsistency. Further any action by an individual or a State organ that contravenes the Constitution is null and void.
Chapter V of the Constitution deals with Land and Environment. Specifically Part 2 elaborates on the following components regarding the protection of the environment.

1. Obligations in respect of the environment
2. Enforcement of environmental rights
3. Agreements relating to natural resources
4. Legislation relating to the environment

Relevance to the proposed project

- The proponent has a right to carry out the project within legal limits
- The proponent must ensure that the development is carried out in an ecologically, economically and socially sustainable manner
- The proponent is entitled to a fair administrative decision making process from NEMA and other State organs
- The proponent must ensure that all the applicable provisions of the Constitution are observed at all times.

3.2.2. The Environmental Management and Co-ordination Act, 1999

The purpose of this Act aims at improving the legal and administrative co-ordination of the diverse sectored initiatives in the field of environment so as to enhance the national capacity for its effective management. To administer the Act, two major institutions have been established. They include the National Environmental Council (NEC) and the National Environmental Management Authority (NEMA). It has several Regulations that are discussed in the proceeding sections.

3.2.3. EMCA Regulations

3.2.3.1. EIA/EA Regulations (Legal Notice No. 101 of 2003)

The EIA/EA Regulations are meant to operate under Sec. 58 of EMCA. It makes it illegal for anyone to undertake developments without an EIA license.

Relevance to the proposed project

- Acquisition of EIA license to commence project development.
- Provide procedures and modalities on the preparation of the EIA/EA projects/studies

3.2.3.2. Water Quality Regulations (Legal Notice No. 120 of 2006)

Water quality regulations were gazetted as a legislative supplement mainly to address the challenges of pollution of water sources and conservation. The regulation provides guides for water use and conservation as well as effluent standards for discharge.

Relevance to the proposed project

- Since the effluent from the premise will discharge into waste water treatment facility, the proponent will ensure that such effluent meets the standards set out under Schedule V
- Monitoring activities will follow the guide values provided under Schedule IV

3.2.3.3. Waste Management Regulations (Legal Notice No.121 of 2006**)**

In pursuit of the provisions of EMCA 1999, the Minister for Environment in 2006 gazetted the waste management regulations focusing on management of solid, industrial and hazardous wastes, pesticides, toxic and radioactive substances.

Relevance to the proposed project

- Ensure there exists proper contractual agreement with licensed solid waste handlers,
- Procure litter bins types that foster separation of wastes at source
- Ensure solid wastes are disposed off in the manner prescribed.

3.2.3.4. Noise Regulations (Legal Notice No. 61 of 2009)

These Regulations were gazetted to manage noise pollution to levels that do not cause a disturbance/nuisance to the public. The proposed construction activities will however have a potential for the production of noise above the acceptable limits. Generally, construction sites generate noise that is above 85 dB (A).

Relevance to the proposed project

- Ensure compliance with the set noise level limits for the site especially during construction and occupational phases.
- The contractor should ensure that employees are not exposed to noise levels above 85dB (A) and in such cases provide suitable personnel protection equipment (ear protective devices).

3.2.4. Electricity Power Act No. 11 of 1997

The Electric Power Act No. 11 enacted in 1997 deals with generation, transmission, distribution, supply and use of electrical energy as well as the legal basis for establishing the systems associated with these purposes.

Relevance to the proposed project:

- Electricity power installation and usage should be done in a manner that seeks to protect the health and safety of the occupiers, the local and other potentially affected communities as well as the environment
- Proponent should adhere to provisions of this Act in all phases of the project.

3.2.5. Occupational Health and Safety Act No. 15 of 2007

The main objective of the Act is to secure the safety, health and welfare of the persons at work and to protect persons other than persons at work against risks to safety and health arising out of or in connection with the activities of persons at work. It assigns duties and liabilities to employers, employees and public in order to facilitate this and promote healthy work environments subsequently enhancing outputs ergonomically. Under part (ii) of the Act the duty of occupiers in section 6(i) is to ensure the safety, health and welfare at work of all persons working in his workplace, sub section (2)(a) to (g) outlines specific duties under section 6(i). These include provision of personal protective equipment (PPEs), preventing risks, information, notifications and maintenance of places of work. Sub section 3 stipulates that occupiers must carry out risk assessment and section 4 requires that the proponent sends a copy to the occupational health and safety officer in the area. Section 13 (a) to (g) also stipulates the duties of the employee in efforts to ensure that he/her safety and health is guarantee at the place of work. Section 21 gives the procedure and duty of

giving notices of accidents and dangerous occurrences. In case of any accidents during the project cycle, this Act will guide the course of action to be taken by the proponent and the project contractor.

Relevance to the project.

All personnel working at the site during installation, operation or possible decommissioning of the plant shall be provided with appropriate Personnel Protective Equipment (PPE) and their use enforced.

3.2.6. The Public Health Act- Laws of Kenya, Chapter 242

Environmental degradation may pose a health hazard to the general public. This is among the factors considered by the Public Health Act to constitute "nuisance". For the interpretation of the Act, Section 15 (IX) indicates that any noxious matter or wastewater discharged from any premise, such as a building constitutes nuisance. Any premise not kept in a clean and free from offensive smell such as gases which are injurious to health such as those from commercial establishments shall therefore generate nuisance. The Act therefore stresses that no person shall cause a nuisance to exist on any land or premise occupied by him. Because of the above, the Act acknowledge that it shall be the duty of all local authorities to take all lawful measures for maintaining its district at all times in a clean and sanitary condition for remedy of any nuisance or condition liable to be injurious to health. To safeguard against this, Part X of the Public Health Act states that where in the opinion of the Medical Officer of Health that food stuffs within a warehouse, or a building are insufficiently protected, the owner shall be compelled to observe the required regulations, else he/she shall be guilty of an offense.

Relevance

The proponent has acquired the requisite approvals from the Public Health Department for the project and shall ensure high standards of sanitation are maintained throughout the project life cycle and will comply with any instructions that may be provided by the Public Health Department for continuous improvement.

3.2.7. The Physical and Land use Planning Act, No.13 of 2019

The Act provides for the planning, use, regulation and development of land and for connected purposes. It was enacted to ensure that every person engaged in physical and land use planning shall promote sustainable use of land and liveable communities which integrates human needs in any locality. The Act allows the County Government to prepare a local physical and land use development plan in respect of a County, Sub-County, or unclassified urban area.

3.3. Institutional Framework

3.3.1. County Government of Kajiado.

This is the principle lead agency in all matters pertaining to planning within the Kajiado County. The County Government Act (Cap 103) requires counties to facilitate the development of a well-balanced system of settlements and ensure productive use of scarce land, water and other resources for economic, social, ecological and other functions across a county; The Physical Planning Act (Cap 286) also confers upon local authorities the powers to control development in their areas of legal jurisdiction. Accordingly, Section 29 (a) has granted all local authorities in Kenya, the County government of Kajiado being no exception, the power to prohibit or control the use and development

3.3.2. National Environmental Management Authority.

In 2002 the government created the National Environmental Management Authority (NEMA) as the supreme regulatory and advisory body on environmental management in Kenya. NEMA is required to coordinate and supervise the various environmental management activities being undertaken by statutory organs with a view to promoting their integration into development policies, programmes, plans and projects that provide sustainable development and a safe and healthy environment to all Kenyans. The key functions of NEMA through the National Environment Council include: responsibility for policy formulation and direction for the purposes of the Act; setting national goals and objectives and determining policies and priorities for the protection of the environment; promotion of cooperation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes; and perform such other functions as are assigned by the Act. NEMA will remain in charge of coordinating all activities related to environmental management in the project area,

such as enforcement of environmental impact assessments, as well as environmental audits and undertake environmental inspections as it deems necessary in carrying out its mandate.

3.3.3.Ministry of Education

The Ministry of Education, Science and Technology is responsible for national policies and programmes that ensure Kenyans access quality and affordable school education, post-school, higher education and academic research. The goals of education in Kenya is to provide, promote and coordinate the delivery of quality education, training and research and enhance integration of science, technology and innovation into national production systems for sustainable development. Read more:

3.3.4.Neighborhood Associations and/or General Public.

The proposed Junior High School development project is likely to attract the interests of the area's neighborhood association(s)/general public. An extensive public participation hence formed a major component of the study. From the foregoing, particular reference is made to Section 17 of the Environmental (Impact Assessment and Audit) Regulations, 2003, which states that: …The proponent shall in consultation with the authority, seek the views of persons who may be affected by the project… The above expression clearly underscores the concept of "participatory environmental planning and management" in the context of urban development.

