### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED UPGRADING OF THE KENGEN PLC GEOTHERMAL TRAINING FACILITY LOCATED ON PLOT L.R NO. 9005/12 IN KAMERE VILLAGE, OLKARIA WARD, NAIVASHA CONSTITUENCY IN NAKURU COUNTY INTO A REGIONAL CENTRE OF EXCELLENCE



#### **PROPONENT:**

#### KENYA ELECTRICITY GENERATING COMPANY PLC KENGEN PENSION PLAZA II KOLOBOT ROAD, PARKLANDS P. O. BOX 47936, 00100, NAIROBI, KENYA

**PRESENTED TO:** 

#### NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

June, 2022

## **DOCUMENT AUTHENTICATION**

**Report Title:** ESIA Study Report for the Proposed Upgrading of the KenGen PLC GTC to a Regional Centre of Excellence

This ESIA Study Report for the Proposed Upgrading of the KenGen PLC GTC to a Regional Centre of Excellence. The ESIA Study Report has been carried out in accordance with the Environmental Management and Coordination Act, 1999 and Environmental (Impact Assessment & Audit) (Amendment) Regulations, 2019 under the Kenya Gazette Supplement No. 62 of 30<sup>th</sup> April 2019

#### **EIA/EA LEAD EXPERT**

NAME:	REG NO	
ADDRESS:		
SIGNATURE	DATE:	
PROPONENT		
() KenGen		
KenGen Pension Plaza II Kelebet Road, Darklands		
P. O. BOX 47936, 00100, Nairobi TEL + 254 711 036-000		
+254 732 116-000 +254 020 366-6000		
NAME:		
POSITION:		
SIGNED:	DATE:	

**KENGEN GTC CoE, 2022** 

# **DISCLAIMER**

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## ACKNOWLEDGEMENT

The Environment and Social Impact Assessment (ESIA) experts are grateful to the proponent KenGen PLC for according us the privilege of undertaking this ESIA report. We are also grateful to the KenGen Project Implementation Unit, for their steadfast support in availing us information we required and to the neighbouring stakeholders for forwarding their views both written and oral during the stakeholder consultation and public participation process.

# **ACRONYMS**

BOD	Biological Oxygen Demand
CBC	Competency Based Curriculum
CDM	Clean Development Mechanism
CIDP	County Integrated Development Plan
COE	Centre of Excellence
CSR	Corporate Social Responsibility
CWMP	Contractor's Waste Management Plan
DOSHS	Directorate of Occupational Safety and Health
EA	Environmental Audits
EASTRIP	East Africa Skills for Transformation and Regional Integration Project
EDCP	Effluent Discharge Control Plan
EDP	Effluent Discharge Permit
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESMMP	Environmental Social Management and Monitoring Plan
EPRA	Energy and Petroleum Regulatory Authority
ESIA	Environmental and Social Impact Assessment
FGD	Focus Group Discussion
FTE	Full Time Employees
GBV	Gender Based Violence
GHGs	Greenhouse Gases
GOK	Government of Kenya
GPS	Global Positioning System
GRCs	Grievance Redress Committees
GRM	Grievance Redress Mechanism
GTC	Geothermal Training Centre
ІК	information knowledge
KenGen	Kenya Electricity Generating Company
КМ	Kilometre
KPLC	Kenya Power and Lighting Company PLC

L&FS	Life and Fire Safety
MEF	Ministry of Environment and Forestry
МОН	Ministry of Health
NAIVAWASCO	Naivasha Water and Sanitation Company
NCA	National Construction Authority
NEAP	National Environmental Action Plan
NEC	National Environment Council
NEMA	National Environment Management Authority
NGEC	National Gender and Equality Commission
NET	National Environmental Tribunal
NPGH	Nakuru Provincial General Hospital
ODS	Ozone Depleting Substances
OHS	Occupational Health and Safety
OP/BP	Operational Policies/ Bank Procedures
OVC	Orphans and Vulnerable Children's
PADV	Protection against Domestic Violence Act
PAI	Project Area of Influence
PCRs	Physical Cultural Resources
PPE	Personal Protective Equipment
PWDs	Provisions for Persons with Disabilities
RFTI	Regional Flagship TVET Institutions
SEA-H	Sexual Exploitation, Abuse and Harassment
STD/I	Sexually transmitted Diseases and Infections
ToR	Terms of Reference
TSS	Total Suspended Solids
TVET	Technical and Vocational Education and Training
TVETA	Technical and Vocational Education and Training Authority
UNFCCC	United Nations Framework Convention on Climate Change
VOCs	Volatile Organic Compounds
WRA	Water Resources Authority

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# **EXECUTIVE SUMMARY**

KenGen PLC, herein referred to as the proponent, proposes to upgrade the KenGen Geothermal Training to a Regional Centre of Excellence on L.R No 9005/12 at Kamere Village within Ol-Karia Ward, Naivasha Constituency, Nakuru County at coordinates 0°49'28.54"S and

#### 36°19'3.87"E.

This report was compiled and to be submitted to the National Environment Management Authority in compliance with the Legal requirement stipulated in the Environmental Management and Coordination Act CAP 387 and the subsequent Legal supplement 62 of 2019.

### CHAPTER ONE

The main objective of the Study was to identify environmental and social impacts associated with the proposed construction of the proposed CoE and to recommend an appropriate environmental management strategy for the project. The core outcome of the Study is an Environmental and Social Management and Monitoring Plan (ESMMP), which will be used to enhance and mitigate any positive and negative impacts respectively for the project. Specific tasks included;

- 1. Evaluation of the existing situation at the project proposed sites,
- 2. Appreciation of the project concepts through studying design documents, construction and intervention layout, feasibility of the project and other documents,
- 3. Identification of potential impacts associated with the proposed projects
- 4. Identification of suitable mitigation and preventive measures appropriate for impacts
- 5. Development of a comprehensive environment and social management plan for integration into the project implementation.

The proposed project categorized under **3. High Risk Projects (3. Urban Development;** (h) Establishment of schools and other learning institutions exceeding one hundred learners.) Project plans indicate that the proposed CoE is poised to accommodate over 150 students by virtue of the occupancies allocated to the student hostels.

The project also falls under **Category B** of the World Bank Group's Safeguard Policies as the impacts envisaged will not be as extensive as those in Category A projects. The proposed project's impacts are site-specific. Mitigation measures against the impacts have also been designed accordingly.

#### **CHAPTER TWO**

Upon completion, the CoE will have a daily occupation capacity for 456 students. The CoE will have a projected number of 36 Full Time Employees (FTE) who will still rely partially on the support of the KenGen staff. Upon completion, it is envisaged that the entire campus will occupy a sum space of approximately 6,850M<sup>2</sup>. A copy of the project master plan providing the layout of the components to be constructed is attached in this report (Annex 3).

All buildings will be connected to a small sewage system leading into two bio-digesters which will become the centre for the wastewater containment and treatment. The proposed CoE will receive water from KenGen's water treatment plant abstracted from Lake Naivasha.

The project is estimated to cost **Kenya Shillings Six hundred and seven million, four hundred and seventy-two thousand, seven hundred and fifty-six** (Ksh 607,472,756.01) while the cost of implementing the ESMMP is estimated at **Kenya Shillings Two million, six hundred thousand** (Ksh. 2,600,000).

#### CHAPTER THREE

The project site is fairly level ground with a gorge cutting along the southern boundary. The project area receives more than 300mm of rainfall per year and therefore rainwater harvesting is deemed environmentally feasible for the proposed CoE. Floral composition includes scattered tufts of grass and shrub with the predominant tree species observed being clusters of *Euphorbia candelabra.* Kamere Township does not have conventional means of solid and liquid waste management. Residents dump waste in pits and burn. KenGen manages solid waste through Diamond and Sparkle Cleaning Firm and liquid waste through septic tanks. Occupational wise, most of the residents of Kamere engage in fishing, selling farm produce at the local market place and in transportation, ferrying people using motorbikes and Public Service Vehicles (PSV).

### **CHAPTER FOUR**

S/No	CATEGORY	FRAMEWORK		
1	Local Plans and Policies	<ol> <li>The Nakuru County Integrated Development Plan, 2017-2022</li> <li>Kenya Environmental Sanitation and Hygiene Policy 2016-2030</li> <li>Draft National Climate Change Framework Policy (2014)</li> <li>National Environment Policy, 2013</li> <li>The Nakuru County Integrated Development Plan, 2017-2022</li> <li>Kenya Environmental Sanitation and Hygiene Policy 2016-2030</li> <li>National Climate Change Framework Policy (2014)</li> <li>National Climate Change Framework Policy (2014)</li> <li>National Climate Change Framework Policy (2014)</li> <li>National Environment Policy, 2013</li> </ol>		
2	World Bank Polices and Guidelines	<ol> <li>The World Bank Group Operational Policies/ Bank Procedures</li> <li>The World Bank Group General Environment, Health And Safety Guidelines</li> </ol>		
3	Local Legislative Framework	<ol> <li>Environmental Management and Coordination (Amendment) Act (EMCA), 2015</li> <li>The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019</li> <li>Environmental Management and Coordination (Waste Management) Regulation, 2006</li> <li>The Environmental Management and Co-ordination (Water Quality) Regulations, 2006</li> <li>The Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009</li> </ol>		

Legislative, Policy and Institutional Framework considered included:

		-	
		6.	The Environmental Management and Co-ordination (Air
		_	Quality) Regulations, 2009
		/.	Water Act, 2002
		8.	The Water Resources Management Rules, 2007
		9.	Occupation Safety and Health Act, 2007
		10.	Public Health Act Cap 242
		11.	Physical Planning Act, 1999
		12.	The Environment and Land Court Act, 2011
		13.	The Climate Change Act, 2016
		14.	Traffic Act Chapter 403
		15.	The County Government Act 2012
		16.	The Energy Act, 2019
		17.	Energy (Solar Water Heating) Regulations, 2012
		18.	The Land Act, 2012
		19.	Kenya National Social Protection Policy, 2011
		20.	Children (Amendment) Bill, 2020
		21.	The Employment (Amendment) Act, No. 15 of 2022
		22.	Employment and Labour Relations Court Act, 2011
		23.	Labour Relations Act
		24.	Sexual Offences Act, 2006
		25.	Protection against Domestic Violence Act, 2015
		26.	National Gender and Equality Commission Act, 2011
		27.	HIV/AIDS Prevention and control Act (Act No. 14 of 2006)
		28.	Work Injury Benefits Act, 2007
		1.	Ministry of Environment and Forestry
		2.	National Environmental Management Authority (NEMA)
		3.	National Environmental Council (NEC)
		4.	The National Environmental Action Plan Committee
		5.	National Environmental Tribunal (NET)
		6.	National Environmental Management Authority (NEMA)
	Local	7.	National Environmental Council (NEC)
4	Institutional	8.	The National Environmental Action Plan Committee
	Framework	9.	National Environmental Tribunal (NET)
		10.	County Environment Committees
		11.	Directorate of Occupational Safety and Health (DOSHS)
		12.	Technical and Vocational Education and Training Authority
			(IVEIA)
		13.	National Construction Authority (NCA)
		14.	Water Resources Authority (WRA)
		1.	United Nations Framework Convention on Climate change
		~	1992 (UNFCCC)
5	International	2.	The Kyoto Protocol, 2004
	Policies	3.	United Nations Convention to combat Desertification, 1994
		4.	Convention on Biological Diversity (1992)
		5.	Montreal Protocol, 1987
		6.	Bamako Convention, 1991

### CHAPTER FIVE

The alternatives considered during the conceptualization of the project were focused on the No project option, Relocation Option, Alternative construction material and technology, Solid waste management alternatives and liquid waste management alternatives. Under the liquid waste management alternatives, several options were discussed including waste stabilization ponds, constructed wetlands, aerated lagoons, activated sludge process, trickling filters, oxidation ditches, rotating biological contractors and on-site treatment systems such as bio digesters, septic tanks, pit latrines, pour flush toilets and VIP latrines.

#### CHAPTER SIX

Stakeholder consultation was undertaken between 2<sup>nd</sup> and 4<sup>th</sup> March 2022. A summary of comments provided by stakeholders is provided below:

S/No	Category Stakeholder	of	Comments
1	Lead Agencies: • Deputy County Commissioner's Office • Water Resources Authority • Fish Eagle Hotel		<ul> <li>Increased business opportunities.</li> <li>Increased employment chances.</li> <li>Local community to benefit from the CoE.</li> <li>Employment creation.</li> <li>Provision of training facility.</li> <li>Enhanced status for KenGen and Naivasha.</li> <li>Opportunity to use modern technology.</li> <li>Increased clientele to the hotel.</li> <li>Economic growth of the PAI</li> <li>Pollution due to effluent discharge.</li> <li>Strain on current wastewater treatment facilities available.</li> <li>Increased strain on living spaces due to population increase.</li> <li>Insecurity.</li> <li>Environmental Pollution.</li> </ul>
2	Focus Group Discussi (Questionnaires)	on	<ul> <li>Noise and Air Pollution</li> <li>Skewed distribution of job opportunities during construction.</li> <li>Increased criminal activity.</li> <li>Constrained land resource.</li> <li>Increased pressure on existing resources such as housing.</li> <li>Soil erosion.</li> </ul>
3	Focus Group Discuss (Minutes)	on	<ul> <li>Will craft courses be provided for the residents of Kamere and will they be required to pay?</li> <li>Kamere residents should be given first priority when it comes to jobs and that the cartels in place that allocate jobs should be done away with.</li> <li>KenGen to set up subsequent stakeholder forums even when the project begins so as to make sure the needs of the community are received by KenGen in real time.</li> <li>Allocate non-skilled jobs from the project to the local youth.</li> </ul>

#### **CHAPTER SEVEN**

Identified impacts and their respective mitigation measures as provided in the ESMMP is summarized follows:

Possible Environmental and Social Impacts	Suggested Mitigation Measures		
ENVIRONMENTAL IM	IPACTS		
Soil disturbance and land degradation	• Confine excavation activities within the immediate project site and only clear vegetation in areas required for the project.		
Soil erosion in and around work sites due	• Phase construction activity to limit the frequency of disturbance soil exposed to.		
to removal of soil	<ul> <li>Set up sediment traps within the project site.</li> </ul>		
machinery access and exit the project site	• Cover construction access points with stone to reduce loose top soil being carried away by construction vehicles or surface run-off.		
Gully located towards the South of the	• Re-vegetate denuded areas with grass and shrub species endemic to the PAI as soon as possible to minimize soil erosion.		
project site is susceptible to soil erosion due to surface runoff from	• Set up drainage channels that are appropriately terminated to ensure rainfall is captured and directed into storm drains or catchment points as soon as possible before carrying away sediment.		
storm water	<ul> <li>Contractors to use locally sourced construction materials and avoid opening of new material sites to the extent possible unless licensed. Material sites (quarry/borrow) areas should be appropriately rehabilitated at the end of the construction period.</li> </ul>		
	<ul> <li>Select an appropriate site for waste spoil piles to avoid blocking surface run- off or drainage ditches.</li> </ul>		
	<ul> <li>Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off.</li> </ul>		
	• Regular site inspection especially after any storm event, including a light rain, promote early detection of potential problems related to soil erosion land degradation.		
	• Consider harvesting surface run-off through setting up a small retention reservoir towards the end of the gully. Water retained can be used for landscaping and external housekeeping.		
Clearing of flora Site preparation, excavations and demolitions will	<ul> <li>Ensure proper demarcation of the project area to be affected by the works. This will be aimed at ensuring that any disturbance to flora is restricted to the actual project area and avoid spill over effects on the neighbouring areas.</li> <li>Ensure strict control of vehicles to ensure that they operate only within the area to be disturbed by access routes and other works.</li> </ul>		
involve clearing and disturbing vegetation.	<ul> <li>Re-vegetate the disturbed areas such as spoil dumping areas, material sites, through implementation of a well-designed landscaping programme.</li> </ul>		
Inadequate liquid	• Liquid waste management layout plans (Annex 4) indicate that the CoE will		
waste	be served by a dedicated bio-digester system.		

Possible Environmental and	Suggested Mitigation Measures
Social Impacts	
infrastructure	
Current infrastructure	
does not have any	
capability to nandle	
Water pollution	• Provide a bunded area for concrete batching instead of doing it directly on
and use Surface and underground water contamination due to runoff and leaching of toxic waste such as oil and grease spills	<ul> <li>the ground to prevent contamination of soils and surface water features.</li> <li>Provide appropriate containment structures to store contaminated water from the construction site and ensure safe disposal of contaminated waste-water.</li> <li>Store fuel on concrete surfaces that are appropriately bunded and provided with a canopy.</li> <li>Project site should have drip trays to contain any potential leakages of fuels and oils.</li> <li>Ensure regular and proper disposal of waste from on-site ablutions to avoid</li> </ul>
from vehicles.	<ul> <li>Ensure regular and proper disposal of waste from on site ablations to avoid leaks which would contaminate of surface water and lead to water-borne diseases.</li> <li>Installing oil and grease traps in construction workshop and vehicle parking areas.</li> <li>Contractor should have agreements with the community on water use; on the quantities, time and charges from the community sources if considered,</li> <li>Contractor should have water abstraction permits if sourcing from nearby water resources and avoid protected areas,</li> <li>Ensure regular inspection and maintenance of permanent erosion/run-off control features</li> </ul>
Soil pollution Leakage of diesel oils could result to significant soil	<ul> <li>Maintenance and regular servicing of equipment.</li> <li>Re-fuelling at safe locations.</li> <li>Use of spill kits and applications of emergency spill procedures.</li> <li>Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and will be</li> </ul>
contamination.	<ul> <li>replaced when saturated.</li> <li>Vehicle maintenance to be done in impervious concrete platforms and grease and oil trans to be used.</li> </ul>
from the bio-digesters	<ul> <li>Fuel and oils should be stored in bunded areas</li> <li>Conduct quarterly effluent quality analysis to ensure treated effluent from the</li> </ul>
contamination	<ul> <li>bio-digester septic tank meets quality levels specified in the 4th schedule of the Water Resources Management Rules, 2007 before it is discharged.</li> <li>Develop an effective Effluent Discharge Control Plan (EDCP) for wastewater treatment as per Schedule 2 of the Water Resources Management Rules, 2007.</li> <li>Apply for an Effluent Discharge Permit (EDP) from the Water Resources Authority (WDA).</li> </ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures
Noise and excessive vibrations Noise and vibration from excavation, demolition and movement of vehicles.	<ul> <li>All construction and decommissioning activities shall be confined between 8am and 5pm and therefore keep noise level within acceptable limits (55 Decibels during the day).</li> <li>Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before commencement of work in their vicinity.</li> <li>Provision of hearing protective devices such as ear plugs and ear muffs to workers exposed to excessive noise and vibrations over long continuous durations.</li> <li>Regular maintenance of machines and vehicles.</li> <li>Contractors and staff to ensure that vehicles/machinery are turned off while not in use.</li> </ul>
	<ul> <li>Install hoise barners between the site and hoise sensitive surroundings to abate noise and excessive vibration pollution.</li> <li>Create awareness and sensitize the public and workers on noise propagation during construction and decommissioning.</li> <li>All generators and heavy equipment will be insulated or placed in enclosures to minimize disrupting ambient noise levels</li> <li>Address all and any complaints received about noise and vibration through the Grievance Redress Mechanism</li> </ul>
Air pollution	• The contractor to comply with the provisions of EMCA Cap 387 (Air Quality Regulations 2014), to be enforced by the Supervising Engineer.
Exhaust emissions	<ul> <li>Workers shall be trained on management of air pollution from vehicles and machinery</li> </ul>
matter in form of from through	<ul> <li>All construction machinery shall be maintained and serviced in accordance with the contractor's specifications</li> </ul>
excavation, demolition and movement of	<ul> <li>The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible</li> </ul>
vehicles.	<ul> <li>Ensure good housekeeping in construction areas, dust should be quickly swept off cement floors/collected in covered containers</li> </ul>
Diesel generators will produce air	<ul> <li>The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds.</li> </ul>
pollutants, especially if they are operated	<ul> <li>Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust</li> </ul>
over long duration.	<ul> <li>water sprays shall be used on all earthworks areas within 200 metres of human settlement especially during the dry season.</li> <li>The proponent will provide Personal Protective Equipment (PPE) such as face</li> </ul>
	masks to all site workers.
	<ul> <li>Set up the generators in well ventilated areas away from general buildings.</li> <li>Regular generator service and maintenance to ensure they function properly.</li> </ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures
Increased colid	• The propoport will oncure the effective application of an integrated solid
waste generation	waste management system i.e. the 3 Rs: Reduction at the source, Reuse and Recycle;
Solid waste produced might interfere with the aesthetic status of the area and create breeding grounds for pests.	<ul> <li>Develop a Contractor's Waste Management Plan (CWMP) to capture in detail all waste that will be produced within the project and specific mitigation measures for all kinds of waste generated. This will be approved by the proponent.</li> <li>Accurate estimation of the dimensions and quantities of materials required;</li> <li>Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time;</li> </ul>
Inadequate infrastructure to handle solid waste from the CoE as the PAI is not served by county waste disposal services.	<ul> <li>Providing facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage;</li> <li>Use of construction materials that have minimal or no packaging to avoid the generation of excessive packaging waste;</li> <li>Providing waste collection bins at designated points on site that encourage waste segregation;</li> <li>Disposing of waste more responsibly by contracting a registered waste handler who will dispose the waste at a designated site or landfills only and in accordance with the existing laws.</li> </ul>
Improper disposal of sludge produced from the bio digesters may lead to pollution.	<ul> <li>Contractor Will keep records of Waste disposal as proof for proper management of waste as designed.</li> <li>Restrict open burning of solid waste generated at sites.</li> <li>Enlist the services of a NEMA-licensed hazardous waste handler to dispose sludge in a safe and environmentally sustainable manner. Retain all waste tracking forms and the service provider's NEMA licence for future reference.</li> </ul>
Increased energy consumption Excessive use of diesel to run vehicles and construction machinery may have environmental implications. Net increase in the use of electrical energy for running the CoE might strain the resources and negatively impact on their sustainability.	<ul> <li>The contractor will ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used.</li> <li>Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts.</li> <li>Monitor energy use during construction and set targets for the reduction of energy use.</li> <li>Installing electricity meters to monitor the consumption of electricity in work sites.</li> <li>Consider tapping biogas produced by the bio digester septic system for cooking in the CoE's kitchens.</li> <li>Make maximum use of natural ventilation and light to the extent possible.</li> <li>The Proponent shall install an energy-efficient lighting in the common areas of the building as well consider installing solar power equipment and solar water heaters. This will immensely contribute to energy saving during the operational phase of the proposed project.</li> <li>All occupants of the development will be sensitized to ensure energy efficiency in their operations.</li> <li>Monitor energy use during the operation and set targets for efficient energy use.</li> </ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures
Increased water demand Excessive water use may negatively impact on source of water and its sustainability. Strain on KenGen's water treatment plan due to increase in demand for water.	<ul> <li>The Proponent will ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.</li> <li>Ensure taps are not running when not in use;</li> <li>Install water conserving taps and toilets;</li> <li>Incorporate rain water harvesting technology into the project design;</li> <li>Monitor water consumption and keep records.</li> <li>The proponent shall upgrade their water treatment and storage capacity to effectively ensure water is present at all times.</li> <li>Seek a variation of water abstraction permit from WRA to accommodate the additional volume of water harvesting systems to augment the normal supply from the water treatment facility used by the proponent.</li> <li>The proponent should consider setting water use targets to monitor the use of water and come up with measures to keep usage below the set targets.</li> <li>Ensure taps are not running when not in use.</li> </ul>
	<ul> <li>Install water conserving taps and toilets</li> </ul>
Unsustainable extraction and use of construction material Availability and sustainability of resources at the extraction sites will be negatively affected as they are not renewable in the short term. Potential Erosion of the gorge	<ul> <li>The contractor shall:</li> <li>Endeavour to keep construction material usage within acceptable volume thresholds.</li> <li>Ensure minimum wastage of construction materials through proper storage.</li> <li>Provide requisite machinery and equipment needed to handle construction materials safely to deter breakage or spillage.</li> <li>Contractors to use locally sourced construction materials and avoid opening of new material sites to the extent possible unless licensed. Material sites (quarry/borrow) areas should be appropriately rehabilitated at the end of the construction period.</li> <li>Contractor shall be required to provide resources such as water, power and security and shall not use the CoE resources for construction works unless approved by relevant stakeholders,</li> <li>Set -up a buffer zone from the edge of the gorge.</li> <li>Protect the edge of the gorge from both surface run-off and canal erosion and re-forestation and physical barriers such as gabion works and wall protection.</li> <li>Subsequent project phases of the centre of excellence will be expected to respect the buffer zone established and continue to maintain the protection measures put in place.</li> </ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures
OCCUPATIONAL HE	ALTH AND SAFETY IMPACTS
The construction and decommissioning activities may expose workers to injuries through over-exertion, slip and fall, working at height and fall of materials or tools. During the operational phase of the project, staff, students and visitors of the CoE might be exposed to physical hazards such as slips, trips, falls, electricity, noise, vibration and fire.	<ul> <li>The contractor shall abide by the requirements stipulated in the Occupational Safety and Health Act (OSHA), 2007.</li> <li>A trained Occupational Health and Safety Supervisor will be stationed at the site.</li> <li>Toolbox talks meetings should be held on a daily basis before the commencement of work at the site</li> <li>Ensuring that active sites are well marked and secured with the appropriate tape at all times to prevent injury to passers-by and animals.</li> <li>Continuous sensitization of the community on possible hazards associated with works.</li> <li>The contractors will put up appropriate safety signage at the active sites at all times. Signage may be displayed in the local language to address the issue of language barrier where the local workforce is used.</li> <li>All workers and visitors to the active site will be expected to do the necessary personal protective equipment at all times. This will include a helmet, reflective jacket, safety boots, hand gloves and overalls.</li> <li>Hoisting equipment will be proyed in the removal of accessories fixed at height and will be properly maintained.</li> <li>Ensure a trained first aider and first aid equipment are present on-site at all times.</li> <li>Good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot path to prevent slip and falls.</li> <li>Staff working in special environments such as at height should be appropriately trained.</li> <li>Ensure all the electrical works are carried out by trained and certified professionals.</li> <li>Implement a workers grievance redress mechanism to allow workers raise safety issues and propose improvements on site.</li> <li>Provision of serviceable fire extinguishers on site and well-equipped first aid kit.</li> <li>Contractor should keep any accidents and incidents logs on site.</li> <li>Ensure all the fire tating should comply with the IFC Life and Fire Safety Guidelines.</li> <li>Ensure that all first-aid stations a</li></ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures
	<ul> <li>basic site rules of work at / on the site and of personal protection and preventing injury to fellow staff or students.</li> <li>As for laboratory facilities, ensure the LPG cage is fitted outside the lab to promote fire safety and there is adequate ventilation in the rooms,</li> <li>Hazardous areas (electrical rooms, compressor rooms, etc), installations, materials, safety measures, and emergency exits, etc. should be marked appropriately according to international standards.</li> <li>Provide user adjustable work and study stations to prevent ergonomic illnesses and injuries.</li> <li>Conduct annual fire safety and OHS audits through a DOSHS-approved advisor to monitor the effectiveness of the CoE's OHS plan.</li> </ul>
Increased fire risks	<ul> <li>Provision of suitable fire-fighting equipment including fire hydrants, hose reels and portable fire extinguishers and install them at strategic locations within the Polytechnic premises</li> </ul>
Sources of fire include; use of fire in the kitchen, laboratory, electrical faults, improper storage of flammable materials, unsupervised hot works, use of faulty equipment, careless smoking and arson	<ul> <li>Sensitization of all staff and students on fire safety, including fire prevention and fire-fighting.</li> <li>Display of emergency contact numbers in-case of fire and have a designated fire assembly points.</li> <li>Conducting periodic fire drills.</li> <li>Provision of smoking guidelines.</li> <li>Develop and implement a fire safety policy.</li> <li>Ensure all flammables are stored in fire resistant areas.</li> <li>Erect "No Smoking Zones" signs especially in areas where flammable substances are stored</li> <li>Provide water reservoir to fight fire.</li> <li>Designate and mark a fire assembly points.</li> <li>Provision of emergency fire exits.</li> <li>Ensure all fire exit doors open outwards.</li> <li>Constitute and train fire marshals.</li> </ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures
COMMUNITY HEALTH	AND SAFETY IMPACTS
Traffic Related Accidents or Disruption of access to areas around the proposed site Constrained access to areas around the project site due to	<ul> <li>The proponent shall issue notices to all affected parties well before the construction and decommissioning phases begin. Use of access roads within the estate shall be communicated in advance to deter any inconvenience.</li> <li>Warning signs shall be provided to the access roads to warn the community during transportation of construction materials,</li> <li>Plan delivery and collection of construction materials to off-peak hours.</li> <li>Contractor shall emphasize safety aspects among project drivers, aspecially speed limits to the institution.</li> </ul>
traffic snarl ups.	<ul> <li>Whenever dust suppression along access roads will be necessary, water will be spraved</li> </ul>
Increase in pedestrian and vehicular traffic during operation.	<ul> <li>Contractors should regularly inspect vehicles, safety and employed trained drivers to minimize potential traffic related accidents.</li> <li>Contractor should consider periodic maintenance of the access roads as the heavy loaded trucks may destroy the access roads</li> <li>"NO PARKING" signs will be posted around the building where Parking is prohibited and likely to cause obstruction as well as other necessary traffic signs</li> <li>Traffic management/parking personnel shall be provided to monitor parking and ensure smooth motoring along the buildings adjacent roads</li> <li>Access to driveways will be maintained at all times</li> <li>Any work that disturbs normal traffic signal operations shall be coordinated with the relevant authorities.</li> <li>Ensure all informal businesses are set up in designated areas to avoid obstruction of access routes.</li> </ul>
Increased risk in contracting diseases Increase in the transmission of Sexually transmitted Diseases	<ul> <li>Conduct regular sensitization and awareness campaign on HIV/AIDS, STD/I and COVID-19 to for workers, students, staff and local community.</li> <li>Reduce risk of STD/I through provision of male and female condoms for all workers during construction and decommissioning phases and provide contraceptive dispensers within the CoE for use during the operational phase.</li> </ul>
and Infections (STD/I), HIV/AIDS and COVID- 19.	<ul> <li>Provide free voluntary STI and HIV/AIDS screening, diagnosis and counselling for workers, students, staff and local people near the site.</li> <li>The contractor should ensure all members of the labour team are vaccinated against COVID-19 and provide means for vaccination for those who are not.</li> <li>Provide hand sanitizing facilities within the work site during construction and decommissioning.</li> </ul>

Possible Environmental and Social Impacts	Suggested Mitigation Measures						
SOCIAL RISKS AND IMPACTS							
Increased risks of Sexual Exploitation, Abuse and Harassment (SEA-H) and gender based violence	<ul> <li>Contractor to prepare and enforce a No Sexual Exploitation and Abuse, Sexual Harassment, and discrimination Policy in all phases of the project in accordance with national law as provided in section 4.5 of this report.</li> <li>Sensitize target communities and project workers on Gender Based Violence/ Sexual Exploitation, Abuse and Harassment( GBV/SEA-SH risks and protocols.</li> <li>Impose zero tolerance on all forms of gender-based violence</li> <li>Ensure a code of conduct highlighting zero tolerance of sexual exploitation and abuse. is signed by all project workers with physical presence on site</li> <li>Ensure visibility of signage and information, education and communication materials on such GBV issues in construction sites.</li> <li>Map all GBV service providers and document referral services for survivors.</li> <li>Ensure that gender inclusivity should be observed during employment opportunities, recruitment and job postings</li> <li>Provision of gender disaggregated data, separate bathing, changing, sanitation facilities for men and women</li> <li>Contractor and project proponent to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal opportunity employment, gender sensitization.</li> <li>Provide separate showering areas, changing rooms and ablution facilities for male and female labourers.</li> <li>The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases.</li> <li>Create awareness on project GRM to all community segments and</li> </ul>						
Gender	<ul> <li>Ensure that gender inclusivity should be observed during employment</li> </ul>						
<b>Discrimination</b> Some contractors believe that women are physically and mentally incapable to execute the tasks that the position requires and may be disinclined to hire them based on that belief	<ul> <li>opportunities, recruitment and job postings.</li> <li>Regular sensitization of workers to promote gender equity in employment during the construction works and during operation.</li> <li>All workers and nearby communities and stakeholders will be educated on preventing and responding to sexual harassment and GBV ahead of any project related works.</li> <li>Provision of gender disaggregated data to allow for follow up,</li> <li>Provision of separate bathing, changing, sanitation facilities for men and women</li> <li>Ensure equal pay for equal work among male and female employees</li> <li>Regular sensitization and awareness campaigns to the workers should be done to promote gender equity in employment during the construction works and during operation.</li> <li>Introduce flexible work schedule for expectant and breastfeeding mothers</li> <li>Embrace equality in sharing out leadership position for male and female employees</li> <li>The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases.</li> <li>Create awareness on project GRM to all community segments and project workers</li> </ul>						

Cases of child labour and crimes towards children	<ul> <li>Ensure no children are employed on site in accordance with national labour laws.</li> <li>Strictly hire people who are above 18yrs and ensure they provide their Identity Card</li> <li>Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.</li> <li>The client and the contractor shall adopt a 'Child Protection Code of Conduct', which sets stringent standards for personal behaviour so as to avoid child exploitation and abuse.</li> <li>Where feasible, sensitize target community of child protection laws and child rights</li> <li>Put in place warning signposts like "NO JOBS FOR CHILDREN</li> <li>Develop a Code of conduct to be signed by all workers to ensure children are protected any negative impact from the construction works.</li> <li>Hoard the construction site to avoid any accidents, especially where there are dug up holes and exposed construction tools and material.</li> <li>Create and operate a workers grievance mechanism on labour issues</li> </ul>					
Drug and substances abuse	<ul> <li>Institute a strict 'No Drugs' policy within the work site as well as within the facility when operational</li> </ul>					
abuse	<ul> <li>Conduct awareness campaigns against drugs for site workers, students,</li> </ul>					
	staff and local residents. • Provide counselling services for workers afflicted by drug and substance					
	abuse.					
	Work in tandem with local law enforcement to curb supply, use or distribution of substances within the area					
	<ul> <li>Sensitize workers on no drug or alcohol abuse within the construction site</li> </ul>					
	<ul> <li>and during working hours.</li> <li>Worker under the influence of drugs or alcohol should not be allowed into</li> </ul>					
	the construction site.					
	• Provide posters sensitizing workers on the dangers of drugs and					
	<ul> <li>Provide "No Smoking" signage within the project site.</li> </ul>					
	• Enhance security at the entry points into the institution.					
	<ul> <li>Create and operate a workers grievance mechanism on labour issues.</li> <li>Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.</li> </ul>					
Increased Crime and	<ul> <li>Provide security lights along the access road linking the main road to the CoE</li> </ul>					
	<ul> <li>Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to provide regular surveillance and patrols address any security and crime arising during project implementation and operation.</li> <li>Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices</li> <li>Installation of CCTV surveillance cameras.</li> <li>Stringent access control guidelines for persons accessing sensitive areas at the facility</li> <li>Select a stakeholder coordination committee from the local residents to facilitate communication of grievances to the proponent.</li> <li>Create and operate a workers grievance mechanism on labour issues</li> <li>Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.</li> </ul>					

Conflicts and	- Ensure adaptate employment enperturities allocated to locals					
Conflicts and	Ensure adequate employment opportunities allocated to locals					
Grievances	Develop a GRM process for the project workers					
	<ul> <li>Sensitization of workers/stakeholders on GRM process</li> </ul>					
Increased complaints	• Ensure that all concerns/conflicts are addressed promptly and effectively.					
such as non-	• Ensure careful documentation of all grievances received processed					
employment of locals	resolved and closed out					
inadequate stakeholder	<ul> <li>Ensure that anonymous complaints are documented and addressed to the</li> </ul>					
concultation due to	• Ensure that anonymous complaints are documented and addressed to the					
	satisfaction of the affected parties					
influx of people.	Ensure adequate consultation with stakeholders in a manner allows them					
	to express their views on project social risks, impacts, and mitigation					
	measures.					
	• Ensure timely and prior disclosure and dissemination of relevant and					
	easily accessible information in a timeframe that enables meaningful					
	consultations					
	Create and energies a workers grievance mechanism on labour issues					
	• Create and operate a workers grievance mechanism on labour issues					
	• Train workers including the workers GRM committee on now to effectively					
	use the Grievance Redress Mechanism.					
Non adherence to	<ul> <li>Create awareness on national labour laws and practices.</li> </ul>					
national labour laws	• Implement a labour management plan which specifies e.g., salary scale					
and good practices	for given type of workers, opportunity for women etc.					
in the management	• Ensure all workers have contracts with terms and conditions that are					
of workers	consistent with national labour laws and policies.					
	Finance each worker signs a code of conduct covering issues such as zero					
	tolorance to unaccontable conduct in the community and CRV (covual					
	tolerance to unacceptable conduct in the continuity and GDV (Sexual					
	narassment, sexual exploitation and abuse of children etc.)					
	• Sensitize project workers on actual meaning and implication of the Code					
	of conduct before signing it.					
	<ul> <li>Create and operate a workers grievance mechanism on labour issues</li> </ul>					
	<ul> <li>Train workers including the workers GRM committee on how to effectively</li> </ul>					
	use the Grievance Redress Mechanism.					
	• Employ project workers who are 18 years and above, and with a valid					
	national ID at the time of hire					
	Implement and monitor the employment register regularly					
	Comply with the national labour laws and labour management practices					
	• Comply with the hational labour laws and labour management practices.					
	• Ensure no children are allowed on sub-project sites and put visible					
	signage on site "No Jobs for children".					
	<ul> <li>Ensure a functional and easily accessible project GRM is in place</li> </ul>					
	• Create awareness on project GRM to all community segments and project					
	workers.					
	• Labour hiring process should be gender sensitive and done with fairness					
Inadequate	• Ensure continuous and meaningful engagement with project stakeholders					
consultation with	throughout the project cycle					
nroject stakeholdere	Final timely and continuous disclosure of project related information to					
Project Stakenouels	ctakeholdere					
	Stanchulucis					
	• Create awareness on project GRM to all community segments and project					
	WORKERS.					

