

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) PROJECT REPORT
FOR
THE PROPOSED CONSTRUCTION OF THE REGIONAL FLAGSHIP MARINE TRANSPORT AND
PORT LOGISTICS CENTER - EAST AFRICA SKILLS FOR TRANSFORMATION AND REGIONAL
INTEGRATION PROJECT AT KENYA COAST NATIONAL POLYTECHNIC**



PROPONENT



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February, 2021

DECLARATION PAGE

SUBMISSION OF ESIA REPORT

ENVIRONMENTAL CONSULTANT

I, **Mr. Charles Ngugi Onchwari**, submit this **Environmental and Social Impact Assessment Project Report** for the proposed Construction of the Regional Flagship Marine Transport and Port Logistics Centre - **East Africa Skills for Transformation and Regional Integration Project located at Kenya Coast National Polytechnic, Waa-Ng'ombeni Zone, Matuga Sub-County in Kwale County**. To my knowledge, all information contained in this report is an accurate and truthful representation of all findings as relating to proposed project.

Signed at **NAIROBI** on this day of **December, 2021**

Signature:

Designation: **Lead Environmental Consultant, NEMA Expert Reg. No.6186**

PROJECT PROPONENT

I,, submit this **Environmental and Social Impact Assessment Project Report** for the proposed Construction of the Regional Flagship Marine Transport and Port Logistics Centre - **East Africa Skills for Transformation and Regional Integration Project, located at Kenya Coast National Polytechnic, Waa-Ng'ombeni Zone, Matuga Sub-County in Kwale County**. To my knowledge, all information contained in this report is an accurate and truthful representation of all findings as relating to proposed project.

Signed at **MOMBASA** on this day of **December, 2021**

Signature.....

Designation:

Official Stamp:

LIST OF PLANNING AND PARTICIPATING CONSULTANTS

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Supporting staff	
Name	Qualification
Mr. Enoch Masava	BSc. Community Development

ACRONYMS

°C	Degrees Celsius
BOD	Biological Oxygen Demand
BOQ	Bill of Quantities
CCTV	Closed Circuit Television
CITES	Convention on International Trade in Endangered Species
COVID-19	Corona Virus Disease 2019
CPP	Consultation and Public Participation
CPR	Comprehensive Project Report
CWMP	Contractor Waste Management Plan
DCC	Deputy County Commissioner
DOSHS	Directorate of Occupational Safety and Health Services
EASTRIP	East Africa Skills for Transformation Project
EDL	Effluent Discharge License
EMCA	Environmental Management Coordination Act
ERT	Electrical Resistivity
ESAP	Environmental and Social Action Plan
ESMP	Environmental and Social Management Plan
ESSS	Environment and Social Safeguards Specialist
ETP	Effluent Treatment Plant
GBV	Gender Based Violence
GHG	Green House Gases
GoK	Government of Kenya
GRC	Grievance Resolution Committee
GRM	Grievance Redress Mechanism
HIV	Human Immunodeficiency Virus
IDA	International Development Association
IEA	Initial Environmental Audit
ISWM	Integrated Solid Waste Management
JSA	Job Safety Analysis
KASNEB	Kenya Accountants & Secretaries National Examination Board
KCNP	Kenya Coast National Polytechnic
KEBS	Kenya Bureau of Standards
KFS	Kenya Ferry Services
KICD	Kenya Industrial and Curriculum Development
KPA	Kenya Ports Authority
LED	Light Emitting Diode
M.A.S L	Metres above Sea Level
MMUST	Masinde Muliro University of Science and Technology
MoEST	Ministry of Education Science and Technology
MoH	Ministry of Health
NCA	National Construction Authority
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
NITA	National Industrial Training Authority
OSHA	Occupational Safety and Health Act
O&M	Operation and Maintenance
PAPs	Project Affected Persons
PIC	Public Involvement and Participation
PPE	Personal Protective Equipment
PV	Permanent Vents
RO	Reverse Osmosis

SDGs	Sustainable Development Goals
SEA	Sexual Exploitation and Abuse
STIs	Sexually Transmitted Infections
TVET	Technical and Vocational Education and Training
TVETA	Technical and Vocational Education and Training Authority
uPVC	unplasticized Polyvinyl Chloride
VCT	Voluntary Counselling and Testing
VES	Vertical Electrical Sounding
WBG	World Bank Group
WIBA	Work Injury Benefits Act
WRA	Water Resources Authority
WRUA	Water Resource Users Association
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

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EXECUTIVE SUMMARY

The Government of Kenya has received financing from the International Development Association (IDA) in the form of a “loan” toward the cost of **EAST AFRICA SKILLS FOR TRANSFORMATION & REGIONAL INTEGRATION PROJECT (EASTRIP)**. The Kenya Coast National Polytechnic has been identified as one of the beneficiaries/implementing agencies for this project.

Kenya Coast National Polytechnic (KCNP) formerly Mombasa Technical Training Institute (Mombasa TTI) is located in Mombasa Town. It was established in 1950 as a Technical High School. Upon the introduction of the 8-4-4 system of education, it was elevated to a middle level technical college in 1984 to provide technical training for the middle level man power for both the private and public sectors of the economy. The trainees in the Polytechnic are drawn from fresh secondary school leavers, graduates from other tertiary institutions, employees on part-time release basis and the informal (*Jua Kali*) sector.

The Polytechnic operation is primarily guided by the Education Act 2013, and the Technical and Vocational Education Training (TVET) Act 2013. It offers curriculum developed by the Kenya Institute of Curriculum Development (KICD), National Industrial Training Authority (NITA), Kenya Accountants and Secretaries National Examinations Board (KASNEB), Masinde Muliro University of Science and Technology (MMUST), among others.

KCNP contracted **Symbion Kenya Ltd** and her consortium of consultants to design and oversee construction of the proposed Regional Flagship Marine Transport and Port Logistics Centre - **East Africa Skills for Transformation and Regional Integration Project, at Kenya Coast National Polytechnic**. The project will be implemented in an undeveloped parcel of land plot title number: **KWALE/SABHARWAL SCHEME/61**. The proposed project site covers an expanse of approximately 19.47 Ha. The proposed project site is located at **Waa-Ng’ombeni Zone, Matuga Sub-County in Kwale County**.

The proposed project design team constitutes of;

- i. Symbion Kenya Limited – Architects (Lead Consultants)
- ii. Getso Consultants Limited – Quantity Surveyors
- iii. Merk Associates Limited – Civil and Structural Engineers
- iv. Maiteri and Associates - Electrical and Mechanical Engineers
- v. Richan Eco Consult Limited – Environment, Safety and Health Consultants

The main objective of the proposed project is to enhance research and training capabilities in the field of marine transport and port logistics. The project aims to tap the maximum potential of the blue economy in Kenya and the region. During the operation phase, the Regional Flagship Marine and Port Logistics Centre will play a key role in providing skilled labour for International Shipping Lines and Logistics companies operating in the region, Kenya Port

Authority (KPA) and other maritime organizations. In addition, the recently completed Lamu Port will provide job opportunities for the graduates upon their graduation.

During the conceptualization phase of the proposed project, the proponent in consultation with the project consultants evaluated various project alternatives. The alternatives evaluated included; relocation of the project, alternative project designs notably alternative water treatment technologies, alternative Waste Water Treatment (WWT) technologies, alternative construction materials and technologies and the no project alternative, details are provided in chapter 3 of the report. The proposed project design discussed herein was selected as the one that best optimizes the objectives for The Proposed Centre of Excellence in Marine Transport and Port Logistics at per the proposal presented to the World Bank.

The proposed project will be implemented in three phases. The long-term goal is to transfer all operations of KCNP to the new proposed site. The scope of this report is however limited to **Phase 1** of the project implementation.