3.3.5.Institutions Standards and Guidelines, 2013

- Every institution, offering face to face/ residential programmes, shall own land capable of supporting a student population.
- Every Institution shall show evidence of owning land on freehold or leasehold term of not less than 45 years
- The facility land shall be free from all encumbrances other than those of a statutory nature
- Each Institution shall be built on land parcels which are either a continuous holding or on individual land parcels that are contiguous to one another or in close proximity to each other. In all cases where land parcels are not contiguous to one another, they shall, in cases where the student population does

not exceed 600, be situated at a distance not exceeding two kilometres from one another and be connected by a motorable road

- Every Institution shall have a Master Plan to guide land use at the institution. The physical master plan shall be designed in such a way that all building facilities and proposed developments are functionally related and compatible. All academic buildings, lecture rooms, libraries, laboratories, assembly halls, auditoriums, audio-visual centre and other facilities are in close proximity to one another.
- The facility shall set aside land for other functional areas of the institution. The minimum total area set aside for open space and car park shall not be less than one hectare which area shall not incorporate land set aside for sporting facilities; and
- It shall set aside at least two and a half hectares of land for outdoor sports for the first six hundred students and at least one hectare for every additional two hundred students.
- All buildings used for learning activities shall have adequate provisions to cater for the physically challenged.
- All buildings and other physical facilities used by an institute to accommodate university activities shall provide for adequate fire safety.
- Every facility shall provide and keep clean and maintain adequate and suitable sanitary conveniences, which conform in all respects to the requirements of the Building Code of the Republic of Kenya and Public Health and Safety Act, for students and all persons working in the University.

CHAPTER FOUR: BASELINE INFORMATION

This section provides detailed information of the site where the project is undertaken. It broadly examines the physiographic factors, social and economic forces both visible and invisible as they operate and the stimuli the new project is likely to inject. All major parameters are assessed to establish their capacities and abilities. Baseline information provides a basis to ascertain the implication of the development process and determine the mitigation measures to be undertaken or suitable to ameliorate the identified impacts.

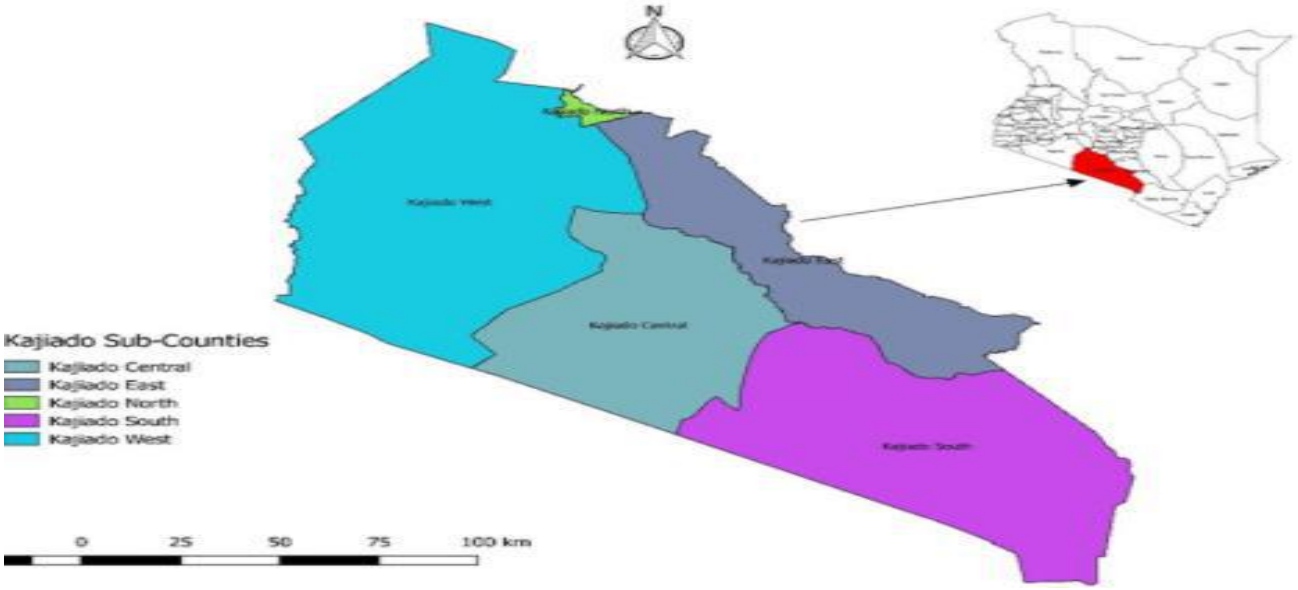
4.1. Location of the Project Area.

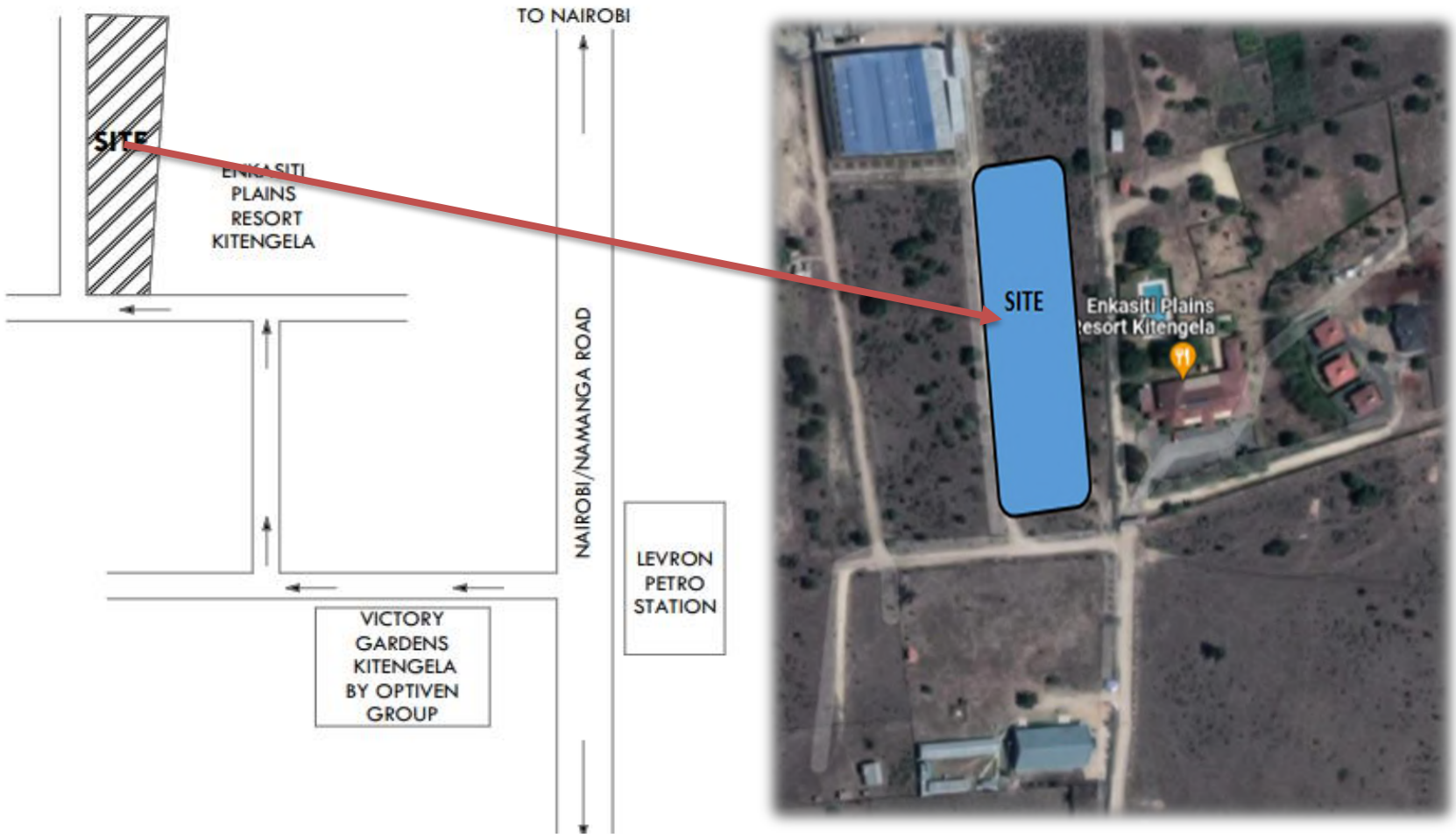
Kitengela is a town located in Kajiado County in the former Rift valley province just 33 kilometres south of Nairobi. The town is part of the Nairobi Metropolitan Area and is one of the 13 urban centres. The proposed land has no any permanent structures within and is secured with a chain link fence with concrete poles of 3M high, it is adjacent to Enkasiti Plains Resort and Ebenezer PCEA .The other sensitive neighbour is the Comfortable Furniture's Limited but the rest of the development are residential developments which are in conformity with Kitengela Zoning Plan.

Kajiado County covers an area of 22,000 km². It borders Nakuru, Nairobi and Kiambu to the north, Narok to the west, Makueni and Kajiado to the east and Taita-Taveta and Tanzania to the south. It lies between latitudes 0º45´South and 1º31´South and longitudes 36º45´East and 37º45´East. Kajiado County is attracting new residents and has in the recent past had new estates and learning institution are coming up to cater for the growing population.