#### CONCLUSION

The Project received favourable support from local people and other stakeholders during consultations and they anticipated numerous benefits as a result of the proposed CoE. The Project is not located near any protected areas. However, chance find procedures were developed in the event of any archaeological finds.

The Project will have both positive and negative impact on the physical and social environment. The positive impacts include construction of modern training that will provide opportunities for locals and people from far and wide to train in various facets of geothermal power production. It will also be responsible for creating direct and indirect employment all through its life-cycle. Nakuru County will benefit from increased revenue collection.

The adverse impacts identified are manageable through diligent implementation of the ESMMP by the Contractor and its supervision by the Proponent.

Based on the analysis conducted in this ESIA, it is concluded that overall the Project will result in positive socio-economic benefits and the negative environmental impacts that have been identified are not significant, and can be minimized adequately through good design, appropriate application of mitigation measures and continuous supervision by the project proponent.

# **CHAPTER ONE- INTRODUCTION**

#### **1.1 PROJECT BACKGROUND AND JUSTIFICATION**

The Kenya Electricity Generating Company (KenGen) PLC, herein referred to as the Proponent, proposes to upgrade the current Geothermal Training Centre (GTC) into a regional Centre of Excellence (CoE) The GTC was established in 1989 and accredited as a Technical and Vocational Education and Training (TVET) Centre in 2019. It has grown to a continental leader in equipping players in the energy sector with the requisite skills in electricity generation.

The GTC currently comprises of a single conference room with limited capacity and infrastructure required to realize its mandate of expanding beyond training KenGen staff members and equipping future professionals with the necessary skills at regional level. As the world pushes towards adopting sustainable energy production from renewable sources, it is pertinent that the GTC be upgraded into a CoE in order to cater for the growing demand for skilled professionals within the Energy sector.

To this effect, the GTC was selected by the East Africa Skills for Transformation and Regional Integration Project (EASTRIP) for upgrading into a CoE. EASTRIP, initiated by the Ministry of Education and the World Bank Group, is supporting up to sixteen Regional Flagship TVET Institutes (RFTI) across Kenya, Ethiopia and Tanzania. The KenGen GTC was earmarked as a beneficiary of the project, receiving funding to achieve the following:

- 1. Upgrade infrastructure and equipment.
- 2. Develop a Competency Based Curriculum (CBC).
- 3. Improve the overall management of the CoE.

The proposed project's master plan constitutes of the following six key pillars:

Pillar 1	Pillar 2	Pillar 3	Pillar 4	Pillar 5	Pillar 6
Offering high quality courses, research and consultancy	Creating a modern, safe and industrial learning environment	Providing state of the art training equipment	Ensuring high qualified management and teaching staff	Obtaining national/ international accreditation	Integration of ICT in Learning and Management
Prioritized 13 CBET courses     Develop short(TVET and management) courses     Internationally accredited courses (long and short)     Establish international networks	<ul> <li>Phased approach</li> <li>Minimum standards TVETA</li> <li>Start EASTRIP training section (phase 1)</li> <li>Expansion (phase 2)</li> <li>Continuation (phase 3)</li> </ul>	•CBET based equipment mapping •Minimum standards TVETA •Industrial standards •real-work environment •ICT enriched •International standards	<ul> <li>Phased approach to recruitment</li> <li>Kenya Trainer Qualification Framework</li> <li>Teacher and staff training</li> <li>Nationally registered and accredited</li> <li>Internationally certified</li> </ul>	<ul> <li>Apply for TVETA 5* accreditation</li> <li>Apply for international accreditation for the different courses</li> </ul>	<ul> <li>Teaching and Learning,</li> <li>Industry Engagement and Linkages</li> <li>Trainee Services</li> <li>Governance and Management</li> <li>Teaching and non- teaching staff</li> <li>Reseach and innovation</li> </ul>

Figure 1: KenGen GTC CoE Implementation Strategy

#### **1.2 CONSULTANT ASSIGNMENT**

The Design and Supervision Consultants, AAKI Consultants, contracted Mr. Godwin Lidahuli Sakwa as the lead expert to carry out an ESIA on the proposed upgrading of the KenGen PLC geothermal training facility into a regional centre of excellence in accordance with the Environmental Management and Coordination (Amendment) Act 2015 and the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019, and submit a report to NEMA for approval.

### **1.3 TERMS OF REFERENCE (ToR)**

The ToR for this assessment was based on the Environmental (Impact Assessment and Audit) (Amendment) Regulations dated June 2019. The report contains a description of the following:

- 1. Description of the nature of the proposed project;
- 2. The location of the project including the:
  - a. Proof of land ownership;
  - b. The Global Positioning System (GPS) coordinates;
  - c. Baseline information/ Physical area that may be affected by the project's activities;
- 3. The preliminary design of the project including description of the activities to be undertaken under the project during the various phases such as construction, operation and decommissioning phases;
- 4. A description of the applicable international, national and county level legislative, institutional and regulatory frameworks for management of environment and social risks and impacts associated with project activities;
- 5. The materials to be used, products and by-products, including waste to be generated by the project and the methods of their disposal;
- 6. An analysis of available alternatives including an alternative
  - a. Project site;
  - b. Design;
  - c. Technologies, and
  - d. Processes
- 7. The potential environmental and social risks and impacts of the project and the recommended mitigation measures to be taken during and after the implementation of the project;
- 8. An action plan for the prevention and management of possible accidents during the project cycle;
- 9. Development of an Environmental and Social Management and Monitoring Plan (ESMMP) that highlights mitigation measures to be carried out, including time-lines, responsible persons and budget;
- 10. An inclusive public participation process to provide a summary of issues discussed through public participation fora and through questionnaires disseminated to the key lead agencies identified and members of the public.
- 11. Prepare a comprehensive environmental and social management plan including a monitoring framework for the project;
- 12. The project cost; and
- 13. Any other information the Authority may require.

#### **1.4 OBJECTIVES AND SCOPE OF STUDY**

#### **1.4.1 Brief Overview of the Study**

The fundamental principle of the ESIA is that every person is entitled to a clean environment and that every person has a duty to enhance and safeguard the environment. ESIA is a planning tool which presents methodologies and techniques for identifying, predicting and evaluating potential environmental and social impacts of projects, policies, plans and programmes in the project cycle (planning, implementation and decommissioning phases). ESIA presents decision with the information necessary to determine whether a project should be implemented.

The principal Environmental Regulatory Agency in Kenya is the National Environment Management Authority (NEMA). NEMA formulates environmental policies and accords environmental licenses or clearance for projects. The need to undertake an ESIA for the project emanated from the following observations.

Under section 58 (1) of Kenya Government's Environmental Management and Coordination Act (EMCA), Number 8 of 1999 (Amendments, 2015) and Environmental Impact Assessment and Audit Regulations of June, 2003; 2019, an ESIA study is necessary and a fully detailed Study Report is to be compiled and submitted to NEMA for approval before commencing the proposed development.

#### 1.4.2 General Objectives

To carry out an ESIA study report in the proposed area in accordance with relevant national legislation and regulations and the World Bank safeguard policies with due consideration being given to pertinent international quality assurance standards and submit the report to NEMA for review and approval.

#### **1.4.3 Specific Objectives**

- a) To describe the scope of the proposed project and associated works;
- b) To establish the baseline environmental and social status of the project site;
- c) To identify and assess the potential environmental and social impacts of the proposed project;
- d) Undertake public consultation with the identified project stakeholders, local residents/ households living around the proposed project site as well as other stakeholders of the project to obtain their views;
- e) To identify and quantify pollution sources and determine the significance of impacts on sensitive receptors;
- f) To predict and evaluate environmental and social impacts expected during the construction and operational phases if any;
- g) To develop mitigation measures to minimize pollution, environmental disturbance and nuisance during construction and functional phases;
- h) To design and specify the monitoring schedule necessary to ensure the implementation and the effectiveness of the mitigation measures adopted;
- i) Propose an Environmental and Social Management Plan (ESMMP) that will guide the implementation of mitigation measures and monitoring throughout the implementation of the project and contribute to the overall process of project monitoring and auditing. This will enable the project developer to take timely action

to prevent negative environmental and social impacts before they become irreversible; and

j) To prepare an ESIA Study Report compliant with EMCA, Cap 387 and in compliance with the acceptable format as stipulated in the Environmental (Impact Assessment and Audit) Regulations, 2003; 2018; properly addressing all the items specified in the Terms of Reference (ToR) approved by NEMA and detailing findings and recommendations from the study.

#### **1.5 METHODOLOGY AND SCOPE OF THE STUDY**

#### **1.5.1 Environmental Screening**

A screening of the proposed project was undertaken to establish whether it is to be subjected to an ESIA study on not. According to Legal Notice 31 and 32 of 2019 on ESIA, low and medium risk projects are to undertake Summary or Comprehensive Study Reports, depending on the severity of their environmental impact. High risk project are to undergo a full ESIA Study.

The proposed project categorized under **3. High Risk Projects (3. Urban Development;** (h) Establishment of schools and other learning institutions exceeding one hundred learners) Project plans indicate that the proposed CoE is poised to accommodate over 150 students by virtue of the occupancies allocated to the student hostels.

The project also falls under **Category B of the World Bank Group's Safeguard Policies** as the impacts envisaged will not be as extensive as those in Category A projects. The proposed project's impacts are site-specific. Mitigation measures against the impacts have also been designed accordingly.

#### 1.5.2 ESIA Approach

The ESIA Report was carried out using a number of methods comprising desktop studies, field visits, administration of semi structured questionnaires and public consultative meeting as described below:

#### a. Literature Review:

Literature review pertaining to the project activities and salient features of the project area was done. This covered the review of the Environmental Management and Coordination Act, relevant studies and reports on the construction. A desk study was also conducted to review available reports, plans and maps in order to compile relevant bio- physical and socio-economic information about the study area.

The bio- physical information was compiled on environmental aspects such as topography, climate, drainage, soils, geology/hydrogeology, and vegetation among other aspects. The socio-economic environment study covered information on issues such as population, the dimensions of well-being and income levels, water supply and sewerage, sanitation levels, infrastructure development, political ramifications and community participation.

The ESIA study team also scrutinized all relevant national policies, legislation and regulation, including institutional requirements to examine their relevance under the project context. The team also considered international policies, more specifically The World Bank safeguard policies that are relevant to the project.

#### b. Field Survey:

The ESIA team conducted a survey of the project site in order to familiarize itself with the site location. The survey established the general environmental site conditions, neighbouring features and characteristics. The ESIA methodology was therefore underpinned by the reconnaissance survey.

A physical inspection of the proposed site and their surrounding environment was conducted to establish the anticipated positive and negative impacts on the biophysical environment (hydrology, geology, soils, climatic patterns, Air, Noise, fauna and flora), socio-economic trends (population trends, settlement trends, economic patterns, land uses etc.).

Specific objectives of the field assessment included:

- 1. Obtaining any available information and data from the local public offices including environment, water, lands and health.
- 2. Undertaking comprehensive consultative public participation exercises so as to reach a large section of the residents as well as other stakeholders.
- 3. Public consultations were also organized with the residents
- 4. Evaluating the environmental setting around the proposed site observations were focused on the topography, land tenure, surface and ground water sources, public amenities, land cover, climate, flora and fauna, soils, etc.
- 5. Evaluating social, economic, physical and cultural settings in the entire project area.

#### c. Public Participation

An interactive approach was adopted in engaging the community members and other relevant stakeholders in discussing issues s u c h as land use, envisaged benefits and/or disadvantages, potential risks and impacts on the social, cultural and economic on the community within the Project Area of Influence (PAI). Interviews with interested and affected parties were conducted with the following objectives;

- 1. To inform local people and leaders about the proposed project;
- 2. To seek views, concerns and opinions of people in the area concerning the project;
- 3. To establish if the local residents foresee any positive or negative environmental effects from the project and if so, how they would wish the perceived impacts to be addressed;

This was achieved through informal interview sessions and structured questions administered to the project area residents. (See attached household questionnaires Annex 10). In order to achieve a wide acceptability of the proposed project and the assessment, the ESIA team, together with the Project Implementation Unit from KenGen and the local administrative figures, convened a public meeting on 4<sup>th</sup> March 2022 at Kamere Centre. Details regarding the discussions during this meeting were consolidated into meeting minutes which are hereby attached (Annex 8).

# **CHAPTER TWO – DESCRIPTION OF THE PROJECT**

#### 2.1 PROJECT SITE DESCRIPTION

The proposed site is located on L.R No 9005/12 at Kamere Village within Ol-Karia Ward, Naivasha Constituency, Nakuru County at coordinates 0°49'28.54"S and 36°19'3.87"E. It is located approximately 25 kilometres from Naivasha Town. The nearest water body to the project site is Lake Naivasha, which is located approximately 1.5 kilometres north of the site. The proposed project site is accessible through a tarmac access road connected to Moi South Lake Road.

The KenGen Olkaria Geothermal Plaza, borders the proposed site to the North-East. It is composed of KenGen's main offices and staff quarters. The Geothermal Plaza's close proximity to the proposed site validates site location due to ease of access by Project Implementation Team (PIT) and staff members during its operational phase.

To the North is Kamere Village, which is an informal settlement consisting of rudimentary housing units that stretch from the main road and are bordered by the access road leading to the project site.



Figure 2: Site Location



Figure 3: Access Route to the Site Location from the Main Road



Figure 4: Location of Lake Naivasha from the Project Site
#### 2.2 LAND OWNERSHIP

The proposed project will be situated on LR. No. 9005/12 which is owned by the proponent under the name KenGen PLC as per the copy of the title deed (Annex 1).

#### **2.3 CURRENT SITE DESCRIPTION**

The proposed site is currently devoid of any buildings or structures. The site has minimal vegetation cover, only consisting of short grasses, scrubs and a cluster of *Euphorbia candelabrum* which will not be removed from the site. The topography of the site consists mainly of level land with the exception of a shallow gorge cutting through the parcel of land. None of the construction activities shall take place close to the gorge. A setback distance (buffer zone) from the edge of the gorge shall be set-up and protected to prevent the gorge from surface run-off and canal erosion. It will also act as a safety buffer against hazard presented by the gorge's vertical cliff. Protection works may range from landscaping activities I.e terracing and re-afforestation to physical barriers like gabion works and wall protection. The client shall ensure sub-sequent project phases of the CoE respect the buffer zones established and continue to maintain the protection measures put in place.



Plate 1: A section of the proposed site



Plate 2: A section of the shallow gorge



Plate 3: A cluster of *Euphorbia candelabrum* located next to the access point



Plate 4: View of the shrubbery located at the end of the gorge



Plate 5: Access road to the site

#### 2.4 PROJECT DESIGN

KenGen's Geothermal Training College and CoE Master Plan has identified, amongst its main considerations, the need to use a phased approach towards transforming the GTC into a full-fledged Regional Flagship TVET Institute (RFTI) and CoE.

The phasing covers:

- 1. Implementation of recommended curriculum courses
- 2. Resource development i.e. training and support human resources, equipment and technology
- 3. Trainee capacity.
- 4. College infrastructure and facilities.
- 5. TVETA 5 accreditations and other international accreditations for various courses.

As highlighted in section 1.1 of the report, the master plan has six key pillars. The phased implementation of the physical infrastructure required towards the proposed upgrade is described under Pillar 2.

#### **2.5 PROJECT COMPONENTS**

Upon completion, the CoE will have a daily occupation capacity for 456 students. The CoE will have a projected number of 36 Full Time Employees (FTE) who will still rely partially on the support of the KenGen staff. All laboratories shall be constructed under Phase One. Upon completion, it is envisaged that the entire campus will occupy a sum space of approximately 6,850M<sup>2</sup>. A copy of the project master plan providing the layout of the components to be constructed is attached in this report (Annex 3).

The upgrade will entail construction in the following sections of the GTC:

#### 1. TRAINING.

Α.	Lecture Rooms			
S/N	Components	Capacity (pax)	Size (m <sup>2</sup> )	No. of Units
1	Standard Lecture Rooms	24	72	5

2	Smart Lecture Rooms	24	72	1
3	ICT Classroom	24	72	1
4	Library-two classrooms combined	24	144	1
5	Conference rooms-two classrooms combined	24	72	1

В.	Laboratories			
S/N	Components	Capacity (pax)	Size (m²)	No. of Units
1	Laboratory with store and offices space	24	135	5

С.	Workshops			
S/N	Components	Capacity (pax)	Size (m <sup>2</sup> )	No. of Units
1	Fully closed workshops	24	180	5
2	Semi-open workshop	24	180	1
3	Open training area	24	300	1

D.	Department Staff Areas			
S/N	Components	Capacity (pax)	Size (m²)	No. of Units
1	Big office	1	16	2
2	Standard office	2	16	4
3	Shared office (Open Plan)	6	28	4
4	Meeting room	12	32	1

Ε.	Washrooms			
S/N	Components	Capacity (pax)	Size (m²)	No. of Units
1	Trainee Washrooms		60	1
2	Staff Washrooms		32	1

#### 2. STUDENT'S ACCOMMODATION.

<b>A</b> .	Accommodation Hostels			
S/N	Components	Capacity (pax)	Size (m <sup>2</sup> )	No. of Units
1	Female Hostels	80		1
2	Male Hostels	80		1
3	Common room	30	70	2
4	Ablution block		30	3
5	Laundry		20	1
6	First aid room	3	27	1

В.	Catering Unit			
S/N	Components	Capacity (pax)	Size (m <sup>2</sup> )	No. of Units
1	Regular Mess Hall	125	300	1

2	Executive Mess Hall	70	240	1
3	Kitchen with stores and staff areas		450	1

#### **3. EXECUTIVE ACCOMMODATION.**

Α.	Accommodation			
S/N	Components	Capacity (pax)	Size (m <sup>2</sup> )	No. of Units
1	Accommodation villa			8 hotel standard rooms

#### 4. SPORTS AND RECREATION AREAS.

Α.	Outdoor Pitches			
S/N	Components	Capacity (pax)	Size (m <sup>2</sup> )	No. of Units
1	Soccer/Rugby Pitch with running track		7140	1

#### 5. OTHERS

This section will constitute boundary fixtures such as gates and fencing, road and pathways that will serve the vehicular, parking and pedestrian usage. It will also involve general landscaping of lawns and greenery to match the local flora i.e. acacia, cactus and euphorbias.

#### 2.6 PROJECT CONSTRUCTION ACTIVITIES

Pre-construction phase consists of site preparation for further work. It involves site clearing, appointing labourers, procurement of construction material and machinery, getting necessary approvals from statutory authorities such as National Environmental Management Authority (NEMA) and Directorate of Occupational Safety and Health Services (DOSHS), National Construction Authority (NCA). This ESIA assessment is part of this stage.

During construction phase there will be temporally impacts on the land use pattern, air pollution due to construction activities, noise pollution, etc. The implementation of the project's design and construction phase will start with thorough investigation of the site soil chemical and physical properties and water table level determination. The construction of the CoE shall be as per the approved designs. The construction will be based on the building standards, code and regulations applicable in Kenya. These include but not limited to the Building Code and the British Building Standards BS 8110 and BS 5950, BS4449, BS446, BS5255, BS497, BS556, BS4466, BS4461 etc. The constructions will as well incorporate environmental guidelines, health and safety measures.

The County's general by-laws on building, water and sewerage by-laws, and Public Health Act must also be adhered to during the construction phase. This phase will be undertaken by a contractor who will be able to handle all the civil works including levelling of the site and clean up including debris that is piled off-site on open areas that are not part of the proposed project plot.

In order to alleviate any negative impacts emanating from the construction and operation activities of the proposed project, relevant and cost effective mitigation measures have been proposed in the ESMMP which is part of this report. Key summary descriptions of the construction activities are presented in the following section and they include:

#### 2.6.1 Preparation of land

This activity shall involve site clearance, site levelling and topsoil removal. This will generate solid waste on the site as top-soil, and removed soil debris etc. The selected site land is currently idle, with some sections used as access routes and grazing pastures by the surrounding community. Therefore, the project does not require a change-of- use permit from the Nakuru County Government. The site has been largely undisturbed and savannah tree types comprised of mainly of *Euphorbia candelabrum* with interspersed grasses and shrubs.

#### 2.6.2 Procurement of building materials

Procuring construction material will lead to increase in temporary air pollution due to vehicular traffic, loading and unloading operations, land degradation from quarrying activities during sourcing building materials among others. Greater emphasis shall be laid on procurement of building materials which shall be done within the project area and its environs.

The contractor is expected to procure from suppliers who to the extent possible use environmentally friendly processes in their operations and are licensed by relevant national agencies and authorities, This makes both economic and environmental sense as it will reduces both the costs and negative impacts of transportation of the materials to the project site through reduced distance of travel.

To avoid much wastage of construction materials, the proponent shall order the materials in quotas as at when they are required and the quantities required and ensure appropriate storage. The contractor shall be tasked to use locally available material so as to also ensure the CoE stays in tune with the locality in terms of identity.

#### 2.6.3 Excavation and foundation works

KenGen shall carry out extensive excavation activities to ensure a stable foundation for the buildings hence avoiding future calamities such as collapsing of the buildings. Excavation activities shall cause considerable levels of disturbance to the project area and must be limited to day time only. No blasting of stones shall be carried out at the project site. The proponent must ensure that all the excavated soils are properly disposed of away from the construction site preferably in areas approved by NEMA and Nakuru County Government to avoid reducing the aesthetic quality of the areas off site.

#### 2.6.4 The structural framework

The foundation and all reinforced concrete structural members e.g. ground beam foundation, columns, beam casting will be carried out in accordance with Ministry of Public works regulations. The best concrete cast must also conform to mixing ration of 1:2:4

reinforced concrete as per the specifications of the structural engineer and be tested in accordance by the material testing section of the Ministry of Public Works.

#### 2.6.6 Masonry and concrete works

Construction of the masonry walls, foundations, floors, pavements, storm water drainage systems, perimeter fence, access road and parking space among other components of the project will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces.

These activities are known to be labour intensive and shall be supplemented by machinery such as concrete mixers.

#### **2.6.7 Roof construction works**

Roof construction shall make use of decra roofing sheets instead of clay roofing tiles. This is to abate the incidences of baboons removing the clay roofing tiles as they have reportedly done to the existing staff housing estate within the KenGen premises.

#### 2.6.8 Electrical works

Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets among others. In addition, there will be other activities involving the use of electricity such as welding and metal cutting. The electrical works will be carried out by trained and certified professionals.

The design team has also put in provisions for the use of solar generated power. This will involve solar power use for lighting common areas and also street lighting. The proponent shall also install solar water heating apparatuses in the hostel areas in line with the Energy (Solar Water Heating) Regulations, 2012.

#### **2.6.9 Door/Window Fixtures**

Doors and their frames shall be of standard measurement as per the architectural designs. Aluminium windows shall be installed to negate corrosion due to hydrogen sulphide in the air from the nearby geothermal plant and will provide adequate light into all buildings. Aluminium windows also have a very low building life cycle maintenance and are therefore the more sustainable option.

The proposed project shall also make use of shading devices such as shutters and projecting horizontal and vertical fins. This will reduce the impact of direct sunlight within the training and administrative areas.

#### 2.6.10 Walling and Floor Finishing

Walls shall consist of masonry walling cladded externally with locally available rubble stone and clay bricks for minimum building life cycle maintenance as per the specifications given and plaster, thick cement, sand mix ratio finished in smooth with steel float for the internal walls. Flooring in sensitive areas i.e. the labs and workshops, will be done in epoxy for easy maintenance. Toilets, washrooms and bathrooms will be fitted with ceramic filing as designated tiles. The design concept adopted by the proponent also provides for a 3.6 meter floor-to-roof height coupled with expansive windows that allow maximum use of natural light and ventilation.

Locally available materials i.e. brick and rubble stone cladding will be used for external finishes. These options were deemed viable as they are sustainable and are easy to maintain.

#### 2.6.11 Fire Fighting System

The detailed fire protection system is planned in this project in line with the requirements of the Kenya Fire Rules of 2005. The proposed Project design and development has been planned with utmost care and all provisions have been made for the safety and security of the property as well as the personnel. The potential cause for fire in this proposed Project include faulty of gas cylinders, short circuit of faulty electrical cables and from accidents with other combustible materials especially from the laboratory.

In all the stages of this project vide construction, operation and decommissioning, strict adherence to measure to minimise fire risks will be enforced such as procurement and use of appropriate high quality materials such as electrical cables, appliances and gas canisters. Banning will be instituted of certain activities such as littering, lighting fires and habits like smoking except in designated areas having corresponding higher safety measures.

#### 2.6.12 Security and services

During peak construction, a large labour force will be employed and there is a potential of increased crime on site. As a control measure the proponent should have a 24 hours security provided including personnel that are expected to pro-actively identity and prevent criminal threats in conjunction with other existing security measures such as police, administration and community or neighbourhood (Nyumba-Kumi) watch groups.

#### 2.6.13: Landscaping

The design concept of the proposed project has defined green social spaces within the site. At the final stages of construction, the contractor shall ensure all these areas earmarked as green areas are landscaped as per specifications, from the size to the type of vegetation.

The proponent does not have any intention of removing the existing vegetation to retain the CoE's sense of place and identity. Flora can also be used as screens against strong winds as they can re-direct it to other areas where it can be put to good use or cannot do any damage. Trees can also be used as a buffer against noise and offer a sense of privacy, especially between the CoE and the KenGen Staff Quarters located a few meters from the site.

For re-vegetation purposes, the proponent can consider planting Kikuyu Grass (*Cenchrus clandestinus*) due to being moderately drought resistant. It can tolerate water-logging and can effectively prevent soil erosion. The proponent can also plant more Euphorbia trees which are endemic to the PAI.

#### **2.7 PROJECT OPERATION ACTIVITIES**

The activities to be conducted in the proposed project's operation phase are various education and accommodation related activities.

#### 2.7.1 Solid Waste Management

Solid waste shall mainly come from the laboratory, kitchen, hostels and discarded materials all over the campus. Accumulations of such waste may rise to problems like bad odour, epidemics of infectious diseases and pest infestation problems. In today's context, matter of concern is how to manage the large quantity of wastes in different forms. Treatment and disposal of such wastes through conventional methods is inefficient as well as unsatisfactory. During the last decade some new biotechnology based options are emerging to solve these problems. Recycling of waste through vermin compost has multi-directional impact.

KenGen has currently engaged Diamond and Sparkle Cleaning Limited to handle solid waste and will retain the company's services for the proposed CoE. Diamond and Sparkle have engaged the Flying Eagle Youth Group, situated in Naivasha, to transport non-hazardous waste to Naivasha Dumpsite, and will engage a NEMA licensed company to handle hazardous waste. A copy of Flying Eagle Group's NEMA licence is attached as Annex 3.

#### 2.7.2 Liquid Waste Management

In Kenya, the most commonly applied technologies in wastewater treatment are use of waste stabilization ponds, oxidation ditches and trickling filters. Oxidation ditches and trickling filters are mechanically operated systems that present challenges with operation and maintenance. On the other hand, waste stabilization ponds have high land requirements, high construction cost and odour nuisance especially from anaerobic ponds.

The proposed CoE is estimated to generate approximately 40m<sup>3</sup> of liquid waste per day from all its constituent sections as per the waste water estimation data sheet attached as annex 6. Taking all the above into account and considering that the PAI does not have conventional sewerage waste water management services, the proponent proposes to install a bio-digester system for this purpose. This was also occasioned through site visits and studying topographical maps. An exhaustive analysis of the options available is provided in section 5.6 of this report.

All buildings will be connected to a small sewer system leading into two bio digesters which will become the centre for the wastewater containment and treatment. Re-use, recycling and recovery of the resources from the waste water will also be conducted from this point. Annex 4 shows the layout of the bio-digesters within the project site.

Laboratory waste will be first diluted in the dilution traps under all the lab sinks before being diverted into four  $1M^3$  collection chambers provided outside the lab for treatment. The treated waste will then be directed to the bio digesters.

By-products of the treatment process include:

#### 1. Treated Effluent

The effluent from the plant can be used for construction, irrigation and landscape watering, flushing toilets, washing hardscape in the compound and for dust control.

The plant is designed to treat wastewater to an effluent of 20mg/l Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS).

The proponent intends to re-use treated effluent to water green areas within the campus. According to the Fourth Schedule of the Water Resources Management Rules, 2006 the maximum allowable limit of BOD for effluent discharged onto land is of 500mg/l and 2100mg/l for TSS. Therefore, effluent from the system will be well within limits for use to water green areas within project site..

#### 2. Sludge

This can be discharged into tankers to transport it to a landfill site, agricultural land or other suitable disposal location.

#### 3. Others.

Biogas produced from the treatment process is a viable substitute for conventional energy sources.





#### 2.7.3 Water Supply

Owing to the fact that the PAI does not have conventional sources of water such boreholes and connections to the Naivasha Water and Sanitation Company (NAIVAWASCO) water supply lines, the main source of water in the area is from Lake Naivasha. KenGen abstracts water from the lake and purifies it in a water treatment facility before use.

The proposed CoE will receive water from KenGen's water treatment plant. It is estimated that during its operational phase, the CoE will use 40m<sup>3</sup> of water per day. To accommodate the additional volume of water abstracted, the proponent shall seek a Variation of Permit from the WRA as per section 42 and Schedule Six of the Water Resources Management Rules, 2006.

The site will have a total underground water storage capacity of 256,000 litres with 146,000 litres for domestic and use 110,000 litres reserved for fire-fighting. It will also have 18,000 litres at high level and a total of 55,000 litres in roof storage. This will ensure that the facility has water throughout should the water treatment plant experience any failure. It is envisioned that the contractor shall provide water for the construction phase through use of bowsers

#### 2.7.4 Storm Water Management

Separate and independent rain water drainage system shall be provided for collecting rain water from terrace, paved areas and lawns, in coordination with architects and structural consultants. Perforated pipe drainage system shall be provided for open-to-sky courtyard/lawn.

#### 2.7.5 Electricity supply

Kenya Power is a limited liability company responsible for the transmission, distribution and retail of electricity throughout Kenya. The main supply to the facility will be from the existing Kenya Power and Lighting Company PLC (KPLC) grid line augmented where appropriate with use of solar energy for water heating and lighting.

#### 2.7.6 Emergency and Disaster Preparedness

All buildings have different types of fire extinguishers and fire detection devices including smoke detectors, Heat Detectors, Break glass and sounders. All of these will be connected to a fire alarm panel for ease of detection of fire hazards. The site will have 110,000 litres of water reserved for fire-fighting. The warning signs for prevention of fire and plans showing the exit paths for escape from fire will be prominently displayed in the working places and corridors of the buildings. Emergency exit lights will be positioned at all the exits for ease of evacuation in the event of an emergency at night are designed to retain power and remain on in case of power outage. All buildings will also be fitted with lightning protection devices.

The facility will be supported by the KenGen Staff medical centre for emergency cases before attendance in nearby hospitals.

#### 2.7.7 Provisions for Persons with Disabilities (PWDs)

All buildings have been provided with ramps in compliance with the safety and statutory requirements for persons with disability. All wash-rooms also have provisions to accommodate PWDs.

#### 2.8 PROJECT COST

As per the bills of quantities provided and attached in annex 2, the project is estimated to cost **Kenya Shillings Six hundred and seven million, four hundred and seventy-two thousand, seven hundred and fifty-six (Ksh 607,472,756.01)** while the cost of implementing the ESMMP is estimated at **Kenya Shillings Two million six hundredthousand (Ksh. 2,600,000)**.

### CHAPTER THREE- BASELINE INFORMATION OF STUDY AREA

#### **3.1 INTRODUCTION**

This chapter describes the existing environmental status of the study area with reference to the prominent environmental attributes such as administrative and political demarcations, climate, hydro-geological aspects, atmospheric conditions, water quality, soil quality, vegetation pattern and ecology, socio-economic profiles of people and land use.

The present environmental status helps in identifying and assessing the potential environmental impacts from activities of the proposed project.

#### **3.2 GENERAL LOCATION**

The proposed development will be constructed in Nakuru County. The County covers an area of approximately 7,498.8 Km<sup>2</sup> and is located between Longitudes 35.41 ° East or 35 ° 24' 36" East and 36.6 °East or 36 °36' 0" East and Latitude 0.23 ° North or 0 ° 13' 48" North and 1.16° South or 1° 9`36" South. The County headquarters is Nakuru Town. It is located in the Rift Valley that borders seven Counties; Laikipia to the north-east, Kericho to the West, Narok to the south-west, Kajiado to the South, Baringo to the North, Nyandarua to the East and Bomet to the West.

The proposed site is located on L.R No 9005/12 at Kamere Village within Ol-Karia Ward, Naivasha Constituency, Nakuru County at coordinates **0°49'28.54"S** and **36°19'3.87"E**.