The following facilities will be developed during Phase 1 of the project;

1. **Marine and Administration Centre**; this shall cover a total area of 5,178 square metres. It shall consist of the following components;

Facility	No. of Units
Workshops/research labs	5
Executive admin offices	1
Boardroom	1
Library/ Computer lab	1
Lecture theatres	2
General classroom	4
Faculty office suits	1

2. **Catering Centre**; this shall cover a total area of 2,680 square metres. It shall consist of the following components.

Facility	No. of Units
Multipurpose hall (sit 400 pax)	1
Meeting rooms	2
Boardroom	1
Main kitchen	1
Training kitchen	1
Restaurant	1
Canteen/shop	1
Training pool	1

3. **Staff Housing;** this shall cover a total area of 812 square metres. It shall consist of the following components.

Facility	No. of Units
Two Bedroom	3
One Bedroom	3
Studio Apartments	3

4. **Students' Accommodations;** this shall cover a total area of 1,780 square metres. It shall consist of the following components.

Facility	No. of Units
Senior students' rooms	9
Junior students' rooms	60

The proposed project area is not served by the local Municipal water supply network. Ground water shall thus be the main source of water supply for general domestic use during the construction and operational phase of the proposed project. Consequently, the proponent commissioned a hydro-geological survey to establish groundwater conditions at the premise and locate suitable points for drilling and construction of production boreholes.

Geophysical investigations comprised of 2 Electrical Resistivity (ERT) profiles and four 1-Dimensional Vertical Electrical Sounding (VES) at suitably selected points within the proposed project site. The points have herein been referred to as VES 1, VES 2, VES 3 and VES 4. The assessment recommends drilling at VES 1 and VES 4 located at grid references **37M UTM 566944 9536770** and **37 M UTM 566793 9536936** respectively. The report further recommends rehabilitation of the already existing shallow well at grid reference **37M UTM 566876 9536775**. The expected yield is estimated from the neighbouring boreholes drilled within the same geologic unit which yield an average of about **2 m³/h**. Therefore, the three water sources recommended can yield approximately **6 m³/h**; a 10 hours per day abstraction would thus yield **60 m³/h**.

Computations by the proposed project consulting engineers estimated the total water demand during the operational phase of the proposed project to be approximately **51.61 m³/day**. The ground water potential is thus sufficient to meet the proposed project operational needs. In addition, water harvesting is also proposed during the project operation phase.

The proposed project design engineers have computed the estimated sewage to be generated during the operational phase of the project as **110 m³/day**. A **Packaged Waste Water Treatment Plant** (PWWTP) will be installed for waste water management at the institution.

Additionally, septic tanks will be incorporated in the project design to supplement the PWWTP depending on distance to the WWTP.

The Proposed Regional Flagship Marine Transport and Port Logistics Centre - **East Africa Skills for Transformation and Regional Integration Project, at Kenya Coast National Polytechnic** has been designed to optimize on process and people flows.

The World Bank safeguard policy OP/BP 4.01 Environmental Assessment requires all new projects with potential adverse environmental and social impacts to undertake an Environmental and Social Impact Assessment (ESIA) study. The study should be carried out at the project planning stages to ensure that significant impacts on the physical and social environment are taken into consideration and are adequately mitigated.

In compliance with the Environmental Management and Coordination Act 1999 (Amended) 2015, the proponent has engaged a **NEMA-registered EIA Lead Expert (Reg. No. 6186)** to conduct an Environmental and Social Impact Assessment for the proposed project and submit a comprehensive ESIA project report to the National Environment Management Authority for review and subsequent licensing.

In the preparation of this ESIA report, the EIA Lead expert followed the guidelines contained in the EIA regulations under Legal Notice No. 101 of June 2003, World Bank Safeguard Policies as well as Technical and Vocational Education Training Authority (TVETA) guidelines. As a requirement for conducting ESIA and the subsequent compilation of this report, the project stakeholders including but not limited to the Project Affected Persons (PAPs), relevant lead government agencies, blue economy industry players, advocacy groups, the project consultants and the proponent were consulted. Methodologies used during Public Involvement and Consultation (PIC) included public meetings (*barazas*), focus group discussions, interviews and administration of structured questionnaires. The views, concerns and comments raised during the public stakeholders' forums and the respective responses were collated, analyzed and incorporated into the chapter 6 of this ESIA report. Minutes of stakeholders' meetings and accompanying delegates' attendance lists are appended to this report under appendix VI.

The following were the main issues of concern raised during the public participation meeting;

- The main access road to the proposed project site is relatively narrow. There is need for its expansion to accommodate the potential surge in traffic especially during the operation phase.
- The proponent to consider renovation of some dilapidated structures (owned by the community) near the proposed project site. The building can potentially be converted into a commercial centre. Community members can set shop there to supply basic goods and services to the students and staff of the institution.
- Concern about the potential impacts that may arise from a proposed cement factory project located approximately 4 km from the proposed project site. How will it impact operations of the institution especially during the operation phase?

- Concerned about security along the main access road (a stretch of approximately 1 km). Proponent to consider installation of street lights.
- The undeveloped parcel of land bordering the proposed project site to the south (between the proposed project site and the beach) could act as hideouts for unscrupulous characters. This poses a significant security risk to students accessing the beach through that route.
- What security measures will be put in place to safeguard the safety of students and faculty from hazards from the ocean e.g., shark attacks while undertaking live training?
- Consider providing alternative access roads to the community since the traditional routes had been blocked by perimeter wall fencing of the proposed project site.
- Kombani Area experiences frequent power outage. Connection of power supply to the proposed project will overwhelm the existing Kenya Power main grid supply. Consider installing a stand-alone transformer for power supply to the proposed project site. On the same note consider upgrading of the existing power supply to Komani Area.
- There are only 2 health centers in the general Komani Area. These will not be adequate to cater for the health needs of the students during operation phase of the project. Consider incorporating a health facility in the project design.
- County Government of Kwale to consider expansion of *Zote* Public Beach to provide recreational services for the anticipated surge in student population.
- Drug abuse is a major social menace in the locality. KCNP to consider awareness creation of the same during orientation of their students to the institution to caution them against getting entangled in the vice.
- Consider including a dispensary in the proposed project design. It will be strategic for use even by members of the community.
- Consider sinking a borehole to provide water to the local community under the CSR programme. This will enhance acceptability and ownership of the project by the community.
- Consider incorporating a chapel and a mosque in the project design to cater for the spiritual needs of the student.
- What are the sustainability mechanisms for the project after the exit of World Bank Funding?
- How is the project going to address the issue of the sea time?
- Radicalization is a significant social ill in Ngómbeni area. The institution should create awareness for its students accordingly.

While undertaking the ESIA process, the EIA Lead expert identified the potential positive and negative environmental and socio-economic impacts of the proposed development and recommended adequate and suitable mitigation measures for the adverse impacts. Further, this ESIA project report has developed an Environmental and Social Management Plan to guide the implementation of the recommended mitigation measures thus forming the basis for Environmental Monitoring.

There are both positive and negative impacts associated with the proposed project. These were identified according to the proposed project implementation phases namely: Construction Phase, Operational Phase and Decommissioning Phase.

In general, the following positive impacts are expected to be associated with the proposed Regional Flagship Marine Transport and Port Logistics Centre - **East Africa Skills for Transformation and Regional Integration Project, at Kenya Coast National Polytechnic;**

- Training of competent graduates for the maritime sector.
- The project will promote blue economy objectives by prioritizing the sustainable use of our **ocean** resources for economic **growth**, livelihoods and jobs, and **ocean** ecosystem health.
- The project will provide skilled labour for International Shipping Lines and Logistics companies, Kenya Port Authority, Kenya Ferry Services and Other associated maritime organizations.
- Knowledge transfer through internships/apprenticeship and international student exchange programmes.
- Upon completion KCNP shall be a Regional Flagship Marine Transport and Port Logistics Center not only in Kenya but also Eastern Africa and beyond. This will attract the best talents into the institution furthering its prestige.
- The project will lead to substantial increase in the property value of the area.
- The increased number of students at KCNP will consequently increase for demand in housing, the higher student numbers will also create more market for household commodities and other consumables creating ready markets for the surrounding business community.
- The project will generate employment opportunities for both skilled and unskilled workers during the construction phase. Also the operation of the Regional Centre will require additional manpower.
- The project will generate a source of revenue for the local community who will be involved in activities like selling food to the construction workers etc.
- The project will also contribute to the economic and infrastructural development of the region, as the modern design for the proposed project will present opportunities for benchmarking.
- The project will provide market for the construction materials and create business opportunities for local traders who will supply the materials.
- Interaction with the equipment at the construction site will enhance the skill sets of local manpower.