Vital trunk infrastructure required for this type of project is available within the project area immediate vicinity.

Kajiado County Map and Location





Locality map showing the proposed site for the Kitengela Presbyterian Junior High School in relation to other infrastructures (refer to Appendix site plan A3

Photo Plate 4.1-3: The site of the proposed development

The site is has a container used for storage of equipment's and for the caretaker.

4.2. Physical Environment

4.2.1. Climate

The area receives a bimodal rainfall with short rains coming in October to December and long rains in March to May. The annual average rainfall is between 500 mm and 1300 mm, which are unevenly distributed and unreliable. Temperature varies between 18˚C and 25˚C throughout the year. The coldest month is July and the warmest are October and March prior to the onset of the rains. Dry periods are experienced in February to March and August to September.

4.2.2. Soil and Topography including water bodies

The proposed project area has predominantly black cotton soil, deep, and well drained . These soils have good load bearing capacities reducing the cost immensely in foundation designs. The soil is also fertile and can support numerous forms of plants making it ideal for landscaping purposes. The property boarders a seasonal river. In defining the riparian reserves, it states that it is land adjacent to the ocean, lake, sea, rivers, dams, and watercourses as provided under the Survey Act or any other written law" (GoK, 2012).

1969 Survey Act provides that for the survey of public land, a reservation of not less than 30 meters above the high-water mark of the wetlands and riparian area. Similarly, the EMCA regulation 2009 read together with Amendment Regulation 2017 (Conservation and Management of Wetlands) provides that no person shall cultivate or undertake any development activity within a minimum of 6 meters and a maximum of 30 meters of a river measured from high water mark unless with written approval from the Authority. *We recommend the proponent of this said project to abide with these pieces of legislation to avoid future conflicts.*

4.3. Biological Environment

4.3.1. Flora and Fauna

The vegetation of the area in question is mainly acacia trees and savannah grassland. Some Acacia trees are also available. There will be minimal cutting of the same to give way to the new houses and these will be preserved and the Architects will strive to work around them. A landscaping Architect will be engaged so as to introduce more indigenous trees after the construction is completed.

4.4. Environment

Enkasiti area is in a serene environment which has not been disturbed by human development. Situated in Kitengela, the proposed development will have a clean environment with a cool breeze from open lands.

4.5. Socio-Economic Environment

Kitengela town is located approximately 30 Km from Nairobi city within a close proximity to Athi-River town. The area is undergoing great transformation from a nomadic town in the 1990's to a robust town with plenty of urban features. These developments have been occasioned by the growth and expansion of Nairobi and the introduction of the devolve system. Proximity to the city and availability of land for development make Kitengela town ideal for most businesses. This has been amplified by the opening up and upgrading of Nairobi-Namanga road and the expansion of water supply to the centre. The economic activities within Kitengela town and the larger Kajiado County are discussed in the following sub-sections.

4.5.1.1. Livestock and Livestock Products

4.5.1.2. Education

Kitengela hosts major educational facilities including St Monica Academy, Thorn Grove School, White Stars Academy, and Orchard School among others.

4.5.1.3. Mining Quarrying and Sand Harvesting

Kajiado district is endowed with natural resource which includes minerals such as gypsum, limestone, salt and soda ash. Some other minerals, which occur in small quantities, are: granites, diatomite, asbestos, feldspar, garnet gaylussite, kaolin, kyanite, meerschaum, mica, quartzite and wollastonite.

Quarrying of building stones is carried out all over Kajiado County including Kisaju town. The demand for this material is high due to the immigration of people from Nairobi to these dormitory townships. However, quarrying leaves much land derelict

4.6. Population

According to the 2019 population census, Kajiado County had a population of 687,312 inhabitants as compared to 406,054 inhabitants in the 1999 census. Though there has been general population growth in the county, there was accelerated growth in certain parts of the county as compared to others. This was registered in Kitengela alongside other towns like Ngong, Kiserian and Ongata Rongai which are considered as 'dormitory towns' of Nairobi City.

Kajiado town is sparsely populated as evidenced by vast grazing lands and open grasslands that are un-habited. Despite this, the town has been experiencing an influx of people and it is projected that the population in the town will be higher in the future.

After completion and commissioning, the proposed the Institution will accommodate a number of pupils and staff. This will bring with it increased economic opportunities and pressure on various amenities within the area.

4.7. Road and Accessibilities

Presently there are adequate developed access roads for vehicular, pedestrian and bicycle traffic. Most access roads are 6-12 m wide. The proposed site can be accessed from Namanga road l through a local access roads abutting on this road. These will be both for vehicular and pedestrian access.

Though these roads are fairly motorable, plans should be made by the CGK in conjunction with investors in the project area to upgrade these roads to all weather roads to befit middle income residential developments associated with the area.

It is also worth noting that the traffic volume experienced in these roads are invariably way below their optimal carrying capacity thus anticipated additional traffic occasioned by the proposed project will not adversely affect the traffic flow in the neighbourhood. The proponent should collaborate with other property owners and residents of *Enkasiti estate* to push for tarmacking of the access roads to help accessibility especially during rainy season.

Photo Plate : Access Road to the site (Murram maintained road)
Source: Field study February, 2022.

4.7.1.Sewerage and Solid Waste Disposal

Kitengela Town has no public sewer reticulation system. Each individual household manages its own liquid wastes. Liquid waste is managed by use of pit latrines, septic tanks and soaks pit systems. However, waste water can easily leak and pollute underground water resources which can lead to outbreaks of water borne diseases as the area rely on underground water resources.

The proponent has already addressed wastewater management in the design stage of the project by providing a water treatment and recycling facility with sufficient capacity to manage liquid waste. Recycled water will be used for landscaping. Regular checks shall be conducted during the operational stage to determine operational efficacy of the sewer systems to ensure sound environmental health.

4.7.2. Electricity and Telecommunication:

The Kenya Power provide electricity throughout Kenya. The County is promoting alternative sources of energy, such as solar energy, especially to new developers as Kajiado enjoys year-round sunlight which the proponent is highly encouraged to adopt. Electricity supply is accessible from the neighbourhood of the property thus any future demand can be met by the Kenya Power as and when needed.
All mobile telephone providers can be accessed at the site without any difficulties.

4.7.3. Water Supply:

Kajiado County does not have adequate surface water resources for livestock and human consumption or irrigation. To a greater part, therefore, the county depends on ground water reserves. The occurrence of the ground water in the County is mainly influenced by climate and topography as well as origin of underlying parent rock. The other alternative source of water for domestic and livestock are sub-surface resources such as water pans, dams and shallow wells. The amount of surface water varies from area to area.

Kitengela Township and its environs get water supply from community boreholes within the area. This is used both for livestock and human consumption.
The proponent is advised to drill one borehole which are used by the institution. The proposed project will source water from the same borehole and supplement from rain water harvesting.

4.8. Neighbourhood Character

Enkasiti area (where the project is situated) is generally undeveloped with large stretches of open land staying idle. However low density houses and bungalows, are being commissioned in the area as well as resorts and hotels. Within the neighbourhood there is a seasonal stream cutting across the vast lands within the visibility. New realities however suggest increasing densities to recoup investments for developers and also ensuring optimal utilization of the land. Noteworthy is the fact that the proposal is expected to increase the land value of the project area as well as fit in the government policy of providing access to learning institution to all by the year 2030.

Comfortable Furniture Limited

Enkasiti Resort adjacent to the land

Ebenezer Church

Photo Plate: Neighbourhood character

NB: Neighbourhood comprising of;

A: Religious facilities, Hotels, manufacturing firms and open fields

CHAPTER FIVE: PROJECT DESCRIPTION AND ACTIVITIES

In preparation on commencement of the proposed Junior High School and its associated amenities, the proponent begun by securing the property and contacting the firm of experts to assess the area for NEMA license application, followed by the public consultation. After the two processes the contractor will begin the excavation and then construction of the structures. The components of the proposed PCEA Junior High School as shown in the architectural drawings and brief from the client include;

- ✓ Administration Block.
- ✓ Dining Hall
- ✓ Boys Dormitories (Built to five levels i.e. Ground plus four floors hosting 20.No rooms)
- ✓ Girls Dormitories (Built to five levels i.e. Ground plus four floors hosting 20.No rooms
- ✓ Gate House
- ✓ Entertainment Arena and Indoor games facility
- ✓ Teachers Quarters
- ✓ 2.No of Tuition Block- (Built to five levels i.e. Ground plus four floors each with 50 classes)

Each class is expected to host between 20-30 pupils, upon completion the facility will host approximately 1500 students. Other components include sanitary facilities, Entry, Plot boundary, Staircases, Walkways, Landscaping and
Drainage pipes.