#### 3.2.1 Administrative Units

Nakuru County is administratively divided into eleven administrative Sub-Counties as shown in table 1 below.

	Constituency	Area in km <sup>2</sup>
1	Molo	478.8
2	Njoro	713.3
3	Naivasha	1685.8
4	Gilgil	1348.4
5	Kuresoi South	559.7
6	Kuresoi North	572.3
7	Subukia	390.7
8	Rongai	1049.1
9	Bahati	375.4
10	Nakuru West	251
11	Nakuru East	74.3
	TOTAL	7498.8

#### Table 1: Nakuru County Administrative Units

Source: Nakuru CIDP, 2018-2022

The proposed site is located in Naivasha Sub-County, which is the largest in Nakuru County, and therefore poised to offer a multitude of opportunities to the residents of Naivasha as well as beyond.

#### 3.2.2 Political Units

Nakuru County is divided into 11 Constituencies namely; Nakuru Town East, Nakuru Town West, Bahati, Subukia, Rongai, Njoro, Molo, Kuresoi South, Kuresoi North, Gilgil and Naivasha. The Total number of the County's electoral wards is 55.

	Constituency	Number of Wards
1	Molo	4
2	Njoro	6
3	Naivasha	8
4	Gilgil	5
5	Kuresoi South	4
6	Kuresoi North	4
7	Subukia	3
8	Rongai	5
9	Bahati	5
10	Nakuru West	6
11	Nakuru East	5
	TOTAL	55

**Table 2: Political Units in Nakuru County** 

Source: IEBC, 2013

The project site is located in Kamere Centre situated within Ol-Karia Ward in Naivasha Constituency.



Figure 6: Administrative map of Nakuru County Source: Kenya National Bureau of Statistics, 2010

#### **3.3 PHYSICAL ENVIRONMENT**

#### 3.3.1 Climatic Conditions

The climate of Nakuru County is strongly influenced by the altitude and physical features. There are four broad climatic zones as shown in the figure 6 below:



#### Figure 7: Climatic zones of Nakuru County Source: Nakuru CIDP, 2018-2022

- **1. Zone 1** has lowest mean annual amount of rainfall of about 500-800mm per annum. This zone is predominantly experienced in Gilgil and Naivasha sub-counties.
- **2. Zone 2** occupies most parts of Nakuru County with a general elevation of between 900M and 1800m amsl.
- **3. Zone 3** receives rainfall of between 1100 and 1400 mm per annum and covers areas with an altitude of between 1800-2300m above sea level. This zone covers much of the sub-counties of Kuresoi North, Molo, Njoro, Subukia and Bahati and are very suitable for agricultural activities.
- **4. Zone 4** covers areas with an altitude between 2300m and 2700m above mean sea level (amsl), receiving rainfall of over 1400mm per annum. This zone covers Mau Escarpment that is parts of both sub-counties of Kuresoi North and South.

From the climatic zonation, the project site is located within Zone Two. The zone receives more than 300mm of rainfall per year and therefore the installation of rainwater harvesting apparatuses is deemed environmentally feasible for the proposed CoE.

#### 3.3.2 Temperature

The mean minimum monthly temperature in the project area has been recorded to range from 15.9 - 17.8°C with a mean of 16.8°C. The mean monthly maximum temperatures range from 24.6 - 28.3°C and the month of July is the coldest month while the hottest month is February.

The project site is located within favourable temperature conditions that can sustain the operational activities of the proposed CoE. Students and staff will be able to carry out their activities with relative comfort during the day and night.

#### 3.3.3 Physical and Topographical Features

The main topographical features in Nakuru County are the Mau Escarpment covering the Western part of the County, the Rift Valley floor, Ol-Doinyo Eburru Volcano, Akira Plains and Menengai Crater. The County boasts of an elaborate drainage and relief system with various inland lakes on the floor of the Rift Valley where nearly all the permanent rivers and streams in the County drain into. These rivers include river Njoro and Makalia which drain into Lake Nakuru, Malewa which drains into Lake Naivasha and Molo River which drains into Lake Baringo among others.

The topographical features provide an interesting niche for research as well great tourist attraction sites. One of the predominant features is the Hells Gate gorges in Naivasha which is part of the important tourist sites. The topography in Naivasha and Gilgil Sub-Counties is characterized by mountain ranges and savannah vegetation that supports various species of wildlife.

The County's soil pattern presents a complex distribution of three main classifications that have been influenced by climatic conditions, volcanic activities and the underlying rock type.

The project site is fairly level ground with a gorge cutting along the southern boundary.

#### 3.3.4 Ecological Conditions

The Ecological zones of Nakuru County are strongly influenced by the climatic conditions and physical features. The Mau Escarpment with an average altitude of 2,400m above sea level is very important as most of the forests are located on it. It is also the source of Njoro River that drains into Lake Nakuru which is inhabited with flamingos, and among the tourist attraction sites in Kenya. Underground hot springs in Olkaria are an important source of geothermal power that serves not only the county but also provides power supply to the national grid. Further explorations are underway at Menengai Crater and Ol-Doinyo Eburru with a view to generating more electricity.

The project site is located in close proximity to the OI-Karia hot springs. With the proponent being a regional leader in power generation from these geothermal sources, the proposed project will greatly benefit as students will have access to the power generation sites for the purposes of practical learning as well as access to stable power.

#### 3.3.5 Water Resources and Supply Schemes

The main sources of water for Nakuru County are surface water and ground water. Surface water is mainly sourced from permanent and seasonal rivers, dams, water pans. The major

rivers are: Malewa, Molo, Igwamiti and Njoro. Underground water is sourced from boreholes, springs and shallow wells.

Nakuru County also received water through various supply schemes. These include; public water companies such as the Naivasha Water and Sanitation Company (NAIVAWASCO), which supplies Naivasha Sub-County. The county also has community water supply schemes and private water vendors.

While the project site does not have access to water through NAIVAWASCO, the proponent installed a water treatment facility that abstracts water from the nearby Lake Naivasha. It is envisioned that the contractor shall provide water for the construction phase through bowsers. The proposed project, when operational, shall draw water from the treatment facility as elaborated on in section 2.7.3 of the report.

#### **3.4 BIOLOGICAL ENVIRONMENT**

#### 3.4.1 Floral Composition

Although there is a significant forest cover in Nakuru County due to the Mau Forest, there are also large areas which have little tree cover. The current forest cover for Nakuru is approximately 9 percent.

Owing to the meagre amount of rainfall received within the project area, it falls under the region of Nakuru County with sparse vegetation. The project site is characterized with scattered tufts of grass and shrub with the predominant tree species observed being clusters of *Euphorbia candelabra*.

#### 3.4.2 Faunal composition

The site is situated approximately 10 kilometres from Hell's Gate National Park and therefore the residents around the project area observe wild animals, especially baboons which frequent Kamere Centre.

#### 3.4.3 Land and Land Use

According to the Nakuru CIDP, land in Nakuru County is categorized as either public, community or private land. The project site is located within a parcel of land owned by the proponent and therefore is classified as public land.

The project area, which is situated approximately 25 kilometres from Naivasha Town, is located within a locale that can be characterized as rural. Most of the developments around in Kamere comprise of informal commercial and residential developments. This is with exception of the proponent's Geothermal Plaza, which hosts the proponent's offices.

The land use for the project site has not been classified for use and remains idle and therefore does not require a change of use permit under the Physical Planning Act, 2012.

The area is generally drained by the existing public drainage system along the access road. The proposed design has provided for internal drains to collect the surface run-off and safely dispose to the existing drainage system.

#### **3.5 SOCIO-ECONOMIC ENVIRONMENT**

#### 3.5.1 Population

According to the Kenya Population and Housing Census of 2019, the population of Naivasha Sub-county stood at 355,383, the highest in the county. The project is located in Kamere Village within Naivasha Sub-County. While it is a rural settlement, the project area is experiencing rapid demographic and socio-economic change, occasioned by urban to rural migration triggred by people seeking opportunities away from urban areas where unskilled and semi-skilled labour is scarce. These people seek employment in the lodges that dot the Lake Naivasha beaches, in geothermal power producers such as KenGen and OrPower and other entities that offer the chances for employment.

The proposed project is poised to draw more people away from the urban areas. Staff and students will spur the growth of the project area as they settle around the campus.

#### 3.5.2 Transport

The project site is well accessible through a network of good roads. Naivasha lies on the side of the Nairobi-Nakuru Highway. Kamere Centre is accessible from Naivasha through Moi South Lake Road. The project site can then be accessed via a tarmac access road that goes around Kamere Centre.

#### 3.5.3 Education

According to the Nakuru CIDP, Nakuru County had 1089 primary schools with an enrolment of approximately 466,000 pupils and over 508 secondary schools with a total enrolment of over 146,000 students. With the enrolments poised to increase over the years, the county will require more tertiary institutions to absorb the increasing number of students seeking good quality training for skill development pertaining to the energy sector. With Nakuru hosting the single largest geothermal power plant in Africa, it is likely that more people will gravitate towards gaining skills in the energy sector once the proposed project is completed.

#### 3.5.4 Health

There are total of 459 health facilities spread across the County. The County has one level 5 hospital which is Nakuru Provincial General Hospital (NPGH) that also serves Baringo, Nyandarua and Laikipia counties. Naivasha Sub-County has 75 public, Faith Based and private health institutions. The closest facility located within the Project Area of Influence is KenGen Mvuke Clinic, which is a level 3B health centre located within the KenGen staff estate.

#### 3.5.5 Sanitation and Hygiene

There are three County designated solid waste disposal sites situated in Naivasha, Nakuru and Mai Mahiu towns. These sites are few and do not meet the ever-growing needs of the urban population. The County will manage solid waste through rehabilitation of the existing disposal sites, acquisition of land for transfer stations & landfills and new dump-sites.

According to KIHBS 2015-16 most of the residents of Nakuru County dispose human waste through pit latrine which are covered which is at 76.9 percent. Only 15.3 percent of households are connected to the main sewer.

Kamere Township does not have conventional means of solid and liquid waste management. Residents dump waste in pits and burn. KenGen manages liquid waste through septic tanks.

To handle solid waste, the proponent has currently engaged Diamond and Sparkle Cleaning Limited to handle solid waste and will retain the company's services for the proposed CoE. Flying Eagle Youth Group have been engaged by Diamond and Sparkle to transport nonhazardous waste to Naivasha Dumpsite in Kayole. The company will also seek to engage a NEMA licensed company to handle hazardous waste. A copy of Flying Eagle Group's NEMA waste transportation licence is attached as Annex 3.

To handle liquid waste from the CoE , KenGen will install two bio-digesters within the project site.

#### 3.5.6 Energy

The project area is served by electricity from the National grid and there are electric lines along the road access to the project site. Upon completion of construction and after acquiring relevant permits, the proponent will connect the proposed development to the national grid. In addition, the proponent will install backup generators and solar power amenities to augment electricity supply from the national grid.

#### 3.5.7 Communication

Data from the Nakuru County Integrated Development Plan offers that an estimated 82.5% of households in Nakuru County own a mobile phone while the mobile coverage stands at 91%. 16.3% of Nakuru Residents have access to internet.

According to data obtained from the American Red Cross on cell towers in Kenya, in 2019, Nakuru County had a total of over 4,000 Base Transceiver Stations. Of these, approximately 1070 were located in Naivasha Sub-County. In 2019, Olkaria Ward had approximately 100 cell towers; forty-nine 2G cell towers, fifty 3G cell towers and one 4G cell tower.

From this data, it can be inferenced that the Project Area of Influence is well covered in terms of mobile communication.

#### **3.5.8 Economic Activities**

In Nakuru County, majority of wage earners are in the private sector mainly in the flower, tea and coffee farms, construction, academic institutions, public transport, wholesale and retail trade, hotels and restaurants and *jua kali* sectors. Most of these wage earners comprise of the youth, some of whom have no relevant vocational or professional training and therefore have limited chances to fully participate in the Labour market and are involved in small enterprises and hawking especially in the urban centres. Trading in food commodities including milk is widely practised. The main formal employment areas are urban centers.

The major fishery activities carried out in the County include; fish farming (aquaculture), inland capture in Lake Naivasha, River Malewa and public and privately-owned dams.

Lake Naivasha fishing activities supports about 704 fishermen (holding about 176 boats, 1,760 fishing nets of 4 inches mesh size), and more than 3000 people indirectly. The main species of fish caught in the County is Common Carp and Tilapia although there are other

species caught but on small scale like the Cray fish. There are three landing sites along Lake Naivasha. These are; Kamere, Central and Tarambeta landing sites.

Most of the residents of Kamere engage in fishing, selling farm produce at the local market place and in transportation, ferrying people using motorbikes and Public Service Vehicles (PSV).

### CHAPTER FOUR- LEGISLATIVE, POLICY AND INSTITUTIONAL FRAMEWORK

#### 4.1 INTRODUCTION

According to Sections 58 and 138 of the Environmental Management and Coordination Act (EMCA) and Section 3 of the Environmental (Impact Assessment and Audit) (Amendment) Regulations 2019, new projects require an Environmental Impact Assessment prepared and submitted to the National Environment Management Authority (NEMA) for review and eventual Licensing. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

#### 4.2 POLICY FRAMEWORK

The Government of Kenya environmental policy aims at integrating environmental aspects into national development plans. The broad objectives of the national environmental policy include:-

- 1. Optimal use of natural land and water resources in improving the quality of the human environment.
- 2. Sustainable use of natural resources to meet the needs of the present generations, while preserving their ability to meet the needs of future generations.
- 3. Integration of environmental conservation and economic activities into the process of sustainable development.
- 4. Meeting national goals and international obligations by conserving bio-diversity, arresting desertification, mitigation effects of disasters, protecting the ozone layer and maintaining an ecological balance on earth.

#### 4.2.1 National Climate Change Framework Policy (2016)

Kenya has shown commitment to protecting the climate system for the benefit of the present and future generations by supporting the United Nations Framework Convention on Climate Change (UNFCCC) process; ratifying the Kyoto Protocol in 2005, and contributing to continental and regional climate change initiatives. Further, the country's Constitution has set out a legal commitment to attain ecologically sustainable development; hence providing a basis to address the challenge of climate change while striving to attain its development goals through the Kenya Vision 2030.

The Policy's focus is on the link between sustainable national development and climate change is critical because climate change adversely impacts key sectors that are important to the economy and society: Environment, Water, and Forestry; Agriculture, Livestock, and Fisheries; Trade; Extractive industries; Energy; Physical Infrastructure; Tourism and Health. This Policy was developed to facilitate a coordinated, coherent and effective response to the local, national and global challenges and opportunities that climate change presents. This

will be achieved through the adoption of a mainstreaming approach that ensures the integration of climate change considerations into the development planning process, budgeting, and implementation in all sectors and at all levels of government. This Policy, therefore, aims to enhance adaptive capacity and build resilience to climate variability and change, while promoting low carbon development pathways.

#### 4.2.2 Vision 2030

Kenya aims to be an industrialized country by the year 2030. The Vision 2030 describes three pillars that are crucial for industrialization, they include Economic, Social and Political pillars. Proposed development projects under Vision 2030 will increase the demand for access to sanitation amenities.

The environment has to be considered in the development projects in order to achieve sustainable development. The country aims to be a state that has a clean secure and sustainable environment by the year 2030. The short-term goals are to decrease diseases that are environmentally related and to increase the percentage of forest cover over the entire period. Strategies have been put in place to ensure environmental conservation in order to enhance sustainable economic development.

Environmental & Social Impact Assessment (ESIA) entails identifying the actual and probable impacts of projects on the environment and recommending alternative and mitigating measures. The assessment is required at all stages of project development. The main purpose of ESIA is to ensure that both existing and proposed public and private sector development projects are environmentally sustainable.

#### 4.2.3 National Environment Policy, 2013

The National Environmental Policy, 2013 sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources and recognizes that natural systems are under intense pressure from human activities particularly for critical ecosystems including rivers, forests, grasslands and arid and semi-arid lands.

#### 4.2.4 National Environmental Action Plan (NEAP)

According to the NEAP-1994 the Government of Kenya recognized the negative impacts on ecosystems emanating from economic and social development programmes that disregard environmental sustainability. Following on this, establishment of appropriate policies and legal guidelines resulted in harmonization of the then 76 existing Statutes into the Environmental Management and Coordination Act (EMCA), cap 387. The NEAP process introduced Environmental Impact Assessment in Kenya culminating in to the development of the Sessional Paper No. 66 on the Environment and Development.

#### 4.2.5 National Policy on Water Resources Management and Development

The National Policy on Water Resources Management and Development (1999) seeks to enhance a systematic development of water facilities in all sectors for the country's socioeconomic progress, and therefore calls for development of appropriate sanitation systems to protect people's health and water resources from pollution. It also sets guidelines for the utilization of water resources to prevent overexploitation and depletion of the resource. Development projects, therefore, should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from. The policy also requires that such projects should undergo comprehensive Environmental Impact Assessments that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighbourhoods and further downstream are not adversely affected by any emissions or effluent discharges.

## 4.2.6 Policy Paper on Environment and Development (Sessional Paper No. 6 Of. 1999)

The paper presents broad categories of development issues that require sustainable approach. The paper harmonizes environmental and development objectives so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding the environment and development. The proposed project will proceed under auspices of these guidelines and strategies that foster environmental values in development projects. Among the key objectives of the Policy Paper on Environment and Development (Sessional Paper No. 6 of 1999) are: -

- To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account,
- To ensure that an independent Environmental and Social Impact Assessment (ESIA) report is prepared before project implementation, and
- To come up with effluent treatment standards that will conform to acceptable health guidelines.

Under this paper, broad categories of development issues have been covered that require a sustainable approach. Among these issues are waste management and human settlement. The policy recommends a need for enhanced re-use/ recycling of residues including wastewater, use of low non-waste technologies, increased public awareness and appreciation of a clean environment. It also encourages participation of stakeholders in the management of wastes within their localities. On human settlements, the paper advocates for better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others.

The design of the proposed project should be such that it adequately addresses the need for a sound waste management system.

#### **4.3 INSTITUTIONAL FRAMEWORK**

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

#### 4.3.1 Ministry of Environment and Forestry

The mandate of the ministry is to monitor, protect, conserve and manage the environment and natural resources through sustainable exploitation for socio-economic development aimed at eradication of poverty, improving living standards and ensuring that a clean environment is sustained now and in the future. The Ministry comprises of various divisions at the headquarters and the following parastatals and departments.

- 1. National Environment Management Authority
- 2. Kenya Meteorological Department
- 3. Mines and Geology Department
- 4. Department of Resource Surveys and Remote Sensing (DRSRS)

The functions of the ministry include but not limited to the following:

- 1. Environment and Natural Resources Policy formulation, analysis, and review;
- 2. Sustainable management of Mineral resources and conservation of the environment;
- 3. Continuous development of geo-database for integrated natural resources and environmental management systems;
- 4. Promote, monitor and coordinate environmental activities and enforce compliance of environmental regulations and guidelines.

#### 4.3.2 National Environmental Management Authority (NEMA)

The object and purpose for which NEMA is established are to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment.

#### 4.3.3 National Environmental Council (NEC)

The National Environment Council established under section 4 of part 3 of the EMCA act consists a board which comprises the Chairman (Minister), PS of the relevant ministry, representatives from public universities, representatives from research institutions, NGO representatives, Director General (Secretary) and such number of members as may, from time to time, be co-opted by the minister to be members of the council.

#### 4.3.4 The National Environmental Action Plan Committee

The National Environment Action Plan Committee (NEAPC) is established under Section 37 of EMCA. This cross-sectoral committee is responsible for inter alia the development of a five-year national environment action plan. The national environment action plan shall contain among other aspects analysis of the natural resources of Kenya and their distribution, quantity and various uses. It shall also recommend legal and fiscal incentives for business that incorporate environmental requirements into their planning and operational processes as well set out guidelines for the planning and management of the environment and natural resources. The national environment action plan shall upon adoption by Parliament be binding on all organs of government.

#### 4.3.5 National Environmental Tribunal (NET)

The NET is established under Section 125 of EMCA for the purpose of hearing appeals from administrative decisions by organs responsible for enforcement of environmental standards. An appeal may be lodged by a project proponent upon denial of an ESIA license or by a local community upon the grant of an ESIA license to a project proponent. NEMA may also refer any matter that involves a point of law or is of unusual importance or complexity to NET for direction. The proceedings of the NET are not as stringent as those in a court of law

and NET shall not be bound by the rules of evidence as set out in the Evidence Act. Upon the making of an award, NET's mandate ends there as it does not have the power to enforce its awards. EMCA provides that any person aggrieved by a decision or award of NET may within 30 days appeal to the High Court.

#### 4.3.6 County Environment Committees

Under section 29 (1) of EMCA, the Cabinet Secretary will by notice in the Gazette appoint County Environment Committees of NEMA in respect of every County. These committees assist NEMA in effectively carrying out its function of proper management of the environment at this level. It is instructive to note that the membership of these committees includes inter alia representatives of farmers or pastoralists, the business community, women and youth.

#### 4.3.7 Directorate of Occupational Safety and Health (DOSHS)

The Directorate of Occupational Safety and Health Services (DOSHS) is a department within the Ministry of Labour and Social Protection, whose primary objective is to ensure safety, health and welfare of all workers in all workplaces. The Directorate enforces Occupational Safety and Health Act, 2007 (OSHA, 2007) with its subsidiary legislation which aims at prevention of accidents and diseases at work. It also administers the Work Injury Benefits Act, 2007 (WIBA, 2007) which provides for compensation of workers who have been injured or have suffered a disease out of and in the course of employment.

As a future workplace, the proposed project will be subjected to DOSHS compliance requirements. Functions of the department that are relevant to the proposed project include:

- 1. Systematic inspection and auditing of workplaces to promote best practices and ensure compliance with safety and health standards as set out in OSHA, 2007 and its subsidiary legislations.
- 2. Examination and testing of steam boilers, air and steam receivers, gas cylinders, refrigeration plants, passenger lifts, hoists, cranes, chains and other lifting equipment to ensure their safe use.

3. Identification, evaluation and control of biological, chemical, physical, psychosocial, ergonomic and other factors in the work environment which may affect the safety and health of employed persons and the general environment.

- 4. Ensuring compensation to employees for work related injuries and diseases contracted in the course of their employment in accordance with the provisions of WIBA, 2007.
- 5. Investigation of occupational accidents, dangerous occurrences and cases of Occupational diseases with a view to preventing recurrence.

#### 4.3.8 Technical and Vocational Education and Training Authority (TVETA)

The Technical and Vocational Education and Training Authority (TVETA) is a public corporate agency established under the Technical and Vocational Education and Training (TVET) Act No. 29 of 2013 to regulate and coordinate training in the country through licensing, registration and accreditation of institutions such as the proposed project as well and the programs and trainers that will be part of the CoE.

#### 4.3.9 National Construction Authority (NCA)

Constituted under the Act No. 41 of 2011, the National Construction Authority (NCA) plays a key role of regulating the Kenyan construction industry.

The NCA is responsible for:

- 1. Registration of Contractors and maintaining a register containing details of all construction companies approved to operate in the country, including the class of works and category for which a company is registered.
- 2. Registration of all construction works happening across the country.
- 3. Accreditation and certification of contractors, skilled construction workers and construction site supervisors to ensure that every individual working in a construction site has the necessary skills to undertake the respective trade.

#### 4.3.10 Water Resources Authority (WRA)

Water Resources Authority (WRA) is a state corporation established under Section 11 of the Water Act, 2016. It is mandated through to safeguard the right to clean water by ensuring that there is proper regulation of the management and use of water resources. It was established under the Water Act, 2002 as Water Resources Management Authority (WRMA).

The core functions of WRA include the following:

- 1. Formulate standards, procedures and regulations aimed at ensuring proper management and use of water resources.
- 2. Enforce Regulations formulated by WRA so as to ensure compliance through inspection, monitoring and enforcement.
- 3. Receive water permit applications for water abstraction, water use and recharge and determine, issue, vary water permits; and enforce the conditions of those permits.
- 4. Regulate Water use allocation.
- 5. Collect water permit fees and water use charges.
- 6. Provide information and advice the Cabinet Secretary for formulation of policy on National Water Resource Management, water storage and flood control strategies.
- 7. Coordinate with other regional, national and international bodies for the better regulation of the management and use of water resources.
- 8. Manage the National Monitoring and Information System.

#### 4.3.11 County Government of Nakuru

This is the special jurisdiction under which the proposed project lies. All efforts must be made to abide by all the by-laws, and other legislation regulating the construction of the proposed project site.

#### Architectural and structural plans for the proposed project will be submitted to The County Government of Nakuru- Planning Department for approval.

#### 4.3.12 KenGen Environmental Sustainability Policy

KenGen has a corporate environmental sustainability policy statement which states that "KenGen is fully committed to long-term environmentally sustainable development that is consistent with national and international standards in the generation of safe and reliable electric energy in the Eastern Africa region".

To achieve this commitment, KenGen shall:

- 1. Provision of resources to maintain and continually improve its Environmental Management System (EMS) based on the ISO 14001:2015 and its supporting standards.
- 2. Identify risks and opportunities, implement, pollution control measures and mitigate negative environmental impacts, while at the same time enhancing positive environmental activities resulting from its activities, products and services
- 3. Endeavour to comply with and exceed the requirements of all applicable environmental laws, regulations, permit licenses conditions and other requirements to which the organization subscribes to.
- 4. Establish environmental objectives, targets, continually review environmental and sustainability and management programs
- 5. Strive to enhance the ecosystems through partnership and engagement with its stakeholders including the local community living around KenGen's installations.
- 6. Purpose to train employees on environmental sustainability, significant environmental aspects and responsibilities associated with their jobs.
- 7. Contribute to global sustainable development through main-streaming of climate change mitigation and adaptation in the business process.
- 8. Effectively communicate its environmental sustainability policy and performance to employees and key stakeholders.

#### 4.4 LEGAL FRAMEWORK

Environmental Management and Co-ordination Act CAP 387, provide a legal and institutional framework for the management of the environmental-related matters. It is the framework law on the environment, which was enacted on the 14th of January 1999 and commenced in January 2002. Topmost in the administration of EMCA is the National Environment Council (NEC), which formulates policies, set goals, and promotes environmental protection programmes. The implementing organ is the National Environment Management Authority (NEMA). EMCA comprises of the parts covering all aspects of the environment.

### 4.4.1 Environmental Management and Coordination (Amendment) Act (EMCA), 1999 (Cap 387), Amended in 2015

Environmental Management and Co-ordination Act CAP 387, provides a legal and institutional framework for the management of the environmental-related matters. It is the framework law on the environment, which was enacted on the 14th of January 1999 and commenced in January 2002. Topmost in the administration of EMCA is the National Environment Council (NEC), which formulates policies, set goals, and promotes environmental protection programmes.

The implementing organ is the National Environment Management Authority (NEMA). EMCA comprises of the parts covering all aspects of the environment. The Second Schedule to the Act specifies the projects for which an ESIA and environmental audit must be carried out. According to the Act, Section 68, all projects listed in the Second Schedule of the Act must undertake an Environmental Impact Assessment, keep accurate records and make annual reports to NEMA or as NEMA may, in writing, require. The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019, provide the basis for procedures for carrying out Environmental and Social Impact Assessments (ESIAs) and Environmental Audits (EAs). The main objectives of the Act are to Provide guidelines for the establishment of an appropriate legal and institutional framework for the management of the environment in Kenya; Provide a framework legislation for over 70 statutes in Kenya that contain environmental provisions; Provide guidelines for environmental impact assessment, environmental audit and monitoring, environmental quality standards and environmental protection orders.

#### 4.4.2 The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019

The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019 state in Regulation 3 that "the Regulations shall apply to all policies, plans, programmes, projects, and activities specified in Part IV, Part V and the Second Schedule of the Act". Regulation 4(1) further states that: "...no proponent shall implement a project: a) likely to have a negative environmental impact; or b) for which an environmental impact assessment is required under the Act or these Regulations; unless an environmental impact assessment has been concluded and approved in accordance with these Regulations..."

Following the initial screening done on the project, the construction of the CoE at KenGen is classified as a High Risk Project. The regulations specify that a project classified as high risk project warrants the compilation and submission of an ESIA Study Report In the interest of transparency and total compliance, the proponent, alongside the consultant, have hereby compiled the ESIA report for submission to NEMA.

#### The proponent has commissioned the consultant to carry an Environmental and Social Impact Assessment Report for submission to NEMA for approval.

#### 4.4.3 EMCA (Waste Management) Regulations 2006

Part II of the Waste Management Regulations 4 (1) states that no person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated receptacle. Regulation 4 (2) further states that a waste generator shall collect, segregate and dispose of such waste in the manner provided for under the regulations.

#### The Proponent will ensure that all waste generated during construction and operational phase is collected and handled appropriately and disposed of at a designated waste disposal site in line with the Waste Management Regulations.

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

Part II of the Noise and Excessive Vibrations regulations, regulation 3 (1) states that Except as otherwise provided in these Regulations, no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which

annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

Regulation 4 of the Noise and Excessive vibrations: - states that except as otherwise provided in the Regulations, no person shall:

- a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or (b) cause to be made excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source; Regulation 11 on Machinery: - states that any person wishing to (a) operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device;
- b) Engage in any commercial or industrial activity, which is likely to emit noise or excessive vibrations shall carry out the activity or activities within the relevant levels prescribed in the First Schedule to the Regulations

#### The project site is located close to Kamere Village and residential houses at the KenGen Staff Quarters and therefore the proponent shall ensure that all noise and vibration are kept below the maximum allowable threshold as recommended by the regulations.

#### 4.4.5 EMCA (Water Quality) Regulations 2006

Part II of the Water Quality Regulations 4 (1) states that every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the enactment of the Act. Regulation 4(2) further states no person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution. Regulation 6 (b) further states that no person shall abstract groundwater or carry out any activity near any lakes, rivers, streams, springs and wells that is likely to have any adverse impacts on the quantity and quality of the water, without an Environmental Impact Assessment license issued in accordance with the provisions of the Act; or (C) cultivate or undertake any development activity within a minimum of six meters and a maximum of thirty meters from the highest ever recorded flood level, on either side of a river or stream, and as may be determined by the Authority from time to time.

# While the proposed development is located close to Lake Naivasha, it is not in close proximity and the proponent is required to mitigate against any possible contamination to the lake.

#### 4.4.6 EMCA (Air Quality) Regulations, 2014

The objective of these Regulations is to provide for the prevention, control, and abatement of air pollution to ensure clean and healthy ambient air.

PART II of the regulation states that 5. (1) No person shall-

a) Act in a way that directly or indirectly causes, or is likely to cause immediate or subsequent air pollution; or

b) Emit any liquid, solid or gaseous substance or deposit any such substance in levels exceeding those set out in the First Schedule of the regulations.

PART III on permissible levels

10. (1) The Authority shall in consultation with relevant lead agencies, from time to time review the list of priority pollutants set out under the Second Schedule and the ambient air quality levels provided for in the First Schedule and prescribe the permissible levels, therefore, setting ambient air quality limits.

(2) The Authority shall in setting limits for ambient air quality levels as stipulated in the First Schedule take into account the limit determining factors set out under Part III of the Fifth Schedule;

## The proponent shall adhere to the provisions of the regulations by commissioning periodic air quality assessments.

#### 4.4.7 Water Act, 2016

Section 25 (1) of this Act states that a permit shall be required for any of the following purposes: any use of water from a water resource, except as provided by Section 26; the drainage of any swamp or other land; the discharge of a pollutant into any water resource; and Any purpose, to be carried out in or in relation to a water resource, which is prescribed by rules made under this Act to be a purpose for which a permit is required. Part II, Section 18, of this Act provides for national monitoring and information system on water resources. Following on this, Sub-section 3 of the same Section, allows the Water Resources Authority (WRA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may be required to be kept by a facility operator and the information thereof furnished to the Authority.

## While the proposed development is located close to Lake Naivasha, it is not in close proximity. The proponent is required to mitigate against any possible contamination to the lake.

#### 4.4.8 The Water Resources Management Rules, 2007

These rules apply to all water resources and water bodies in Kenya, including all lakes, water courses, streams and rivers, whether perennial or seasonal, aquifers, and shall include coastal channels leading to territorial waters.

# The proponent shall be required to apply for a Variation of Permit to accommodate the additional volume of water abstracted from Lake Naivasha to cater for the proposed CoE's operations.

#### 4.4.9 The Occupational Safety and Health Act, 2007

This is an Act of Parliament to provide for the safety, health, and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

The Act has the following functions among others:

- 1. Secures safety and health for people legally in all workplaces by minimization of exposure of workers to hazards (gases, fumes & vapours, energies, dangerous machinery/equipment, temperatures, and biological agents) at their workplaces.
- 2. Prevents employment of children in workplaces where their safety and health is at risk.
- 3. Encourages entrepreneurs to set achievable safety targets for their enterprises.
- 4. Promotes reporting of workplace accidents, dangerous occurrences and ill health with a view to finding out their causes and preventing of similar occurrences in future.
- 5. Promotes the creation of a safety culture at workplaces through education and training in occupational safety and health.

The report advice the Proponent on safety and health aspects, potential impacts, personnel responsible for implementation and monitoring, the frequency of monitoring, and estimated cost, as a basic guideline for the management of Health and Safety issues of the project.

The proponent shall ensure the safety and health guidelines are implemented to the latter during the project construction and operational phase and all construction workers and operational staff are properly trained in occupational safety and health and that they have all the appropriate PPE. A full-time Environment Health and Safety (EHS )officer will be employed during the project construction phase to monitor and supervise the project contractor and the workers.

#### 4.4.10 Public Health Act (Cap. 242)

Occupational Health and Safety Officers are Part IX, section 115, of the Act, states that no person/ institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent the occurrence of nuisance or condition liable to be injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drainers or refuse pits in such state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health. Any noxious matter or wastewater flowing or discharged from any premises into the public street or into the gutter or side channel or watercourse, an irrigation channel, or bed not approved for discharge is also deemed a nuisance. Other nuisances are an accumulation of materials or refuse which in the opinion of the medical officer of the medical officer of health is likely to harbour rats or other vermin.

#### The Proponent undertakes to safeguard the environment ensuring that all solid waste or waste water effluent emanating from the project is managed and disposed of appropriately.

#### 4.4.11 Physical Planning Act, 1999

The Local Authorities are empowered under Section 29 of the Act to preserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section, therefore, allows for the prohibition or control of the use and development of land and buildings in the interest of proper and orderly development of an area. Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant a license for commercial or industrial use or occupation of any building without a development permission granted by the respective Local Authority.

Finally, section 36 states that in the connection with a development application, Local Authority is of the opinion that the proposed development activity will have an injurious impact on the environment, the application shall be required to submit together with the application an environment and social impact assessment ESIA report. EMCA, CAP 387 echoes the same by requiring that such an ESIA is approved by the NEMA and should be followed by annual environmental audits. Land Planning Act (Cap. 303). Section 9 of the subsidiary legislation (The Development and Use of Land Regulations, 1961) under this Act requires that before the Local authorities submit any plans to the Minister for approval, steps should be taken as may be necessary to acquire the owners of any land affected by such plans. Particulars of comments and objections made by the landowners should be submitted. This is intended to reduce conflict with the interest such as settlement and other social and economic activities.

#### The Proponent will apply for all required approvals for the project development and licenses from all relevant authority and County Government offices. Architectural, civil and structural plans for the proposed project have submitted to the County Government of Nakuru- Planning Department for approval.