The negative impacts associated with the proposed project and proposed mitigation measures are summarized in the table below;

Table 0-1 Summary of potential environmental & social risks and impacts and recommended mitigation measures;

Aspect/Impact	Mitigation measures
<p>Removal of vegetation (Construction phase).</p>	<ul style="list-style-type: none"> • Plant vegetation (trees, shrubs and grass) in open spaces and around the project site and their maintenance. • Limit excavation to areas earmarked for development. • Incorporate erection of structures to merge with natural vegetation. • Design and implement an appropriate landscaping programme.
<p>Stakeholders Involvement and Participation (Design and Construction phase).</p>	<ul style="list-style-type: none"> • Develop a Stakeholder Engagement Plan for affected proximal developments - • Ensure all stakeholders and the public are involved in the planning process.
<p>Disturbance of soil geology: (Change of local aspect, increased erosivity index, impact on underlying bedrock, soil compaction and patterns of pressure release. (Construction and operation phases).</p>	<ul style="list-style-type: none"> • The top 6 inches of excavated material (a soil-and-rock matrix) must be separated from deeper excavated soils. Soils to be compacted to meet design specifications. • Provide proper culvert and drainage channels for permanent access roads. • Excavated earth should be held away from areas susceptible to surface run-off of storm waters. • Limit excavations and substructure works including foundation to the approved plan to prevent furthering sub-surface impacts • Ensure structures are not positioned on water courses or overhanging cliffs. • Compact loose soils on excavated areas and plant adequate vegetation to prevent soil erosion. • Vegetated stands rich with prioritized species to be retained. • Provide appropriate drainage ways in between structures to offset infrastructural erosivity. • Incorporate soil conservation methodologies during the whole project cycle e.g. site remediation techniques, re-use excavated soils for backfilling and landscaping. • Use of minimally invasive drilling technology (rotary machines). • Ensure geological rock samples are collected at 2 metres interval of drilling. • Refilling of trenches with soil to level after laying pipes. • Planting of vegetation to control soil erosion.
<p>Interruption of natural water courses: stream pollution, impacts on hydro fauna and flooding impacts</p>	<ul style="list-style-type: none"> • Engage a licensed surveyor to peg the riparian zone on all surface water bodies in close proximity to the proposed project site. • Existing water ways or wetlands within and outside the construction zones to be preserved. • All riparian zones and species next to water ways to be retained. • Maintain drainage course flows during excavations. • Ensure storm water run-off from construction site is channeled through

Aspect/Impact	Mitigation measures
(Construction and occupational phases).	sieve traps, rocks or hay traps to remove organic pollutants. <ul style="list-style-type: none"> • Provide proper waste water drainage ways with treatment facilities where necessary. • Install silt traps or other control structures at the outset of the construction. • Stagger construction activities during wet seasons to prevent sedimentation.
Generation of solid waste. (Construction and operation phase).	<ul style="list-style-type: none"> • Contractor should prepare a waste management plan prior to commencement of the construction activities. • Secure waste holding shed should be set up to facilitate segregation and temporary storage of wastes. • Employees should be sensitized on environmental protection and waste management. • Engage the services of a NEMA licensed solid waste handler to be collecting wastes from the premises. • Provision of suitable solid waste receptacles on site. • Wastes should be segregated according to characteristics and their disposal routes will be determined according to the waste hierarchy, taking account of the potential for recycle or recovery for reuse where possible. • All persons involved working at the proposed project should be in full protective attire. • Contractor to keep waste tracking forms for all the wastes that leave the site to ensure proper record keeping of waste movement. • Control movement and handling of waste. • Stringent operational procedures to be put in place to control wastes ending up in landfills. • Select an appropriate site for waste spoil piles to avoid blocking surface run-off or drainage ditches. • Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off.
Generation of Effluent (Especially during the operation phase).	<ul style="list-style-type: none"> • Appropriate waste water containment should be provided for any effluent generated on site. • Ensure quarterly analysis of effluent water quality in accordance with NEMA standards. • Maintain a valid Effluent Discharge License (EDL) on site. • Consider effluent treatment and reuse. • Ensure provision of adequate sanitary convenience facilities. • Use environmentally friendly detergents for cleaning.
Increased generation of storm water (Construction and operation phases).	<ul style="list-style-type: none"> • Use of storm water management practices that slow peak run-off flow, reduce sediment load and increase infiltration. • Use of vegetated swales, filter strips, terracing, check dams, detention ponds or basins, infiltration trenches and infiltration basins. • Regular inspection and maintenance of permanent erosion and run-off

Aspect/Impact	Mitigation measures
	control features.
High demand of Raw materials use (Construction and operation phases).	<ul style="list-style-type: none"> • Source building materials from local suppliers who use environmentally friendly processes in their operations. • Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered. • Ensure accurate budgeting and estimation of food items during the operational phase to minimize wastage.
Emission of air pollutants. (Dust during construction, fumes during construction and operation).	<ul style="list-style-type: none"> • Spray water during construction works to arrest dust. • Material trucks hauling construction debris should be covered during transport. • All equipment should be maintained for efficient operation. • Commission air quality monitoring surveys for ambient air and stack emissions during the construction and operational phase in conformity with NEMA guidelines. • Using efficient machines with low emission technologies for the ones that burn fossil fuels. • Educate and raise awareness of workers on emission reduction techniques. • Use of clean fuels e.g., unleaded and de-sulphurized fuels.
Noise and Vibration. (During construction).	<ul style="list-style-type: none"> • Adhere to NEMA Regulations on Noise and Excessive Vibration Pollution Control. • Provision of appropriate personal protective equipment to workers. • Erection of cautionary signage during project implementation. • Use of safe working procedures. • Creation of safety awareness to workers. • Noise/vibration intensive operations will be carried out where practically possible during day light hours. • Using equipment with noise suppressing technologies (i.e., equipment designed with noise control elements). • Low vibration equipment and technologies will be explored. • Regular maintenance of equipment to ensure they remain efficient and effective.
Increased traffic (Construction and operational phases).	<ul style="list-style-type: none"> • Document and implement a traffic management plan. • Plan delivery and collection of construction materials to off-peak hours. • Provision of adequate parking space within the facility. • Provide adequate signage in liaison with traffic authorities. • Ensure use of roadworthy vehicles that have been inspected and approved for all activities. • Ensure all drivers have valid driving licenses. • Maintain a log detailing every accident at site or associated with the project work activities.
Increased pressure on water	<ul style="list-style-type: none"> • Adhere to extraction rate as recommended by the hydrogeologist. • Obtain a water permit from WRA prior to commencement of drilling.