- The proposed block has convenience of using staircases.
- Orientation of the block allows easy access and exit from the building.
- Passages/ walkways are wide to cater for emergency exit.
- The design ensures compliance with development requirements, legislative and infrastructural capacities.
- The proposed facility block has been set (on average) six meters away from the plot boundary. This caters for easy circulation and inspection whenever need arises. This provides a buffer corridor to minimize fire risks in cases of emergencies.
- Ample landscaping shall be instituted at the proposed development to restore the lost vegetative cover.

The building and site plans of the proposed Development are annexed in the report.

5.1. Nature of the Project

The project is a ground breaking one as the site is virgin and has not been used for any other development before. The proposed project is a medium impact one and will not exert severe negative impacts on the environment. However there is mitigation measures on the possible negative ones in the EMP covered in this report thereafter

5.2. Proposed Site Ownership

The land is registered under the Registered Land Act, (Chapter 300) under PCEA Kitengela Township Church of P.O. Box 228-00242 Nairobi. The land is under freehold
Ownership documents are annexed in the appendices.

5.3. Project Alternatives

In deciding on the type of development to be included in the project, the proponent considered various alternatives. Four options were considered as outlined below. Despite a number of detailed technological alternatives at project proponent's discretion, the technology adopted in this project is informed by conventional building trend in the project area. It's worth noting that only those alternatives with the potential to materially affect the outcome of the environment have been discussed here.

5.3.1. The "No Project" alternative.

Without the proposed development, the subject plot would remain in its current underutilized state. Advantage associated with this are that there would be no negative implications on the environment brought about by implementing the project. However the disadvantages of a no project alternative 'outweigh the advantages. This are;

- The proponent would be in a loss financially since they have already invested a lot of resources in terms of professional and statutory fees.
- The Statutory bodies and professionals firms engaged in the project would lose out on potential revenue.
- The proponent will lose an investment opportunity.
- There will be no employment opportunities created
- There will be no contribution to the shortage of learning centres which is problem within the area
- The government will lose revenue inform of taxes

5.3.2. Alternative site

There is inadequate junior secondary school nearby, the area less junior secondary school which are unable to accommodate all learners within the area. The area chosen for the development of the school was determined to be the most feasible in terms of accessibility and have the lowest impact with regards to vegetative clearing and any disturbance on watercourses. Therefore, the proposed site was deemed suitable for the proposed school and no location alternatives were therefore investigated

5.3.3. Alternative Land Use

The proponent has an option to use the land for other purposes other than proposed commercial use. This option however calls for change of user as the project area is currently zoned as an Agricultural zone. Change of user from Agricultural to other uses will still have some potential impacts some even worse than the proposed project depending on their nature.

5.3.4. Technology Alternatives.

Consideration of such alternatives is to include the option of achieving the same goal by using a different method or process (e.g. to reduce resource demand and increase resource use efficiency.) In a building type development, technology could be applied to enhance energy efficiency, water saving, waste management etc., depending on the nature and scale of the development. Within this context, traditional energy options (i.e. electricity) and technology options (i.e. building materials) have been considered and included in the proposed design. Rainwater harvesting from roofs (for small-scale storage and irrigation requirements at the school) will

be incorporated as an additional technology incorporated into the technology design. No further technology alternatives were considered.

5.3.5. Activity Alternative

The project entails the construction of a Junior High school, the site is to provide a service to the rural residents in this area whom do not have enough school facilities: No reasonable or feasible alternatives in terms of the type of activity to be undertaken were therefore be investigated.

5.3.6. Design/ Layout alternatives

As there have been no identified highly environmental sensitivities on the property, no design alternatives have been considered. The proposed design maximises the school layout in terms of the site footprint.

5.3.7. Operational Alternative

Not applicable to this type of development.

5.3.8. No-go alternative

The No-go option implies that the Project does not proceed, and will thus comprise of the requirements of Ministry of Education not going ahead with the construction of the new proposed Junior High School. Ideally this would be the preferred alternative as the status quo of the environment remains unchanged, however due to the growing demand for education facilities in the area, this alternative is not feasible. Although the no-go alternative has been considered, it is not a practical project alternative in terms of providing stable service delivery supply in the area as it implies a continuation of the current situation or the status quo; therefore, it doesn't render any positive outcomes.

5.3.8.1. Bulk Services Requirements

Potable Water: According to the visual assessments conducted, there is no bulk potable water supply source within the allocated site. Due to the unavailability of bulk and potable water, there is an opportunity to explore the possibility of boreholes. Including an elevated tank for storage purposes. (Important note: If water

abstraction from a borehole becomes an intended need, the Project applicant/developer will need to officially enquire and clarify with the relevant authority relating to any potential authorization and registration processes and requirements for any use of borehole water (i.e. groundwater)). An alternative will also be rainwater harvesting from roofs for small-scale storage and irrigation requirements at the school will be implemented using pipes connected to roof gutters directed to temporary storage tanks. Further assessments and studies will provide more details on the status of bulk water supply, as alluded to above.

Sewage There is no sewer system within the community. Schools nearby use pit latrines for sanitation purposes. It would seem that toilets will be recommended during the Preliminary design stages. The accommodation schedule issued by the Public Health Department will be used in this regard.

Storm water Management As per visual assessment, there is slight gentle slope towards the seasonal stream. All the storm water generated from the rain is flowing downstream towards the stream. The storm water management plan will be part of the new design. One of the options is to harvest the storm water generated from the buildings' roofs to be collected by means of gutters and downpipes into strategically positioned storage tanks for use as potable water. Storm water generated from paved areas will be collected into catch-pits, and then linked to the main collectors, while storm water on open grassed areas percolates into the ground or flow as sheet flow until coming into contact with catch-pits which then links to the main collectors.

Waste Management:

The construction phase will result in the generation of some excess spoil material and building and demolition waste. This is however expected to be of relatively minimal quantities. Construction sites will be contained and all related waste generated during the construction phase will be removed to Disposal Site. Construction rubble (excess cement/concrete) will also be removed to a registered landfill site. All waste material categorized as recyclable may be donated to the local SMME's within the area.

5.4. Construction process

The preparatory activities to be undertaken at the site will be site clearance followed by the excavation of the site to create trenches for use in laying footings for the development. Foundations will then be laid, and eventually the building.

There will be use of machinery mainly for concrete mixing and lifting installations during the construction.

5.4.1. Sourcing and Transportation of Building Materials

Building materials will be transported to the proposed project site from their extraction, manufacture, or storage sites using Lorries. Greater emphasis will be laid on procurement of building materials from within the local area which will be economical and environmental friendly as this will reduce the negative impacts of transportation of the building materials.

5.4.2. Storage of materials

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

5.4.3. Excavation and Foundation works

Excavation will be carried out to prepare the site for construction of foundations, pavements and drainage systems. This will involve the use of heavy earth-moving machinery such as bulldozers, tractors as well as human labour.

5.4.4. Electrical Work

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

5.4.5. Plumping

Installation of pipe-work for water supply and distribution will be carried out within the premises. In addition, pipe-work will be done to connect waste water and sewage from the premises to drain to the underground onsite

waste water treatment plant. Plumbing works will also be done to drain storm water from the rooftops. Plumbing works will include metal and plastic cuttings, the use of adhesives, metal grinding and wall drilling among others.

5.4.6. Landscaping

To improve the aesthetic value of the site once construction work is over, landscaping will be carried out by the proponent. The proponent is advised to use plant species that are available locally preferably indigenous ones for landscaping.

5.5. Description of the Project's Operational Activities

5.5.1. Solid Waste Management

During the operation phase solid waste will be generated from the housing units. The proponent and occupants will seek to hire a private licensed solid waste collection company, who will collect solid waste at least five (5) times per week to reduce the impact on the local collections services. All refuse and debris generated from this phase of the development will be properly transported and disposed of at the nearest licensed solid waste facility.

5.5.2. Waste Water Management

The proposed development will generate substantial quantity of waste water. The area has no reticulated sewer system in place and as such waste water will be disposed off into a waste water treatment facility that is proposed as part of the development. This will be made of concrete to prevent seepage of waste water into underground water. This is because there's substantial reliance on borehole water by the residents within Ildamat area and as such a septic tank/soak pit would not be appropriate.

5.6. Infrastructure to Service the Site

5.6.1. Accessibility

There will be no establishment of new access roads to serve the development since the project area is well served by a good road network. The site is accessible from Namanga road via local access road abutting two boundaries of the project land parcel. The access roads are 6-12 m wide and are thus able to accommodate all abutting

developments including the proposed facility. The access roads need to be upgraded so that they can be passable at all times. The site frontage shall be paved with 50mm thick standard porous paving blocks based on council's adoptive standards.

5.6.2. Power

Electricity supply is accessible from transcending KPLC power grid. However, the proponent will need to apply to KPLC to be connected to the existing grid. Information sought from KPLC Kajiado office confirmed capacity of the transcending line to meet the anticipated energy demand.