#### 4.4.12 The Environment And Land Court Act, 2011

This Act is in place to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

#### 4.4.13 The Climate Change Act, 2016.

The objective and purpose of the Act

(a) This Act is applied for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

The Act is applied in all sectors of the economy by the national and county governments to:

- 1. Mainstream climate change responses to development planning, decision making, and implementation;
- 2. Build resilience and enhance adaptive capacity to the impacts of climate change;
- 3. Formulate programmes and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change;
- 4. Mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities;
- 5. Mainstream intergenerational and gender equity in all aspects of climate change responses;
- 6. Provide incentives and obligations for private sector contribution in achieving low carbon climate resilient development;

- 7. Promote low carbon technologies, improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development;
- 8. Facilitate capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information;
- 9. Mobilize and transparently manage public and other financial resources for climate change response;
- 10. Provide mechanisms for, and facilitate climate change research and development, training and capacity building;
- 11. Mainstream the principle of sustainable development into the planning for and decision making on climate change response; and
- 12. Integrate climate change into the exercise of power and functions at all levels of governance, and to enhance cooperative climate change governance between the national government and county governments.

# The proponent has incorporated provisions for sustainable use of natural resources into the project design and shall ensure they are installed and maintained throughout the operational phase of the project.

#### 4.4.14 Traffic Act Chapter 403

The Traffic Act, gives provisions and guidelines that govern the Kenya roads transport sector. These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads hence ensuring the environment; the human being a component is safeguarded. In section 41 The Act demands for installation and certification of speed governors for the commercial vehicles ferrying goods adjusted to the loading condition of such vehicles to a limit of 80 KPH, registration and competence of drivers. Section 26 and 27 of the same discourages engines that emit exhaust gases to the atmosphere without passing via a silencer or expansion chamber. This Act also consolidates the law relating to traffic on all public roads. The Act also prohibits encroachment on and damage of roads including land reserved for roads.

The proposed project is under the provisions of the Act, in that it will utilize the roads near the project and will not encroach on any roads. In ensuring compliance to this Act the proponent shall ensure that all site drivers and all material suppliers to the site satisfy the provisions as stipulated in Act.

#### 4.4.15 The County Government Act 2012

The County Government Act of 2012, which has been adapted to the Constitution's State and County structure in relation to devolution, declares the County Integrated Plan to be central to the County's administration and prohibits any public spending outside of the plan. The Act clarifies that the County Integrated Plan to be broken down into the economic plan, physical plan, social environmental plan and spatial plan. Also, the Act states that the County Plan commands,

- County integrated development plan
- County Sectoral plans
- County spatial plan

• Cities and urban areas plans as stipulated by Urban Areas and Cities Act

The act also stipulates that the County Government will be –responsible for functions stipulated in article 186 and assigned in the Fourth Schedule of the Constitution which includes control of air pollution, noise pollution, other public nuisances and outdoor advertising.

The Proponent will ensure the project will be compliant with County Government Act 2012 by controlling all forms of pollution. Additionally an Environmental and Social Management/monitoring plan has been provided in this report with measures for mitigating potential environmental pollution anticipated from the development of the project. The Planning department of the County Government of Nakuru, will review and approve the architectural and structural designs and the proponent will ensure compliance and due diligence is done.

#### 4.4.16 The Energy Act, 2019

The act consolidates laws relating to energy and provides for National and County Government functions in relation to energy, the establishment, powers and functions of the energy sector entities; promotion of renewable energy; exploration, recovery and commercial utilization of geothermal energy; regulation of midstream and downstream petroleum and coal activities; regulation, production, supply and use of electricity and other energy forms; and for connected purposes.

## The proponent shall comply to the Act with respect to the operations of the proposed project that are guided by it such as connection of the facility to the national grid.

#### 4.4.17 Energy (Solar Water Heating) Regulations, 2012

Regulation 3 provides for installation of solar water heating system in all premises within the jurisdiction of a local authority with hot water requirements of a capacity exceeding one hundred litres per day.

The responsibility for compliance as per regulation 6 is imposed on:

- 1. Developer of a housing estate, a promoter of the construction, an owner of the premises or an Architect or an Engineer engaged in the design or construction of premises.
- 2. An owner of premises, architect and an engineer engaged in the design, construction, extension or alteration of premises shall incorporate solar water heating systems in all new premises designs and extensions or alterations to existing premises.
- 3. An owner or occupier of premises that has a solar water heating system shall use and carry out the necessary operational maintenance and repairs required to keep the installation in good and efficient working condition.
- 4. An electric power distributor or supplier shall not provide electricity supply to premises where a solar water heating system has not been installed in accordance with these Regulations.
- 5. An owner or occupier to whom these regulations apply may investigate the inclusion of the relevant solar water heating system into a project to be registered under any carbon

finance mechanism that may be established from time to time including the Clean Development Mechanism (CDM).

#### Hostels within the proposed CoE will have a capacity exceeded 100 litres a days and therefore the proponent is required to install solar water heaters.

#### 4.4.18 The Land Act, 2012

The Land Act provides for the sustainable administration and management of land and land based resources.

### The proponent has provided a title deed in annex 1 showing ownership of the land in which the project site is situated.

#### 4.5 SOCIAL POLICIES AND LEGISLATIVE FRAMEWORK

#### 4.5.1 Kenya National Social Protection Policy, 2011

This Policy was developed to address challenges such as providing retirement pensions, sickness benefits, maternity protection, employment injury and disease protection (workers' compensation), survivors' benefits, disability coverage, family benefits, and unemployment protection. It builds on Kenya's commitment to poverty reduction as articulated in various policy documents, development plans, and budgetary allocations, including Kenya Vision 2030. It also recognizes and builds on existing social protection initiatives such as education bursaries, school feeding programmes, fee waivers in public health facilities, Orphans and Vulnerable Children's (OVC) programme, older persons cash transfer and youth enterprise fund, among others

#### 4.5.2 Children (Amendment) Bill, 2020

The Bill seeks to safeguard the rights and welfares of children as well as define parental responsibilities. It also defines the roles of local authorities and the Department of Children's Services. The Bill also explicitly safeguards children from child labour and armed conflict. It also provides for fostering, adoption, custody, maintenance, guardianship, care and protection of children. The administration of children's institutions is discussed and it also gives effect to the principles of the Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child and for connected purposes.

#### 4.5.2 The Employment (Amendment) Act, No. 15 of 2022

It defines the benefits, duties and obligations of the employer and the worker, which includes: contract of service, prohibition against forced labour, discrimination in employment, sexual harassment, payment of wages, leave, termination, and living amenities. Part VII highlights the protection against child labour while Part XII provides for the procedures in settling disputes between employer and employees. All complaints are directed to the County Labour Office or the Industrial Court.

#### 4.5.3 Employment and Labour Relations Court Act, 2011

This act established the Employment and Labour Relations Court to hear and determine disputes relating to employment and labour relations and for connected purposes.
## 4.5.4 Labour Relations Act

The act was enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratisation of trade unions and employers organisations or federations, to promote sound labour relations through the protection and promotion of freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute settlement, conducive to social justice and economic development.

#### 4.5.5 Sexual Offences Act, 2006

The aim of the Sexual Offences Act is to explain sexual offences and make ways for prevention and protection of all persons from illegal sexual acts. The Act is a big step in the fight against sexual offences as it has strong punishment for criminals and also has sections which look at crimes which were not looked at by other laws in Kenya.

#### 4.5.6 Protection against Domestic Violence Act, 2015

Domestic Violence, as defined in the Protection against Domestic Violence Act (PADV), 2015 is any form of violence against a person, threat of violence or imminent danger to that person, by any other person with whom that person is, or has been, in a domestic relationship. The act seeks to provide relief and protection to victims of domestic violence and offenses such as economic violence, emotional abuse, stalking, and interference from in-laws as well as virginity testing and sexual violence in marriage

# 4.5.7 National Gender and Equality Commission Act, 2011

This act was enacted to establish the National Gender and Equality Commission (NGEC) as a successor to the Kenya National Human Rights and Equality Commission pursuant to Article 59(4) of the Constitution. NGEC was created to promote and ensure gender equality, principles of equality and non-discrimination for all persons in Kenya as provided for in the Constitution of Kenya 2010 with a focus on the following Special Interest Groups (SIGs): women, persons with disability, children, youth, and older members of society, minority and marginalised groups.

#### 4.5.8 County Public Participation Guidelines

The Guidelines provide a solution to challenges such as insufficient public access to information and participatory processes. In the past, tokenistic participation deprived the public of the ability to engage with trust at every stage, to ensure development of sound policies and quality legislation, effective planning and budgeting and efficient service delivery. These guidelines support issue based, people centred engagement as improving citizen participation will lead to a more responsive, inclusive and sustainable engagement of the public. They also prepare the public for their roles and responsibility in decision making.

# 4.5.9 HIV/AIDS Prevention and control Act (Act No. 14 of 2006)

Part 11, Section 7 of the Act requires that HIV and AIDs education be carried out at the work-place. The government is expected to ensure the provision of basic information and instruction on HIV and Aids prevention and control to employees of all government ministries, departments, Authorities, and other agencies and employees of private and

informal sectors. The information on HIV/AIDS is expected to be treated with confidentiality at the work place and positive attitude towards infected employees.

The proponent should shall ensure that the contractor offers such training to the worker as provided by law.

# 4.5.10 Work Injury Benefits Act, 2007

This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes. An employee is a person who has been employed for wages or a salary under a contract and includes apprentice or indentured learner.

# 4.6 INTERNATIONAL POLICIES AND CONVENTIONS

# 4.5.1 United Nations Framework Convention on Climate change 1992 (UNFCCC)

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

# 4.5.2 The Kyoto Protocol, 2004

An amendment to the international treaty on climate change, assigning mandatory emission limitations for the reduction of greenhouse gas emissions to the signatory nations.

# 4.5.3 United Nations Convention to combat Desertification, 1994

An agreement to combat desertification and mitigate the effects of drought through national action programs that incorporate long term strategies supported by international cooperation and partnership arrangements.

# 4.5.4 Convention on Biological Diversity (1992)

This was ratified on 11th September 1994. Agenda 21 – a programme of action for sustainable development worldwide, the Rio Declaration on Environment and Development was adopted by more than 178 governments at the United Nations Conference on Environment and Development, known as the Earth Summit, held in Rio de Janeiro, Brazil from 3rd to 14th June 1992. Principle No. 10 of the declaration underscore that environmental issues are best handled with participation of all concerned citizens at all the relevant levels. At the national level, each individual shall have appropriate access to information that is concerning environment that is held by public authorities. States shall encourage and facilitate public participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy shall be provided. The foregoing discussion is relevant to the proposed development because EMCA demands that public must be involved before any development project that is likely to have adverse impacts to the environment is initiated by a proponent. The Act has further established Public Complaints Committee (PCC) where the issues raised by the public in regard to any proposed development can be addressed.

#### 4.5.6 Montreal Protocol, 1987

The Montreal Protocol on Substances that deplete the ozone layer (1987) was ratified on November 9, 1988. This treaty was designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion.

#### 4.5.7 Bamako Convention, 1991

A treaty of African nations prohibiting the import of any hazardous (including radioactive) waste.

#### 4.5.8 The IFC Life and Fire Safety Guidelines

The Life Safety Code is the most widely used source for strategies to protect people based on building construction, protection, and occupancy features that minimize the effects of fire and related hazards. The code provides guidelines for fire prevention, means of egress, detection and alarm systems, compartmentation, fire suppression and control, emergency response and the operation and maintenance of fire safety features.

#### 4.6 THE WORLD BANK ENVIRONMENTAL AND SOCIAL SAFEGUARD POLICIES

World Bank requires environmental assessments to identify, avoid, minimize and mitigate the potential negative environmental and social impacts associated with Bank financed operations.

After carrying out a screening exercise, The World Bank Group classifies projects into the categories depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

- **1. Category A:** A proposed project is classified as Category A if it is likely to have significant adverse impact on the environment.
- **2. Category B:** A proposed project is classified as Category B if it's potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects.

# After the screening process, it was deduced that the proposed CoE project falls under Category B as it will not have irreversible adverse effects to the environment.

- **3. Category C:** Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C project.
- **4. Category FI:** A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

The World Bank Group also has a number of Operational Policies/ Bank Procedures (OP/BP) that are applicable to the proposed project.

Table 3 below gives details regarding to the OPs that the proposed CoE might trigger.

ОР	TITLE	COMMENT	
		Triggered.	
4.01	Environmental Assessment	This project falls under category B as per the World Bank OP 4.01 and an environmental and social impact assessment has been undertaken as part of the project preparation to ensure the design, construction, operation and decommissioning phase mitigate the significant adverse environmental and social impacts	
		Not applicable.	
4.04	Natural Habitats	While the project is located about 8 kilometres from the Hell's Gate National Park, there are no significant natural habitats on the site of the proposed project.	
4.00	Deat Management	Not applicable.	
4.09	Pest Management	There no pests at the proposed project site.	
	Indigenous Peoples	Not applicable.	
4.10		There are no known indigenous people living at the proposed project site – the project area consists of a small village with a rural population.	
	Physical Cultural Resources (PCRs)	Triggered	
4.11		While the project site was observed to be idle, there is a possibility of identifying buried PCRs that need protection. The chance find procedures formulated for the proposed project are attached in annex 7	
4 1 2	Involuntary resettlement	Not Applicable.	
7.12	involuntary resettlement	The project site is unoccupied.	
4 36	Forests	Not applicable.	
1.50		The proposed project site has no forest	
4.37	Safety of Dams	<b>Not applicable.</b> The project does not involve construction of dams.	
7.50	Projects on International Waterways	<b>Not applicable</b> . The proposed project is not on any waterway.	

# Table 3: Proposed Project's Applicability to the World Bank OPs

7.60	Projects in Disputed Areas	<b>Not applicable.</b> The proposed project Site is not on disputed areas and is easily accessible from an existing tarmac road branching off South Lake Road near Kamere Township.
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#### 4.8 WORLD BANK GROUP GENERAL ENVIRONMENT, HEALTH AND SAFETY GUIDELINES

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. The guidelines are organized and summarized with respective relevance as follows below:

1.	1. ENVIRONMENTAL GUIDELINES			
S/No	IO TITLE SCOPE COMMENT			
1	Air Emissions and Ambient Air Quality	Ambient Air Quality	No perceived production of general source pollutants provided in the Air Quality Regulations, 2014 beyond specified limits during construction and operation.	
		Point Sources	Generators installed within the proposed project shall be placed on a concrete surface in a well ventilated shed.	
		Fugitive Sources	No perceived production of VOCs, Ozone Depleting Substances (ODS) and particulate matter beyond specified limits provided in the Air Quality Regulations, 2014 during construction and operation.	
		Mobile Land Based Sources	Recommendations made against vehicle emissions in the ESMMP.	
		Greenhouse Gases (GHGs)	No production of GHGs perceived during construction and operation.	
2	Energy Conservation	Energy Efficiency and Management Programs	Recommendations on energy management provided in the ESMMP.	
		Process Heating	Mass use of energy in heating not envisioned.	
		Process Cooling	Mass use of energy in heating not envisioned.	
		Compressed Air Systems	Installation of compressed air systems not envisioned.	

#### **Table 4: The World Bank Environmental Guidelines**

S/No	TITLE	SCOPE	COMMENT	
	Wastewater	Wastewater Management	Recommendations on the bio-digester septic tank provided in the ESMMP.	
		General Liquid Effluent Quality	Treated effluent discharged from the bio-digester septic tank to meet quality levels specified in the 4 <sup>th</sup> schedule of the Water Resources Management Rules, 2007/EHS Guidelines table 1.3.1.	
3	and Ambient	Storm water Management	Recommendations provided in the ESMMP.	
		Wastewater Treatment	Recommendations on treating sludge from bio-digester septic tank provided in the ESMMP.	
		Quality Monitoring	Recommendations on effluent quality monitoring provided in the ESMMP.	
		Water Monitoring and ManagementWater meters to be installed at point source plant and areas of greatest use in the CoE		Water meters to be installed at point source from KenGen's water treatment plant and areas of greatest use in the CoE.
	Water	Reuse and Recycling	Rainwater harvesting options are available.	
4	Conservation	Facility Operations	Recommendations on identifying saving opportunities provided in the ESMMP.	
		Heating Systems	Mass use of water in heating not envisioned.	
		Cooling Systems	Mass use of water in cooling not envisioned.	
5	Hazardous Materials Management General Hazardous Materials Management Production, use and storage of hazardous materials not envision		Production, use and storage of hazardous materials not envisioned.	
6	6 Waste General Waste Management Recommendations on waste management provided in the		Recommendations on waste management provided in the ESMMP.	
7 Noise Noise and Excessive Vibration Management No perceived production of noise and vibrations beyon provided in the Noise And Excessive Vibration Pollutior 2009 during construction and operation.		No perceived production of noise and vibrations beyond specified limits provided in the Noise And Excessive Vibration Pollution (Control) Regulations, 2009 during construction and operation.		
8	Contaminated Land	Contamination Risk Management	t Land contamination by hazardous materials not envisioned.	

Table 5: T	he World	<b>Bank OHS</b>	Guidelines
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2.	2. OCCUPATIONAL HEALTH AND SAFETY (OHS) GUIDELINES				
S/No	TITLE	SCOPE	COMMENT		
1	General Facility and Design	Precautions in protecting health and safety of staff and students.	The design of the proposed facility, as described in chapter two has incorporated all requisite measures to provide a safe, secure and comfortable work and study spaces for staff and students respectively.		
2	Communication and Training	Relaying safety and health information to staff, students and visitors.	Recommendations on ensuring safety of staff, students and visitors provided in the ESMMP.		
3	Physical Hazards	Eliminating/controlling potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity.	As the proposed facility will be a training institution, prolonged exposure to machinery, equipment and conditions likely to cause an accident, injury or illness is not envisioned.		
4	Chemical Hazards	Eliminating/controlling potential for accident or injury or illness through exposure to toxic, corrosive, sensitizing or oxidative substances.	Prolonged exposure to hazardous substances is not envisioned.		
5	Biological Hazards	Eliminating/controlling potential for illness through exposure to biological agents.	Use of any harmful biological agents likely to cause harm is not envisioned.		
6	Radiological Hazards	Eliminating/controlling potential discomfort, injury or serious illness through exposure to radiation	Sources of radiation are not envisioned.		
7	Personal Protective Equipment (PPE)	Provide additional protection to people exposed to workplace hazards.	Contractor to ensure all requisite PPE is provide for construction and decommissioning phases.		
8	Special Hazard Environments	Protection against hazards under unique or especially hazardous circumstances.	Lone or isolated workers or activities in confined spaces are not envisioned.		
9	Monitoring	Verify effectiveness of prevention and control strategies in the OHS plans.	Recommendations on monitoring OHS plan effectiveness provided in the ESMMP.		

3.	3. COMMUNITY HEALTH AND SAFETY GUIDELINES			
S/No	TITLE	SCOPE	COMMENT	
-1	Water Quality and Availability	Water Quality	Recommendations on ensuring high water quality levels provided in the ESMMP.	
1		Water Availability	Recommendations on abating strain on current sources of water provided in the ESMMP.	
2	Structural Safety of Project Infrastructure	Reduction of Hazards posed to the public while accessing project facilities.	The design of the facility has incorporated buffer measures, engineering controls and relevant construction codes to ensure minimal public exposure.	
3	Life and Fire Safety (L&FS)	Compliance with local and international life and fire safety codes.	The facility is designed and will be constructed, and operated in full compliance with local building codes, local fire department regulations, local legal/insurance requirements, and in accordance with an internationally accepted life and fire safety (L&FS) standard, more specifically, the Life Safety Code.	
4	Traffic Safety Prevention and control of traffic related injuries and fatalities.		Recommendations on traffic safety provided in the ESMMP.	
5	Transport of Hazardous Materials	Compliance with local laws and international requirements.	Transportation of hazardous waste is not envisioned.	
6	Disease Prevention	Communicable Diseases	Recommendations on prevention of spread of COVID-19 and proliferation of Sexually transmitted Diseases and Infections (STD/I) provided in the ESMMP.	
		Vector-Borne Diseases	Recommendations on control of mosquito and other arthropod- borne diseases provided in the ESMMP.	
7	Emergency Preparedness and Response	Prevention of injuries and fatalities due to unplanned events.	Sufficient safety measures provided in the ESMMP including a Grievance Redress Mechanism (GRM) to cater for complains from the community.	

4.	4. CONSTRUCTION AND DECOMMISSIONING			
S/No	TITLE	SCOPE	COMMENT	
1	Environment	Environmental protection during construction and decommissioning.	Implement recommendations provided in the ECMMD	
2	2 OHS Health and Safety of labour during construction and decommissioning.		Implement recommendations provided in the ESMMP.	
3	Community Health and Safety	Community welfare during construction and decommissioning.		

# **CHAPTER FIVE - ANALYSIS OF PROJECT ALTERNATIVES**

#### **5.1 INTRODUCTION**

Legal Notice 32 of 2019 (4) specifies the basic content of an Environmental Impact Assessment subsequent to which, subsection (h) requires an analysis of alternatives. Analysis of project alternatives requires comparison of feasible alternatives for the proposed project in terms of project site, design, technologies and processes.

This chapter describes and examines the various alternatives considered during the conceptualization of the project. The consideration of alternatives is one of the proactive sides of environmental and social assessment required to enhance project design. This is achieved through examining options instead of only focusing on the more defensive task of reducing adverse impacts of a single design option. The alternative that was considered for the project was focused on: -

- 1. No project option
- 2. Relocation Option
- 3. Alternative construction material and technology
- 4. Solid waste management alternatives
- 5. Liquid waste management alternatives

#### **5.2 NO PROJECT OPTION**

The "No Project" option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions.

This option will, however, involves several losses both to the proponent, government and the society as a whole. The" No Project" Option is the least preferred from the socioeconomic and partly environmental perspective due to the following factors:

- The main beneficiary the proponent will not realise the benefits from the proposed CoE in training professionals in the energy generation sector and from making the most of project site which is currently unoccupied.
- There will be no added value to other developments in the surrounding area.
- The government kitty will not benefit from the revenue earned due to the establishment of the proposed development such as taxes on earnings made by purchasing building materials, on the revenue accrued from the added commercial units and on the wages of construction and decommissioning staff.
- The economic status of the Kenyans and the local people would remain unchanged.
- Future investment would be deterred.
- The local skills would remain underutilized.
- Reduced interaction at the local, national and international level.
- No employment opportunities will be created for Kenyans who would have worked in the project

From the analysis above, it becomes apparent that the *No Project Option* is the least favourable alternative to the proponent, local people, Kenyans, and the Government of Kenya.

## **5.3 RELOCATION OPTION**

Relocating the project to a different site is not an option available for the project implementation as the project site is expansive enough to host the proposed project in its entirety and it would be almost impossible to secure land of the same size elsewhere.

The current site is located away from a bustling urban centre, offering an ideal site to set up a training centre with minimal external distractions. This gives credence to the viability of the site and negates the relocation option.

## 5.4 ALTERNATIVE CONSTRUCTION MATERIALS AND TECHNOLOGY

Construction materials and technologies to be used in the construction phase were exhaustively deliberated on by the project design team. Factors considered included but were not limited to the project location, characteristics of the project site and cost efficiency. The conclusion of these discussions presented the current choice as elaborated in sections 2.6 and 2.7 of this report as the best alternative. This alternative is modern, locally and internationally acceptable and will achieve public health, safety, security and environmental aesthetic requirements. Materials used throughout the project's life-cycle will be locally sourced and will meet the Kenya Bureau of Standards requirements.

#### 5.5 SOLID WASTE MANAGEMENT ALTERNATIVES

Solid wastes will be collected from the site for safe disposal by a NEMA licensed waste collector after necessary contractual agreement during both construction and operational phases. For solid wastes management, an integrated solid waste management system is recommended which is as follows:

- a) First the proponent should give priority to reduction at source of the materials. This option will demand a solid waste management awareness programme.
- b) The proponent should also consider recycling and reusing of the waste as a second alternative in priority. This shall call for at-source separation programme to be put in place. The recyclables may be sold to waste buyers locally or directly to any company that recycles waste such as plastic bags.
- c) The third priority in the hierarchy of options is land-filling of the waste that is not recyclable or reusable. It is to the interest of the proponent and the community that the waste is effectively managed so as to maintain a safe and healthy environment to the workers and the community at large through appropriate disposal mechanism.

# 5.6 LIQUID WASTE MANAGEMENT ALTERNATIVES

Alternatives explored in managing liquid waste are provided in the table below:

S/No.	Treatment Process	Advantages	Disadvantages
1	Waste stabilization ponds	<ol> <li>No power requirements.</li> <li>Very low operations and maintenance requirements.</li> <li>No mechanical installations.</li> <li>Very simple method of treatment</li> </ol>	<ol> <li>High land requirement.</li> <li>Odour nuisance, particularly from the anaerobic ponds.</li> <li>Sensitive to temperature variations</li> </ol>
2	Constructed wetlands	Have substantially capacity for wastewater treatment	<ol> <li>High land requirement.</li> <li>Requires relatively flat or gentle slopes.</li> <li>Requires specific aquatic plants.</li> <li>Appropriate for small institutions, not for municipal wastewater treatment.</li> </ol>
3	Aerated lagoons	<ol> <li>Detention time less than in stabilization ponds.</li> <li>Less land requirement as compared to stabilization ponds.</li> </ol>	<ol> <li>High operation and maintenance requirements.</li> </ol>
4	Activated sludge process	<ol> <li>Any degree of treatment is possible.</li> <li>Final effluent is clear and odourless.</li> <li>Low land requirement.</li> <li>Freedom from odour nuisance.</li> <li>Freedom from nuisance due to flies.</li> <li>Recommended for treatment of sewage from large communities (not small works)</li> </ol>	<ol> <li>Sensitive to organic loading particularly for industrial wastes which result in bulking of sludge.</li> <li>High O&amp;M requirements.</li> <li>High skilled management</li> <li>Sensitive to shock loading.</li> <li>Produces large quantity of sludge whose disposal is a problem</li> </ol>
5	Trickling filters	<ol> <li>Durability in all weather conditions and in the presence of corrosive effluents.</li> <li>Does not upset for variation of hydraulic or organic loading</li> <li>Low operation and</li> </ol>	<ol> <li>Limitation in volumetric loading</li> <li>Significant loss of head</li> <li>Nuisance due to flies</li> </ol>

 Table 8: Analysis of Liquid Waste Management Alternatives

		maintenance cost	
6	Oxidation ditches	Relatively low land requirement	High operation and maintenance
			requirements
7	Rotating biological contractors	Can withstand hydraulic and organic shock loads Low land requirement	High operation and maintenance requirements
8	On-site Treatment Systems i.e: • Bio Digesters • Septic Tanks • Pit Latrines • Pour Flush Toilets • VIP Latrines	<ol> <li>Applicable only at household levels and institutions</li> <li>Low land requirement</li> <li>Low capital cost</li> <li>Low operation and maintenance cost.</li> <li>Easy to construct</li> </ol>	<ol> <li>High potential to contaminate ground water.</li> <li>Need for periodic desludging.</li> </ol>

The proponent proposed to install two bio digesters as the most favourable option due to:

- 1. **No exhaustion required** Compared to traditional septic tanks, the bio digester does not require exhausting which is an additional cost and can be messy and potentially hazardous.
- 2. **Cost Friendly Installation** They only require a hole excavated at about 1.1 meters deep and some trenches with very few manholes. They also take a very short time to install which is roughly 7 days.
- 3. **Minimal Space Requirements** Since it only requires a hole and some trenches, the top surface can be used to serve other purposes such as parking or a driveway.
- 4. **No Bad Odour is experienced** They are airtight and are filled with water initially before using which guarantees a hundred percent biodegradation under the water.
- 5. **Safe For The Environment** They do not emit any smell and on top of that, they work in any type of soil and topography.
- 6. **It is a Solid structure** They are made out of reinforced concrete which enhances structural strength making it easy to withstand soil pressure.
- 7. **They are not a Health Hazard** This is because they do not fill up and in turn do not end up emitting raw sewage that may cause water-borne diseases.
- 8. **Easily customized** Their cost is determined by size which is determined by the number of daily users and the soil topography.
- 9. **Water is recycled** The water from the bio digester can be recycled and used for toilet flushing and watering of plant.

# 5.7 THE COMPARISON OF ALTERNATIVES

Various alternative designs and technology have been evaluated by the proponent and various professionals involved. After extensive discussions and relevant considerations, the various options were assessed and the most optimal design and technology were agreed as per the proposed plans, materials and technology.

Under the No Action Alternative, there would be no development at all. There would be no benefits from the site and neither would there be the insignificant environmental impacts.

The layout redesign may perhaps give an optimal design and should be explored for optimization of the benefits and environmental enhancement. However, provided the proposed mitigation measures are implemented as well as adoption of sound construction management practices, the identified negative impacts will be avoided/minimized. The proponent commitments related to development alternative will ensure that potential project impacts are minimized to levels of insignificance as envisaged in the ESMMP.

Under the Proposed Development Alternative, the project would create more opportunities for quality tertiary education would provide employment directly and indirectly to the public. It would provide jobs for the workers during construction. After completion more jobs would be created during occupation.

The choice of materials and technology is normally an engineering decision informed by consideration of site conditions, availability of appropriate materials, labour versus capitalintensive policy, budgetary provisions, requirements for operation maintenance and decommissioning etc. the choice of technology will be subjected to review to ensure that the selected technology offers a combination of technical feasibility, economic viability and socially acceptable. The technology used should be suitable both for the proponent and the environment since it has minimal environmental pollution or even degradation especially during the decommissioning phases.

# 5.8 CONSULTANT RECOMMENDATION

The Consultant therefore, recommends that the proposed action, which involves the construction of the proposed CoE according to the current design be adopted, provided that the proponent adheres to the recommendations offered in this report and to the conditions spelt out in the EIA licence issued by NEMA.

# CHAPTER SIX-STAKEHOLDER AND PUBLIC PARTICIPATION

#### 6.1 INTRODUCTION

Stakeholder consultation was undertaken between 2<sup>nd</sup> and 4<sup>th</sup> March 2022 as an integral part of the ESIA. The public participation was meant to offer stakeholders an opportunity to learn about the project and to raise any issues/concerns pertaining to the project. The public are also encouraged to make suggestion and/or recommendations which would then be incorporated into the project design and during implementation and operation phases. The findings of the stakeholder consultation were very important in predicting impacts and development of the ESMMP.

#### 6.2 OBJECTIVES OF THE PUBLIC PARTICIPATION

The main objective of the exercise was to inform stakeholders about the project and its likely risks and impacts. The views of the stakeholders would assist in identification of additional risks and impacts as well in recommending appropriate material measures necessary for their mitigation. The specific objectives of the consultations were geared towards:

- Disclosing project information and specifically the potential environmental and social risks and impacts to the stakeholders for their understanding and contribution on mitigation measures
- ii) Obtaining local and traditional information knowledge (IK) that may be useful for improving project decision making
- iii) Facilitating consideration of alternatives, mitigation measures and trade-offs (if any)
- iv) Ensuring that important impacts are not overlooked and benefits are maximized
- v) Reducing chances of conflict through early identification of contentious issues
- vi) Providing an opportunity for stakeholders to contribute the Project design and operational plan in a positive manner
- vii) Improving transparency and accountability in project decision making while boosting public confidence in the ESIA process.

#### 6.3 METHODOLOGY USED IN THE STAKEHOLDERS AND PUBLIC PARTICIPATION

The Consultation and Public Participation (CPP) Process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA CAP 387 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development. Further, the World Bank Safeguard Policy (OP/BP) 4.01 on Environmental Assessment) which is triggered by the project also mandates public consultation with relevant stakeholders on the project environmental and social impacts including taking their views into account. The public consultation exercise was conducted between 2<sup>nd</sup> and 4<sup>th</sup> March 2022. A Focus Group Discussion (FDG) with the residents of Kamere was organized and held on 4<sup>th</sup> March 2022 which assisted in the identification of specific issues of concern from the stakeholders. The response provided additional aspects for consideration during the assessment.

In addition, the key stakeholders were interviewed through holding consultative discussions and administration of questionnaires that were used to capture the concerns of the people. The purpose of such interviews was to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively.

# 6.4 STAKEHOLDER MAPPING

A stakeholder analysis was undertaken with support from the proponent's Project Implementation Unit (PIU) to identify all the potential stakeholders of the project. The aim was to ensure that all stakeholder interests were identified and incorporated in project development: at the planning, implementation and operation phases. The stakeholder engagement process was carried out at three levels; local residents, lead agencies and County/National administrative offices. Different communication methods and time were also framed.

#### 6.5 STAKEHOLDER ENGAGEMENT APPROACH

#### 6.5.1 Interviews

Meetings held between 2<sup>nd</sup> and 4<sup>th</sup> March with relevant lead agency stakeholders are summarized in table 9 below:

S/No.	Lead Agency	No. of Participants	Comments
1	Deputy County Commissioner's Office	3	<ul> <li>Increased business opportunities.</li> <li>Increased employment chances.</li> <li>Local community to benefit from the CoE.</li> <li>Insecurity.</li> </ul>
2	Water Resources Authority	3	<ul> <li>Employment creation.</li> <li>Provision of training facility.</li> <li>Enhanced status for KenGen and Naivasha.</li> <li>Opportunity to use modern technology.</li> <li>Pollution due to effluent discharge.</li> <li>Strain on current wastewater treatment facilities available.</li> </ul>

 Table 9: Summary of Meetings Held With Lead Agencies

# 6.5.2 Focus Group Discussion (FDG)

An FDG with the residents of Kamere Village was held on 4<sup>th</sup> March 2022. Minutes of the meeting (Annex 8) and a list of attendees (Annex 9) have been attached.

	COMMENT/QUERY	RESPONSE BY KENGEN
1	Will craft courses be provided for the residents of Kamere and will they be required to pay?	The Ministry of Education is the driver of the project therefore the curricula and fee structures will come from them. KenGen would only play the role of the host institution.
2	Kamere residents should be given first priority when it comes to jobs and that the cartels in place that allocate jobs should be done away with.	<ul> <li>The Kamere Stakeholder Coordination Committee is consulted on this.</li> <li>KenGen has a stakeholder mapping process for all projects and that Kamere would be the nucleus of the proposed GTC CoE.</li> <li>The contractor sourced through the tendering process would be required to subcontract local labour for non-technical works.</li> </ul>
3	KenGen to set up subsequent stakeholder forums even when the project begins so as to make sure the needs of the community are received by KenGen in real time.	The Senior CLO mentioned that KenGen will coordinate with the Stakeholder Coordination Committee in Kamere on the same.
4	Allocate non-skilled jobs from the project to the local youth.	KenGen shall keep this in mind when the project enters the tendering stage for the contractor

# Table 10: Summary of Comments and Queries Raised during the FDG



Plate 6: Participants of the FGD show their support for the project



Plate 7: The Assistant Chief addressing the meeting



Plate 8: The Senior Community Liaison Officer from KenGen addressing the members



Plate 9: The Assistant County Commissioner addressing the participants

#### 6.5.3 Questionnaires

EIA questionnaires were distributed to the stakeholders interviewed. All questionnaires were duly completed and signed by the participants with the assistance of the consultants. The copies of the filled questionnaires are attached to this report (Annex 10).

# 6.6 RESULTS OF THE STAKEHOLDER CONSULTATIONS AND PUBLIC PARTICIPATION

The views/concerns of the stakeholders present were noted and their identification and contact details are taken as required by NEMA.