Aspect/Impact	Mitigation measures
<p>resources/ground water depletion. (Construction and operational phases).</p>	<ul style="list-style-type: none"> • Abstraction of water from the borehole should be within allowable conditions of the WRA permits. • Install a water master meter to monitor consumption/abstraction of water. • Identify opportunities for water saving. • Install a piezometer and airline to monitor borehole water levels. • Incorporate rain water harvesting technology into the project design. • Sensitizing the workers, staff on efficient use of water. • Put in place water conservation measures such as installing auto-shut water taps to reduce on water wastage. • Provide water storage tanks with adequate storage capacity. • Ensure that the water supply system is well maintained. • Ensure prompt detection of leaking water pipes and repair. • Consider reusing treated effluent from the PWWTP. • Regular inspection of water pipelines and connections and ensure prompt repair and maintenance. • Sensitize the community on water conservation to limit on water wastage.
<p>Maintenance costs and water user charges.</p>	<ul style="list-style-type: none"> • Provision of budget for optimum maintenance of the water supply system including; borehole, pipelines and water storage structures. • Payment of water user charges as per WRA permit guidelines. • Sensitize the KCNP community on water resource management and conservation. • Ensure the pipeline connections and joints are regularly checked to avoid water wastage. • Encourage good record keeping and documentation including relevant permits and water monitoring records.
<p>Ground water Pollution (Construction, Borehole drilling and operation phase).</p>	<ul style="list-style-type: none"> • Ensure any sources of water pollution are eliminated. Control land use activities near the borehole well-head before, during and after drilling activities. • Provide adequate waste receptacles and sanitation facilities at strategic places. • Construction of sanitation facilities at KCNP should be at safe distance from well-head. • Ensure that screens are placed against the optimum aquifer zones. • Ensure the well is cased and screened with good quality material (uPVC of high open surface area). • After installation, gravel packed sections should be sealed off top and bottom with clay. • The annular space should be backfilled with an inert material. • The top 5 metres should be grouted with cement to ensure that no surface water at the well head can enter the water bore and cause contamination. • Waste-water drainage channel should be constructed to lead water away from the pump pad. Ensure efficient well development and cleaning after completion of the borehole (air or water jetting is preferred).

Aspect/Impact	Mitigation measures
	<ul style="list-style-type: none"> • Ensure proper storage, handling of hazardous waste (waste oil, lubricants, oil filters and fuel) and disposal by use of licensed hazardous waste contractor. The drilling team should be aware of the procedures to be followed when dealing with spills and leaks.
<p>Risk of water pollution, water-borne diseases and vectors thrive.</p>	<ul style="list-style-type: none"> • Carrying out water quality analysis (chemical and bacteriological tests) in an approved laboratory before project commissioning and incorporation of water treatment component in the project design based on analysis results. • Protection of the borehole from pollution; provide adequate waste receptacles and sanitation facilities at strategic places. Construction of sanitation facilities should be at safe distance from well-head. • Protection of water in the reservoir tank from contamination. • Regular cleaning of the storage tanks. • Educating water consumers on boiling water before consumption. • Enhance security at the borehole and storage tanks to ensure clean water provision.
<p>Increase Pressure on energy resources/increased energy demand. (Construction and operation phases).</p>	<ul style="list-style-type: none"> • Adopt energy efficiency measures including use of energy saving bulbs, sensor lighting, solar power and regular maintenance of machinery for efficiency. • Alternative sources of energy such as; solar may be used to pump water from the borehole to the reservoir rather than use of generators. • Make maximum use of natural ventilation and light. • Switching off electrical appliances when not in use. • Adopt use of energy efficient equipment (green star rated). • Sensitizing the workers, staff and students on efficient use of energy resources. • Monitor energy consumption and keep records.
<p>Occupational Health and Safety risks: (a) Incidents, accidents, and dangerous occurrences; (b) Occupational hazards; (c) Faulty machinery/equipment safety; (d) Improper storage of materials; (e) Safe means of access and safe place of employment; (f) Emergency situations;</p>	<ul style="list-style-type: none"> • Contractor should prepare an Occupational Health and Safety plan prior to commencement of construction activities. • Ensure the construction site is registered by DOSHS. • Drilling/construction of the boreholes should be supervised by a qualified hydro-geologist. • Use of correct and well-maintained tools, equipment, vehicles and machinery. • The site shall be fenced off and provided with security at the access gates to reduce potential accidents and injuries to the public. • Access to construction site should be restricted to authorized persons only. • Workers should be provided with appropriate personal protective equipment (such as mask, ear plugs, safety boots, and helmets) and enforce use. • Well-equipped first aid kit should be provided at the site. • An emergency preparedness and response program should be developed. • Only competent staff and contractor will be employed. • Training staff and managers on safe handling and use of equipment and

Aspect/Impact	Mitigation measures
<p>(g)Lack of First aid kits (Construction and operation phases).</p>	<p>materials. Contractor shall encourage daily toolbox meetings on site before engaging on any activities.</p> <ul style="list-style-type: none"> • A comprehensive contingency plan on accident response to be developed before commencement of operations at the polytechnic. • The standard operating and emergency response procedures to be strategically displayed at the polytechnic. • Adherence to safety procedures at all stages of the project to be enforced. • All workers, pursuant to labour laws, shall be accordingly insured against accidents. • Adequate job supervision. • Constitute and train emergency response teams including safety and health committee, first aiders and fire marshals. • Carry out periodic risk assessment audits to evaluate the efficacy of the mitigation measures proposed. • Provide a well-equipped health facility manned by a qualified nurse in the project design. • The contractor and all sub-contractors to be compelled to sign the EHS code of conduct prior to commencement of construction works. • The contractor will comply with provisions of Work Place Injuries and Benefits Act (WIBA) 2007. • Implement a workers grievance redress mechanism to allow workers raise safety issues and propose improvements on site.
<p>Social ills and spread of diseases including HIV/AIDS, and STD</p>	<ul style="list-style-type: none"> • Develop a comprehensive STDS, HIV and AIDs control programme. • Provision of STDs, HIV and AIDS prevention measures to workers. • Creation of awareness of STDs, HIV/AIDS in workers' camps. • Organize moonlight Voluntary Counselling and Testing (VCT) sessions for the workers in conjunction with local service providers.
<p>Drug and Substance Abuse</p>	<ul style="list-style-type: none"> • Create awareness to the students about the drug abuse menace in the locality and related impacts. • Establish peer to peer mentorship teams to champions against drug and substance abuse. • Form coalitions with the local community in the fight against drug abuse. • Establish a training and counselling center with competent personnel at the institution. • Incorporate Drug Abuse Resistance Education (DARE) in the students' curriculum. • Introduce behavioral modelling and behavioral modification strategies/programmes at the institution. • Introduce students' mentorship programmes. • Enhance security at the entry points into the institution. • Sensitize workers on no drug or alcohol abuse within the construction site and during working hours. • Provide "No Smoking" signage within the project site. • Worker under the influence of drugs or alcohol should not be allowed into the construction site. • Provide posters sensitizing workers on the dangers of drugs and

Aspect/Impact	Mitigation measures
Unapproved architectural plans and designs (Design and construction phases)	substance abuse. <ul style="list-style-type: none"> • Ensure that all plans are approved by the CGK Physical Planning Department and the local Occupational Health and Safety Office
Inadequate consultation with project stakeholders.	<ul style="list-style-type: none"> • Ensure continuous and meaningful engagement with project stakeholders throughout the project cycle. • Ensure timely and continuous disclosure of project related information to stakeholders. • Ensure stakeholder representation in the project GRM. • Ensure a functional and accessible GRM is in place and accessible. • Create awareness on project GRM to all community segments and project workers.
Religious Radicalization (Operation phase).	<ul style="list-style-type: none"> • Create awareness to students about the menace of radicalization in the local community and its related impact. • Collaborate with the local community associations on security issues. • In collaboration with the government security agencies, support community resilience to violent extremism programmes/campaigns. • Conduct open days in the institute to show case some of the achievements made by the youth.
Fire Safety (Operation phase).	<ul style="list-style-type: none"> • 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. • Sensitization of all staff and students on fire safety, including fire prevention and fire-fighting. • Conducting periodic fire drills. • Provision of smoking guidelines. • Develop and implement a fire safety policy. • Ensure all flammables are stored in fire resistant areas. • Provide water reservoir to fight fire. • Designate and mark a fire assembly points. • Provision of fire exits. • Ensure all fire exit doors open outwards. • Constitute and train fire marshals.
Increased Security risks. (Construction and operation phases).	<ul style="list-style-type: none"> • Thoroughly screen workers, suppliers and distributors. • Ensure 24-hour surveillance by engaging the services of day and night guards. • Install CCTV cameras in strategic locations of the institution. • Accord the local people the first priority in employment. • Ensure close liaison with the local Police Department.
Risk of spread of COVID 19.	<ul style="list-style-type: none"> • Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed. • Adhere to the MoH and World Bank guidelines on Covid-19 management.