5.6.3. Water Supply

The existing developments within Enkasiti estate get their water supply from private boreholes within the area. The proponent will one boreholes and he/she will institute rain water harvesting. The proponent will be encouraged to install tank(s) with storage capacity of between 3-7days use.

5.6.4. Health Facilities

Many private health facilities are within the reach of the project site.

5.7. Description of the Project's Decommissioning Activities

5.7.1. Demolition Works

A third phase of the project i.e. decommissioning is possible. A number of factors may contribute to the need for decommissioning including;

- End of project life,
- An order by a court of law due to non-compliance with existing regulations,
- Change of user,
- Natural calamities, among others.

Upon decommissioning, the project's building, pavements, drainage systems, parking areas among others will be demolished. This will produce a lot of solid waste which can be re-used for other construction works or if not re-usable, disposed off appropriately by a licensed waste disposal company.

5.7.2. Dismantling of Equipment and Fixtures

All equipment including electrical installations, finishing fixture partitions, pipe-works 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/ contractors or donation of these equipment to schools, churches and other charitable organizations.

5.7.3. Site Restoration

Once all the demolition and dismantling works are over and the wastes removed from the site, there will be restoration of the site through replenishment of the top soil and re-vegetation using indigenous plant species.

5.8. Project Budget

5.8.1. Overview

The estimated cost of construction for the above project based on the prevailing construction market rates amounts to *Kenya Shilling* ***One hundred and fifty million, eight hundred thousand (150,800, 000) only.***

CHAPTER SIX: PUBLIC CONSULTATION AND PARTICIPATION

6.1. Public Participation and Neighbourhood Perception

Public Participation Process (PPP) is a policy requirement by the Government of Kenya. It is a mandatory procedure as stipulated by EMCA 1999 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development.

During the field survey for the proposed development of a Junior High School, public consultation formed an integral part of project development. This was done pursuant to the Environmental Management and Coordination Act CAP 387. Section 17 of the Environmental (Impact Assessment and Audit) Regulations of 2003 amended 2016, requires that all E&SIA Studies incorporate Public Consultation (PC). The aim of the PC is to ensure that all stakeholders interested in a proposed project (including project beneficiaries and the general public in the vicinity of the proposed project) are identified and their opinion considered during project planning, design, construction, operation and decommission phase.

6.1.1. Overview of the Public Participation.

Community Consultation and Public participation is a key part that aims at involving the public in the project development and implementation. The main aim of public participation is to ensure a participatory approach in development which ensures acceptability of the project by the community and neighbours and any uncertainties addressed. For this proposal public participation conducted involved: enlightening the public on the proposed development documenting their opinions and views from the meeting.

During the writing and preparation of this ESIA on the proposed project site, the project team and experts visited the site and assessed the suitability of the site to the proposed project. The team and ESIA expert also visited the community and held consultative meeting with more than 30 community members and neighbours about the proposed project. The minutes of the meeting

together with photos and attendance list are provided in this ESIA report and is annexed at the end of the ESIA final report.

Further consultation was done through the use of **22** semi structured questionnaires that were randomly given to the area residents around the nearest neighborhood 0.5-2km away. The respondents were mainly residents or villagers and had resided in the area for a period of between 2 months-35 years. Out of those interviewed, 5% were not aware of the proposed project while 95% were aware of it. Mostly, the respondents had the same views on the impacts associated with the development, however, some respondents had different opinions of importance that would arise as a result of the implementation of the proposed project development.

The exercise was conducted by a team of environmental experts to members of the public within the proximity of the site and property owners within the project area. Public consultations executed rated the project as highly acceptable. The perceived benefits were as follows: -

6.1.2. Opinions of the Neighbours

6.1.2.1. Positive Impacts of the Proposed Project

- Education facility will be closer to the residents hence reduce cost and time used to access these facilities elsewhere
- The proposed project will increase the number of higher education facilities in the County of Kajiado.
- The project will open up more investment opportunities for complimentary facilities like student hostels within Kitengela area
- The construction of the facility will create employment opportunities both at Design, construction and operational phases
- The development will be a source of income to the proponents.
- Physical growth/ development of Kitengela town in general.
- There will be an improve in aesthetic and development in the area.

6.1.2.2. Negative Impacts of the Proposed Development

The respondents also cited the following as possible problems or negative impacts which could arise from the proposed project. The following concerns were raised by neighbours in relation to the proposed development

- Noise from the construction site arising from movements of machineries.
- Generation of dust temporarily during the construction time.
- Degradation of the soil
- Waste generation (solid and liquid wastes)
- The project will require huge volume of water which might lead to water shortage
- During construction phase some accidents might occur
- Child protection.

6.1.3. Recommendations of the Neighbours.

- The proposed Construction site should be fenced off and signs indicating a construction going on mounted to condone the area from unauthorised trespassers
- The institution should have CCTV Cameras to monitor the activities of the school.
- Collection and appropriate disposal of solid waste and construction debris from the construction work and materials.
- Ensure construction work is undertaken during the day.
- Ensure that the site developments are carried out during the day time only.
- The proposed site should be watered to prevent huge generation of dust
- Ensure monitoring and control of vehicular movements.
- Water harvesting and Solar power utilization
- Avoid necessary excavations and other soil disturbances that can predispose it to agent of erosion.
- Adequate and properly designed waste/grey water treatment and disposal system overall, the community recommended the implementation of the project

Project Manager addressing the Participants and introducing the project to the stakeholders.

Area Assistant Chief addressing the various stakeholders during the Public Baraza forum.

Church representative addressing the congregation, explaining the plan of the church to decongest the current School in Kitengela Town.

CHAPTER SEVEN: IMPACTS IDENTIFICATION & MITIGATION

7.1. Introduction:

This chapter identifies probable anticipated impacts of the project, their analysis and mitigation measures. Implementation of proposed building will have both positive and negative impacts resulting from activities carried out during Construction, Occupational and Decommissioning phases of the project. Mitigation measures give ways of reducing or avoiding adverse environmental impacts of the project.

7.2. Description of anticipated impacts.

7.2.1. Anticipated impacts

An impact assessment was undertaken following full characterization of the environmental and social baseline, and identification of all project aspects. The anticipated impacts of the proposed project on the environmental elements are both positive and negative.

The magnitude of each impact is described in terms of being significant, minor or permanent, short-term or long term, specific (localized) or widespread, reversible or irreversible. The scope of the assessment will cover the proposed project site, and will be undertaken in accordance with, the National Environmental legal requirements, and guidelines triggered for the project. All the relevant environmental, social and economic aspects will be identified for the proposed activities, the activities will be considered in terms of their potential to interact with the (physical, biological, socio-economic) environment. The ESIA project report shall distinguish the impacts through the following phases.

- Construction.
- Operation.
- Occupation Phase.

Most of the impacts have been addressed in the proactive design of the project and other mitigation measures can only be guaranteed through active and responsible management committed to the propositions of the environmental management plan.

7.3. Potential Impacts

Assessment of impacts depends on the nature and magnitude of the activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the mitigation measures. The proposed development consists of a modern Junior High School. In order to support the aforementioned functions of the institution, the following facilities are incorporated in the pro-active design of the proposed blocks: Entry and Exit Gate; Staircases; Plot boundary; Walkways; Drainage pipes; and Parking area.
Other by-products from the project include:

- Increased surface water runoff
- Increased traffic
- Increased resident population
- Increased waste water discharge
- Increased solid waste generation

As a result anticipated potential impacts shall be experienced on the project area, within the neighbourhood and multiplier effects on small scale shall transcend the zone. For the purpose of writing this report, potential impacts (whether direct, indirect or ultimate), are assessed based on their timeframe (short-term or long-term) and effect (positive or negative). Impacts are also classified in three groups: Impacts due to project location: Impacts as a result of project construction and Impacts as a result of project occupation.

7.4. Positive Impacts

The projects' undertaking with a strong capital outlay shall exert great economic transformation on the site and by extension Ildamat area. Its operation shall lead to:

7.4.1. Increased Revenue to the National and County Government

The approval, issue of permits and other fees shall guarantee County Government of Kajiado income. The National Government through the department of lands shall also benefit through increased rates occasioned by improved site value.

7.4.2. Employment Opportunities

The site contractor shall utilize about 10 to 20 people on site during construction phase. On completion the project will provide job opportunities including security personnel, gardeners, house helps and many others who will be involved in the day to day running of the facility and to undertake maintenance. This shall provide openings for the otherwise unemployed youth.

7.4.3. Increased Educational facilities in Kajiado area

The proposed development shall increase the number of educational facilities to cater for the needs of the increasing population. In the long run the project shall occasion extension of infrastructure and capacities of utilities serving the neighbourhood.

7.4.4. Improved Infrastructure

Project activities will lead to improvement of transport, water supply and telecommunication networks. Such services are a prerequisite to development in any region

Other notable benefits include:

- Creation of market for goods and services;
- Improvement of social interaction;
- Increase in land value of the subject plot and the neighbouring plots.