#### 6.6.1 Summary of Comments and Concerns Provided

Positive comments received included:

• It will realise an increment in job opportunities and improvement of livelihoods.

- The project will bring about improved infrastructure.
- Increased security within the area.
- Benefits to surrounding businesses through supply services.
- Local residents will have access to training in life-changing skills.
- The youth will be positively engaged through employment and education instead of being idle.

Table 11 below provides a summary of concerns collated from the questionnaires.

Table 11: Summary of Concerns Raised from the Questionnaires

S/No	Concern	Mitigation
1	Noise and Air Pollution	Recommendations against any sources of pollution provided in the ESMMP.
2	Skewed distribution of job opportunities during construction.	Elect residents to a Stakeholder Consultation Committee (SCC) for transparency in allocating opportunities.
3	Increased criminal activity.	Increased presence of security agents (police and private security) and street lighting.
4	Constrained land resource.	The land was previously idle and will therefore not interfere with the status quo.
5	Increased pressure on existing resources such as housing.	Student and staff accommodation quarters factored into the project's designs.
6	Soil erosion.	Contractor to ensure minimal disturbance of the project site by only working on the required area.

Other comments collected from the questionnaires included:

- Priority to be accorded to Kamere and its residents in KenGen Corporate Social Responsibility (CSR) programmes.
- Include neighbouring communities in development programmes.
- Prioritize the youth within the community for sponsored training opportunities.
- Lack of a dispensary and secondary school within the PAI.
- The community does not have adequate access to clean drinking water.

# CHAPTER SEVEN- ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

# 7.1 INTRODUCTION

An environmental or social impact is any change to the existing condition of the environment caused by human activity or an external influence. Impacts may be:

- Positive (beneficial) or negative (adverse);
- Direct or indirect, long-term or short-term in duration, and widespread or local in extent.

Environmental and social risks and impacts of this project were determined by analysing the different phases of the project (construction, operation and decommissioning phases) and examining the activities to be undertaken in each phase. After assessment of the environmental and social risks and impacts, mitigation measures have been prescribed and subsequently, the Environmental and Social Management Plan (ESMMP) developed. The mitigation measures were formulated in line with the World Bank General EHS Guidelines)

#### 7.2 POSITIVE IMPACTS

#### 7.2.1 Construction Phase

#### i) Creation of employment and business opportunities

Job opportunities will be created especially among the youth. Employment opportunities are a benefit both in the economic and social sense. Economically, it means abundant skilled/unskilled labour is being used in economic production while socially, the youth will be engaged and in doing so, keep them from social vices such as alcohol, drug abuse etc. Construction materials will also be sourced from local sources and will therefore provide a boost to local businesses.

#### ii) Increased government revenue

There will be a positive gain from the revenue obtained through the levies charged by the government for the materials used during the construction phase. Taxes on the construction workers' remuneration will also benefit the government.

#### iii) Maximum use of the land area.

The proposed project's site is currently idle. When the proposed project is realised, it will ensure that the proponent and the county government receive maximum gains from the land as opposed to the status quo.

#### iv) Environmental benefits

Landscaping during and after construction and re-vegetation of cleared places will give a boost to environmental conservation.

#### v) Enhanced Security

During the construction phase, security will be enhanced in the area to protect construction materials from burglars through hoarding, instalment of security lights and the presence of

a security guard. This will lead to an improvement in the general security of the surrounding area.

# vi) Increased aesthetic value of the area

The project design of the proposed project will add to the aesthetic value of the project site and surrounding areas.

## 7.2.2 Operational Phase

#### i) Improve access to quality tertiary education

The project once commissioned will have a direct benefit the residents of Kamere, its environs and regionally. It will accord people with vested interest in gaining skills within the energy generation sphere access to world class learning facilities.

#### ii) Security

The proposed development will boost the security levels within the premises as the proponent will look to increase security options to safeguard his investment. Security around the premises will therefore also increase.

#### iii) Provision of quality services

The project will enable the proponent to provide better services to clients due to the increase in trained energy generation professionals.

#### iv) Creation of Employment

The proposed development may provide employment opportunities as the proponent will require staff to run the proposed CoE.

# v) Increased revenue collection by the national and county governments

Levies collected by the Kenya Revenue Authority and the Nakuru County will increase through payments of rates, taxes and fees

# 7.2.3 Decommissioning Phase

# i) Rehabilitation

Decommissioning will involve phasing out the envisaged operations of the building. This may involve conversion of the facility to other uses or rehabilitation of the project site in line with the projected plans. This may involve new landscaping schemes and demolition of some structures within the facility.

# ii) Creation of Employment Opportunities

Both skilled and unskilled labour will be required during the demolishing of the development. Direct opportunities for labourers site and indirect opportunities for community members such as catering, kiosks, barber shops, etc., to service the crew.

#### iii) Increased economic activity in the project area

The on-site workers will need basic amenities such as food, shelter and clothing. They will also involve recreation during off times. All these goods and services will be sourced from providers in the project area thus increasing the economic activity around the same area.

## 7.3 NEGATIVE IMPACTS

#### 7.3.1 Environmental Impacts

#### i) Soil disturbance and land degradation

Construction and decommissioning activities could lead to increased soil erosion in and around work sites due to removal of soil cover as people and machinery access and exit the project site.

#### Mitigation measures:

The contractor is recommended to undertake the following measures to mitigate the risk of soil erosion during construction:

- 1. Confine excavation activities within the immediate project site and only clear vegetation in areas required for the project.
- 2. Phase construction activity to limit the frequency of disturbance soil exposed to.
- 3. Set up sediment traps within the project site.
- 4. Cover construction access points with stone to reduce loose top soil being carried away by construction vehicles or surface run-off.
- 5. Regular site inspection especially after any storm event, including a light rain, promote early detection of potential problems related to soil erosion land degradation.
- 6. Re-vegetate denuded areas with grass and shrub species endemic to the PAI as soon as possible to minimize soil erosion.
- 7. Set up drainage channels that are appropriately terminated to ensure rainfall is captured and directed into storm drains or catchment points as soon as possible before carrying away sediment.
- 8. Contractors to use locally sourced construction materials and avoid opening of new material sites to the extent possible unless licensed. Material sites (quarry/borrow) areas should be appropriately rehabilitated at the end of the construction period.
- 9. Select an appropriate site for waste spoil piles to avoid blocking surface run-off or drainage ditches.
- 10. Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off.

The area around the gully located towards the South of the project site is susceptible to soil erosion due to surface run-off from storm water. This is likely to occur throughout the project's life-cycle in the absence of proper controls.

#### Mitigation Measures:

1. Consider harvesting surface run-off through setting up a small retention reservoir towards the end of the gully. Water retained can be used for landscaping and external housekeeping.

# ii) Clearing of flora

Construction and decommissioning activities such as site preparation, excavations and demolitions will involve clearing and disturbing vegetation within the premises.

#### Mitigation Measures:

To minimize effects and mitigate vegetation disturbance the proponent shall:-

- 1. Ensure proper demarcation of the project area to be affected by the works. This will be aimed at ensuring that any disturbance to flora is restricted to the actual project area and avoid spill over effects on the neighbouring areas.
- 2. Ensure strict control of vehicles to ensure that they operate only within the area to be disturbed by access routes and other works.
- 3. Re-vegetate the disturbed areas such as spoil dumping areas, material sites, through implementation of a well-designed landscaping programme.

#### iii) Inadequate liquid waste management infrastructure.

Currently, the PAI does not have any public sewerage systems. KenGen uses septic tanks to handle liquid waste while majority of residents in Kamere Village make use of pit latrines and rudimentary drainage channels for liquid domestic waste such as from kitchens. The present infrastructure does not have any capability to handle additional waste water from the CoE.

#### Mitigation Measures

1. Liquid waste management layout plans (Annex 4) indicate that the CoE will be served by a dedicated bio-digester system.

#### iv) Water pollution and use

During construction and decommissioning, surface and underground water sources are liable for contamination due to runoff and leaching of toxic waste respectively. The runoff and leachates may contain contaminants such as oil and grease spills from vehicles and wastewater generated on site activities such as washing vehicles. A potential impact on water quality may also arise from the risk of soil erosion and poor surface drainage management. Any surface water contamination may enter the area drainage water resources and negatively impact on the aquatic ecology of the area.

# Mitigation measures:

- 1. Provide a bunded area for concrete batching instead of doing it directly on the ground to prevent contamination of soils and surface water features.
- 2. Provide appropriate containment structures to store contaminated water from the construction site and ensure safe disposal of contaminated waste-water.
- 3. Store fuel on concrete surfaces that are appropriately bunded and provided with a canopy.
- 4. Project site should have drip trays to contain any potential leakages of fuels and oils.
- 5. Ensure regular and proper disposal of waste from on-site ablutions to avoid leaks which would contaminate of surface water and lead to water-borne diseases.
- 6. Installing oil and grease traps in construction workshop and vehicle parking areas.
- 7. Contractor should have agreements with the community on water use; on the quantities, time and charges from the community sources if considered,

- 8. Contractor should have water abstraction permits if sourcing from nearby water resources and avoid protected areas,
- 9. Ensure regular inspection and maintenance of permanent erosion/run-off control features

# v) Soil pollution

Construction and decommissioning will involve use of equipment diesel oils. In the event that these oils accidentally leak into the environment, they could result to significant soil contamination.

#### Mitigation Measures:

- 1. Maintenance and regular servicing of equipment.
- 2. Re-fuelling at safe locations.
- 3. Use of spill kits and applications of emergency spill procedures.
- 4. Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and will be replaced when saturated.
- 5. Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used.
- 6. Fuel and oils should be stored in bunded areas.

During the CoE's operation, it is envisaged that the waste treatment by-products of the biodigester septic system will be used for other purposes such as biogas and fertilizer. However, unusable waste from the system which is expected to be discharged into the environment, may lead to soil contamination.

#### Mitigation Measures

- 1. Conduct quarterly effluent quality analysis to ensure treated effluent from the biodigester septic tank meets quality levels specified in the 4<sup>th</sup> schedule of the Water Resources Management Rules, 2007 before it is discharged.
- 2. Develop an effective Effluent Discharge Control Plan (EDCP) for wastewater treatment as per Schedule 2 of the Water Resources Management Rules, 2007.
- 3. Apply for an Effluent Discharge Permit (EDP) from the Water Resources Authority (WRA)

#### vi) Noise and Excessive Vibrations

The construction and decommissioning works will most likely be a noisy operation due to excavation, demolition and movement of vehicles that will be transporting construction material, demolition debris and labour. The immediate surroundings will experience an increase in human traffic and noise during the construction phase. Majority of those that will be affected will mainly be the surrounding neighbours.

# Mitigation measures:

The contractor will adhere to the EMCA Noise and Excessive Vibration Pollution Control Regulation, 2009 and will be required to implement noise control measures amongst exposed workforce and community.

This will include:

- 1. All construction and decommissioning activities shall be confined between 8am and 5pm and therefore keep noise level within acceptable limits (55 Decibels during the day).
- 2. Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before commencement of work in their vicinity.
- 3. Provision of hearing protective devices such as ear plugs and ear muffs to workers exposed to excessive noise and vibrations over long continuous durations.
- 4. Regular maintenance of machines and vehicles.
- 5. Contractors and staff to ensure that vehicles/machinery are turned off while not in use.
- 6. Install noise barriers between the site and noise sensitive surroundings to abate noise and excessive vibration pollution.
- 7. Create awareness and sensitize the public and workers on noise propagation during construction and decommissioning.
- 8. All generators and heavy equipment will be insulated or placed in enclosures to minimize disrupting ambient noise levels
- 9. Address all and any complaints received about noise and vibration through the Grievance Redress Mechanism

#### vii)Air pollution

During construction and decommissioning, exhaust emissions and particulate matter in form of dust are likely to be generated through excavation and demolition works as well as through movement of vehicles. This will directly affect the air quality of the project area.

#### Mitigation measures:

- 1. The contractor to comply with the provisions of EMCA Cap 387 (Air Quality Regulations 2014), to be enforced by the Supervising Engineer.
- 2. Workers shall be trained on management of air pollution from vehicles and machinery.
- 3. All construction machinery shall be maintained and serviced in accordance with the contractor's specifications
- 4. The removal of vegetation shall be avoided until such time as clearance is required and exposed surfaces shall be re-vegetated or stabilized as soon as practically possible
- 5. Ensure good housekeeping in construction areas, dust should be quickly swept off cement floors/collected in covered containers
- 6. The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds.
- 7. Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust
- 8. Water sprays shall be used on all earthworks areas within 200 metres of human settlement especially during the dry season.
- 9. The proponent will provide Personal Protective Equipment (PPE) such as face masks to all site workers.
- 10. Vehicle operators will observe set speed limits.

Diesel generator sets will be installed for emergency purposes in case of outage from the national grid. While they are a negligible point source of air pollution, combustion of fuel for electricity production will produce air pollutants, especially if they are operated over long durations.

#### Mitigation Measures:

- 1. Set up the generators in well ventilated areas away from general buildings.
- 2. Regular generator service and maintenance to ensure they function properly.

#### viii) Increased solid waste generation

Solid waste produced during excavation works and from materials left unused from throughout the construction and decommissioning phases might interfere with the aesthetic status of the area. This may also lead to the creation of breeding grounds for pests and the overall pollution of the physical environment.

#### Mitigation measures:

- 1. The proponent will ensure the effective application of an integrated solid waste management system i.e. the 3 Rs: Reduction at the source, Reuse and Recycle;
- 2. Develop a Contractor's Waste Management Plan (CWMP) to capture in detail all waste that will be produced within the project and specific mitigation measures for all kinds of waste generated. This will be approved by the proponent.
- 3. Accurate estimation of the dimensions and quantities of materials required;
- 4. Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time;
- 5. Providing facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage;
- 6. Use of construction materials that have minimal or no packaging to avoid the generation of excessive packaging waste;
- 7. Providing waste collection bins at designated points on site that encourage waste segregation;
- 8. Disposing of waste more responsibly by contracting a registered waste handler who will dispose the waste at a designated site or landfills only and in accordance with the existing laws.
- 9. Contractor will keep records of waste disposal as proof for proper management of waste as designed.
- 10. Restrict open burning of solid waste generated at sites.

The CoE's operation will lead to an exponential increase in solid waste produced within the PAI. Since the area is not served by county waste disposal services, waste produced by the facility is likely to raise grievances. Improper disposal of sludge produced from the bio digesters may lead to pollution.

# Mitigation Measure:

1. Enlist the services of a NEMA-licensed hazardous waste handler to dispose sludge in a safe and environmentally sustainable manner. Retain all waste tracking forms and the service provider's NEMA licence for future reference.

#### ix) Unsustainable extraction and use of construction material

Most of the building materials such as stones, aggregates, and sand required for construction of the proposed project will be obtained from nearby quarry sites, concrete block sites and borrow pits. Since substantial quantities of these materials will be required for construction, the availability and sustainability of land resources at the extraction sites will be negatively affected as they are not renewable in the short term.

#### Mitigation Measures:

The contractor shall:

- 1. Endeavour to keep construction material usage within acceptable volume thresholds.
- 2. Ensure minimum wastage of construction materials through proper storage.
- 3. Provide requisite machinery and equipment needed to handle construction materials safely to deter breakage or spillage.
- 4. Contractors to use locally sourced construction materials and avoid opening of new material sites to the extent possible unless licensed. Material sites (quarry/borrow) areas should be appropriately rehabilitated at the end of the construction period.
- 5. Contractor shall be required to provide resources such as water, power and security and shall not use the CoE resources for construction works unless approved by relevant stakeholders,

# x) Increased energy consumption

During construction, the project will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have environmental implications on its availability, price and sustainability.

# Mitigation Measures:

- 1. The contractor will ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used.
- 2. Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts.
- 3. Monitor energy use during construction and set targets for the reduction of energy use.
- 4. Installing electricity meters to monitor the consumption of electricity in work sites.

During the operational phase of the project, there will be a net increase in the use of electrical energy for running the CoE. Since electricity generation involves utilization of natural resources, excessive electricity consumption will strain the resources and negatively impact on their sustainability.

#### Mitigation Measures:

- 1. Consider tapping biogas produced by the bio digester septic system for cooking in the CoE's kitchens.
- 2. Make maximum use of natural ventilation and light to the extent possible.
- 3. The Proponent shall install an energy-efficient lighting in the common areas of the building as well consider installing solar power equipment and solar water heaters. This will immensely contribute to energy saving during the operational phase of the proposed project.
- 4. All occupants of the development will be sensitized to ensure energy efficiency in their operations.
- 5. Monitor energy use during the operation and set targets for efficient energy use.

#### xi) Increased water demand

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

#### Mitigation Measures:

- 1. The Proponent will ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.
- 2. Ensure taps are not running when not in use;
- 3. Install water conserving taps and toilets;
- 4. Incorporate rain water harvesting technology into the project design;
- 5. Monitor water consumption and keep records.

To operate the CoE, water will be sourced from KenGen's water treatment plant which draws and purifies water from Lake Naivasha. Therefore, the CoE will increase the demand for water and may cause a strain on the treatment plant.

#### Mitigation Measures

- 1. The proponent shall upgrade their water treatment and storage capacity to effectively ensure water is present at all times.
- 2. Seek a variation of water abstraction permit from WRA to accommodate the additional volume of water abstracted to cater for the CoE.
- 3. Install rooftop rainwater harvesting systems to augment the normal supply from the water treatment facility used by the proponent.
- 4. The proponent should consider setting water use targets to monitor the use of water and come up with measures to keep usage below the set targets.
- 5. Ensure taps are not running when not in use.
- 6. Install water conserving taps and toilets.

#### 7.3.2 Occupational Health and Safety (OHS) Impacts

The construction and decommissioning activities may expose workers to injuries through over-exertion, slip and fall, working at height and fall of materials or tools.

#### Mitigation Measures:

- 1. The contractor shall abide by the requirements stipulated in the Occupational Safety and Health Act (OSHA), 2007.
- 2. A trained Occupational Health and Safety Supervisor will be stationed at the site.
- 3. Toolbox talks meetings should be held on a daily basis before the commencement of work at the site
- 4. Ensuring that active sites are well marked and secured with the appropriate tape at all times to prevent injury to passers-by and animals.
- 5. Continuous sensitization of the community on possible hazards associated with works.
- 6. The contractors will put up appropriate safety signage at the active sites at all times. Signage may be displayed in the local language to address the issue of language barrier where the local workforce is used.
- 7. All workers and visitors to the active site will be expected to do the necessary personal protective equipment at all times. This will include a helmet, reflective jacket, safety boots, hand gloves and overalls.
- 8. Hoisting equipment will be provided in the removal of accessories fixed at height and will be properly maintained.
- 9. Ensure a trained first aider and first aid equipment are present on-site at all times.
- 10. Appropriate road signs will be strategically placed in the project area to serve as a warning to motorists and pedestrians during decommissioning activities.
- 11. Good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot path to prevent slip and falls.
- 12. Staff working in special environments such as at height should be appropriately trained.
- 13. Ensure all vehicles, equipment and machine are inspected, repaired and maintained before use, and machine operators are trained on machine use and safety.
- 14. Ensure all the electrical works are carried out by trained and certified professionals.
- 15. Implement a workers grievance redress mechanism to allow workers raise safety issues and propose improvements on site.
- 16. Provision of serviceable fire extinguishers on site and well-equipped first aid kit.
- 17. Contractor should keep any accidents and incidents logs on site.

During the operational phase of the project, staff, students and visitors of the CoE might be exposed to physical hazards such as slips, trips, falls, electricity, noise, vibration and fire.

#### Mitigation measures:

- 1. Ensure the CoE is equipped with fire detectors, alarm systems, and fire-fighting equipment. The building should comply with the IFC Life and Fire Safety Guidelines.
- 2. Ensure that all first-aid stations are appropriately equipped and are easily accessible throughout the facility.
- 3. Provide OHS training to all new employees/students to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow staff or students.
- 4. As for laboratory facilities, ensure the LPG cage is fitted outside the lab to promote fire safety and there is adequate ventilation in the rooms,

- 5. Hazardous areas (electrical rooms, compressor rooms, etc), installations, materials, safety measures, and emergency exits, etc. should be marked appropriately according to international standards.
- 6. Provide user adjustable work and study stations to prevent ergonomic illnesses and injuries.
- 7. Conduct annual fire safety and OHS audits through a DOSHS- approved advisor to monitor the effectiveness of the CoE's OHS plan.

## 7.3.3 Increased fire risks

Sources of fire include; use of fire in the kitchen, laboratory, electrical faults, improper storage of flammable materials, unsupervised hot works, use of faulty equipment, careless smoking and arson.

#### Mitigation measures:

- 1. Provision of suitable fire-fighting equipment including fire hydrants, hose reels and portable fire extinguishers and install them at strategic locations within the Polytechnic premises.
- 2. Sensitization of all staff and students on fire safety, including fire prevention and firefighting.
- 3. Display of emergency contact numbers in-case of fire and have a designated fire assembly points.
- 4. Conducting periodic fire drills.
- 5. Provision of smoking guidelines.
- 6. Develop and implement a fire safety policy.
- 7. Ensure all flammables are stored in fire resistant areas.
- 8. Erect "No Smoking Zones" signs especially in areas where flammable substances are stored
- 9. Provide water reservoir to fight fire.
- 10. Designate and mark a fire assembly points.
- 11. Provision of emergency fire exits.
- 12. Ensure all fire exit doors open outwards.
- 13. Constitute and train fire marshals.
- 14. Enhance security and vigilance at all times

# 7.3.4 Community Health and Safety Impacts

# i. Traffic Related Accidents or Disruption of access to areas around the proposed site

Construction and decommissioning activities might also constrain the ease through which people use to access areas around the project site. This might be through traffic snarl ups caused by vehicles ferrying construction material and site workers.

#### Mitigation Measures:

1. The proponent shall issue notices to all affected parties well before the construction and decommissioning phases begin. Use of access roads within the estate shall be communicated in advance to deter any inconvenience.

- 2. Warning signs shall be provided to the access roads to warn the community during transportation of construction materials,
- 3. Plan delivery and collection of construction materials to off-peak hours.
- 4. Contractor shall emphasize safety aspects among project drivers, especially speed limits to the institution
- 5. Whenever dust suppression along access roads will be necessary, water will be sprayed
- 6. Contractors should regularly inspect vehicles , safety and employed trained drivers to minimize potential traffic related accidents.
- 7. Contractor should consider periodic maintenance of the access roads as the heavy loaded trucks may destroy the access roads

During the operational phase, the CoE is likely to cause an increase in population through students and staff which in turn will cause a significant increase in pedestrian and vehicular traffic. This may come along with noise concerns by people visiting the premises.

# Mitigation Measures:

The following measures shall be put in place so as to manage traffic along surrounding roads during operational phase of the project:-

- 1. "NO PARKING" signs will be posted around the building where Parking is prohibited and likely to cause obstruction as well as other necessary traffic signs
- 2. Traffic management/parking personnel shall be provided to monitor parking and ensure smooth motoring along the buildings adjacent roads
- 3. Access to driveways will be maintained at all times
- 4. Any work that disturbs normal traffic signal operations shall be coordinated with the relevant authorities.
- 5. Ensure all informal businesses are set up in designated areas to avoid obstruction of access routes.

#### ii. Increased risk in contracting diseases

The proposed project may lead to an increase in the transmission of Sexually transmitted Diseases and Infections (STD/I), HIV/AIDS and COVID-19. This is due to the influx of immigrant workmen interacting with the local people during construction and decommissioning as well as through students and staff who join the CoE during the operational phase.

#### Mitigation Measures:

- 1. Conduct regular sensitization and awareness campaign on HIV/AIDS, STD/I and COVID-19 to for workers, students, staff and local community.
- 2. Reduce risk of STD/I through provision of male and female condoms for all workers during construction and decommissioning phases and provide contraceptive dispensers within the CoE for use during the operational phase.
- 3. Provide free voluntary STI and HIV/AIDS screening, diagnosis and counselling for workers, students, staff and local people near the site.
- 4. The contractor should ensure all members of the labour team are vaccinated against COVID-19 and provide means for vaccination for those who are not.

5. Provide hand sanitizing facilities within the work site during construction and decommissioning.

# 7.3.5 Social Risks and Impacts

# i) Increased risks of Sexual Exploitation, Abuse and Harassment (SEA-H) and Gender Based Violence

During construction and decommissioning, gender inequality might occur during through discrimination against women. This might be exhibited through unequal distribution of work between men and women, unequal and/or delayed pay for women, and lack of provision of separate ablution and changing facilities for women, among others. SEA-H against women might also happen as a result of mixing of women and men at the work site. Incidences of GBV may also arise as a result of construction workers sleeping with people's wives/husband leading to GBV

# Mitigation Measures:

- 1. Contractor to prepare and enforce a No Sexual Exploitation and Abuse, Sexual Harassment, and discrimination Policy in all phases of the project in accordance with national law as provided in section 4.5 of this report.
- 2. Sensitize target communities and project workers on GBV/SEA-SH risks and protocols.
- 3. Impose zero tolerance on all forms of gender-based violence
- 4. Ensure a code of conduct highlighting zero tolerance of sexual exploitation and abuse is signed by all project workers with physical presence on site
- 5. Ensure visibility of signage and information, education and communication materials on such GBV issues in construction sites.
- 6. Map all GBV service providers and document referral services for survivors.
- 7. Ensure that gender inclusivity should be observed during employment opportunities, recruitment and job postings
- 8. Provision of gender disaggregated data, separate bathing, changing, sanitation facilities for men and women
- 9. Contractor and project proponent to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal opportunity employment, gender sensitization.
- 10. Provide separate showering areas, changing rooms and ablution facilities for male and female labourers.
- 11. The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases.
- 12. Create awareness on project GRM to all community segments and project workers

# ii) Gender Discrimination

In the construction industry, many a times women are exposed to discrimination in hiring and employment or even receiving lower pay than men for the same job position. Some contractors believe that women are physically and mentally incapable to execute the tasks that the position requires and may be disinclined to hire them based on that belief.

## Mitigation Measures:

- 1. Ensure that gender inclusivity should be observed during employment opportunities, recruitment and job postings.
- 2. Regular sensitization of workers to promote gender equity in employment during the construction works and during operation.
- 3. All workers and nearby communities and stakeholders will be educated on preventing and responding to sexual harassment and GBV ahead of any project related works.
- 4. Provision of gender disaggregated data to allow for follow up,
- 5. Provision of separate bathing, changing, sanitation facilities for men and women
- 6. Ensure equal pay for equal work among male and female employees
- 7. Regular sensitization and awareness campaigns to the workers should be done to promote gender equity in employment during the construction works and during operation.
- 8. Introduce flexible work schedule for expectant and breastfeeding mothers
- 9. Embrace equality in sharing out leadership position for male and female employees
- 10. The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases.
- 11. Create awareness on project GRM to all community segments and project workers

#### iii) Cases of child labour and crimes towards children

The laws of Kenya prohibit contractors from "employing children in a manner that is economically exploitative, hazardous, and detrimental to the child's education, harmful to the child's health or physical, mental, spiritual, moral, or social development. It is also important to be vigilant towards potential sexual exploitation of children, especially young girls.

#### Mitigation Measures:

- 1. Ensure no children are employed on site in accordance with national labour laws.
- 2. Strictly hire people who are above 18 years and ensure they provide their Identity Card
- 3. Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.
- 4. The client and the contractor shall adopt a 'Child Protection Code of Conduct', which sets stringent standards for personal behaviour so as to avoid child exploitation and abuse.
- 5. Where feasible, sensitize target community of child protection laws and child rights
- 6. Put in place warning signposts like "NO JOBS FOR CHILDREN
- 7. Develop a Code of conduct to be signed by all workers to ensure children are protected any negative impact from the construction works.
- 8. Hoard the construction site to avoid any accidents, especially where there are dug up holes and exposed construction tools and material.
- 9. Create and operate a workers grievance mechanism on labour issues

10. Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism

#### iv) Drug and substances abuse

Increased exposure to drugs and intoxicating substances may be realised due to influx of people working at the CoE, from site labour to operational staff. Students coming from far and wide may also introduce a variety of substances to the area.

#### Mitigation Measures:

- 1. Institute a strict 'No Drugs' policy within the work site as well as within the facility when operational.
- 2. Conduct awareness campaigns against drugs for site workers, students, staff and local residents.
- 3. Provide counselling services for workers afflicted by drug and substance abuse.
- 4. Work in tandem with local law enforcement to curb supply, use or distribution of substances within the area.
- 5. Sensitize workers on no drug or alcohol abuse within the construction site and during working hours.
- 6. Worker under the influence of drugs or alcohol should not be allowed into the construction site.
- 7. Provide posters sensitizing workers on the dangers of drugs and substance abuse
- 8. Provide "No Smoking" signage within the project site.
- 9. Enhance security at the entry points into the institution.
- 10. Create and operate a workers grievance mechanism on labour issues.
- 11. Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.

#### v) Increased Crime and Insecurity

Influx of persons to the project area throughout the project's lifecycle may lead to increased insecurity and incidences of crime. This impact applies to all the project areas under this assessment.

#### <u>Mitigation Measures:</u>

- 1. Provide security lights along the access road linking the main road to the CoE.
- 2. Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to provide regular surveillance and patrols address any security and crime arising during project implementation and operation.
- 3. Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices
- 4. Installation of CCTV surveillance cameras.
- 5. Stringent access control guidelines for persons accessing sensitive areas at the facility
- 6. Select a stakeholder coordination committee from the local residents to facilitate communication of grievances to the proponent.
- 7. Create and operate a workers grievance mechanism on labour issues
8. Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.

# vi) Conflicts and Grievances

Influx of persons to the project area throughout the project's lifecycle may lead to increased complaints and grievances caused by factors such as non-employment of locals, inadequate stakeholder consultation on project activities and Non-payment/delayed payment of workers among others.

# Mitigation Measures:

- 1. Ensure adequate employment opportunities allocated to locals
- 2. Develop a GRM process for the project workers
- 3. Sensitization of workers/stakeholders on GRM process
- 4. Ensure that all concerns/conflicts are addressed promptly and effectively.
- 5. Ensure careful documentation of all grievances received; processed, resolved and closed out.
- 6. Ensure that anonymous complaints are documented and addressed to the satisfaction of the affected parties
- 7. Ensure adequate consultation with stakeholders in a manner allows them to express their views on project social risks, impacts, and mitigation measures.
- 8. Ensure timely and prior disclosure and dissemination of relevant and easily accessible information in a timeframe that enables meaningful consultations
- 9. Create and operate a workers grievance mechanism on labour issues
- 10. Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.

# vii) Non-adherence to national labour laws and good practices in the management of workers

# Mitigation Measures:

- 1. Create awareness on national labour laws and practices.
- 2. Implement a labour management plan which specifies e.g., salary scale for given type of workers, opportunity for women etc.
- 3. Ensure all workers have contracts with terms and conditions that are consistent with national labour laws and policies.
- 4. Ensure each worker signs a code of conduct covering issues such as zero tolerance to unacceptable conduct in the community and GBV (sexual harassment, sexual exploitation and abuse of children etc.)
- 5. Sensitize project workers on actual meaning and implication of the Code of conduct before signing it.
- 6. Create and operate a workers grievance mechanism on labour issues
- 7. Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.
- 8. Employ project workers who are 18 years and above, and with a valid national ID at the time of hire.
- 9. Implement and monitor the employment register regularly.

- 10. Comply with the national labour laws and labour management practices.
- 11. Ensure no children are allowed on sub-project sites and put visible signage on site "**No Jobs for children**".
- 12. Ensure a functional and easily accessible project GRM is in place
- 13. Create awareness on project GRM to all community segments and project workers.
- 14. Labour hiring process should be gender sensitive and done with fairness

### viii) Inadequate consultation with project stakeholders

#### Mitigation Measures:

- 1. Ensure continuous and meaningful engagement with project stakeholders throughout the project cycle
- 2. Ensure timely and continuous disclosure of project related information to stakeholders
- 3. Create awareness on project GRM to all community segments and project workers.

# CHAPTER EIGHT-ENVIRONMENTAL SOCIAL MANAGEMENT AND MONITORING PLAN

### 8.1 INTRODUCTION

An Environmental and Social Management and Monitoring Plan (ESMMP) provides a summary of the activities to be undertaken in order to manage the negative environmental and social risks and impacts. The ESMMP provides for integration of environmental and social concerns to project management and forms the basis for assessing compliance with relevant provisions for management of environmental and social risks and impacts.

The objectives of the ESMMP Plan are:

- 1. To guide the proponent on the likely impacts of the projects of the project, when they are likely to occur, mitigation measures and the monitoring of the measures.
- 2. It assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done.
- 3. To guide the proponent in allocating adequate resources for the implementation of the identified mitigation measures.

### 8.2 ROLES AND RESPONSIBILITIES IN THE IMPLEMENTATION OF THE ESMMP

### 8.2.1 KenGen PLC

As the proponent of the project, KenGen is expected to ensure the following:

- 1. Ensure the environmental and social requirements are prescribed in contractors bidding documents. The ESMP should form part of contractors bidding document.
- 2. Take overall responsibility of ensuring that the mitigation measures proposed in the ESIA/ ESMP and CESMP are implemented.
- 3. Periodic monitoring and surveillance of all project's investment to ensure compliance with the mitigation measures as set out in the ESMMP and other contractual requirements.
- 4. Ensure a functioning grievance redress mechanism and follow-up all environment and social issues raised.
- 5. Share the monthly and quarterly monitoring reports with the Bank.
- 6. Report immediately to the World Bank upon occurrence of any significant environmental, social, or health and safety incidents.
- 7. Develop and fully implement including the necessary resources, all operational phase EHS plans.

### 8.2.2 The World Bank Group

- 1. To advise the borrower through the EIA process and ensure that the quality of the EIA reports and related outputs is consistent with the requirements of OP 4.01.
- 2. To ensure that the EIA effectively feeds into project preparation and implementation.
- 3. Periodic monitoring of the project to ensure conformance with WBG guidelines, and the safeguard instruments prepared for the project.

### 8.2.3 NEMA

- 1. The National Environment Management Authority will receive the final ESIA report for review and subsequent licensing. Should there be any issues that NEMA would require the proponent to tackle, the lead expert shall handle the issues in the client's stead.
- 2. Develop conditions for implementation of the project to ensure sustainability and conformance with statutory legislative requirements.
- 3. Conduct periodic inspection of the project site to monitor adherence with the ESMP developed during the ESIA process.

### 8.2.4 Supervising Contractor

AAKI Limited is charged with the responsibility of ensuring:

1. Review the contractor environment and Social Management Plan (C- ESMP) and other EHS plans prepared by the contractor and provided the required guidance

2. Supervision consultant will be required to have an ESHS officer on day to day guidance on project matters on environment, social, health and safety issues

3. Ensure compliance with the ESMP and other plans prepared through supervision and monitoring of environmental and social issues and reports to KCNP

4. Provide information to KCNP related to HSE (health, Safety and Environment) performance, and immediately report any significant environmental incident or worker accident,

5. Responsible for compiling the environment health and safety monitoring reports and share with KCNP.

#### 8.2.5 Contractors

- 1. Responsible for implementation and reporting on ESMP implementation
- 2. Contractor will have an EHS officer on day to day guidance on project matters on environment, social, health and safety issues
- 3. Prepare contractor specific ESMP including OHS plans, waste management plans among other plans
- 4. Obtain the required licenses and permits such as the work place registration
- 5. Maintain log on grievances, accidents and incidents on site.
- 6. Report on E&S issues in the project progress reports.
- 7. Provide information to KenGen related to HSE (Health, Safety and Environment) performance, and immediately report any significant environmental incident or worker accident.