Aspect/Impact	Mitigation measures
	<ul style="list-style-type: none"> • Ensure a functional and easily accessible GRM is in place. • Create awareness on project GRM to all community segments and project workers.
Gender Inclusivity.	<ul style="list-style-type: none"> • Ensure equal pay for equal work among male and female employees. • Ensure that women are given adequate employment opportunities during recruitment and job postings. • Regular sensitization and awareness campaigns to the workers should be done to promote gender equity in employment during the construction works and during operation. • Provide adequate sanitation facilities for both men and women • Introduce flexible work schedule for expectant and breastfeeding mothers. • Embrace equality in sharing out leadership position for male and female employees.
Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA).	<ul style="list-style-type: none"> • Create awareness to all community segments and project workers on GBV/SEA-SH, to demystify the stigma associated with GBV/SEA and H including prevention and management. • Ensure a code of conduct highlighting zero tolerance of sexual exploitation and abuse is signed by all project workers with physical presence on site. • The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases. • Create awareness on project GRM to all community segments and project workers. • The contractor to communicate to workers that there should be no interaction with the students. • Map all GBV service providers and document referral services for survivors. • Contractor to prepare and enforce a No Sexual Harassment Policy in accordance with national law where applicable. • Where feasible map out all the GBV/SEA service providers as well as referral pathways. • Partner with relevant government agencies and NGOs to ensure survivors of GBV and sexual offenses access survivor centered services such as medical care, psychosocial support, legal redress, safety, etc. as and when necessary.
Child protection.	<ul style="list-style-type: none"> • Institutionalize zero tolerance to child labor clause in contractor's code of conduct. • Where feasible, sensitize target community of child protection laws and child rights. • No child should be allowed to work on site. • Put in place warning signposts like "NO JOBS FOR CHILDREN". • Workers will be educated on the relevant laws and polices protecting children. • Reach out to children in and out of school in the vicinity of the

Aspect/Impact	Mitigation measures
	<p>construction sites with a life skills program focusing on HIV/AIDS and sexual abuse prevention among others areas.</p> <ul style="list-style-type: none"> • Strengthen school based and school led life skills programs targeting any schools near construction sites. • Ensure visibility of signage and information, education and communication materials on such issues in the construction site.
Employment-Labour issues	<ul style="list-style-type: none"> • The contractors should as far as possible engage the local skilled and unskilled labour within the project area during construction stages • Ensure that the local communities are given priority in relation to employment -all unskilled labour should be contracted or obtained from the local community if possible. • Ensure that all workers have contracts with terms and conditions that are consistent with national labour laws and polices • Every worker should also sign a code of conduct as an annex to the employment contract – covering issues such as zero tolerance of unacceptable conduct in the community, GBV, sexual harassment, sexual exploitation and abuse of children, etc. • Facilitate workers to form a committee through which their grievances will be received attended to or channeled to management
Conflicts/grievances caused by: <ol style="list-style-type: none"> a. Non employment of locals. b. Inadequate stakeholder consultation on project activities. c. Nonpayment/ delayed payment of workers. 	<ul style="list-style-type: none"> • 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. • Ensure careful documentation of all grievances received; processed, resolved and closed out. • Ensure that anonymous complaints are documented and addressed to the satisfaction of the affected parties. • 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. • Document and disclose all stakeholder consultation fora.
Non adherence to national labor laws and good practices in the management of workers.	<ul style="list-style-type: none"> • Create awareness on national labor laws and practices. • Implement a labor management plan which specifies e.g., salary scale for given type of workers, opportunity for women etc. • Ensure all workers have contracts with terms and conditions that are consistent with national labor laws and policies. • 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.) • Sensitize project workers on actual meaning and implication of the Code of

Aspect/Impact	Mitigation measures
	<p>conduct before signing it.</p> <ul style="list-style-type: none"> • Put in place a GRM for workers and facilitate workers to form a committee through which their grievances will be received attended to or channeled to management. • Put in place a GRM for project workers and facilitate project workers to form a committee through which their grievances will be received attended to or channeled to management. • Create awareness on the sub-project policy regarding use of child labour to all community segments and project workers. • 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. • Ensure no children are allowed on sub-project sites and put visible signage on site “No Jobs for children”. • Ensure a functional and easily accessible project GRM is in place. • Create awareness on project GRM to all community segments and project workers.
<p>Non-inclusion of contractor responsible social risks mitigation measures. (Construction phase)</p>	<ul style="list-style-type: none"> • Ensure all contractor responsible social risk mitigation measures are captured contractually (included in the contractor’s contract). • Link final payment to contract to the requirement of addressing all worker related social risks. • Ensure the contractor avails qualified and experienced social safeguards focal persons e.g., community liaison officers. • Ensure the allocation of adequate budgets to manage social risks and impacts.
<p>Social Evils/Crime. (Construction phase)</p>	<ul style="list-style-type: none"> • Provide security at the construction site. • Ensure adequate checking of visitors to the site. • Engage management of polytechnic in hiring workers as they have more knowledge of local people. • Engage CCTV camera in appropriate places.
<p>Labor influx and related impacts including the risks of Gender-Based Violence (Sexual Exploitation and Abuse and Workplace Sexual Harassment), HIV/AIDs, substance abuse, crime etc.</p>	<ul style="list-style-type: none"> • Create awareness to all community segments and project workers on SEA/SH, to demystify the stigma associated with GBV-SEA and SH. • Map all GBV service providers and document referral services for survivors. • Ensure a code of conduct is signed by all project workers with physical presence on site. • Put in place security measures throughout the project cycle, to mitigate any insecurity risks (vandalism). • Hire laborers from the local community to reduce demand for accommodation services. • Laborer hiring process should be gender sensitive and done with fairness. • The contractor will comply with provisions of Work Place Injuries and Benefits Act (WIBA) 2007.

Aspect/Impact	Mitigation measures
	<ul style="list-style-type: none"> • Ensure project workers and all community segments are consistently sensitized on emerging issues and work-related diseases such as HIV/AIDS. • Sensitize all community segments and project workers on GBV risks and mitigation measures. • Ensure a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases. • Create awareness on project GRM to all community segments and project workers.
Inaccessibility to project benefits.	<ul style="list-style-type: none"> • Ensure the facilities are accessible to PWD and elderly persons. • Create awareness on project GRM.
Ineffective management of project related grievances.	<ul style="list-style-type: none"> • Create awareness on project GRM to all stakeholders including project workers. • Ensure the GRM is functional, and accessible to both project workers and all stakeholders. • Ensure all reported grievances are logged, dated, processed, resolved and closed out in a timely manner. • Ensure representation of stakeholders in the grievances redress committee. • Ensure the GRM provides for confidential reporting of particularly sensitive social aspects such as GBV, as well as anonymity for those who wish to report anonymously.
Incomprehensive monitoring of the ESMP	<ul style="list-style-type: none"> • Ensure all environmental and social mitigation actions are monitored, and effectively executed. • Ensure quarterly reports on the implementation of the ESMP are prepared and shared with the Bank. • Conduct statutory annual EHS compliance audits to monitor the efficacy of the ESMP.
Demolition waste. (Decommissioning phase)	<ul style="list-style-type: none"> • Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling. • All installations, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible • All foundations must be removed and recycled, reused or disposed of at a licensed disposal site • Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site • Donate reusable demolition waste to charitable organizations, individuals and institutions
Occupational hazards (Decommissioning phase)	<ul style="list-style-type: none"> • Document and adhere to SOPs developed. • Provision of suitable and adequate PPE • Provision of adequate first aid facilities • Adequate supervision and monitoring of OSH performance.
Soil and water contamination from decommissioning of	<ul style="list-style-type: none"> • The Contractor should ensure that the employees on site are aware of the company procedures for dealing with spills and leaks using dispersants or adding biological agents to speed up the oil breakdown

Aspect/Impact	Mitigation measures
<p>the WWTP , borehole and the shallow wells (Decommissioning phase)</p>	<ul style="list-style-type: none"> • In case of spillage the Contractor should isolate the source of oil spill and contain the spillage to the source of leakage before it makes it leaves the affected area, using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer. • Provision of adequate and suitable personal protective equipment. • During decommissioning of the borehole, care should be taken to avoid contamination of the remaining water in the aquifer.