7.5. Impacts during Construction & Occupational Phases

Construction and Occupation phases of the proposed development shall have a bearing on site physiography, utility services such as water and electricity, space use and densities, the horizon profile and human aspects that espouse labour, incomes and new opportunities.

7.5.1. Change of Land Use

A transect survey of the project area depicts emerging high rise building trend. As a result, the proposed project setting does not occasion an out of character situation as developments within the project immediate vicinity constitute of both low and high-rise developments.

Noteworthy is the fact that the proposal is expected to increase the land value of the project area as well as fit in the government policy of providing affordable education to all by the year 2030. Packets of undeveloped land parcel sandwiched between developed plots are slowly fading away as more construction projects are being commissioned in the neighbourhood.

Mitigation of Measures for Change of Land Use

- ✓ Institute a compatible development that fosters continuity of the neighbourhood character
- ✓ Comply with regulatory and legal requirements. To this end, the approval process of the change of use and building plans has followed an elaborate process to ensure that the project proposal meets the necessary approval standards. The assessment has ensured that all activities proposed on site are compatible with the neighbourhood.

7.6. Impacts Due To Project Construction

Project constructions typically change the natural environment, creating negative impacts in some cases. However, these are short-term impacts of low magnitude, which are easily managed.

7.6.1. Loss of Habitat and Biodiversity

An immediate and most adverse environmental impact to the area would occur during the preparatory phase which calls for clearing of the site for the proposed development. The removal of existing vegetative cover

will result in irreversible loss of natural habitat for flora and fauna particular to the area. The proposed development will have negative effects on the composition of natural plant species both on site and neighbourhood. Compacting, levelling and site improvement creates new conditions that limit regeneration.

Mitigation measures

The loss of habitat and negative impacts on the local biodiversity are obvious adverse consequences of any proposed development. Mitigation calls for protecting and restoring of as much of the original condition on the development site as possible. Additional measures must be considered to further minimize negative impacts on the terrestrial ecology in the area:

- ✓ A landscape plan should be developed by a landscape architect who would include action items corresponding to each phase of the project ensuring gradual, albeit partial and restoration of the site's ecological characteristics.
- ✓ Roof gardens and other plant enhancement strategies shall be adopted.
- ✓ Set up barriers to prevent off-road driving

7.6.2.Pollution

- Impact on water quality
- Impact on air quality (including dust generation)
- Noise pollution

7.6.2.1. Ground Water Quality Degradation

No impact is expected on piped water, since this will be directly supplied and stored on site. Surface water however, may be impacted as follows:

- Chemical contamination from construction materials such as cement, paint and mechanical fluids and
- Increased siltation caused by surface runoff (as a result of the removal of vegetation and the stacking of raw materials e.g. sand).

Mitigation Measures for Ground Water Quality Degradation

During the construction phase, run-off from the site will not be allowed to stagnant or enter directly into trenches. In order to reduce run-off contamination to ground water, grease traps will be used to intercept wash out of spilled oils from entering drainage areas.

7.6.2.2. Impact on Air Quality

Potential impact on the air quality during the construction stage will be due to the fugitive dust and the exhaust gases generated in and around the construction site. Dust is a major component of air pollution, generated mainly from the following construction activities:

- Site clearance
- Use of heavy vehicles and machinery/equipment etc. at construction site,
- Procurement and transport of construction materials, such as sand and cement to the construction site and
- Excavated materials (soil) stockpiled.

Mitigation Measures for Air Pollution

- ✓ All the loose material, either stacked or transported, shall be kept on site for the shortest possible time and provided with suitable covering, such as tarpaulin
- ✓ Water sprinkling shall be done at the location where dust generation is anticipated
- ✓ To minimize the occupational health hazard, proper personal protective gears i.e. dust masks shall be provided to the workers who are engaged in dust generation activities
- ✓ To control vehicular emissions, a system shall be put in place constituting the following guidelines:
- Diesel powered construction equipment with engine horsepower (HP) ratings of 60 HP and above, that are on the project for a period in excess of 30 consecutive calendar days, shall be retrofitted with emission control devices and/or use clean fuels to reduce diesel emissions
- In addition, all motor vehicles and/or construction equipment shall comply with all pertinent National regulations relative to exhaust emission controls and safety
- The reduction of emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), and particulate matter (PM10) will be accomplished by installing Retrofit Emission Control Devices or by using less polluting clean fuels.

7.6.2.3. Noise Pollution

Noise is perceived as one of the most undesirable consequences of any construction activity. Though the level of discomfort caused by noise is subjective, the most commonly reported impacts of increased noise levels are interference in oral communication, and disturbance in sleep. Due to the various construction activities, there will be short-term noise impacts in the immediate vicinity of the project corridor, which may exceed acceptable limits and reach nuisance levels for residents. These include among others:

- Concreting and mixing,
- Excavation for foundations with driller (if used) and
- Heavy vehicle movement (e.g. Lorries).

Since the project site is surrounded by residential properties, some impacts are envisaged in the project area. But, the noise levels are not expected to exceed occupational limits; therefore no adverse effects on employees should result. Nonetheless, noise control procedures will be introduced when necessary.
During the construction stage, expected noise levels shall be above 85dBA, which will decrease inversely with the increase in distance from the site.

Mitigation Measures for noise Pollution

- ✓ Silencers and mufflers should be affixed to the exhaust systems of all mechanical equipment being used on the project site.
- ✓ Any activity that is deemed noisy and maybe a nuisance to the neighbours shall be scheduled at times least likely to affect those within hearing distance.
- ✓ Isolation of the source and sensitive receptors during the construction phase will be undertaken to minimize the impacts of noise and vibration.
- ✓ To prevent any occupational hazard, earmuff/earplug shall be provided to the workers working around or operating machinery emitting high noise levels.

7.6.3. Incidents, Accidents and Dangerous Occurrences/ Health and Safety

The construction phase may generate safety hazards in relation to increases in traffic and access to the construction site (if not adequately controlled), and potential health impacts and nuisance factors due to noise, dust, vibrations and gaseous emissions.

Mitigation measures

- ✓ Remove and cart away earth works as soon as it's generated
- ✓ Warning signs of construction work in progress should be displayed
- ✓ The contractor should maintain a regular inspection schedule with the CGM to certify and conform to standards set
- ✓ Fence off the construction site
- ✓ Appoint a safety supervisor.
- ✓ Machines to be operated by qualified personnel only.
- ✓ All machinery and other moving parts of machinery must be enclosed/ guarded to protect against injury.
- ✓ Warning and safety signage indicating that construction is in progress should be clearly shown
- ✓ Provide fully equipped First Aid Kits
- ✓ Install safety net to protect workers against falling objects
- ✓ Medical check-up for all workers prior to and throughout the construction phase
- ✓ Persons providing food for workers at the site must have all the necessary Public Health Licenses
- ✓ Contractor should provide a section within project site with a shade and clean water where food will be served
- ✓ Provide a mobile toilet on site for construction workers
- ✓ Use stable ladders and other climbing/support structures
- ✓ Provision must be put in place for a Health and Safety committee with representatives from workers and employer

7.7. Impacts Due To Project Occupation

The proposed learning institution shall provide housing services within the neighbourhood. The occupation of this facility shall occasion activities that would cumulatively generate grave impacts on site if measures to ameliorate them are not instated properly.

7.7.1. Increased Waste Generation

The cumulative provision and consumption services generate wastes. These wastes must be carefully managed to avoid inconveniences and minimize environmental hazards. The kitchens and toilets plus parking yard present potential source of pollution. Both liquid and solid waste shall transcend during the occupation period.

7.7.1.1. Solid Waste

It is expected that a certain quantum of solid waste will be generated during the occupation phase of the proposed development which will include bio-degradable and non- biodegradable wastes. Solid waste if not well managed have a potential of causing diseases outbreaks due to suitable breeding conditions for pathogens and have long term effect on the environment.

Mitigation measures

- ✓ Create awareness on the solid waste integrated management programme to all staff and students
- ✓ Provision of bins, one for bio-degradable and another for non-degradable matter. These will be strategically placed within each floor
- ✓ Private refuse handlers should be hired to facilitate waste handling and disposal
- ✓ All the wastes will be disposed appropriately as per the CGM by-laws.

7.7.1.2. Visual Impacts

The building has relatively greater height and towers over other single family units neighbouring the proposed site. Like other high-rise buildings within the project area it shall be visible within the project area and beyond. The visual feel associated with the site and screen effect caused by the structure's elevations shall greatly interfere with the natural landscape. Sentimental value that translates to tranquillity and relaxation shall give

way to constrained space as well as infringe of privacy of adjoining low-rise developments. This transformation of the site could set precedence that shall guide preferred housing typology of adjacent undeveloped plots. In the long run it shall occasion neighbourhood transformation and envisaged development density.

Mitigation measures

- ✓ The proponent shall engage the services of a landscape architect on preferred finishes that enhances visual outlook, uniqueness and visual appreciation.
- ✓ Other site improvements shall be undertaken to enhance neighbourhood aesthetics.