#### 8.3 IMPLEMENTATION PERIOD

The ESMMP indicates the risks impacts that will be anticipated during the various project phases and will be implemented in the various phases of the project to ensure that all environmental and social risks and impacts are effectively management.

# 8.3 ESMMP FOR THE PROPOSED CENTRE OF EXCELLENCE

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Environmental In	npacts				
Soil disturbance and land degradation Soil erosion in and around work sites due to removal of soil cover as people and machinery access and exit the project site Gully located towards the South of the project site is susceptible to soil erosion due to surface runoff from storm water	<ol> <li>Construction and Decommissioning         <ol> <li>Confine excavation activities within the immediate project site and only clear vegetation in areas required for the project.</li> <li>Phase construction activity to limit the frequency of disturbance soil exposed to.</li> <li>Set up sediment traps within the project site.</li> <li>Cover construction access points with stone to reduce loose top soil being carried away by construction vehicles or surface run-off.</li> <li>Re-vegetate denuded areas with grass and shrub species endemic to the PAI as soon as possible to minimize soil erosion.</li> <li>Set up drainage channels that are appropriately terminated to ensure rainfall is captured and directed into storm drains or catchment points as soon as possible before carrying away sediment.</li> <li>Contractors to use locally sourced construction materials and avoid opening of new material sites to the extent possible unless licensed. Material sites (quarry/borrow) areas should be appropriately rehabilitated at the end of the construction period.</li> </ol></li> </ol>	Contractor     Supervising Engineer	Routine site inspection.	Pre-construction and during construction.	Included in BoQ under Item 3 and 9

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
	<ul> <li>blocking surface run-off or drainage ditches.</li> <li>9. Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off.</li> <li>10. Regular site inspection especially after any storm event, including a light rain, promote early detection of potential problems related to soil erosion land degradation.</li> </ul>			Daily (especially during rainy seasons)	
	<b>Operation</b> Consider harvesting surface run-off through setting up a small retention reservoir towards the end of the gully. Water retained can be used for landscaping and external housekeeping.	<ul><li>Contractor</li><li>Project proponent</li></ul>	Routine inspection and observation.	During operation stage	100,000
<b>Clearing of flora</b> Site preparation, excavations and demolitions will involve clearing and disturbing vegetation.	<ol> <li>Ensure proper demarcation of the project area to be affected by the works. This will be aimed at ensuring that any disturbance to flora is restricted to the actual project area and avoid spill over effects on the neighbouring areas.</li> <li>Ensure strict control of vehicles to ensure that they operate only within the area to be disturbed by access routes and other works.</li> <li>Re-vegetate the disturbed areas such as spoil dumping areas, material sites, through implementation of a well- designed landscaping programme.</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> </ul>	<ol> <li>Inspection and routine maintenance.</li> <li>Observation.</li> </ol>	Before and after works	Included in BoQ under Item 9
Inadequate liquid waste management infrastructure Current infrastructure does not have any capability to handle waste from the CoE.	Liquid waste management layout plans (Annex 4) indicate that the CoE will be served by a dedicated bio-digester system.	• Contactor	Routine inspection and observation.	One off	Included in BoQ under item 4.

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Water pollution Surface and underground water contamination due to runoff and leaching of toxic waste such as oil and grease spills from vehicles.	<ol> <li>Construction and Decommissioning         <ol> <li>Provide a bunded area for concrete batching instead of doing it directly on the ground to prevent contamination of soils and surface water features.</li> <li>Provide appropriate containment structures to store contaminated water from the construction site and ensure safe disposal of contaminated waste-water.</li> <li>Store fuel on concrete surfaces that are appropriately bunded and provided with a canopy.</li> <li>Project site should have drip trays to contain any potential leakages of fuels and oils.</li> <li>Ensure regular and proper disposal of waste from on-site ablutions to avoid leaks which would contaminate of surface water and lead to water-borne diseases.</li> </ol> </li> </ol>	<ul> <li>Project proponent</li> <li>Contractor</li> <li>Vehicle drivers</li> </ul>	<ol> <li>Routine inspection and observation.</li> <li>Grievances recorded through the GRM</li> </ol>	Daily	Included in contractor's costs
	<ol> <li>Installing oil and grease traps in construction workshop and vehicle parking areas.</li> <li>Contractor should have agreements with the community on water use; on the quantities, time and charges from the community sources if considered,</li> <li>Contractor should have water abstraction permits if sourcing from nearby water resources and avoid protected areas,</li> <li>Ensure regular inspection and maintenance of permanent erosion/run-off control features</li> </ol>				

Possible Environmental and Social Impacts		Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Soil pollution Leakage of diesel oils could result to significant soil contamination. Discharged waste from the bio-digesters may lead to soil contamination	1. 2. 3. 4. 5.	Maintenance and regular servicing of equipment. Re-fuelling at safe locations. Use of spill kits and applications of emergency spill procedures. Provision of a 20cm layer of sand and ballast at the machinery storage area and diesel tank section, this layer act as sink to potential oil spills and will be replaced when saturated. Vehicle maintenance to be done in impervious concrete platforms and grease and oil traps to be used. Fuel and oils should be stored in bunded areas	<ul><li>Supervising Engineer</li><li>Contractor</li></ul>	Routine inspection and observation.	Daily	Included in contractor's costs
	1.	Conduct quarterly effluent quality analysis to ensure treated effluent from the bio-digester septic tank meets quality levels specified in the 4th schedule of the Water Resources Management Rules, 2007 before it is	Project proponent	1. Effluent analysis reports.	Quarterly	To be determined by service provider
2	2. 3.	discharged. Develop an effective Effluent Discharge Control Plan (EDCP) for wastewater treatment as per Schedule 2 of the Water Resources Management Rules, 2007. Apply for an Effluent Discharge Permit (EDP) from the Water Resources Authority (WRA).		<ol> <li>WRA - approved EDCP.</li> <li>EDP</li> </ol>	Within first year of operation	WRA to advice on permit cost.

Possible Environmental and Social Impacts		Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Noise and excessive vibrations	1.	All construction and decommissioning activities shall be confined between 8am and 5pm and therefore keep noise level within acceptable limits (55 Decibels during the day).	<ul><li>Supervising Engineer</li><li>Contractor</li></ul>	Routine inspection and observation.	Daily	Included in contractor's costs
Noise and vibration from excavation, demolition and	2.	Hospitals and other noise sensitive areas such as schools shall be notified by the Contractor at least 5 days before commencement of work in their vicinity.				
movement of vehicles.	3.	Provision of hearing protective devices such as ear plugs and ear muffs to workers exposed to excessive noise and vibrations over long continuous durations				
	4. 5.	Regular maintenance of machines and vehicles. Contractors and staff to ensure that vehicles/machinery				
	6.	Install noise barriers between the site and noise sensitive surroundings to abate noise and excessive vibration pollution				
	7.	Create awareness and sensitize the public and workers on noise propagation during construction and decommissioning.				
	8.	All generators and heavy equipment will be insulated or placed in enclosures to minimize disrupting ambient noise levels				
	9.	Address all and any complaints received about noise and vibration through the Grievance Redress Mechanism				
Air pollution	<u>Cc</u>	onstruction and Decommissioning	<ul> <li>Supervising Engineer</li> </ul>	Routine inspection and	Daily	Included in
	1.	The contractor to comply with the provisions of EMCA Cap	Contractor	observation.		contractor's
Exhaust emissions		387 (Air Quality Regulations 2014), to be enforced by the				costs
and particulate	~	Supervising Engineer.				
matter in form of	2.	workers shall be trained on management of air pollution				
from through	2	ITOITI VEHICLES and machinery.				
excavation,	5.	An construction machinery shall be maintained and				
	1	The removal of vogetation shall be avoided until such				
vehicles	4.	time as clearance is required and exposed surfaces shall				
		une as clearance is required and exposed suffaces shall				

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Diesel generators will produce air pollutants, especially if they are operated over long duration.	<ul> <li>be re-vegetated or stabilized as soon as practically possible</li> <li>5. Ensure good housekeeping in construction areas, dust should be quickly swept off cement floors/collected in covered containers</li> <li>6. The contractor shall not carry out dust generating activities (excavation, handling and transport of soils) during times of strong winds.</li> <li>7. Vehicles delivering construction materials and vehicles hauling excavated materials shall be covered to reduce spills and windblown dust</li> <li>8. Water sprays shall be used on all earthworks areas within 200 metres of human settlement especially during the dry season.</li> <li>9. The proponent will provide Personal Protective Equipment (PPE) such as face masks to all site workers.</li> <li>10. Vehicle operators will observe set speed limits.</li> </ul>				
	<ul> <li>Operation</li> <li>1. Set up the generators in well ventilated areas away from general buildings.</li> </ul>		Internal inspection.	Daily	No additional cost envisioned
	<ol><li>Regular generator service and maintenance to ensure they function properly.</li></ol>	Project proponent	Routine service	Quarterly	To be determined by service provider
Potential Erosion of the gorge	<ol> <li>Set -up a buffer zone from the edge of the gorge.</li> <li>Protect the edge of the gorge from both surface run-off and canal erosion</li> <li>Protection works may include; landscaping activities such as terracing and re-forestation and physical barriers such as gabion works and protection walls.</li> <li>Subsequent project phases of the centre of excellence will be expected to respect the buffer zone established and continue to maintain the protection measures put in</li> </ol>	<ul><li>Project Proponent</li><li>Contractor</li></ul>	<ul> <li>Protected gorge buffer zone</li> <li>Routine inspection and observation</li> </ul>	Quarterly	Included in contractors cost.

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
	place.				
Increased solid	Construction and Decommissioning	Supervising Engineer	Inspection of:	Daily	Included in
waste generation	1. The proponent will ensure the effective application of an integrated solid waste management system i.e. the 3 Rs:	Contractor	<ul> <li>Disposal methods</li> <li>Housekeeping</li> </ul>		contractor's
Solid waste produced	Reduction at the source, Reuse and Recycle:		· Housekeeping		0313
might interfere with	2. Develop a Contractor's Waste Management Plan (CWMP)				
the aesthetic status of	to capture in detail all waste that will be produced within				
the area and create	the project and specific mitigation measures for all kinds of				
breeding grounds for	Waste generated. This will be approved by the proponent.				
pests.	materials required:				
	4. Use of durable, long-lasting materials that will not need to				
	be replaced as often, thereby reducing the amount of				
	construction waste generated over time;				
Inadequate	5. Providing facilities for proper handling and storage of construction materials to reduce the amount of waste				
infrastructure to	caused by damage:				
handle solid waste	6. Use of construction materials that have minimal or no				
from the CoE as the	packaging to avoid the generation of excessive packaging				
PAI is not served by	waste;				
county waste disposal	7. Providing waste collection bins at designated points on site				
Sel VICES.	8 Disposing of waste more responsibly by contracting a				
	registered waste handler who will dispose the waste at a				
Improper disposal of	designated site or landfills only and in accordance with the				
sludge produced from	existing laws.				
the bio digesters may	9. Contractor will keep records of waste disposal as proof for				
	10 Restrict open burning of solid waste generated at				
	sites.				
	<u>Operation</u>	Project proponent	1. Inspection and	Throughout	Included in
	1. Enlist the services of a NEMA-licensed hazardous waste		routine maintenance.	operation stage	BoQ under

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
	handler to dispose sludge in a safe and environmentally	entally 2. Observation	2. Observation		item 4.
	sustainable manner. Retain all waste tracking forms and the service provider's NEMA licence for future reference.		<ol> <li>NEMA waste handler licence.</li> <li>Waste tracking forms</li> </ol>	During operation stage.	Costs determined by service provider
Unsustainable extraction and use of construction material Availability and sustainability of resources at the extraction sites will be negatively affected as they are not renewable in the short term.	<ol> <li>The contractor shall:</li> <li>Endeavour to keep construction material usage within acceptable volume thresholds.</li> <li>Ensure minimum wastage of construction materials through proper storage.</li> <li>Provide requisite machinery and equipment needed to handle construction materials safely to deter breakage or spillage.</li> <li>Contractors to use locally sourced construction materials and avoid opening of new material sites to the extent possible unless licensed. Material sites (quarry/borrow) areas should be appropriately rehabilitated at the end of the construction period.</li> <li>Contractor shall be required to provide resources such as water, power and security and shall not use the CoE resources for construction works unless approved by relevant stakeholders,</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> </ul>	Inspection of storage area and machinery,	Weekly	Included in contractor's costs
Increased energy consumption Excessive use of diesel to run vehicles and construction machinery may have environmental implications. Net increase in the	<ol> <li>Construction and Decommissioning         <ol> <li>The contractor will ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used.</li> <li>Proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts.</li> <li>Monitor energy use during construction and set targets for the reduction of energy use.</li> </ol> </li> </ol>	<ul><li>Supervising Engineer</li><li>Contractor</li></ul>	<ol> <li>Inspection and routine maintenance.</li> <li>Observation.</li> </ol>	Daily	Included in contractor's costs

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
use of electrical energy for running the CoE might strain the resources and	electricity in work sites.				
negatively impact on their sustainability.	Operation1. Consider tapping biogas produced by the bio digester septic system for cooking in the CoE's kitchens.			During operation stage.	1,000,000
	<ol> <li>Make maximum use of natural ventilation and light to the extent possible.</li> <li>The Proponent shall install an energy-efficient lighting in the common areas of the building as well consider installing solar power equipment and solar water heaters. This will immensely contribute to energy saving during the operational phase of the proposed project.</li> <li>All occupants of the development will be sensitized to ensure energy efficiency in their operations.</li> <li>Monitor energy use during the operation and set targets for efficient energy use.</li> </ol>	Project proponent	<ol> <li>Inspection and routine maintenance.</li> <li>Observation.</li> </ol>	Throughout operation stage	Energy costs.
<b>Increased water</b> <b>demand</b> Excessive water use may negatively impact on source of water and its sustainability.	<ol> <li>Construction and Decommissioning         <ol> <li>The Proponent will ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.</li> <li>Ensure taps are not running when not in use;</li> <li>Install water conserving taps and toilets;</li> <li>Incorporate rain water harvesting technology into the project design;</li> <li>Monitor water consumption and keep records.</li> </ol> </li> </ol>	<ul><li>Supervising Engineer</li><li>Contractor</li></ul>	<ol> <li>Inspection and routine maintenance.</li> <li>Observation.</li> <li>Water consumption records.</li> </ol>	Daily	Included in contractor's costs

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Strain on KenGen's water treatment plan due to increase in demand for water.	<ol> <li>Operation         <ol> <li>The proponent shall upgrade their water treatment and storage capacity to effectively ensure water is present at all times.</li> <li>Seek a variation of water abstraction permit from WRA to accommodate the additional volume of water abstracted to cater for the CoE.</li> </ol> </li> </ol>		WRA variation of water abstraction permit.	After every five years.	WRA to advise on permit cost.
	<ol> <li>Install rooftop rainwater harvesting systems to augment the normal supply from the water treatment facility used by the proponent.</li> <li>The proponent should consider setting water use targets to monitor the use of water and come up with measures to keep usage below the set targets.</li> <li>Ensure taps are not running when not in use.</li> <li>Install water conserving taps and toilets</li> </ol>	Proponent	Inspection and routine maintenance.	Daily	Included in proponent costs

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Occupational Health	and Safety (OHS) Impacts				
The construction and decommissioning activities may expose workers to injuries through over-exertion, slip and fall, working at height and fall of materials or tools. During the operational phase of the project, staff, students and visitors of the CoE might be exposed to physical hazards such as slips, trips, falls, electricity, noise, vibration and fire.	<ol> <li>Construction and Decommissioning</li> <li>The contractor shall abide by the requirements stipulated in the Occupational Safety and Health Act (OSHA), 2007.</li> <li>A trained Occupational Health and Safety Supervisor will be stationed at the site.</li> <li>Toolbox talks meetings should be held on a daily basis before the commencement of work at the site</li> <li>Ensuring that active sites are well marked and secured with the appropriate tape at all times to prevent injury to passers-by and animals.</li> <li>Continuous sensitization of the community on possible hazards associated with works.</li> <li>The contractors will put up appropriate safety signage at the active sites at all times. Signage may be displayed in the local language to address the issue of language barrier where the local workforce is used.</li> <li>All workers and visitors to the active site will be expected to do the necessary personal protective equipment at all times. This will include a helmet, reflective jacket, safety boots, hand gloves and overalls.</li> <li>Hoisting equipment will be provided in the removal of accessories fixed at height and will be properly maintained.</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> </ul>	<ol> <li>Site and equipment inspection.</li> <li>Number of OHS- related incidences and accidents.</li> <li>Workplace risk assessments.</li> </ol>	Weekly	Included in contractor's costs
	9. Ensure a trained first aider and first aid equipment are				

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
	<ul> <li>present on-site at all times.</li> <li>10. Appropriate road signs will be strategically placed in the project area to serve as a warning to motorists and pedestrians during decommissioning activities.</li> <li>11. Good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot path to prevent slip and falls.</li> <li>12. Staff working in special environments such as at height should be appropriately trained.</li> <li>13. Ensure all vehicles, equipment and machine are inspected, repaired and maintained before use, and machine operators are trained on machine use and safety.</li> <li>14. Ensure all the electrical works are carried out by trained and certified professionals.</li> <li>15. Implement a workers grievance redress mechanism to allow workers raise safety issues and propose improvements on site.</li> <li>16. Provision of serviceable fire extinguishers on site and well-equipped first aid kit.</li> <li>17. Contractor should keep any accidents and incidents</li> </ul>				
	logs on site.				

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
	<ol> <li>Operation         <ol> <li>Ensure the CoE is equipped with fire detectors, alarm systems, and fire-fighting equipment. The building should comply with the IFC Life and Fire Safety Guidelines.</li> <li>Ensure that all first-aid stations are appropriately equipped and are easily accessible throughout the facility.</li> </ol> </li> </ol>	Proponent	<ol> <li>Number of fire related incidences and accidents.</li> <li>Provision of fire extinguishers</li> <li>OSH trainings to employees</li> </ol>	Throughout operation stage	Included in proponent costs
	<ol> <li>Provide OHS training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow staff or students.</li> <li>As for laboratory facilities, ensure the LPG cage is fitted outside the lab to promote fire safety and there is adequate ventilation in the rooms,</li> <li>Hazardous areas (electrical rooms, compressor rooms, etc), installations, materials, safety measures, and emergency exits, etc. should be marked appropriately according to international standards.</li> <li>Provide user adjustable work and study stations to prevent ergonomic illnesses and injuries.</li> <li>Conduct annual fire safety and OHS audits through a DOSHS-approved advisor to monitor the effectiveness of the CoE's OHS plan.</li> </ol>		4. Annual fire safety and OHS reports.		500,000
Increased fire risks Sources of fire include; use of fire in the kitchen, laboratory, electrical faults, improper storage of flammable materials, unsupervised hot works, use of faulty	<ol> <li>Provision of suitable fire-fighting equipment including fire hydrants, hose reels and portable fire extinguishers and install them at strategic locations within the Polytechnic premises.</li> <li>Sensitization of all staff and students on fire safety, including fire prevention and fire-fighting.</li> <li>Display of emergency contact numbers in-case of fire and have a designated fire assembly points.</li> <li>Conducting periodic fire drills.</li> <li>Provision of smoking guidelines.</li> </ol>	Proponent	Inspection and routine maintenance	Monthly	Costs determined by service provider

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
equipment, careless	8. Develop and implement a fire safety policy.				
smoking and arson	9. Ensure all flammables are stored in fire resistant areas.				
	10. Erect "No Smoking Zones" signs especially in areas				
	where flammable substances are stored				
	11. Provide water reservoir to fight fire.				
	12. Designate and mark a fire assembly points.				
	13. Provision of emergency fire exits.				
	14. Ensure all fire exit doors open outwards.				
	15. Constitute and train fire marshals.				
	16. Enhance security and vigilance at all times				

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Community Health a	nd Safety Impacts				
Traffic Related Accidents or Disruption of access to areas around the proposed site Constrained access to areas around the project site due to traffic snarl ups. Increase in pedestrian and vehicular traffic during operation.	<ol> <li>Construction and Decommissioning         <ol> <li>The proponent shall issue notices to all affected parties well before the construction and decommissioning phases begin. Use of access roads within the estate shall be communicated in advance to deter any inconvenience.</li> <li>Warning signs shall be provided to the access roads to warn the community during transportation of construction materials,</li> <li>Plan delivery and collection of construction materials to off-peak hours.</li> <li>Contractor shall emphasize safety aspects among project drivers, especially speed limits to the institution.</li> <li>Whenever dust suppression along access roads will be necessary, water will be sprayed.</li> <li>Contractors should regularly inspect vehicles, safety and employed trained drivers to minimize potential traffic related accidents.</li> <li>Contractor should consider periodic maintenance of the access roads as the heavy loaded trucks may destroy the access roads.</li> </ol> </li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> </ul>	Number of traffic accidents/incidences recorded.	Before works commence.	Included in contractor's costs

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
	<ol> <li>Operation         <ol> <li>"NO PARKING" signs will be posted around the building where Parking is prohibited and likely to cause obstruction as well as other necessary traffic signs</li> <li>Traffic management/parking personnel shall be provided to monitor parking and ensure smooth motoring along the buildings adjacent roads</li> <li>Access to driveways will be maintained at all times</li> <li>Any work that disturbs normal traffic signal operations shall be coordinated with the relevant authorities.</li> <li>Ensure all informal businesses are set up in designated areas to avoid obstruction of access routes.</li> </ol> </li> </ol>	Project Proponent		Weekly	Included in proponent costs
Increased risk in contracting diseases Increase in the transmission of Sexually transmitted Diseases and Infections (STD/I), HIV/AIDS and COVID- 19.	<ol> <li>Conduct regular sensitization and awareness campaign on HIV/AIDS, STD/I and COVID-19 to for workers, students, staff and local community.</li> <li>Reduce risk of STD/I through provision of male and female condoms for all workers during construction and decommissioning phases and provide contraceptive dispensers within the CoE for use during the operational phase.</li> <li>Provide free voluntary STI and HIV/AIDS screening, diagnosis and counselling for workers, students, staff and local people near the site.</li> <li>The contractor should ensure all members of the labour team are vaccinated against COVID-19 and provide means for vaccination for those who are not.</li> <li>Provide hand sanitizing facilities within the work site during construction and decommissioning.</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	<ol> <li>Number of awareness campaigns.</li> <li>Presence of contraceptive dispensers and hand sanitizing facilities.</li> <li>Number of STD/I and COVID-19 texts conducted.</li> <li>Number of COVID- 19 vaccines administered.</li> </ol>	Monthly	1,000,000

Possible Environmental and Social Impacts	Suggested Mitigation Measures	Responsibility	Monitoring indicator(s)	Timing	Cost estimate (Kshs.)
Social Risks and Imp	pacts				
Increased risks of Sexual Exploitation, Abuse and Harassment (SEA-H) and gender-based violence	<ol> <li>Contractor to prepare and enforce a No Sexual Exploitation and Abuse, Sexual Harassment, and discrimination Policy in all phases of the project in accordance with national law as provided in section 4.5 of this report.</li> <li>Sensitize target communities and project workers on GBV/SEA-SH risks and protocols.</li> <li>Impose zero tolerance on all forms of gender-based violence</li> <li>Ensure a code of conduct highlighting zero tolerance of sexual exploitation and abuse. is signed by all project workers with physical presence on site</li> <li>Ensure visibility of signage and information, education and communication materials on such GBV issues in construction sites.</li> <li>Map all GBV service providers and document referral services for survivors.</li> <li>Ensure that gender inclusivity should be observed during employment opportunities, recruitment and job postings</li> <li>Provision of gender disaggregated data, separate bathing, changing, sanitation facilities for men and women</li> <li>Contractor and project proponent to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal opportunity employment, gender sensitization.</li> <li>Provide separate showering areas, changing rooms and ablution facilities for male and female labourers.</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	<ol> <li>No Sexual Harassment Policy on display</li> <li>Gender Action Plan present</li> <li>Segregated facilities</li> <li>Number of gender- based incidences filed.</li> </ol>	Monthly	Included in contractor's costs

		culturally appropriate GRM is in place and accessible				
		and provides for confidential reporting of GBV cases.				
	12.	Create awareness on project GRM to all community				
		segments and project workers				
Gender	1.	Ensure that gender inclusivity should be observed	<ul> <li>Supervising</li> </ul>	Number of gender-	Monthly	Included in
Discrimination		during employment opportunities, recruitment and job	Engineer	based incidences filed.		contractor's
		postings.	<ul> <li>Contractor</li> </ul>			costs
Some contractors	2.	Regular sensitization of workers to promote gender	<ul> <li>Project</li> </ul>			
believe that women are		equity in employment during the construction works	Proponent			
physically and mentally		and during operation.				
incapable to execute	3.	All workers and nearby communities and stakeholders				
the tasks that the		will be educated on preventing and responding to				
position requires and		sexual harassment and GBV ahead of any project				
may be disinclined to		related works.				
hire them based on that	4.	Provision of gender disaggregated data to allow for				
belief		follow up,				
	5.	Provision of separate bathing, changing, sanitation				
		facilities for men and women				
	6.	Ensure equal pay for equal work among male and				
		female employees				
	7.	Regular sensitization and awareness campaigns to the				
		workers should be done to promote gender equity in				
		employment during the construction works and during				
	-	operation.				
	8.	Introduce flexible work schedule for expectant and				
	•	breastfeeding mothers				
	9.	Embrace equality in sharing out leadership position for				
	4.0	male and female employees				
	10.	The contractor should provide a functional and				
		culturally appropriate GRM is in place and accessible				
		and provides for confidential reporting of GBV cases.				
	11.	Create awareness on project GRM to all community				
		segments and project workers				

Cases of child labour and crimes towards children	<ol> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> <li>6.</li> <li>7.</li> <li>8.</li> <li>9.</li> </ol>	Ensure no children are employed on site in accordance with national labour laws. Strictly hire people who are above 18yrs and ensure they provide their Identity Card Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police. The client and the contractor shall adopt a 'Child Protection Code of Conduct', which sets stringent standards for personal behaviour so as to avoid child exploitation and abuse. Where feasible, sensitize target community of child protection laws and child rights Put in place warning signposts like "NO JOBS FOR CHILDREN .Develop a Code of conduct to be signed by all workers to ensure children are protected any negative impact from the construction works. Hoard the construction site to avoid any accidents, especially where there are dug up holes and exposed construction tools and material. Create and operate a workers grievance mechanism on labour issues	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	<ol> <li>Random inspections</li> <li>Labour records</li> </ol>	Monthly	Included in contractor's costs
Drug and substances abuse	<ol> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> <li>6.</li> <li>7.</li> </ol>	Institute a strict 'No Drugs' policy within the work site as well as within the facility when operational. Conduct awareness campaigns against drugs for site workers, students, staff and local residents. Provide counselling services for workers afflicted by drug and substance abuse. Work in tandem with local law enforcement to curb supply, use or distribution of substances within the area. Sensitize workers on no drug or alcohol abuse within the construction site and during working hours. Worker under the influence of drugs or alcohol should not be allowed into the construction site. Provide posters sensitizing workers on the dangers of	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	Number of drug and substance abuse related incidences recorded.	Monthly	Included in contractor's costs

	8. 9. 10. 11.	drugs and substance abuse Provide "No Smoking" signage within the project site. Enhance security at the entry points into the institution. Create and operate a workers grievance mechanism on labour issues. Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism.				
Increased Crime and Insecurity	1. 2. 3. 4. 5. 6. 7. 8.	<ol> <li>Provide security lights along the access road linking the main road to the CoE.</li> <li>Contractor and Supervision Team to liaise regularly with the Local Administration and Police Service to provide regular surveillance and patrols address any security and crime arising during project implementation and operation.</li> <li>Contractor to provide 24 hours security to Workforce Camps, Yards, Stores and to the Supervising Team's Offices</li> <li>Installation of CCTV surveillance cameras.</li> <li>Stringent access control guidelines for persons accessing sensitive areas at the facility</li> <li>Select a stakeholder coordination committee from the local residents to facilitate communication of grievances to the proponent.</li> <li>Create and operate a workers grievance mechanism on labour issues</li> <li>Train workers including the workers GRM committee on how to effectively use the Grievance Redress Mechanism</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	<ol> <li>Number of criminal incidences reported.</li> <li>Grievances recorded as per GRM.</li> </ol>	Monthly	Included in contractor's costs
Conflicts and Grievances Increased complaints such as non- employment of locals	1. 2. 3. 4.	Ensure adequate employment opportunities allocated to locals Develop a GRM process for the project workers Sensitization of workers/stakeholders on GRM process Ensure that all concerns/conflicts are addressed promptly and effectively	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	Grievances recorded as per GRM.	Monthly	Included in contractor's costs
inadequate stakeholder consultation due to	5.	Ensure careful documentation of all grievances received; processed, resolved and closed out.				

influx of people.	<ol> <li>Ens and</li> <li>Ens soci</li> <li>Ens rele time</li> <li>Orea labo</li> <li>Trai how Med</li> </ol>	sure that anonymous complaints are documented d addressed to the satisfaction of the affected parties sure adequate consultation with stakeholders in a nner allows them to express their views on project cial risks, impacts, and mitigation measures. Sure timely and prior disclosure and dissemination of evant and easily accessible information in a efframe that enables meaningful consultations eate and operate a workers grievance mechanism on our issues in workers including the workers GRM committee on <i>w</i> to effectively use the Grievance Redress chanism.				
Non adherence to national labour laws and good practices in the management of workers	<ol> <li>Creating practication</li> <li>Impression</li> <li>Impression</li> <li>First contain and and and and and and and and and an</li></ol>	eate awareness on national labour laws and actices. plement a labour management plan which specifies ., salary scale for given type of workers, opportunity women etc. sure all workers have contracts with terms and aditions that are consistent with national labour laws d policies. sure each worker signs a code of conduct covering ues such as zero tolerance to unacceptable conduct the community and GBV (sexual harassment, sexual politation and abuse of children etc.) nsitize project workers on actual meaning and polication of the Code of conduct before signing it. eate and operate a workers grievance mechanism on our issues in workers including the workers GRM committee on w to effectively use the Grievance Redress chanism. ploy project workers who are 18 years and above, d with a valid national ID at the time of hire. plement and monitor the employment register rularly. mply with the national labour laws and labour	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	Grievances recorded as per GRM.	Monthly	Included in contractor's costs

	<ul> <li>management practices.</li> <li>11. Ensure no children are allowed on sub-project sites and put visible signage on site "No Jobs for children".</li> <li>12. Ensure a functional and easily accessible project GRM is in place</li> <li>13. Create awareness on project GRM to all community segments and project workers.</li> <li>14. Labour hiring process should be gender sensitive and done with fairness</li> </ul>				
Inadequate consultation with project stakeholders	<ol> <li>Ensure continuous and meaningful engagement with project stakeholders throughout the project cycle</li> <li>Ensure timely and continuous disclosure of project related information to stakeholders</li> <li>Create awareness on project GRM to all community segments and project workers.</li> </ol>	<ul> <li>Supervising Engineer</li> <li>Contractor</li> <li>Project Proponent</li> </ul>	<ol> <li>Grievances recorded as per GRM.</li> <li>Stakeholder engagement minutes</li> </ol>	Monthly	Included in contractor's costs
	TOTAL APRROXIMATE COST OF IMPLEME	NTING THE ESM	1MP: Kshs. 2,600,000	)	

# **CHAPTER NINE – GRIEVANCE REDRESS MECHANISM**

# 9.1 INTRODUCTION

A Grievance Redress Mechanism (GRM) is an instrument through which dispute resolution is sought and provided. It involves the receipt and processing of complaints from individuals or groups negatively affected by activities of a particular project.

Proper and strong Grievance mechanisms are very important in ensuring the stakeholders grievances and issues as they relate to the proposed project are addressed in a timely and appropriate manner, to enhance the relationship between the project proponent, contractor, and the stakeholders. It is therefore recommended that the project proponent should put in place a GRM for the project to ensure any issues raised by stakeholders related to the project safeguards are addressed.

It is important to emphasize that grievance redress mechanisms are for all aspects of a project, not just environmental and social safeguards. The implementing agency should prepare and disseminate grievance redress guidelines for the project, including a hierarchy of reporting levels for redress, roles, and responsibilities. Public information about grievance redress should be posted in visible locations in project area of influence. Where needed, Grievance Redress Committees (GRCs) should be established, with the necessary authority, training and resources. Entities involved in grievance redress should keep proper records and logs.

Project budgets should include resources for the establishment and operation of the GRM. The implementing agency should on regular occasions review the GRM and verify that they are working properly.

# 9.2 GRIEVANCE REDRESS MECHANISM

A Grievance Redress Committee (RDC) will be constituted to handle all grievances put forward. The structure of the GRC will be composed of but will not be limited to the members delineated in table 12.

Table 12: Composition of the GRC Team

Name / organization	Representative	Membership Position	
	Environmental and Social Safeguards specialist	Chairperson	
Project Implementation Unit (KenGen)	Resident Engineer (RE) Safeguard specialist	Member	
	Contractor representative	Member	
	Institution Safeguard Specialist	Member	
	Deputy County Commissioner	Member	
Local Administration	Chief	Member	
	Assistant Chief	Member	
NEMA Naivasha Sub- County	NEMA Officer	Observer	
Other Stakeholders	As may be determined during the implementation of the project		

The main role of the committee will be arbitration through mediation and negotiation when complaints arise to ensure that cases are resolved quickly and fairly. The above committee shall normally meet once per month and may form special sub-committees or ad-hoc committee that shall meet on a weekly basis or more frequently as the nature of some grievances may demand. Such sub-committees or special ad-hoc committee will report their findings and recommendations to the main committee for ratification or approval.

Project budgets should include resources for the establishment and operation of the GRM. The implementing agency should on regular occasions review the GRM and verify that they are working properly.

# 9.2.1 Grievance Reception

Collection of Grievances will be through means identified by the PIU as a formal mode of communicating any issues that may arise. This can be through the following offices:

- a) KenGen Offices
- b) Regional Government administrative offices
- c) Contractor or Resident Engineer's office

- d) Ministry of Education
- e) National Environment Management Authority (NEMA)
- f) Representative at the Kamere Community level

The complaints can be made in writing, verbally, over the phone, by fax, emails or any other media. As soon as the officer receives a complaint he /she would issue an acknowledgement of the complaint, including the details of the person bringing the grievance. The officer receiving the complaints should try to obtain relevant basic information regarding the grievance and the complainant and will immediately inform the safeguard specialist the receipt of the complaint.

The GRC will maintain a Complaint / Grievance and Redress register or log book and the responsibility of keeping records collected from relevant bodies will be the responsibility of the PIU safeguard specialist.

After registering the complaint in the Grievance Redress Registration and Monitoring Sheet, the safeguard specialist would study the complaint made in detail and forward the complaint to the concerned officer with specific dates for replying and redressing the same. He/she would hold meetings with the affected persons / complainant and then attempt to find a solution to the complaint received. If necessary, meetings have to be held with the concerned affected persons / complainant and the concerned parties to find a solution to the problem and fix up plans to redress the grievance. The deliberations of the meetings and decisions taken are recorded and minutes of the meetings filed.

The grievance mechanism process hereby attached under Annex 5. Also attached under Annex 6 is a sample of a grievance log matrix.