Conclusion

The ESIA study for the Proposed Regional Flagship Marine Transport and Port Logistics Centre - **East Africa Skills for Transformation and Regional Integration Project, at Kenya Coast National Polytechnic** established that the project will have some potentially negative environmental and socio-economic impacts. However, the identified impacts are reversible. Considering the major potential socio-economic benefits of the project to Kenya's and the region's blue economy, the proposed project is viable. The adverse environmental and social risks and impacts of the project can adequately be mitigated as demonstrated in the Environmental and Social Management Plan (ESMP) presented in chapter nine (9) of this ESIA project report. It is recommended that the ESMP be implemented to the latter. The stakeholders consulted during the project planning phase have fully endorsed the project.

1 INTRODUCTION

1.1 Background information

The Government of Kenya has received financing from the International Development Association (IDA) in the form of a “loan” toward the cost of **EAST AFRICA SKILLS FOR TRANSFORMATION & REGIONAL INTEGRATION PROJECT (EASTRIP)**. Kenya Coast National Polytechnic has been identified as one of the beneficiaries/implementing agencies for this project. The main objective of the proposed project is to enhance research and innovation capabilities in the field of marine transport and port logistics in Kenya and the Eastern Africa Region.

A NEMA Registered Firm of Experts; Richan Eco-Consult Ltd was contracted by the proponent to undertake the Environmental and Social Impact Assessment (ESIA) for the project. The ESIA Experts were tasked to identify, assess and quantify the specific environmental and social economic risks and impacts associated with the proposed project across the construction, operation and decommissioning phases. The objective of this is to ensure all environmental and social aspects of the project comply with Kenyan legislation as well as World Bank Group (WBG) guidelines. Specifically, the Environmental and Social Impact Assessment experts are supposed to generate a comprehensive ESIA report for subsequent submission to NEMA for review and issuance of an ESIA license approving implementation of the project.

This study was guided by the Environment Management and Coordination Act, 1999 (Amended 2015), World Bank Operational Policies: and O.P 4.01-Environmental Assessment. The World Bank Environment, Health and Safety (EHS) Guidelines were applied in the process for identification of social and environmental impacts including the formulation of the mitigation measures for negative impacts as outlined in the Environmental and Social Management Plan (Chapter 9). Other relevant national legislative and institutional frameworks (see section 5 of this report) were referenced as secondary sources of information while conducting this study.

1.2 Scope Objective and Criteria of the ESIA Project Report

1.2.1 Scope of the ESIA

The scope of this ESIA report, covered:

- The baseline environmental and social conditions of the proposed development and its surrounding environs,
- Description of the proposed project,
- Provisions of the relevant environmental laws,
- Identification and discussion of adverse environment and social impacts anticipated from the proposed project,
- Identification of appropriate mitigation measures to address the anticipated environmental and social impacts
- Development of an environmental and social management plan including monitoring of the same

1.2.2 Objectives of the ESIA

The principal objective was to identify the potential positive and negative environmental and social impacts expected during the establishment and operation of the proposed project with the aim of proposing the possible mitigation measures and enhancing the positive impacts. This was done to ensure that such a development does not negatively impact the environment in terms of social aspects; human health and safety; and physical (land, water, plants and animals) state of the area.

In brief, the specific objectives of the ESIA project report were to:

- i. Describe the proposed project (construction, operations and decommissioning), including the technology to be used.
- ii. Discuss the policy, legal, and administrative frameworks within which the ESIA is carried out.
- iii. Collect, collate and present baseline information (Physical environment, biological environment and Socio-economic and cultural environment)
- iv. Undertake analysis of alternatives by systematically comparing feasible alternatives to the proposed project
- v. Carry out public participation and consultations to collect the concerns, expectations, and opinions of affected, concerned and interested stakeholders
- vi. Prepare a comprehensive Environmental and Social Management and Monitoring Plan (ESMMP)

1.2.3 Data Collection Procedures

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

1.3 Methodology Outline

Since the proposed site is not located in a sensitive ecosystem, the total effect to the surroundings could not be adverse and noting that the intended development and use of the facility is not in conflict with what exists in the surrounding environment, the ESIA report would be seen to be adequate. The general steps followed during the assessment were as follows:

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

1.3.1 Environmental Screening

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

1.3.2 Environmental Scoping

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

A scoping report was subsequently generated and submitted for review to the client and the World Bank.

The key potentially significant adverse impacts identified include;

- i. Removal of vegetation to pave way for the construction.
- ii. Changes in geological environment.
- iii. Increased pressure on utilities notably water and power especially during the operational phase of the project.
- iv. Generation of effluent.
- v. Social risks including; non employment of locals, Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) associated with labour influx, discrimination of women and other vulnerable groups, delayed payment of workers, drug abuse and radicalization especially during the operation phase.
- vi. Occupational Health and Safety risks especially during the construction phase.

The ESIA consultant in liaison with the project implementation team has however documented adequate and suitable mitigation measures to counter the potential negative impacts. These have been further elaborated in the ESMP section (Chapter 9) of this ESIA project report.

1.3.3 Desktop Study and interviews

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

1.3.4 Physical inspection of the site and surrounding areas

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

1.3.5 Public Participation Meetings

Since the proposed project conceptualization back in 2018, four official public involvement and participation meetings have been held to deliberate on the project implementation. These culminated on the grand PIC meeting held on 20th May 2021 at Southern Palm Beach Resort Hotel - Diani. The project affected persons, local civic leadership, lead government agencies as other interested stakeholders were invited to express their views, comments and concerns towards the upcoming project. Comprehensive minutes of the meeting are appended to this report (**See appendix VI**). Besides this, structured questionnaires (**See Appendix VII**) were also administered to capture in greater details the stakeholders' views on the project.

1.3.6 Data Analysis, Reporting and Documentation

The ESIA project report from the findings was compiled in accordance with the guidelines issued by NEMA. The potential environmental and social impacts (both positive and adverse) were predicted based mainly on concerns raised by the public, stakeholders and expert observations on the ground and available tools. The magnitude, significance, and acceptability of predicted impacts were evaluated with a view to determine whether observed adverse impacts were significant enough to warrant mitigation. Impacts were further screened for occurrence and significance of residual (those which cannot be mitigated satisfactorily) and cumulative impacts with a view to provide a basis of making recommendations on the way forward for the project. The report was prepared and submitted for consideration and approval. The Consultant ensured constant briefing of the client during the exercise. Description plans and sketches showing various activities are attached as part of the Appendices.