7.7.2. Increased Traffic Flow and Conflicts on the Access Road

As an educational centre the development, the site shall contribute to the generation of traffic though at a minimal level which will not create conflicts or pile ups.

Mitigation Measures

- ✓ Comply with all applicable legislation and by-laws with regard to road safety and transport.

7.7.3. Increased Pressure on Trunk Infrastructure

The occupation phase of the proposed facility will lead to:

- Increased water demand hence exerting pressure on the existing water supply.
- Increased demand on electricity for lighting, cooking, cooling of units and running of electric equipment and gadgets.
- Strain on existing drainage system is also envisaged as the building roof and pavements will lead to increased volume and velocity of storm water and/or run-off flowing across paved area(s). This will lead to increased amounts of storm water entering the drainage systems, which might result into overflow, erosion or water logging in the neighbouring plots and access roads which may cause damage of the existing drainage systems.

Mitigation Measures

- ✓ Water conservation taps that turn off automatically when water is not in use shall be installed.
- ✓ Sensitize the residents on efficient water use.
- ✓ Paving of block and site frontage and any other open area should be done using pervious materials like concrete blocks as this will encourage water percolation.
- ✓ Ensure shared electrical equipment, appliances and lights are switched off when not being used.
- ✓ Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy.
- ✓ The proponent should join hands with the other property owners within the neighbourhood to form lobby groups to pressurize the government and other non-governmental organizations to improve the access roads serving the neighbourhood.

7.7.4. Incidents, Accidents and Dangerous Occurrences/ Health and Safety

Due to increased and diverse activities within and around the building, unexpected eventualities might occur. It is important to be adequately prepared to prevent and counter such incidents like fire outbreaks and/or occupational related accidents that may lead to injuries, loss of life and property.

Mitigation Measures

- ✓ Install automatic fire alarm system for the entire development.
- ✓ Set up 500 litres fire reserve water tank attached with an automatic booster pump for horse reel.
- ✓ Adequate means of fighting electrical fires will be provided by means of carbon dioxide (Co_2) fire extinguishers or dry powder fire extinguishers.
- ✓ Use of non-oil paints is highly recommended to prevent fast spread of fire in case of an outbreak.
- ✓ In addition to the above, the project management should ensure that all firefighting equipment's are strategically positioned, regularly maintained and serviced.

7.8. Decommissioning Phase Impacts

Decommissioning is an important phase in the project cycle and comes as the last step to wind up the occupation activities of a particular project. The main purpose of decommissioning is to restore/ rehabilitate the site to acceptable standards.

Quality and standard projects of this nature have a lifespan of between 30 to 50 years which is much dependent on the maintenance measures. This is long period of time and there may be many changes which may not be foreseeable. The following factors may lead to decommissioning of the proposed development:

- Technological aspects
- Legal aspects.
- Change in physical planning policy
- Discovery/realization of a more optimal use of the land.

It is therefore recommended that an EIA be conducted when the time for decommissioning comes so that all aspects will be looked at in totality against the prevailing conditions and requirements.

The decommissioning will in brief involve demolitions of structures, removal of debris and landscaping. The other social implications involve laying off workers who may be employed thus will lose their income; Issues of safety and health etc.

CHAPTER EIGHT: ENVIRONMENTAL MANAGEMENT & MONITORING PLAN (EMP)

8.1. EMP outline

This section outlines a vital EMP output which constitutes the final output of the environmental impact assessment exercise. The EMP extended herein provides a checklist of the proposed development monitoring and evaluation parameters. Noteworthy is the fact that considerable provisions have been made for dynamism and flexibility and therefore the EMP outlined herein will be subject to a regular regime of periodic review.

Tables 8.2- 8.5 have addressed the identified potential negative impacts and mitigation measures of the proposed development through a tailor made systematic approach for planning, construction, occupation and decommissioning phases.

In a nutshell, the Tables outline the potential safety, health and environmental risks associated with the project and detail all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring.

The EMP will be used as checklist in future environmental audits.

8.2. Planning Phase EMP

The planning phase involves all the steps to be followed by the proponent before the start of construction. This includes the approvals from all the relevant authorities such as the County Government of Kajiado through the Sub County Administration of Ildamat and NEMA.

Foremost, the EMP ensures that the proponent shall have undertaken and obtained all the requisite approvals and procedures before the actual implementations of the proposed project.

Table 8.2: **EMP for the Planning Phase of the Proposed Development**

Time Frame	Environmental Issue	Mitigation Measures	Actors
Planning Phase	Obtaining Development permission as per the County Government Act and the Physical Planning Act	-Proponent to appoint a registered Physical Planner to undertake change of use application. -Registered Planner to consult all the relevant agencies to obtain development permission for the project.	Proponent Registered physical planner
	Building designs as per the building code	-Proponent to appoint an Architect for the project. -Building plans to be designed and submitted by a registered architect. -Building plans to be submitted to CGM prior to the commencement of the development.	Proponent Registered Architect Project contractor
	Environmental Impact Assessment License	-Proponent to appoint NEMA registered Lead Experts to undertake the report. -Undertake an Environmental Impact Assessment project report. -NEMA to issue Environmental License on approval of the project.	Proponent Environmental Lead Expert NEMA

	Environmental Awareness	-Position environmental awareness notices and message at the entry to the construction site. -Formulate an Environmental Policy.	Proponent Environment Lead Expert
	Ensure proper construction workmanship as per approved plans and conditions	-Proponent to appoint Main Contractor for the project. -Supervision of construction work.	Proponent, Contractor, Engineer, County building inspectors.
	Ensure effective site management as per approved plans and conditions.	-Appointment of Site Foreman. -Appointment of Clerks of Works.	Contractor
	Make adequate provisions for accidents and disasters on site.	-Obtain insurance to cover all accidents including Workmen's Compensation.	Proponent

8.3. Construction Phase Environmental Management and Monitoring Plan

Table 8.3: EMP for the Construction Phase of the Proposed Development.

Predicted Environmental Impacts and Proposed Mitigation Measures	Mitigation Period	Responsible Party	Budget (Ksh)	Verifiable Indicators

Loss of Habitat and Biodiversity				
Demarcate and delineate areas to be affected by the construction work. Set up barriers to prevent off-road driving. Conducting site clearing activities in stages to minimize the area of exposed soil.	During early stages of construction phase	Contractor / project manager	100,0000	Selective excavation Off- road barricades
Destruction of the Soil Structure, Landscape and Change in Drainage Patterns				
Control earthworks Install drainage structures properly Compact loose soils Ensure management of excavation activities especially during rainy conditions	Throughout construction phase	Contractor Project	350,000	Landscaped garden Paved walk ways The number of
Enclose the site with dust-proof net or iron sheets to provide buffer against dust propagation. Control speed of vehicles ferrying materials and wastes from the site	Through out construction phase	Contractor, Project manager	250,000	Workers have dust masks and other PPE

Spraying of dry soils in excavated areas and access road to suppress dust. Regular maintenance of construction equipment/ machines Construction activities to be restricted to daytime (008-1700hrs) only Workers in the vicinity of high-level noise to wear safety & protective gear. Affix Silencers and mufflers on exhaust systems of all mechanical equipment Stacked building material on-site shall be kept for shortest time possible.		Public Health.		Enclosed construction sites Efficient construction equipment/ machines No overstaying of stacked building materials on site
Increased Traffic Volume & Conflicts				
Use appropriate signage to control the flow of traffic to and from the site. Sensitize drivers to ensure they abide by traffic rules and defined speed limits. Implement regular maintenance programmes on construction vehicles and machines to reduce emissions and noise. Prohibit off street parking within the access roads.	During construction phase	The Works Officer The County Engineer	100,000	-Speed pumps along access roads -A walkway and separate paved motorist access -Parking bays

		Proponent		-No off street parking within the access road
Stacking of Construction Waste On-site				
Minimize waste generated through hierarchy of options: source reduction, recycling, reuse, combustion and sanitary land filling Segregate wastes by separating hazardous waste from non-hazardous wastes The contractor should adhere to bill of quantities to avoid wastage Provide adequate number of suitable solid waste containers Securely bundle and label hazardous waste Sub-contract an agent licensed by NEMA to clear the site debris Provide adequate number of sanitary facilities	During construction phase	Proponent Project manager	150,000	-Non-existence stock piles of wastes on site -Separated waste securely bundled and labelled -Adherence to bill of quantities -Availability of adequate number of waste containers