### 9.2.2 Grievance Redress Process

The stakeholders are informed of various points of making complaints (if any) and the PIU collect the complaints from these points on a regular basis and record them. This is followed by coordinating with the concerned people to address the grievances. The PIU will manage the grievance activities at the respective stake-holder's level to address the Grievances and would act as the focal point in this regard.

A three tier Redress structure is proposed to address all complaints in the proposed project.

### a) First tier of Redress

The complaints are received at various means as described above.

The resolution at the first tier will normally be done within 14 working days and notified to the concerned through a disclosure form. Should the Grievance be not solved within this period, this would be referred to the next level of Grievance Redress. However, if the PIU feels that adequate solutions are worked out but it would require a few more days for actions to be taken, he/she can decide on retaining the issue at the first level by informing the complainant accordingly. However, if the complainant requests for an immediate transfer of the issue to

the next level, it would be accepted and the issue would be taken to the next tier, especially if the issue is not addressed within 21 days.

# b) Second tier of Redress

The Grievance Redress Committee (GRC) would be the one which would address the grievance in the next level in case the problem is not solved at the first tier.

The PIU will coordinate with the respective chairman of the GRC in getting this Committee constituted and get the necessary circulars issued in this regard so that they can be convened whenever required.

The safeguard specialist will coordinate the convening of the meetings of the GRC. He / She is also responsible for briefing the GRC on the grievances and deliberations of the first level of Redress, outcomes and on the views of both the parties (project proponent and complainant).

The GRC will hold the necessary meetings with the affected party / complainant and attempt to find a solution acceptable at all levels. The GRC would record the minutes of the meeting and filed by the PIU. The decisions of the GRC will be communicated to the complainant formally and if he/she accepts the resolutions, the complainant's acceptance is obtained in writing and signing off is done between the complainant and the GRC.

If the complainant does not accept the solution offered by the GRC, then the complaint is passed on to the next level / or the complainant can reach the next level for redress. The Chairman of the GRC would be required to forward the issue to the Third Tier to facilitate in exploring a solution to the grievance. In any case, the grievance should be forwarded to the next level if no solution is reached within 14 days of the case reaching the second level. However, in cases nearing offering an amicable solution, it can be retained to an extent of 21 days.

# c) Third tier of Redress

If the affected party / complainant does not agree with the resolution at the 2nd level, or there is a time delay of more than a month in solving the issue, the complainant can opt to consider taking it to the third level.

Where an agreement has not been reached, the complainant will be offered the option of an independent mediation process at an alternative arbitration body such as local arbitration arrangements, local administration, or other avenues as might be prescribed in the country constitution before legal redress. The PIU will collect all the details of the Grievance including the deliberations of first tier efforts and of the GRC and present it to the 3<sup>rd</sup> level tier. The 3<sup>rd</sup> tier structure will deliberate upon the issue and give suitable recommendations. The minutes of the meetings will be recorded and kept at the PIU office.

The decisions of the 3<sup>rd</sup> tier structure would be final from the project side and will be communicated to the complainant formally and if he/she accepts the resolutions, the complainant's acceptance is obtained and signed off by the complainant and the 3<sup>rd</sup> tier

structure, including the project GRC. The Complainant may decide to take a legal or any other recourse if he /she is not satisfied with the resolutions of the deliberations of the three tiers of GRM. It should be encouraged that the 3 levels of handling the grievances should be exhausted extensively before one goes to courts as last resort.



Figure 8: GRM Flow Chart

### 9.2.3 GRM Monitoring

All complaints received will be entered into a publicly accessible system that will allow complaints to be tracked and monitored. The system will also present a database showing:

- i. No of complaints received.
- ii. No and % of complaints that have reached agreement.
- iii. No and % of complaints that have been resolved.
- iv. No and % of complaints that have gone to mediation
- v. No and % of complaints that have not reached agreement.

The database should also show the issues and geographic areas most complaints circle around. The information provided by the database is expected to help EASTRIP to improve the Grievance Redress Mechanism and better understand and address the environmental and social impacts of the project.

# **CHAPTER TEN – CONCLUSION AND RECOMMENDATIONS**

# **10.1 CONCLUSION**

The objective of the proposed project is to develop a state of the art training centre with modern facilities and to increase human capacity in geothermal power generation therefore bringing economic benefits to the project beneficiaries and the country as well.

An environmental and social assessment of the Project was commissioned to establish the level of environmental and social impacts that the Project is likely to cause. Impacts identified are not significantly adverse. However, each impact has been readily addressed by control measures in the engineering design of the Project as well as additional mitigation measures as suggested in the Environmental Social Management and Monitoring Plan.

The Project received favourable support from local people and other stakeholders during consultations and they anticipated numerous benefits as a result of the proposed CoE. The Project is not located near any protected areas. However, chance find procedures were developed in the event of any archaeological finds.

The Project will have both positive and negative impact on the physical and social environment. The positive impacts include construction of modern training that will provide opportunities for locals and people from far and wide to train in various facets of geothermal power production. It will also be responsible for creating direct and indirect employment all through its lifecycle. Nakuru County will benefit from increased revenue collection.

The adverse impacts identified are manageable through diligent implementation of the ESMMP by the Contractor and its supervision by the Proponent.

Other possible negative impacts include increased demand for energy and water resources in the area, Unsustainable extraction and use of construction material, potential occupational health and safety of the workers, and increase in HIV/AIDS and COVID-19 prevalence. However, these impacts can be mitigated with appropriate mitigation measures built in as part of the Project planning process

It was established that the Project activities will trigger World Bank Operation Policy (OP 4.01) on Environmental Assessment due to environmental and social impacts arising from the Project as presented in this report, and OP 4.11 Physical Cultural Resources (PCRs) due to the possibility of chance find. However, none of the other operational policies will be triggered by the project.

Based on the analysis conducted in this ESIA, it is concluded that overall the Project will result in positive socio-economic benefits and the negative environmental impacts that have been identified are not significant, and can be minimized adequately through good design, appropriate application of mitigation measures and continuous supervision by the project proponent.

#### **10.2 RECOMMENDATIONS**

Environmental monitoring is essential to track and sustain the effectiveness of the mitigation measures proposed in this report. An environmental and social management monitoring plan has been prepared as part of the ESMMP. The focus areas of monitoring cover air, noise, traffic management, Water and energy resources, occupational health and safety, as well as community health and safety all through the project's lifecycle. Responsibility for implementing the mitigation measures largely lies with the Project Contractor under supervision by the Proponent. Key observations are that most adverse impacts are short-term and will disappear once civil works ends.

The Contract for the proposed project should bear relevant clauses binding the contractor to institute environmental mitigation as recommended in this study. The core monitoring strategy for this project will be through site meetings, in which case, it is recommended that the County Environmental Officers be invited to such meetings. Other stakeholders such as the County Labour Officer should also attend such meetings to ensure measures towards securing the health and safety of workers have been put in place.

It is the duty of the Proponent to carry out an annual environmental and social audits once the CoE is operational. This will be in compliance with the Environmental Management and Coordination Act, EMCA of 1999 and the Environmental Impact Assessment and Audit Regulations, Legal Notice No. 101 of 2003.

The tentative budget allocated to implementation of mitigation measures and in addition to the provisions of BOQ was calculated to be approximately Kenya Shillings 2,600,000.00. It is the responsibility of the project proponent to allocate this budget to facilitate implementation of the ESMMP.

The following is recommended for effective implementation of the mitigation measures for the project;

- 1. All mitigation measures need to be specified in tender and contract documents, and must be included in the Engineering Drawings, Specifications and Bills of Quantities.
- 2. Diligence on the part of the contractor and proper supervision by the Project Engineer during construction and the initial operation phase is crucial for mitigating negative impacts.
- 3. Periodic environmental and social monitoring is required by the project proponent to ensure that mitigation measures have been implemented in order to prevent or avert any negative impacts of the project.
- 4. The implementing agency should set up proper and applicable workers Grievance Redress Mechanism (GRM) for the project to deal with grievances and issues on the project.
- 5. Progress in implementing E&S safeguards should be incorporated in the monthly reporting of the project.

# **REFERENCES**

- 1. The Nakuru County Integrated Development Plan, 2017-2022
- 2. Kenya Environmental Sanitation and Hygiene Policy 2016-2030
- 3. Draft National Climate Change Framework Policy (2014)
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- 5. The Nakuru County Integrated Development Plan, 2017-2022
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- 8. National Environment Policy, 2013
- 9. The World Bank Group Operational Policies/ Bank Procedures
- 10. The World Bank Group General Environment, Health And Safety Guidelines
- 11. Environmental Management and Coordination (Amendment) Act (EMCA), 2015
- 12. The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019
- 13. Environmental Management and Coordination (Waste Management) Regulation, 2006
- 14. The Environmental Management and Co-ordination (Water Quality) Regulations, 2006
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- 16. The Environmental Management and Co-ordination (Air Quality) Regulations, 2009
- 17. Water Act, 2002
- 18. The Water Resources Management Rules, 2007
- 19. Occupation Safety and Health Act, 2007
- 20. Public Health Act Cap 242
- 21. Physical Planning Act, 1999
- 22. The Environment and Land Court Act, 2011
- 23. The Climate Change Act, 2016
- 24. Traffic Act Chapter 403
- 25. The County Government Act 2012
- 26. The Energy Act, 2019
- 27. Energy (Solar Water Heating) Regulations, 2012
- 28. The Land Act, 2012

### **KENGEN GTC COE, 2022**
- 29. Kenya National Social Protection Policy, 2011
- 30. Children (Amendment) Bill, 2020
- 31. The Employment (Amendment) Act, No. 15 of 2022
- 32. Employment and Labour Relations Court Act, 2011
- 33. Labour Relations Act
- 34. Sexual Offences Act, 2006
- 35. Protection against Domestic Violence Act, 2015
- 36. National Gender and Equality Commission Act, 2011
- 37. HIV/AIDS Prevention and control Act (Act No. 14 of 2006)
- 38. Work Injury Benefits Act, 2007

39.

# **ANNEXES**

- Annex 1: Land Title Deed
- Annex 2: Summary Bills of Quantity
- Annex 3: NEMA Licence to Transport Waste
- Annex 4: Project Masterplan
- Annex 5: Liquid Waste Management Layout Plan
- Annex 6: Grievance Redress Process Charter
- Annex 7: Grievance Log Matrix
- Annex 8: Waste Water Production Estimates
- Annex 9: Chance Find Procedure
- Annex 10: Minutes of the Focus Group Discussion
- Annex 11: Attendance Sheets For the Focus Group Discussion
- Annex 12: Stakeholder Comment Sheets
- Annex 13: Lead Expert NEMA Practising Licence

#### **ANNEX 1: LAND TITLE DEED**



REPUBLIC OF KENYA

THE LAND REGISTRATION ACT, No. 3 OF 2012 (Section 108)

THE REGISTRATION OF TITLES ACT (Chepter 281) (Rej caled)

### CERTIFICATE OF TITLE

FITTE NUMBER I.R. IR. 165605

TERMI 952

YEARS PROM 1-10-1957

)

ANNUAL RENT SHILLINGS 438.600/=

(Revisable)

I HEREBY CERTIFY that KENYA ELECTRICITY GENERATING COMPANY a limited liability company having its registered office at Nairobi

of Post Office Box Number 47936-00100 NAIROBI

In the Republic of Kenya pursuant to a Transter registered as Number LR, 14524/20 is/are now registered proprietor(s) as Lesses(s)

from the Government of the Republic of Kenys for the term of Mine Hundred and Fifty Two

years for the First day of October One Togo thousand Nine Hundred

nd Fifty Seven of ALL that plece of land situate Adjoining Lake Naivasha

In the Naivasha District containing by measurement Six Six Nine Decimal Six

hectares/access@accessations.com

hectares/acres) or thereabouts and being Land Reference Number 9005/12

(Original Number 9005/4/1)

as delfnested on Land Sarvey Plan Number 244606

annexed to the said Transfer

Sumser however to the revisable annual rent of Shillings

and to the Act(a) Special Conditions Encombrances and other [matters specified in] the Memorandum hereunder written,

In Wrrness whereof I have hereunto set my hand and seal this 6th

day of March Two theossaid and Fifteen

active MEMORANDUM C. K. Nyakundi \*298 (1) The Land Act, No. 6 of 2012. (2) The Land Registration Act, No. 3 of 2012. The Government Lands Act (Chapter 280) (Repealed).
 The Special Conditions contained in a Grant registered as Number I.R. 14524/1 GPK 5204-3m-1/2014 LARD THILES REGISTRY-NAROES RECEIPTRY REAL TAN OF THILE ACT Parases be March 2015 C. X. Myahundi "258



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SOA/	SECTION N BIw/LW/GTC-3,2022	0.9 Prop	osed Geothermal Training Centre (GTC) - Naivasha
ITEM	DESCRIPTION	UNIT QTY	RATE (KSHS AMOUNT (KSHS)
	SECTION NO. 9		
	EXTERNAL WORKS		
	SUMMARY		
	ELEMENT	PAGE NO	TOTALS
1	SITE CLEARANCE	9/1	275,000.00
2	ROADS, CARPARKS AND PAVED AREAS	9/2	33,650,000.00
3	STORMWATER DRAINAGE	9/4	1,134,500.00
4	FOUL WATER DRAINAGE	9/7	19,421,000.00
5	BOUNDARY FENCE	9/8	4,025,000.00
6	SERVICES BUILDING	9/18	5,066,975.00
7	UNDERGROUND & ELEVATED TANKS	9/24	18,877,380.00
8	FOOTBAL PITCH/GROUNDS	9/25	12,613,300.00
9	LANDSCAPING	9/26	3,300,000.00
10	GATE & GATE HOUSE	9/40	6,222,350.00
11	RADIO ACTIVE MATERIAL HOLDING TANK	9/43	1,019,920.00
12	PROVISIONAL SUM FOR BRANDING AND SIGNAGE	9/44	2,500,000.00
	<u>TOTAL FOR EXTERNAL WORKS TO MAIN</u> <u>SUMMARY</u>	KSHS	108,105,425.00

©Songa Ogoda Associates

9/1

External Works

FORM II	FORM NEMA /W
NATIONA	L ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)
THE ENVI	RONMENTAL MANAGEMENT AND CO-ORDINATION ACT LICENCE TO TRANSPORT WASTE
	(r.7)
Licence No. TR/HW	076320
Name	FLYING EAGLE YOUTH GROUP
Address	P.O. BOX 126 - 20117
	NAIVASHA
You are hereby licenced to	a transport waste to:
	NAIVASHA DUMPSITE (KAYOLE)
	(Location/district) NAKURU COUNTY
and an and a second	(Location/district)
Type and registration num	ber of vehicle licenced KAA 229Y
	AITSUBISHI
This licence is valid from .	171H FEBRUARY 20 22
	101H FEDRUARY 20 23
This licence is granted sub SEE O	ject to the following conditions: VERLEAF
Date:17TH FE	BRUARY 2022 Signature N
	Director General
	National Environment Management Autho

### **ANNEX 3: NEMA LICENCE TO TRANSPORT WASTE**

EM	DESCRIPTION	COSTS (KSHS)		TOTALS(KSHS.)	SPECIFICATIONS		
1	LECTURE & ADMINISTRATION BLO	оск					
1.1	Sub-structures	25,004,470.00	21.3%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, Lift shaft, t & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plin finishes.		
1.2	Reinforced Concrete Superstructure	19,233,600.00	16.4%		Reinforced concrete columns, Lift shaft, beams, suspended slab, gutters, formwork.		
1.3	Staircases, Steps & pedestrian ramps	769,560.00	0.7%		Reinforced concrete to staircase,mild steel balustrading & railing, finishes		
1.4	Wallings and Partitions	7,620,450.00	6.5%		Machine cut natural Stone walls, Aluminium and glass composite partitions.		
1.5	Windows and Curtain Walling	3,673,360.00	3.1%		Aluminium composite windows, Glazing, Curtain walling, window boards; and paintwork		
1.6	Doors	3,379,210.00	2.9%		Aluminium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery		
1.7	Roofing and Rain water disposal	10,477,660.00	8.9%		Light gauge steel roof, IT5 roofing sheets, 'Decra' roofing tiles and rain water disposal.		
1.8	Finishes	23,406,000.00	19.9%		Screed, Granito tiles, liquid epoxy floor finishPlaster and paint to ceiling, Plaster and pai to internal and external walls, Structural steel & Alucobond cladding to selected areas on the external wall, Aluminium louvre sunshaders. All as per schedule.		
1.9	Fittings, Fixtures and Planters	004,587.50	0.0%		Storage shelves, lab worktops finished with granite, planters and planter boxes.		
.10	BWICS, Branding, signage & planter boxes	1,557,850.00	1.3%		Branding and signage and entrance canopy		
.11	Mechanical Engineering Services	4,623,224.00	3.9%		Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services		
1.12	Electrical Engineering Services	17,170,500.00	14.6%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services		
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	117,580,471.50			
PREPARED BY: SONGA OGODA & ASSOCIATES QUANITITY SURVEYORS, BUILDING ECONOMISTS, CONSTRUCTION COST ENGINEERS, CONTRACTS & CLAIMS ADMINISTRATORS AND ARBITRATORS							

KENGEN GTC COE, 2022

SOA/GTC/E4/2022

ESTIMATED COST SUMMARY

	PROPOSED GEATHERMAL TRAINING CENTRE - NAKURU COUNTY								
	COST ESTIMATE								
	5/6/2022								
ITEM	DESCRIPTION	COSTS (KSHS)		TOTALS(KSHS.)	SPECIFICATIONS				
1	LABORATORIES								
1.1	Sub-structures	28,220,865.00	28.6%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, tie & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plinth finishes.				
1.2	Reinforced Concrete Superstructure	7,107,412.39	7.2%		Reinforced concrete columns, beams, suspended slab, gutters, formwork.				
1.3	Staircases, Steps & pedestrian ramps	0.00	0.0%		Reinforced concrete to staircase,mild steel balustrading & railing, finishes				
1.4	Wallings and Partitions	4,705,550.00	4.8%		Machine cut natural Stone walls, Aluminium and glass composite partitions.				
1.5	Windows and Curtain Walling	2,572,590.00	2.6%		Aluminium composite windows, Glazing, Curtain walling, window boards; and paintwork.				
1.6	Doors	3,393,330.00	3.4%		Aluminium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery				
1.7	Roofing and Rain water disposal	9,803,560.00	9.9%		Light gauge steel roof members, 'Decra' roofing tiles and rain water disposal.				
1.8	Finishes	20,612,250.00	20.9%		Screed, Granito tiles, liquid epoxy floor finishPlaster and paint to ceiling , Plaster and paint to internal and external walls, Structural steel & Alucobond cladding to selected areas on the external wall, Aluminium louvre sunshaders. All as per schedule.				
1.9	Fittings, Fixtures and Planters	9,198,500.00	9.3%		Storage shelves, lab worktops finished with granite, planters and planter boxes.				
1.10	Branding, signage & entrance canopy	201,500.00	0.2%		Branding and signage and entrance canopy				
1.11	Mechanical Engineering Services	6,776,234.00	6.9%		Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services				
1.12	Electrical Engineering Services	6,015,600.00	6.1%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services				
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	98,607,391.39					
	PREPARED BY: SONGA OCODA & ASSOCIATES QUANTITIY SURVEYORS, BUILDING ECONOMISTS, CONSTRUCTION COST ENGINEERS, CONTRACTS & CLAIMS ADMINISTRATORS AND ARBITRATORS SUPERITY POAD VARIABLE ENVIL								

SOA/GTC/E4/2022

**KENGEN GTC COE, 2022** 

ESTIMATED COST SUMMARY

	COST ESTIMATE						
TEN	DESCRIPTION	COSTS (KSHS)		TOTAL S(KSHS)	SPECIFICATIONS		
1	WORKSHOPS	00010(1010)		101120(1012.)			
1.1	Sub-structures	18,527,670.00	32.9%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, tie & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plinth finishes.		
1.2	Reinforced Concrete Superstructure	5,827,300.00	10.4%		Reinforced concrete columns, beams, suspended slab, gutters; formwork.		
1.3	Staircase	284,495.00	0.5%		Reinforced concrete to steps and ramps, stainless steel balustrading & railing, finishes		
1.4	Wallings and Partitions	2,814,500.00	5.0%		Machine cut natural Stone walls, Aluminium and glass composite partitions.		
1.5	Windows and Curtain Walling	2,945,243.75	5.2%		Ahuminium composite windows, Glazing, Curtain walling, window boards; and paintwork.		
1.0	Doors	2,779,275.00	4.9%		Ahuninium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery		
1.7	Roofing and Rain water disposal	5,771,048.84	10.3%		Light gauge steel roof members, 'Decra' roofing tiles and rain water disposal.		
1.8	Finishes	8,614,030.00	15.3%		Screed, Granito tiles, liquid epoxy floor finish, Plaster and paint to external walls, Structura steel & Ahucobond cladding to selected areas on the external wall, Ahuminium houvre sunshaders. All as per schedule.		
1.9	Fittings, Fixtures and Planters	656,000.00	1.2%		Storage shelves, Workshop worktops , planters and planter boxes.		
1.10	Branding, signage & entrance canopy	200,000.00	0.4%		Branding and signage and entrance canopy		
1.11	Mechanical Engineering Services	2,340,636.00	4.2%		Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services		
1.12	Electrical Engineering Services	5,479,450.00	9.7%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services		
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	56,239,648.59	+		
PREPARED BY: SONGA OGODA & ASSOCIATES QUANTITITY SURVEYORS, BUILDING ECONOMISTS, CONSTRUCTION COST ENGINEERS, CONTRACTS & CLAIMS ADMINISTRATORS AND ARBITRATORS SERENITY ROAD, NAROBI-KENYA							

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Proposed Geathermal Training Centre

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ESTIMATED COST SUMMARY

	PROPOSED GEATHERMAL TRAINING CENTRE - NAKURU COUNTY							
	COST ESTIMATE							
	5/6/2022							
ITEM	DESCRIPTION	COSTS (KSHS)		TOTALS(KSHS.)	SPECIFICATIONS			
1	MALE HOSTELS (GROUND - 1ST FLO	OOR)						
1.1	Sub-structures	16,707,010.00	24.2%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, tie & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plinth finishes.			
1.2	Reinforced Concrete Superstructure	11,584,725.00	16.8%		Reinforced concrete columns, beams, suspended slab, gutters, gutter slabs; formwork.			
1.3	Staircases, Steps & pedestrian ramps	865,485.00	1.3%		Reinforced concrete to staircase, stainless steel balustrading & railing, finishes			
1.4	External and internal walling	3,634,650.00	5.3%		Machine cut natural Stone walls,			
1.5	Windows	2,126,565.00	3.1%		Aluminium composite windows, Głazing, Curtain walling, venation blinds, window boards; and paintwork.			
1.6	Doors	3,012,820.00	4.4%		Aluminium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery			
1.5	Roofing and Rain water disposal	4,889,202.61	7.1%		Light gauge steel roof members, 'Decra' roofing tiles and rain water disposal.			
1.8	Finishes	12,824,870.00	18.6%		Screed, Granito tiles, liquid epoxy floor finish, Suspended gypsum ceiling , Plaster and paint to external walls, Structural steel & Alucobond cladding to selected areas on the external wall, Aluminium louvre sunshaders. All as per schedule.			
1.9	Fittings, Fixtures and Planters	3,250,000.00	4.7%		Fittings & fixtures, planters and planter boxes.			
1.10	BWICS, Branding, signage	204,000.00	0.3%		Branding and signage and entrance canopy			
1.11	Mechanical Engineering Services	6,365,052.00	9.2%		Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services			
1.12	Electrical Engineering Services	3,662,900.00	5.3%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services			
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	69,127,279.61				
	PREPARED BY: SONGA OGODA & ASSOCIATES QUANTITIY SURVEYORS, BUILDING ECONOMISTS, CONSTRUCTION COST ENGINEERS, CONTRACTS & CLAIMS ADMINISTRATORS AND ARBITRATORS SERENITY ROAD, NAROBI-KENYA							

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ESTIMATED COST SUMMARY

	PROPOSED GEATHERMAL TRAINING CENTRE - NAKURU COUNTY						
	COST ESTIMATE						
	5/6/2022						
ITEM	DESCRIPTION	COSTS (KSHS)		TOTALS(KSHS.)	SPECIFICATIONS		
1	LADIES' HOSTELS (GROUND - 1ST F	LOOR)					
1.1	Sub-structures	16,707,010.00	24.1%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, tie & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plinth finishes.		
1.2	Reinforced Concrete Superstructure	11,584,725.00	16.7%		Reinforced concrete columns, beams, suspended slab, gutters, gutter slabs; formwork.		
1.3	Staircases, Steps & pedestrian ramps	865,485.00	1.3%		Reinforced concrete to staircase, stainless steel balustrading & railing, finishes		
1.4	External and internal walling	3,634,650.00	5.3%		Machine cut natural Stone walls,		
1.5	Windows	2,126,565.00	3.1%	1	Aluminium composite windows, Glazing, Curtain walling, venation blinds, window boards; and paintwork.		
1.6	Doors	3,012,820.00	4.4%		Ahuminium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery		
1.7	Roofing and Rain water disposal	4,889,202.61	7.1%		Light gauge steel roof members, 'Decra' roofing tiles and rain water disposal.		
1.8	Finishes	12,824,870.00	18.5%		Screed, Granito tiles, liquid epoxy floor finish, Suspended gypsum ceiling , Plaster and paint to external walls, Structural steel & Alucobond cladding to selected areas on the external wall, Aluminium louvre sunshaders. All as per schedule.		
1.9	Fittings, Fixtures and Planters	3,250,000.00	4.7%		Fittings & fixtures, planters and planter boxes.		
1.10	BWICS, Branding, signage	204,000.00	0.3%		Branding and signage and entrance canopy		
1.11	Mechanical Engineering Services	6,467,852.00	9.3%	1	Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services		
1.12	Electrical Engineering Services	3,662,900.00	5.3%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services		
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	69,230,079.61			
	PREPARED BY: SONGA OGODA & ASSOCIATES QUANTITIY SURVEYORS, BUILDING ECONOMISTS, CONSTRUCTION COST ENGINEERS, CONTRACTS & CLAIMS ADMINISTRATORS AND ARBITRATORS SERENITY ROAD, NAROBI-KENYA						

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Proposed Geathermal Training Centre

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ESTIMATED COST SUMMARY

	PROPOSED GEATHERMAL TRAINING CENTRE - NAKURU COUNTY							
	COST ESTIMATE							
	5/6/2022							
ITEM	DESCRIPTION	COSTS (KSHS)		TOTALS(KSHS.)	SPECIFICATIONS			
1	STUDENT KITCHEN AND DINNING	(GROUND FLOOR)						
1.1	Sub-structures	18,506,300.00	29.6%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, tie & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plinth finishes.			
1.2	Reinforced Concrete Superstructure	6,433,900.00	10.3%		Reinforced concrete columns, beams, suspended slab, gutters, gutter slabs; formwork.			
1.3	Staircases, Steps & pedestrian ramps	0.00	0.0%		Reinforced concrete to staircase, stainless steel balustrading & railing, finishes			
1.4	External and internal walling	3,031,315.00	4.9%		Machine cut natural Stone walls,			
1.5	Windows and Curtain Walling	2,531,658.75	4.1%		Aluminium composite windows, Glazing, Curtain walling, venation blinds, window boards; and paintwork.			
1.6	Doors	1,609,455.00	2.6%		Aluminium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery			
1.7	Roofing and Rain water disposal	6,506,127.56	10.4%		Light gauge steel roof members, 'Decra' roofing tiles and rain water disposal.			
1.8	Finishes	12,742,530.00	20.4%		Screed, Granito tiles, liquid epoxy floor finish, Suspended acoustic , Plaster and paint to external walls, Structural steel & Alucobond cladding to selected areas on the external wall, Aluminium louvre sunshaders. All as per schedule.			
1.9	Fittings, Fixtures and Planters	2,000,000.00	3.2%		Fittings & fixtures, planters and planter boxes.			
1.10	BWICS, Branding, signage	114,000.00	0.2%		Branding and signage and entrance canopy			
1.11	Mechanical Engineering Services	5,055,752.00	8.1%		Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services			
1.12	Electrical Engineering Services	3,941,700.00	6.3%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services			
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	62,472,738.31				
	PREPARED BY: SONGA OCODA & ASSOCIATES QUANTITIY SURVEYORS, BUILDING ECONOMISTS, CONSTRUCTION COST ENGINEERS, CONTRACTS & CLAIMS ADMINISTRATORS AND ARBITRATORS SERENITY ROAD, NAROBI-KENYA							

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Proposed Geathermal Training Centre

ΤEN	5/6/2022 DESCRIPTION	COSTS (KSHS)		TOTALS(KSHS.)	SPECIFICATIONS
1	VILLA (GROUND - 1ST FLOOR)				
1.1	Sub-structures	6,215,290.00	23.8%		Site clearance; Excavation upto 3M deep (due to poor soils) & disposal for foundation trenches, column bases, Reinforced concrete in column bases, columns, Strip, tie & ground beam, water proofing, ground floor slab, formwork, steel reinforcement, & Plinth finishes.
1.	Reinforced Concrete Superstructure	3,064,200.00	11.7%		Reinforced concrete columns, beams, suspended slab, gutters, gutter slabs; formwork.
1.	Staircases, Steps & pedestrian ramps	425,820.00	1.6%		Reinforced concrete to staircase, stainless steel balustrading & railing, finishes
1.4	External and internal walling	1,380,600.00	5.3%		Machine cut natural Stone walls,
1.	Windows	414,280.00	1.6%		Ahuminium composite windows, Giazing, window boards; and paintwork.
1.0	i Doors	1,895,650.00	7.3%		Aluminium Doors, Steel grille doors, hardwood timber panel doors externally, solid cored flush doors internally and frames; paintwork and ironmongery
1.	Roofing and Rain water disposal	3,142,140.00	12.0%		Structural timber roof members, 'Decra' roofing tiles and rain water disposal.
1.3	Finishes	4,677,340.00	17.9%		Screed, Granito tiles, Plaster and paint tointernal and external walls, Plaster and Paint to suspended gypsum ceiling.
1.9	Fittings, Fixtures and Planters	450,000.00	1.7%		Wardrobes and shelvings, study tops etc.
.1	BWICS & Branding, signage	87,500.00	0.3%		Builders works in connection to Engineering services, Branding and signage
1.1	Mechanical Engineering Services	2,504,702.00	9.6%		Mechanical Installations, Profits & attendance to MC, & builder's work in connection to engineering services
1.1	Electrical Engineering Services	1,852,200.00	7.1%		Electrical Installations, Profits & attendance to MC, & builder's work in connection to engineering services
	TOTAL FOR BUILDER'S WORK AND ENGINEERING SERVICES;		100.0%	26,109,722.00	

### **ANNEX 4: PROJECT MASTERPLAN**



KENGEN GTC COE, 2022

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### ANNEX 5: LIQUID WASTE MANAGEMENT LAYOUT PLAN

**KENGEN GTC COE, 2022** 

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### ANNEX 6: GRIEVANCE REDRESS PROCESS CHARTER

Process	Description	Time frame	Other information
Identification of grievance	Face to face; phone; letter, e-mail; recorded during public/community interaction: others	1 Day	Email address; hotline number
Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book)	4-7 Days	Significance criteria: Level 1 –one off event; Level 2 – complaint is widespread or repeated; Level 3- any complaint (one off or repeated) that indicates breach of law or policy or provisions in other project documents
Grievance is acknowledged	Acknowledgement of grievance through appropriate medium	7-14 Days	
Development of response	Grievance solved at Tier 1 (Resolved at EASTRIP level) Response development with input from management/ complainant/relevant stakeholders	4-14 Days	
Response signed off	Grievance closed Redress action approved at appropriate levels	Within above timelines	Project staff at KenGen and complainant to sign off
Grievance not solved, passed to GRC	Grievance passed to appropriate party for resolution (GRC) – Tier 2 Redress action approved at appropriate levels	7-14 Days	GRC and complainant to sign off
Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant	Within 7 days	
Complaints Response	Redress action recorded in grievance log book	4-7 Days	
	Confirm with complainant that grievance can be closed or determine what follow up is necessary		
Grievance not solved, passed to MRC	Grievance passed to appropriate party for resolution (MRC) – Tier 3 Final decision communicated to complainant	7 -14 days	MRC to sign off Complainant to sign off
Close grievance	Record final sign off of grievance If grievance cannot be closed, return to step 2 or refer to sector minister or recommend third-party arbitration or resort to court of law.	4-7 Days	Final sign off on by EASTRIP Secretariat, MoE

#### **ANNEX 7: GRIEVANCE LOG MATRIX**

#### COMPLAINT RECEIVING FORM

KEN-GRN	1/001)				
Date:			Complaint i	no.:	
Place of i	ssuing complaint				
Mode of	Receipt (please t	ick where applicable):			
١	WRITING	VERBAL	PHO	NE	EMAIL
Details of	f the Complainar	it (optional):			
Name					Gender:
Email add	dress:			Phone no.:	·····,
Location	of complaint/cor	cern: Village/Town/Cit	y/Area:	County:	
Category	of Complainant:	(please tick where ap	plicable):		
i.	Project Benef	ciaries			
ii.	Project Execut	ters			
iii.	Project impler	menters			
iv.	Funding agen	ties			
۷.	Other interest	ed party (Please specif	y)		
Category	of Grievances (p	lease tick where appli	cable):		
i.	Project impler	mentation related			
ii.	Social				
iii.	Environment				
Brief Des	cription of the G	rievance:			
Attach le Describe	tter/petition/do attachments in b	cuments detailing grie rief below:	vance information	n as submitte	ed?
(1)					
(1)					
(2)					
(3)					
Received	/prepared by:		Date:	Si	gnature:

#### **ANNEX 8: WASTE WATER PRODUCTION ESTIMATES**

	Occupancy/	Number of	Total Occupancy/	Per Capita Consumption		Water Demand	Water Demand	Waste Water Generated	Add 15%
Space	capacity	units	Capacity	(L/Head/day)	(l/day)	L/day	(m³/day)	(m3/day)	Infiltration
Lecture and Admin Block									
Single occupancy office	1	2	2						
Standard offices	2	4	8						
Shared office	6	4	24						
Meeting room	12	1	12						
Standard lecture rooms	24	6	144						
Smart class room	24	1	24						
Virtual training room	24	1	24						
ICT training room	24	1	24						
			262	25		6550	6.55		
Laboratories									
Power Plant engineering		1	24						
Electrical Engineeering		1	24						
Mechanical engineering		1	24						
Energy geoscience		1	24						
Instrumentation & Control engineering		1	24						
			120	50		6000	6		
Workshops									
Semi-open workshop	24	1	24						
Fully closed workshop	24	1	24						
Open workshop	24	1	24						
			72	75		5400	5.4		
						17950	17.95	14.36	17
Student Hostel									
Single capacity rooms	1	30	30						
Double capacity	2	30	60						
4 pax capacity rooms	4	36	144						
Common rooms	30	2	60						
			294	50		14700	14.7		
Student Dining & Kitchen									
General dining	125	1	125						
Executive dining	70	1	70						
			195	25		4875	4.875		
Executive accomodation section									
Ensuite rooms	1	30	30						
Lounge	10	1	10						
			40	50		2000	2		
	1					21575	21.575	17.26	20

 Total Water Demand(m3/day)
 39.525

 Total Waste Water Generated (m3/day)
 31.62

 Add 15% Infiltration
 36.36
 Say

40 m3/day

### **ANNEX 9: CHANCE FIND PROCEDURE**

### **1.** Purpose of the chance find procedure

The chance find procedure is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation. A Chance Find Procedure, is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

### 2. Scope of the chance find procedure

This procedure is applicable to all activities conducted by the personnel, including contractors that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

### 3. Induction/Training

All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

### 4. Chance find procedure

If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

- b.Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;
- c. Immediately notify a foreman. The foreman will then notify the Resident/Supervising Engineer and the Environment Officer (EO)/Environmental Manager (EM);
- d.Record details in Incident Report and take photos of the find;
- e.Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over;
- f. Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria

relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find;

- g.Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor. The results of all archaeological work must be reported to the National Museums of Kenya (NMK), once completed.
- h.In case of significant find the National Museums of Kenya (NMK) should be informed immediately and in writing within 7 days from the find.
- i. The onsite archaeologist provides the NMK with photos, other information as relevant for identification and assessment of the significance of heritage items.
- j. The NMK must investigate the fact within 2 weeks from the date of notification and provide response in writing.
- k. Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
- I. Construction works could resume only after permission is granted from the responsible authorities.
- m. In case no response received within the 2 weeks' period mentioned above, this is considered as authorization to proceed with suspended construction works.