2 PROJECT DESCRIPTION

2.1 Introduction

KCNP has contracted Symbion Kenya Ltd and her consortium of consultants to design and oversee construction of the Proposed Regional Flagship Marine Transport and Port Logistics Centre for the East Africa Skills for Transformation and Regional Integration Project, at Kenya Coast National Polytechnic. The project will be located at Waa-Ng'ombeni Zone, Matuga Sub-County in Kwale County. The main objective of the proposed project is to enhance research and innovation capabilities in the field of marine transport and port logistics. The proposed EASTRIP project shall cover a spatial scope of approximately 10,450 square metres. The project development is estimated to cost US Dollars Five Million and Fifty-One Thousand. (USD 5,051,000)

2.2 Site Description

The proposed project site is located on plot number KWALE/SABHARWAL SCHEME/61 approximately 1.5 km off the Likoni – Ukunda Road. The parcel of land measures approximately 19.47 hectares. The area around the site is generally a mixture of residential and commercial setting. The site's immediate neighbourhood comprises of residential homes, several institutions i.e. Mekaela Academies (Mekaela Weber School), Waa School and several mosques including Kaya Waa Mosque, Masjid Naswir Mosque and Masjid Hairat Mosque.

The proposed project site was donated to KCNP by the County Government of Kwale in collaboration with Chitsakmata Development Centre; a local community association.

The proposed project site is geographically located at GPS Coordinates: **4°11'39.2"S 39°36'20.6"E at an elevation of 21 meters above sea level.**

The google earth image below shows the location of the proposed project site.

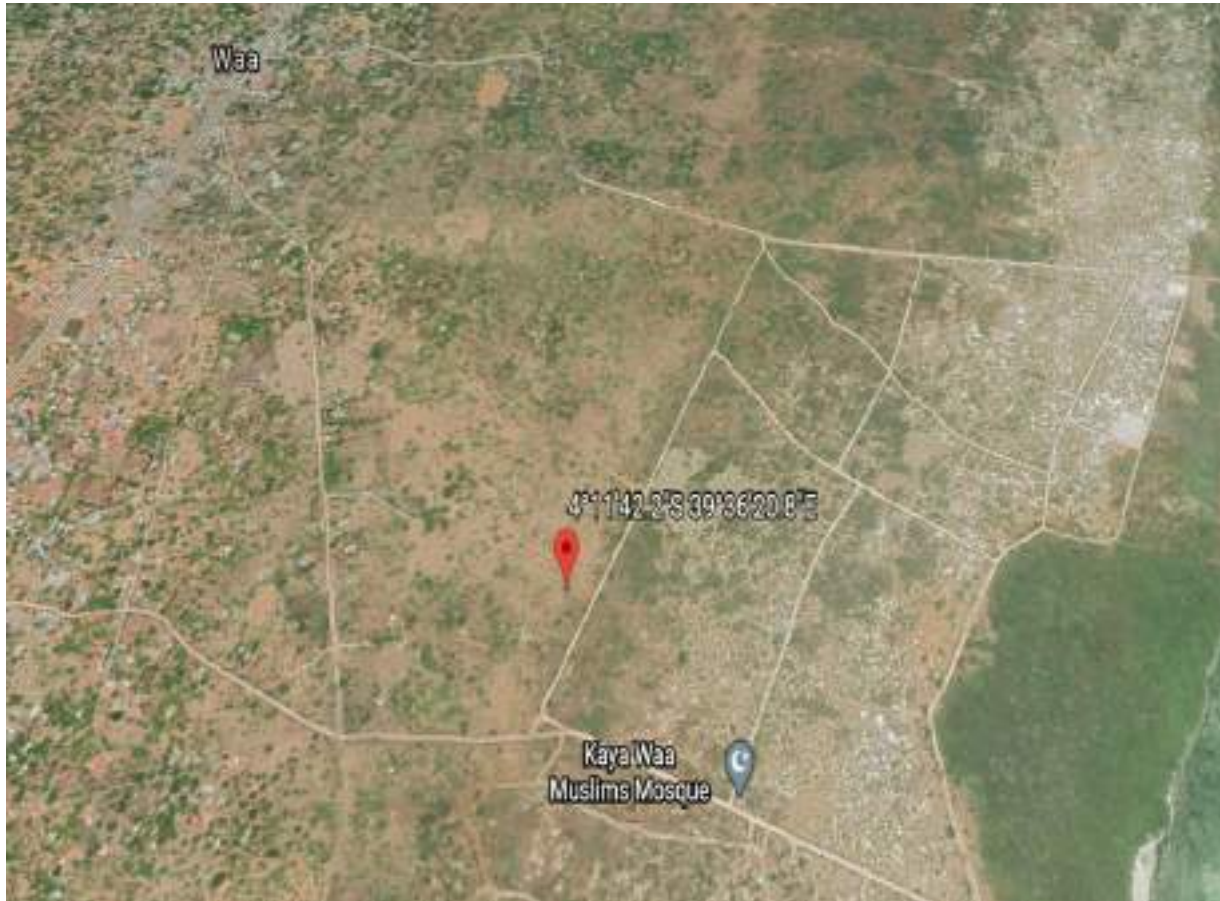


Figure 2-1 Google Earth Image showing the location of the proposed project site

The parcel of land on which the proposed project is to take place is currently undeveloped and with no infrastructure developed therein. The land can be characterized as a thicket consisting of an array of trees, shrubs, herbs and grasses. The predominant vegetation species observed at the site included; *Hyphaene coriacea* (Lala palm), palm trees, common guavas, cashews, *Annona senegalensis*, mango trees, *Rubus caesius* (dewberries) and elephant grass. No mega fauna species were recorded on site. The site was also characterized by numerous coral outcrops and an abandoned shallow well. The well shall be rehabilitated to supply water for domestic use during the operational phase of the proposed project.

The plates below show the current status of the proposed project site;



Plate 2-1 Thicket at the proposed site



Plate 2-2 Mango tree



Plate 2-4 Coral outgrowths



Plate 2-3 Abandoned shallow well

2.3 Description of the Proposed Development Works

The proposed project will be implemented in 3 phases. The long-term goal is to transfer all operations of KNCP to the new proposed site. The scope of this report is however limited to **Phase 1** of the project implementation.

Phase 1 of the project will constitute;

1. **Marine and Administration Centre**; this shall cover a total area of 5,178 square metres. It shall consist of the following components;

Table 2-1 Marine and Administration Centre

Facility	No. of Units
Workshops/research labs	5
Executive admin offices	1

Boardroom	1
Library/ Computer lab	1
Lecture theatre	2
General classroom	4
Faculty office suits	1

2. **Catering Centre;** this shall cover a total area of 2,680 square metres. It shall consist of the following components.

Table 2-2 Catering Centre

Facility	No. of Units
Multipurpose hall (sit 400 pax)	1
Meeting rooms	2
Boardroom	1
Main kitchen	1
Training kitchen	1
Restaurant	1
Canteen/shop	1
Training pool	1

3. **Staff Housing;** this shall cover a total area of 812 square metres. It shall consist of the following components.

Table 2-3 Staff Housing

Facility	No. of Units
Two Bedroom	3
One Bedroom	3
Studio Apartments	3

4. **Students' Accommodations;** this shall cover a total area of 1,780 square metres. It shall consist of the following components.

Table 2-4 Students' Accommodations;

Facility	No. of Units
Senior students' rooms	9
Junior students' rooms	60

5. Two boreholes shall be drilled to supply water for domestic use at the proposed project site. An existing shallow well shall also be rehabilitated to supplement water supply from the boreholes.
6. The scope of the project also includes installation of an on-site packaged waste water treatment plant for managing the waste water generated during the operational phase

of the project. Additionally, septic tanks will be incorporated in the project design to supplement the packaged WWTP depending on distance to the WWTP.