				-Adequate number of sanitary facilities.
Incidents, Accidents and Dangerous Occurrences/ Health and Safety				
Avail Warning signs of on-going construction work Maintain a regular inspection schedule with CGM Fence off the construction site Appoint a safety supervisor. Machines to be operated by qualified personnel only. Ensure All machinery and other moving parts of machinery are enclosed or guarded Provide fully equipped First Aid Kits Install safety net to protect workers against falling objects. Undertake Medical check-up for all workers Food for workers to be supplied by vendors licensed by Public Health office Provide a mobile toilet on site Use stable ladders/ support structures.	Through out construction phase	Proponent Workers on site Labor Office Kajiado Occupation and safety officer Kajiado	200,000	-Marked emergency exist -Fire hydrant and extinguishers -Labelled building alarm system -Presence of mobile toilet -Presence of fully equipped first aid kits -Ladders & support structures on site

Make Provision for a HSC with representatives from workers and employer.				Presence of a HSC committee
Occupational Phase Environmental Management and Monitoring Plan **Table 8.4: EMP for the Occupational Phase of the Proposed Development.**				
Increased Waste Generation: Solid Waste and Wastewater				
Provide adequate number of suitable solid waste containers for every unit and floor Provide bins, one for bio-degradable matter and another for non- biodegradable Contract a waste dealer registered with NEMA to collect solid waste from the site Conduct regular checks on onsite wastewater treatment facility for blockages/damages Monitor effluent quality regularly to ensure that the stipulated discharge rules and standards are not violated	Throughout occupation period	Proponent CGM Clients	150,000	-Existence of treatment works. -Waste bins -Clean sanitary facilities -Number of times collection is done

Ensure proper hygiene and cleanliness of the common sanitary facilities				-No blockages/ damages on the treatment facility
Visual obstruction and changed horizon. Infringe on privacy of adjoining developments				
Engage the services of a landscape architect on preferred finishes that enhances visual outlook, uniqueness and visual appreciation. Design & incorporate a screening effect that blocks direct views of the neighbouring plots from the terraces and upper windows of proposed units Harmonize detail, material and finishes for roofs and walls with existing developments in the neighbourhood	Inception stage Design phase Construction Phase Occupation phase	Proponent Contractor Project architect	100,000	-Visual outlook and uniqueness of the proposed development -No direct views of the neighbouring plots from the terraces & upper windows
Increased traffic flow and conflicts on the access road				

Provide sign posts to guide motorists Liaise with the roads department to improve on safety.	During Construction and Occupation phases	Transport planner Proponent Works Officer County engine er	50,000	-Speed pumps along the access road -A walkway and separate paved motorist access
Increased Pressure on trunk infrastructure; Energy, Water etc.				
Supplement water supply with onsite water reservoirs and rainwater harvesting systems Construct a modern waste water treatment facility on site for wastewater management and repair the supply system Correct leakage and water loss Use energy saving systems (bulbs). Purchase of step up systems to cushion against variation Provide finishes that limit power use. Paint the interior with a whitish colour Pave the compound with pervious materials to reduce storm water generation	Throughout Construction & Occupational period	Constructor Tenants Building Care taker	100,000	- Step up system used for energy saving -Water reservoir on site -Water saving taps -Presence of onsite waste water treatment facility

Incidents, Accidents and Dangerous Occurrences/ Health and Safety				
Indicate Clear warnings of hazards or risk prone areas Install firefighting equipment in strategic points Clearly mark emergency exist to guide occupants Install and label alarm systems in the residence. Institute monitoring systems to ensure proper occupational and good maintenance to address disaster needs.	During Construction & Occupation phase	Contractor Proponent	100,000	- Marked emergency exists - Fire hydrant and extinguishers - Labelled building alarm system – Clear warning of hazards/ risk prone areas

Decommissioning Phase Environmental Management Plan

Table 8.5: EMP for the Decommissioning Phase of the Proposed Development.

Winding up of the Project				
Engage a qualified contractor to undertake demolition works Undertake ground verification before committing the ground to any new use. Engage qualified personnel in demolition of structures. Selectively undertake works in phases as advised by experts. Employ the best technology in demolition and destruction of structures Sample out useful materials. Dispose of waste Provide advance notice to notify the public of impeding demolition Engage a landscape architect to restore the site qualities in the preparation for new projects	Once-off	Proponent Contractor Landscape Architect Labor Office, Pensions Department Insurance companies.	100,000	-Payments made to workers -Notification to the labour office & the public about impending demolition works -Non-existence of rubbles on site -The quantities of salvaged materials.

CHAPTER NINE: ENVIRONMENTAL MONITORING

9.1. Introduction

During the occupational phase, the proponent will undertake a regular monitoring which is intended for proper safety and protection of the environment. \

9.2. Environmental Management System (EMS)

An environmental management system (EMS) is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of development management.

9.3. Environmental Management Organization (EMO)

The project proponent will work with EIA/EA experts in identifying ways for the property to improve its environmental performance, setting objectives and targets, monitoring and evaluating implementation.

9.4. Monitoring Schedule

The proponent or property manager will follow the monitoring schedule that will assist in observation, evaluation assessment and reporting on the performance of different/ various variables. Table **7.4** below summarizes the suggested monitoring schedule for the proposed development.

Table 10.4: Summary of Monitoring Schedule

Parameter to be Monitored	Monitoring Schedule and Duration
Water resources	Review quarterly to determine impact on supply
Ground water quality	Sampling and testing every six months from boreholes within the neighbourhood
Solid waste	Daily throughout the project cycle
Effluent from the development	Monthly

9.5. Environmental Auditing

Annual environmental audits will be carried out as required under Legal Notice No. 101 of 2003. The audits will serve the purposes of confirming the efficacy and adequacy of the Environmental Management Plan (EMP) developed during the preparation of this proposal.

CHAPTER TEN: CONCLUSIONS AND RECOMMENDATIONS

10.1. Conclusion

From the foregoing analysis, the EIA exercise established that the proposed development is a low risk project and is consistent with the preferred developments in the area. Noteworthy is the fact that Kajiado County serves as a dormitory residence of Nairobi city and hosts major educational facilities including a university and as a result there is a high demand of such facilities against a background of limited supply. The Educational development envisaged will help to bridge this widening gap.
The project is also anticipated to enhance income to diverse professionals in the construction industry. It is expected that these positive impacts that emanate from such activities shall be maximized as much as possible as exhaustively outlined within the report. Despite aforementioned positive impacts, some negative impacts will also be experienced during the proposed project implementation cycle. In order to ameliorate the envisaged negative impacts, suitable mitigation measures have been integrated in this project report.

EMCA regulation 2009 read together with Amendment Regulation 2017 (Conservation and Management of Wetlands) provides that no person shall cultivate or undertake any development activity within a minimum of 6 meters and a maximum of 30 meters of a river measured from high water mark. We recommend the developer seeks the services of WARMA to determine the highest water mark of the nearby stream.

The proponent is hereby advised to create Buffer zone of about 3 meters between the Enkasiti Resort and the proposed school to separate the two users, this will act as an important tool in controlling privacy while at the same time addressing the development issues of the people in the areas surrounding it.

In conclusion, this report offers a management and monitoring plan that shall be used by the proponent to enforce development control in an attempt to meet statutory regulations. Annual audits shall also be executed to establish efficiency and adequacy of occupational systems.

It is with these considerations that I recommend this project for approval and issuance of NEMA license to facilitate commencement of works on site.

REFERENCES

1. Republic of Kenya, (1968): **The Building Code.**
2. Republic of Kenya, (2012): The County Government Act (No. 17).
3. Republic of Kenya, (1972): The Public Health Act, CAP 242.
4. Republic of Kenya, (1982): The Factories and Other Places of Work Act, CAP 514.
5. Republic of Kenya, (2013): The Physical and land use Planning Act, No.13 of 2019.
6. Republic of Kenya, (1999): Environmental Management and Coordination Act, No. 8 of 1999.
7. Republic of Kenya, (2003) Legal Notice No. 101: The Environmental (Impact Assessment and Audit) Regulations, 2003.
8. Republic of Kenya, (2009): National Land Policy, 2009.
9. Republic of Kenya, (2010): **Constitution.**
10. Proposed development site and architectural plans
11. Reference to other EIAs of the area prepared by the consultants
12. Kenya Population and Housing Census, 2019
13. Project documentation provided by the proponent

LIST OF ANNEXURES AND APPENDICES

ANNEXURES

ANNEX 1: Copies of PIN and ID Certificate of the proponent

ANNEX 2: Copy of Ownership Documents of the Project Site

ANNEX 3: Copy of Practicing License of the Lead Expert

ANNEX 4: Building Plans of the Proposed Development

APPENDICES

APPENDIX 1: Evidence of Public Consultations (separate filled in questionnaires)

ANNEX 1:

COPIES OF PIN AND ID CERTIFICATE OF THE PROPONENT

ANNEX 2:

COPY OF OWNERSHIP DOCUMENTS OF THE PROJECT SITE

ANNEX 3:

COPY OF PRACTICING LICENSE OF THE LEAD EXPERT

ANNEX 4:

BUILDING PLANS OF THE PROPOSED DEVELOPMENT

APPENDIX 1:

EVIDENCE OF PUBLIC CONSULTATIONS (SEPARATE FILLED IN QUESTIONNAIRES)