One of the main requirements of the procedure is record keeping. All finds must be registered. Photo log, copies of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports - kept.

### ANNEX 10: MINUTES OF THE FOCUS GROUP DISCUSSION

### THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF THE KENGEN GTC COEIN KAMERE CENTRE, OLKARIA WARD, NAIVASHA CONSTITUENCY IN NAKURU COUNTY

# MINUTES OF FOCUS GROUP DISCUSSION MEETING HELD ON 4<sup>TH</sup> MARCH 2022 AT 1700HRS AT KAMERE TOWNSHIP

### AGENDA:

- 1. Preliminaries
- 2. Introduction
- 3. Description of the proposed project
- 4. Description of ESIA process
- 5. Plenary
- 6. Closing Remarks

### MEMBERS PRESENT

• See attached scanned attendance sheet

### PRELIMINARIES

1. The meeting was called to order by the Assistant Chief at 1700hrs and began with a prayer by one of the community leaders of Kamere.

### MIN 01/03/22: INTRODUCTION

- 1. The assistant chief led the introductions by introducing herself and the two Assistant County Commissioners (ACC) present. She then invited A.C.C Mwonge to address the meeting.
- 2. The A.C.C thanked the members of the public for attending the meeting and encouraged the Kamere Community to support the proposed project. He then invited A.C.C Rioba to address the meeting.
- 3. A.C.C Rioba thanked the members of the meeting before mentioning the importance of the public participation exercise that was being carried out. He asked the members to assist the ESIA expert and the KenGen team in any way possible. The A.C.C then invited the Senior Community Liaison Officer (CLO) from KenGen to address the meeting.
- 4. The Senior CLO thanked the members of the public and the local administration team for being part of the team.

# MIN 02/03/22: DESCRIPTION OF THE PROPOSED PROJECT

- 1. The Senior CLO gave a thorough rundown of the proposed project to the members present. He described the history of the project and how it came to be.
- 2. The Senior CLO also mentioned that the project will be located behind Kamere Township and therefore it was prudent for the members of the community to be involved in the decision making process before the construction phase began. He added that the ESIA process is a key element in the decision making process.
- 3. The Senior CLO then invited the ESIA expert to describe the ESIA process and what the public participation exercise will entail.

# MIN 03/03/22: DESCRIPTION OF THE ESIA PROCESS

- 1. The ESIA expert thanked the members of the public for attending and the administrative leaders as well as the KenGen Senior CLO for their input.
- 2. He then went on to describe the ESIA process. He mentioned to the members that NEMA requires any development of scale to undertake an environmental impact assessment.
- 3. He mentioned that since the proposed KenGen GTC COE, when complete, will host over 1,000 students, it is categorized as a high risk project and therefore KenGen is to conduct a full Environmental and Social Impact Assessment Study.
- 4. He explained his role as an ESIA expert contracted by KenGen to conduct the ESIA.
- 5. He then explained that as part of the ESIA Study, NEMA requires KenGen, through the expert, to conduct a thorough public participation exercise. This was to collect the views and concerns of the people working or living within or around the proposed site are required so as to ensure the neighbours accept the project.
- 6. The expert then mentioned than the public participation would be done through the meeting that was ongoing and through dissemination of questionnaires which the members were to fill.
- 7. He then paved way for ACC Mwonge to introduce the plenary session where members of the meeting were invited to share their views about the project as he distributed the questionnaires to the members of the meeting.

# MIN 04/03/22: PLENARY SESSION AND DISCUSSION

- 1. ACC Mwonge invited the members to share their views about the project but reminded them to try and keep any concerns within the scope of the project.
- 2. Views and concerns raised by the community are given below with the responses given:

# Comments by Walter Nyaribo:

- Mr. Nyaribo began by commending the KenGen team for coming up with the project and asked the members of the public to show by hand if they accept it.
- He then asked on when the project is to start and the budget of the project. The ESIA expert mentioned that the project is slated to start before the end of the year and is poised to cost about Ksh. 1.3 Billion after phase three is complete.

 He then asked if there will be craft courses provided for the residents of Kamere and if the Kamere Residents will pay. The Senior CLO mentioned that since the Ministry of Education is the driver of the project, the curricular and fee structures will come from them. KenGen would only play the role of the host institution.

### Comments by Jecinta Njoki:

• Madam Njoki voiced her support for the project. She mentioned that it would be good for the community as it would keep the youth engaged.

### Comments by Robinson Ogoda:

- Mr. Ogoda also voiced his support for the project as it would provide employment opportunities to the youth of Kamere and help keep them off drugs.
- He then mentioned that the Kamere residents should be given first priority when it comes to jobs and that the cartels in place that allocate jobs should be done away with. The Senior CLO mentioned that the Kamere Township has a Stakeholder Coordination Committee that is consulted on these matters.
- The Senior CLO also mentioned that KenGen has a stakeholder mapping process for all projects and that Kamere would be the nucleus of the proposed GTC COE.
- Mr. Robinson then asked for a fresh committee members to be selected. He also asked for the ACC and Assistant Chief to be involved in the selection process.

### Comments by Mzee Robert Opondo:

 Mzee Opondo requested KenGen to set up subsequent forums even when the project begins so as to make sure the needs of the community are received by KenGen in real time. The Senior CLO mentioned that KenGen will coordinate with the Stakeholder Coordination Committee in Kamere on the same.

# <u>Comments by John Sane:</u>

• Mr. Sane also asked KenGen to ensure that Kamere youth are given first priority when it came to employment opportunities, especially when it came to non-technical labour. To this, the Senior CLO responded by saying that the contractor would be sourced through the tendering process and would be required to subcontract local labour for non-technical works.

### Comments by Kennedy Wanjala:

• Mr. Wanjala inquired on the affordability of the fees and if the Kamere Residents would benefit. The Senior CLO mentioned that the MoE is responsible for establishing the fee structure and that since the project is still in the early stages, KenGen's mandate is yet to be defined past the host role.

# Comments by Patricia Wanjiku:

• Madam Wanjiku requested that KenGen allocated non-skilled jobs from the project to the local youth. The Senior CLO mentioned that KenGen shall keep this in mind when the project

enters the tendering stage for the contractor.

• She also asked that KenGen set aside some space for the ladies to set up their shops and eateries to serve the construction workers.

### MIN 05/03/22: CLOSING REMARKS

- 1. The associate expert thanked all members for their time and assured them that all their views will be relayed to the proponent.
- 2. The members present, led by the Assistant Chief thanked the ESIA expert for consulting them on the project and assured the expert that the members unanimously agree with the project and that the local community would not have any issues with it as the development promises the addition of more jobs into the area and would also spur the development of the locality.

### MIN 06/03/22: A.O.B

- 1. Filled out questionnaires were collected.
- 2. There being no other business, the meeting was closed at 1830hrs.

	CONNENCE
ESIA CONSULTING TEAM	KENGEN TEAM
Name	Name
Designation	Designation
Signature	Signature
Date	Date

### FOR CONCURRENCE

#### PUBLIC CONSULTATION MEETING ATTENDANCE LIST FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A **REGIONAL CENTRE OF EXCELLENCE** LIST OF MEMBERS PRESENT Name Designation ID No. Telephone No. Signature 1. MACIN MAINA ELLA PRPFRI 29249230 07031153496 2. ement obuce Kamene 8260789 0721729486 3. DAVID BARNSON RAMERE 20141172 07237279 4. KITCLIFF OMBATI KAMERE 29733461 071223066 5. PATRICIA WATIJIKU ELBER A2.87596 072355569 6. OSIA MYAMISOA LAMERE 23960949 7. JOHNSON K. KWCHKI KAMERE 0508432 8. ROBERIO OPONISO 1 (AMERE 79010 07922058 9. John Caul Alemwaka Oldonyia 33724675 0792867843 10. Richard Tubyla Oldonyis 37024374 0799219027 11. KENEDD OKUMU SAMEBE 38717098 0708522719 12 STEVE C 34783074 0717268200 13. Kell Shricho-Kenfen 70360 Ignallard 07261293 14. Joseph Loniko Komere 35429043 0711780024 ALBERT RICRA DNDERI A.CC (CENTRAC) 26303370 0706791238 15. 16. WARTER N. NYARIBO DPC MEMBER 21786720 0720780356 Water 17. TABITHAN MUTIMBA KAMERE 35549902 0725993878 705 18. Kasongon 1554 118152,80 0721688124 09 19. hEarth 1/1 plopin 1/2 m mine 25750097 07/9825970 to 20. Namarice Watthers Asschief Olkaries 20428442 0731291749 Car COURTY NAKURU ... Constituency. NAVASHA .... Ward OLKARIA KAMERE Village/Estate 4"+ MARGH 2022 1830hrs Time Ended Date

#### ANNEX 11: ATTENDANCE SHEETS FOR THE FOCUS GROUP DISCUSSION

#### PUBLIC CONSULTATION MEETING ATTENDANCE LIST FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

#### LIST OF MEMBERS PRESENT

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8.	OSIRI NYAMILAA ALBERT	KAMERE	23160949	0727247959	ALA
9.	ALICE MARCAG ONDER!	KAMERE	8262593	0723316477	Aa
10.	BENSON KARANIA	KAMERE	2408 4chalt k	0727563337	R
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#### PUBLIC CONSULTATION MEETING ATTENDANCE LIST FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

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### PUBLIC CONSULTATION MEETING ATTENDANCE LIST FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

# LIST OF MEMBERS PRESENT

	Name	Designation	ID No.	Telephone No.	Signature
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5.	Albert Onungy	Kamer	28908901	07/023061	SHAP -
6.	FELLA KOSLIEI	KIMERE	22305827	6775 (7) 7m	
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#### **ANNEX 12: STAKEHOLDER COMMENT SHEETS**

#### ESIA FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

#### QUESTIONNAIRE TO LEAD AGENCIES

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified key lead agencies and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and eventual inclusion into the project's construction, operation and decommissioning phases. We request that you kindly fill out this questionnaire and append a stamp.

Respond	ient's Name	Nlag	whent	2.491		
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Respon	dent's Telepho	ne Number	0111 4-24	t		
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**KENGEN GTC COE, 2022** 

Page 145 of 195

4. Please provide any positive impacts that you anticipate to be realized through the proposed project: anomic 410-494 InThe Gree The first alstabilited. Sygness Sypan A.RY .... annund 5. Kindly suggest ways in which these and any other positive impacts can be enhanced: relations 1 ple Alward 64512051 aug Contractors to (pcal) 0. 2. 10 CRYVI 1.48 · · · · · localin product cuppy to be form 6. Do you perceive the project to have any negative impacts? If YES kindly state them below: h hallanty 2 Sources Hunder Deliter 7. Kindly suggest ways in which these negative impacts can be addressed: -Spect Fossure all HEE miles are 9. If you disapprove, kindly provide reasons as to why you disapprove of the project: Date 04/03/2021 Signature ..... THANK YOU FOR YOUR CONTRIBUTION

#### ESIA FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

#### QUESTIONNAIRE TO LEAD AGENCIES

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#### **General Information**

Lead Agency WATER RESOURCES AN THIRITY (NAWASHA) Respondent's Name JEREMIAH M-NYAGAIH Respondent's Address A-D BOX 1577-20117 NAWASHA Respondent's Telephone Number 0722 16/353 Respondent's E-mail Address jmny agah 06 @ gmail. Com **Comments and Concerns:** 1. Do you perceive the project to have an effect to the operations of your organization? If YES, 1) Water Abstrachin from Lake Nailusha & Ground Water 2) Fiftwent gewration & Disposal to the environment - May Cause Pollupion to Ensiminent kindly state how: 2. What are your main concerns regarding the proposed upgrading of the KenGen GTC to a White water (Efficient) generated from the expanded Achi ty Function may increase beyond the current system of Treatment COE? 3. Kindly suggest mitigation measures to be taken against the concerns raised in (2) above: Development J. an Effective Efferent Discharge
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4. Please provide any positive impacts that you anticipate to be realized through the proposed Employment creation Pristin if ambient Training furthity away from Town Enhanced Status of KENGEN & Nailasha Town opportunity to use the Modern Technology in IT & others 5. Kindly suggest ways in which these and any other positive impacts can be enhanced: ) Promote the fullity through website (Sovial Muchia and other another hages that an locally frationally be 3) Offer Short Torm frainings that Can offract Mary People 6. Do you perceive the project to have any negative impacts? If YES kindly state them below: I Generation of Wasterrater (efficients dust Can overwhelen the existing treatment faithing 7. Kindly suggest ways in which these negative impacts can be addressed: ) Expand the Current Tree freet systems of and of the opposed wasternater treatment systems with prodem Technology Approve 8. Do you Approve/Disapprove of the proposed project?.... 9. If you disapprove, kindly provide reasons as to why you disprove of the project: SUB-REGIONAL MANAGER RESOURCES AUTHORITY WATE Ma WASHA MAKURU SU Date 3rd March 2022 Signature. PO Box 1577-20117 NAIVASHA THANK YOU FOR YOUR CONTRIBUTION

#### ESIA FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

#### QUESTIONNAIRE TO LEAD AGENCIES

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#### **General Information**

Respondent's Name Kistly mufter Respondent's Address II Nainsta Respondent's Telephone Number OP24443 2086 Respondent's Telephone Number OP24443 2086 Respondent's Telephone Number OP24443 2086 Respondent's Telephone Number OP24443 2086 Comments and Concerns: 1. Do you perceive the project to have an effect to the operations of your organization? If YES, kindly state how: How with the Second Sector, the Poped will Inihally a coardenation number of the population, when activated it will open of Karline proposed upgrading of the KenGen GTC to a COEP - Inversed flow of runey May also attrack critte - The Student Hay be a target of Criminals - The Student Hay be a target of Criminals - Secondrice The Students of how TD carry thorse willing on measures to be taken against the concerns raised in (2) above: - Secondrice The Students of how TD carry thorse closes with the Orices (Kongoni) e of - Horice Closes with the Orices (Kongoni) e of - Herice Closes with the Orices (Kongoni) e of	Lead Agency Deputy commission	
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patrois.	<ol> <li>Do you perceive the project to have an effect to the operations of your organization? If YES, kindly state how:</li> <li>Ho way to the Scorth Sector, the Popel will highed a cardientie number of the population, when activate a to init open of Kander dra to business and an increased infto flow of Mine 1</li> <li>What are your main concerns regarding the proposed upgrading of the KenGen GTC to a COE?</li> <li>What are your main concerns regarding the proposed upgrading of the KenGen GTC to a COE?</li> <li>What are your main concerns regarding the proposed upgrading of the KenGen GTC to a COE?</li> <li>The shuleach Hay be a though of an attack crites of the flow of the KenGen GTC to a coer of the Studeach Hay be a thought of an and target.</li> <li>Kindly suggest mitigation measures to be taken against the concerns raised in (2) above:         <ul> <li>Seanthice The studeats of how TD card though of the concerns raised in (2) above:</li> <li>Seanthice The studeats of how TD card though of the concerns raised in (2) above:</li> <li>Seanthice The studeats of how TD card though of the concerns raised in (2) above:</li> <li>Seanthice The studeats of how TD card though of the concerns raised in (2) above:</li> <li>Seanthice The studeats of how TD card though of the concerns raised in (2) above:</li> <li>Seanthice The studeats of how TD card though of the concerns raised in (2) above:</li> <li>Horte closed with the O.c.s (ko mpai) e of the studeats of how the concerns for the studeats of how the patrols is the local alignment of the concerns flow of the studeats of how the studeats of how the patrols is the local alignment.</li> </ul> </li> </ol>	5.

4. Please provide any positive impacts that you anticipate to be realized through the proposed project: > prodision of employment Cat Construction & Decal commondy with requisite academic quelle > Local Lonno benefit with Traings 5. Kindly suggest ways in which these and any other positive impacts can be enhanced: - Engry the local administration and Member of - Inverty accords to recontinuent of local Labour - Have a dispute resolution declanism arcing for the mic 6. Do you perceive the project to have any negative impacts? If YES kindly state them below: Kindly suggest ways in which these negative impacts can be addressed: NIA 8. Do you Approve/Disapprove of the proposed project?..... 9. If you disapprove, kindly provide reasons as to why you disprove of the project DEPUTY COUNTY COMMISSIONER NAIVASHA SUB-COUNTY P.O. BOX 11 - 20117 NAIVASHA Signature Notertus Date 5/3/22 THANK YOU FOR YOUR CONTRIBUTION

#### ESIA FOR THE PROPOSED UPGRADING OF THE KENGEN GEOTHERMAL TRAINING CENTRE (GTC) TO A REGIONAL CENTRE OF EXCELLENCE

#### QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified members of the community and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and eventual inclusion into the project's construction, operation and decommissioning phases.

Res	pondent's Name UGODA NOBINAS NURGAN
ID.	No. 28638+66 Tel. No. 07.7329900
Loc	ation KAFTERE Distance from Project Site 500 M
Rel	ationship to the project. (cmm unity STikt Lolder
Co	mments and Concerns:
1.	How long have you lived/worked near the proposed project site? 15 7rs
2.	Will the project have negative impacts? If YES, Kindly give details below:
	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.) Smokes and Sail Right Will lead to Other sond is an array will prove the partited to dry prove more
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.) (hag i be lited - 2 1050 f. us, and improving and Tivehoods and Instructure
3	How will the project benefit the surrounding community? Kindly give details below: / improving by (120-2 Jib opporty fles by Upg for the ground improving bh. Tiving Ctz Tc. or by Upg and for strong
4	Kindly comment on any other issue that should be considered in regards to the project
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	THANK YOU FOR YOUR CONTRIBUTION
### QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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Re	spondent's Name JAMUSA ANLIATIA
IC	· OOUS688/1 - ··· NHOZCAGLLZ
	No. 2240000 4 Tel. No. UT and SD TOPS
La	cation NAVASTA Distance from Project Site 200 MUDIES
R	elationship to the projectNEIGhbbwy
c	omments and Concerns:
1	. How long have you lived/worked near the proposed project site? Alound 10 your
2	. Will the project have negative impacts? If YES, Kindly give details below:
	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.) Our regularis of brodiers not included in ant of the present taking place
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)
	3. How will the project benefit the surrounding community? Kindly give details below: the there will instruct our relation stups the neglion will infrance on many activities that as lack of idelegin
	4. Kindly comment on any other issue that should be considered in regards to the project: HS the Griend of thank they the project be cause now we had
	Date 4/03/2022 Signature
	THANK YOU FOR YOUR CONTRIBUTION

## QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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#### **General Information**

icati	on DEST 121 K ) JUSTICE OF DIStance from Project Site IS OF WIDE
elati	onship to the project. So SAMUMAT IN SAG DOWN
omi	ments and Concerns:
. H	ow long have you lived/worked near the proposed project site?
. W	ill the project have negative impacts? If YES, Kindly give details below:
1	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)
	<del>R</del> ] <del>K</del>
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)
	<u>N</u> [ <del>X</del>
3.	How will the project benefit the surrounding community? Kindly give details below: Jourth Simples meanly and 165, offortunity? Churring Construction Period and also Junion the Tratating Countses.
4.	Kindly comment on any other issue that should be considered in regards to the project:
Dat	e 410312022 Signature 9200
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### QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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.ocat Relat	ion Oldonyio (Top Camp) Distance from Project Site 500 M.
Com	ments and Concerns:
1. H	low long have you lived/worked near the proposed project site? 23 years
2. V	Vill the project have negative impacts? If YES, Kindly give details below:
	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)
	<u>~1</u> ×
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)
	People - Job opportunilles
3.	How will the project benefit the surrounding community? Kindly give details below:
	Develop relation things and problem solving skills to conquer the diverse challenges during the community
4.	Equal opportunities dravid be given the community.
Dat	e 47" MARCH. 2020. Signature
	THANK YOU FOR YOUR CONTRIBUTION

**KENGEN GTC COE, 2022** 

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# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified members of the community and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and eventual inclusion into the project's construction, operation and decommissioning phases.

#### **General Information**

ID.	No 21786720 Tel No 0720780356 078571196
Loc	ation Distance from Project Site / KM
Reli	ationship to the project. Nuclearch parmily
Co	mments and Concerns:
1.	How long have you lived/worked near the proposed project site?
2.	Will the project have negative impacts? If YES, Kindly give details below:
	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.) Noise is HEARD FROM A DISTANCE BUT MANAGAN ATR POLANTION OCCUPS AT INTERVALS KOTH CONTROLS
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.) MINT THE LUBERDE IT BRINGS MORE PEOPLE AROUND ATTE PROTECT HEACE NEED FAR HOUSES ANCH ARE CORDER DUE TO KACK OF RAND FOR PRWATE DEVELOPMENT.
3.	How will the project benefit the surrounding community? Kindly give details below: THE COMMUNITY WILL PROSPER ECANTMUCKLY SLACE INTERE IS CARCULATION OF MONEY THRAVIOU THE CSR PROBLEMENTE THE THEM DENELOPS INTERSTRUCTERA EMPLOYMENT OPPOLIUMITES AT OUR LOCAL CUIZENS Kindly comment on any other issue that should be considered in regards to the project: THE CSR PROGRAMMENTES TO BE FELT MORE THE KAMERE FAMILY BE PRIDEITING INTERNS OF CUIRENS
D	ate 04(03/2022 Signature VILLE
	THANK YOU FOR YOUR CONTRIBUTION

# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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#### **General Information**

ID,	No 35549902	Tel No. 0735 9902
Loc	cation KAMERE	Distance from Project Site 3 14M
Re	elationship to the projectNELCL+)	BUUR
Co	omments and Concerns:	
1.	How long have you lived/worked near t	he proposed project site?
2.	Will the project have negative impacts?	If YES, Kindly give details below:
	a. Environmental Issues (Drainage, so No.152 will affed n au z pullit w.n. vill p	Il erosion, noise, air pollution, etc.) Warny peapol = with noise polly hom XII.J.D.C. air producing Contan Oxid
	b. Socioeconamic Issues (People, Lanc people It will Leip P. hand ann exship hel there (1435 to le	downership, livelihoods, infrastructure, etc.) Septe to TUN, Hacrir, business IP CUT PERPLE to talke axh TXEM that I
3.	How will the project benefit the surrou The project will especially the you you'll have	Inding community? Kindly give details below: a enrified the Community Ha warth warris (1) Our Ha warth to help there prople
4.	Kindly comment on any other issue the PEOPER WILL benefit it will help their different through their	at should be considered in regards to the project: Line the project as in Chaldren rem learning ngs
0	are HH FEB 2022	Signature fort
	THANK YOU FO	R YOUR CONTRIBUTION

# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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#### **General Information**

CO	nments and Concerns:
1.	How long have you lived/worked near the proposed project site? 25 Years
2.	Will the project have negative impacts? If YES, Kindly give details below:
	* Noise pollution - During Construction Legan Machinery in operation and Sounds during diffling * hit follution - This depends on the cite adjuities, but las include heavy muchineries Like by early s, buildozers and Luo b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.) People - Unit imployment.
3.	How will the project benefit the surrounding community? Kindly give details below: - It provides enriched learning open tunities for students and faiter new views of thinking about their own practices as they become more aware of community services resources
4.	Kindly comment on any other issue that should be considered in regards to the project: Locals ishould be considered and given equal offertunities during Construction
Da	te 4th That 2022 Ath March 2022 ignature Sul
	THANK YOU FOR YOUR CONTRIBUTION

#### QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified members of the community and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and eventual inclusion into the project's construction, operation and decommissioning phases.

#### **General Information**

cation	. Last
elationship to the project 46:	0.10.42/3
omments and Concerns:	0.4
How long have you lived/worked	near the proposed project site?
. Will the project have negative im	ipacts? If YES, Kindly give details below:
a. Environmental Issues (Draina	age, soil erosion, noise, air pollution, etc.)
b. Socioeconomic Issues (Peopl	e, Land ownership, livelihoods, infrastructure, etc.)
	surrounding community? Kindly give details below:
<ol> <li>How will the project benefit the</li> </ol>	Surrounding community romany give octains second
gruduants since	e brief would have the skills
4. Kindly comment on any other is	sue that should be considered in regards to the project:
Date 04/03/022	Signature
THANK Y	OU FOR YOUR CONTRIBUTION
india.	

**KENGEN GTC COE, 2022** 

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### QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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#### **General Information**

D. No	34283074	Tel. No. 0727 248 340
.ocati	ion OF KARIA	Distance from Project Site 3.K-M
Relatio	onship to the project	FRUAC
Comr	ments and Concerns:	
1. He	ow long have you lived/w	vorked near the proposed project site? 2.5 years
2. W	Vill the project have negat	tive impacts? If YES, Kindly give details below:
10	a. Environmental Issues ( <u>N 915 E</u>	Drainage, soil erosion, noise, air pollution, etc.)
	b. Socioeconomic Issues ( CP.I.M.E. CONSTRAINED PRESURE ON INCREASED	(People, Land ownership, livelihoods, infrastructure, etc.) LAND RESOURCE N ERISTING RESOURCES HILE HINSING POPULATION
3.	How will the project bene - INCREATED - INCREATED./I - INCREATED./I	HIT THE SURFACE AND
4.	Kindly comment on any o - IMPROVING T LIVING NEX	TO THE PROTOCT
Date	e 04/03/2022	Signature
	ТНИ	ANK YOU FOR YOUR CONTRIBUTION

## QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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#### **General Information**

<ul> <li>a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)</li> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>N.O.</li> <li>B. Monumental Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>N.O.</li> </ul>	
<ul> <li>a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)</li> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>N.O.</li> </ul>	
<ul> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.) N.O.</li> <li>3. How will the project benefit the surrounding community? Kindly give details below: ,</li></ul>	
<ol> <li>How will the project benefit the surrounding community? Kindly give details below:</li> </ol>	
which mul be allocated around	
4. Kindly comment on any other issue that should be considered in regards to the project: Let our Douths get Job opportunities from the Droject which will be allocated	
Date H/3/2022 Signature H	
THANK YOU FOR YOUR CONTRIBUTION	

**KENGEN GTC COE, 2022** 

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# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

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#### **General Information**

location	(	4 Distance from Project Site
Relationship to the	project Commun	ity neighber
Comments and C	oncerns:	
L. How long have	you lived/worked near	r the proposed project site? 10 1 7 5
2. Will the project	have negative impacts	s? If YES, Kindly give details below:
a. Environmen	tal Issues (Drainage, s	soil erosion, noise, air pollution, etc.)
b. Socioeconor	mic Issues (People, Lai	nd ownership, livelihoods, infrastructure, etc.)
3. How will the p	roject benefit the surro	punding community? Kindly give details below:
4. Kindly commer NO	nt on any other issue th	hat should be considered in regards to the project:
Date 04/03/8	)02/	signature
	THANK YOU F	OR YOUR CONTRIBUTION

**KENGEN GTC COE, 2022** 

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# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Ge	neral Information
Res	pondent's Name JOHNSON KURIA MUCHAI
ID.	No. 0503432 Tel. No. 0724785510
Loc	ation KAME US Distance from Project Site 50 MF
Rel	ationship to the project. CO mmw HIFY (NE 15HBOVE.
Co	mments and Concerns:
1.	How long have you lived/worked near the proposed project site? $2.3.7$ ks.
2.	Will the project have negative impacts? If YES, Kindly give details below:
	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)
	N/B
3.	How will the project benefit the surrounding community? Kindly give details below: CFORCE JBS JON DWR Childs within Childs
4.	Kindly comment on any other issue that should be considered in regards to the project:
Da	e 4-3-2022 Signature Atta Real.
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KENGEN GTC COE, 2022

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# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified members of the community and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and eventual inclusion into the project's construction, operation and decommissioning phases.

#### **General Information**

ID. No. 82C0789       Tel. No. 0721729486         Location 0LLARIA       Distance from Project Site         Relationship to the project Community       Distance from Project Site         Relationship to the project Community       Comments and Concerns:         1. How long have you lived/worked near the proposed project site?       D. 7.9.9.75         2. Will the project have negative impacts? If YES, Kindly give details below:       a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)	Res	Dondent's Name CLEWENT OBURE
Location       Older Line         Relationship to the project Community       Distance from Project Site         Relationship to the project Community       Comments and Concerns:         1. How long have you lived/worked near the proposed project site?       Date 20 Jr C         2. Will the project have negative impacts? If YES, Kindly give details below:       a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)	ID.	No. 8260789 Tel. No. 0721729486
Relationship to the project Some nifty         Comments and Concerns:         1. How long have you lived/worked near the proposed project site?         2. Will the project have negative impacts? If YES, Kindly give details below:         a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)         How you lived/worked near the proposed project site?         b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)         How will the project benefit the surrounding community? Kindly give details below         Mathematical Comments         How will the project benefit the surrounding community? Kindly give details below         Mathematical Comments         Mathematical Comments         Mathematical Issues (People, Land ownership, livelihoods, infrastructure, etc.)         Mathematical Issue (Data Mathematical Issue I	.00	stion OLKARIA Distance from Project Site
Comments and Concerns:         1. How long have you lived/worked near the proposed project site?       Def 1 f.         2. Will the project have negative impacts? If YES, Kindly give details below:       a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)         . Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)	Rela	itionship to the project Community
<ol> <li>How long have you lived/worked near the proposed project site? D. J. f.</li> <li>Will the project have negative Impacts? If YES, Kindly give details below:         <ul> <li>Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)</li> <li>K. f. K.</li> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>K. f. K.</li> </ul> </li> <li>How will the project benefit the surrounding community? Kindly give details below:         <ul> <li>M. f. K.</li> <li>How will the project benefit the surrounding community? Kindly give details below:</li> <li>M. f. Kindly comment on any other issue that should be considered in regards to the project:</li> <li>Date: 4-3-2022 Signature Mathematical Signature Signature</li></ul></li></ol>	Cor	nments and Concerns:
<ol> <li>Will the project have negative impacts? If YES, Kindly give details below:         <ul> <li>a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)</li> <li>A. A.</li> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>A. A.</li> </ul> </li> <li>How will the project benefit the surrounding community? Kindly give details below:         <ul> <li>A. A.</li> <li>How will the project benefit the surrounding community? Kindly give details below:</li></ul></li></ol>	1.	How long have you lived/worked near the proposed project site?
<ul> <li>a. Environmental Issues (Drainage, soll erosion, noise, air pollution, etc.)</li> <li>A. A. A.</li> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>A. How will the project benefit the surrounding community? Kindly give details below with the project benefit the surrounding community? Kindly give details below with the project benefit the surrounding community? Kindly give details below with the project benefit the surrounding community? Kindly give details below with the project benefit the surrounding community? Kindly give details below with the project benefit the surrounding community? Kindly give details below with the project of the projec</li></ul>	2.	Will the project have negative impacts? If YES, Kindly give details below:
<ul> <li>b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)</li> <li>A. How will the project benefit the surrounding community? Kindly give details below with a state of the project of the project of the project.</li> <li>4. Kindly comment on any other issue that should be considered in regards to the project:</li> <li>Date 4-3-2022 Signature Math.</li> <li>THANK YOU FOR YOUR CONTRIBUTION</li> </ul>		a. Environmental Issues (Drainage, soll erosion, noise, air pollution, etc.)
<ul> <li>How will the project benefit the surrounding community? Kindly give details below with a source of the project of the project.</li> <li>Kindly comment on any other issue that should be considered in regards to the project:</li> <li>Date 4-3-2022 Signature Mathematical Signature Mathematical Signature Community.</li> </ul>		b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)
4. Kindly comment on any other issue that should be considered in regards to the project: Date 4-3-2022 Signature Mathe THANK YOU FOR YOUR CONTRIBUTION	3.	How will the project benefit the surrounding community? Kindly give details below we details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project benefit the surrounding community? Kindly give details below will the project below will the project benefit the surrounding community? Kindly give details below will the project below will the project benefit the surrounding community? Kindly give details below will the project below will
Date 4-3-2022 Signature Cloph THANK YOU FOR YOUR CONTRIBUTION	4.	Kindly comment on any other issue that should be considered in regards to the project:
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		THANK YOU FOR YOUR CONTRIBUTION

**KENGEN GTC COE, 2022** 

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# QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified members of the community and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and

eventual inclusion into the project's construction, operation and decommissioning phases.

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	ation Olkans Distance from Project Site 200 m.				
Rel	ationship to the project. An acommonishy Member				
Co	mments and Concerns:				
1.	How long have you lived/worked near the proposed project site? Mimach ten years				
2. Will the project have negative impacts? If YES, Kindly give details below:					
	a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.)				
	b. Socioeconomic Issues (People, Land ownership, livelihoods, infrastructure, etc.)				
3.	- Day Should Conner Building Decembery Statist - Barth agent hospital : - They should also bring alean Water for drinking How will the project benefit the surrounding community? Kindly give details below:				
4. D	Kindly comment on any other issue that should be considered in regards to the project. The Company also school consider building the haspital, and one signature school to accommente the straggle building long destantic bound for elocation: ate 40 march 2022 Signature MAA				
	THANK YOU FOR YOUR CONTRIBUTION				

#### QUESTIONNAIRE TO COMMUNITY STAKEHOLDERS

Kenya Electricity Generating Company PLC (KenGen) proposes to upgrade the KenGen GTC into a regional Centre of Excellence (COE). As one of the identified members of the community and as mandated by the Environmental Management and Coordination Act (EMCA), 1999 and Audit Regulations, 2019, you are requested to give your views and concerns for consideration and eventual inclusion into the project's construction, operation and decommissioning phases.

**General Information** Respondent's Name ROBGRID OTONDO ID. NO 7579014 Tel. NO. 07922058/3 Location. ICAMERE Distance from Project Site 500 Metros Relationship to the project. COMMMMNT Comments and Concerns: 2. Will the project have negative impacts? If YES, Kindly give details below: a. Environmental Issues (Drainage, soil erosion, noise, air pollution, etc.) and ownersbip, livel Kindly give details be sy plent er issue that should be considered in regards to the project ar grand (muun Re. 4 CH Signature / 14 THANK YOU FOR YOUR CONTRIBUTION 5

### ANNEX 13: LEAD EXPERT NEMA PRACTICING LICENCE

FORM 7



(r.15(2))

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

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

License No : NEMA/EIA/ERPL/16936 Application Reference No: NEMA/EIA/EL/21830

M/S Godwin Lidahuli Sakwa (individual or firm) of address

P.O. Box 18075-00500 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) Lead Expert registration number 2492

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

Issued Date: 3/25/2022

Expiry Date: 12/31/2022

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