The illustrations below show select architectural impressions of the proposed project facilities;



Figure 2-2 Aerial Perspective of the Proposed Maritime Centre

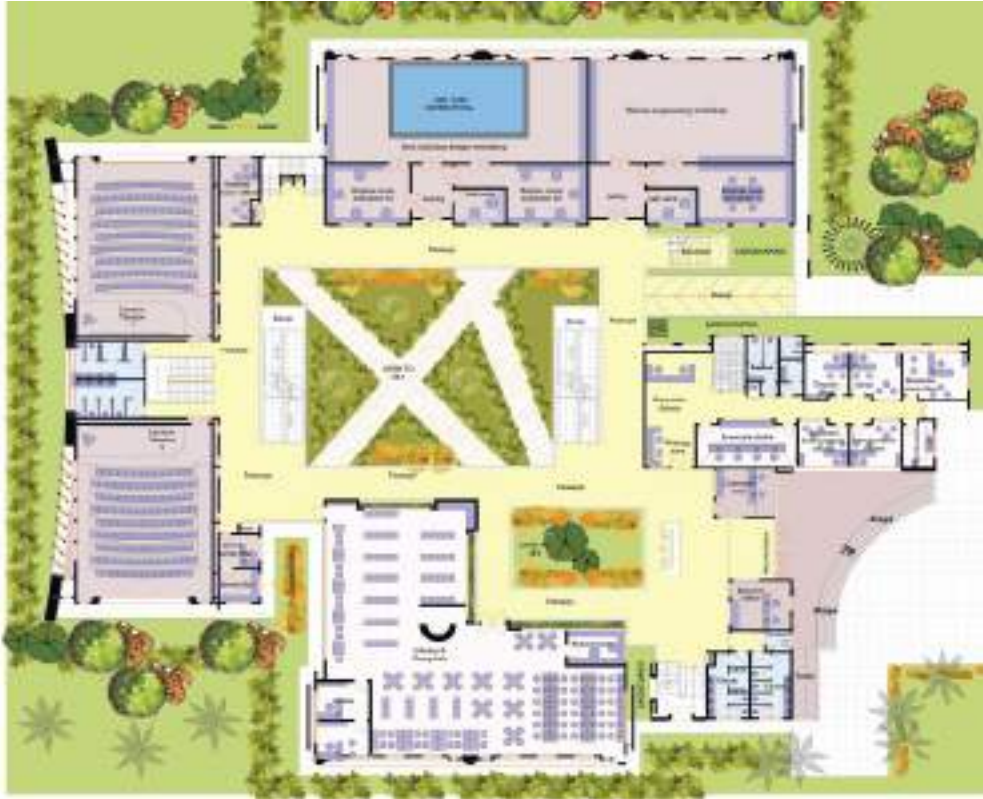


Figure 2-3 The Maritime Centre Ground Floor Plan



Figure 2-4 Aerial Perspective of the Proposed Catering Centre



Figure 2-5 The Catering Centre Ground Floor Plans

Sustainability was a core factor in the building's design. Green building aspects considered include;

- **Natural Lighting** – The buildings will be single banked to allow for sufficient natural lighting from at least two sides. Windows shall be operable to allow users to control the indoor environments as they wish.
- **Natural ventilation/ Cross ventilation:** All windows will have permanent vents (PV) incorporated into them. All workshops will have a combination of both windows and concrete vent blocks which will provide the much required permanent ventilation to these spaces.
- **Materials and Finishes:** Choice of materials will be done to ensure that the materials used will be durable and requiring less maintenance i.e. use of renewable materials, materials choice to favor locally available materials around Kwale County and its environs thus requiring minimum transportation, materials associated with low CO₂ emissions over their life and choice of materials associated with low environmental impact during extraction e.g. natural stones.

- **Water:** The following measures for water conservation will be implemented in the project design; use of dual flush WCs, water efficient urinals, use of automatic taps, etc.
- Rain water harvesting and storage has been incorporated into the project design.

Ramps and passenger lifts have been factored in the project design to ease access of the proposed facilities by Persons with Disabilities (PWDs). Adequate and suitable disabled friendly wash room facilities have also been incorporated into the project design.

Water supply for general use during the construction and operation phases of the proposed project shall be sourced from ground water. Two boreholes shall be drilled on site to provide the water for domestic use. An existing shallow well shall also be rehabilitated to supplement water supply from the boreholes.

The proponent commissioned a hydro-geological survey to establish groundwater conditions at the premise and locate suitable points for drilling and construction of the production boreholes. Geophysical investigations comprised of 2 Electrical Resistivity (ERT) profiles and four 1-Dimensional Vertical Electrical Sounding (VES) at suitably selected points within the proposed project site. The points have herein been referred to as VES 1, VES 2, VES 3 and VES 4. The assessment recommends drilling at VES 1 and VES 4 located at grid references **37M UTM 566944 9536770** and **37 M UTM 566793 9536936** respectively. The borehole is located approximately **326 metres from the WWTP**. The report further recommends rehabilitation of the already existing shallow well at grid reference **37M UTM 566876 9536775**. The expected yield is estimated from the neighbouring boreholes drilled within the same geologic unit which yield an average of about **2 m³/h**. Therefore, the three water sources recommended can yield approximately **6 m³/h**; a 10 hours per day abstraction would thus yield **60 m³/h**. (**Annex X** appended to this report shows the Water and Waste Water Management layout for the proposed project site).

The map below shows the location of the proposed borehole drilling sites in relation to the general site plan.



Figure 2-6 Location of the proposed boreholes drilling sites.

Computations by the proposed project consulting engineers estimated the total water demand during the operational phase of the proposed project to be approximately **51.61 m³/day**. The ground water potential is thus sufficient to meet the proposed project operational needs.

A Test pumping exercise should be carried for the borehole once all drilling and construction work is complete. It is an exercise aimed at establishing safe abstraction rates and selection of the right pump size for the borehole. Upon completion of the exercise, the water should be sampled (2 litres) and taken to competent laboratory for chemical and bacteriological analysis. The results should be checked against Kenya Bureau of Standards (KEBS) thresholds for safe drinking or domestic water use. It is important to note that the proposed project scope includes installation of a Reverse Osmosis (RO) water treatment system for treatment of raw water to meet applicable KEBS standards for domestic water.

Table 2 below provides an outline of the estimated water demands during the operation phase of the proposed project. The project engineers have computed the figures based on the total floor area for the respective facilities proposed for development and the approximate numbers of people expected to be accommodated within the facilities. In computation of the anticipated water consumption rates, reference was made to **The Practice Manual for Water Supply Services in Kenya (October 2015)**. It is important to note that the water computations are

limited to facilities to be implemented during phase 1 of the proposed project implementation; the scope of this ESIA report.

Table 2-5 Water Demand Computations for Phase 1 of the Proposed Project

No.	Proposed Facility	Water Demand Computations	Remarks
1.	STUDENTS ACCOMODATION (Total floor area per block 1780 m ²)	4 people *150 l/p/d +110 people *50 l/p/d =6,100 litres/day or 6.1 m ³ /d	
2.	STAFF ACCOMODATION (Total floor area per block 812 m ²)	Total water demand for block Type A 88 people *150 l/p/d =13,200 litres/day or 13.2 m ³ /d	<ul style="list-style-type: none"> • Occupancy rate of 3-bedroom unit taken as 6 i.e. 2 parents + 3 children + 1 house help • Occupancy rate of 2-bedroom unit taken as 5 i.e. 2 parents + 2 children + 1 house help • Occupancy rate of 1-bedroom unit taken as 4 i.e. 2 parents + 1 children + 1 house help
3.	MARITIME CENTRE (total floor area 5,178 m ²)	Total water demand =655 people *25 l/p/d =16,375 litres/day or 16.375 m ³ /d	<ul style="list-style-type: none"> • No of Students= 234*2=468 • Administrative and Support staff =31No
4.	Main Kitchen & BOH	Water Demand = restaurant & kitchen x 500 l/d = 500 l/d = 0.5 m ³ /d	
	Students Centre	Water Demand = restaurant x 500 l/d = 500 l/d = 0.5 m ³ /d	
	Multi-Purpose Hall & Meeting Rooms(Total floor Area=2,680m ²)	Water Demand = 887 people x 5 l/p/d = 4,435 l/d = 4.435 m ³ /d	<ul style="list-style-type: none"> • Area per person for meeting room estimated at 1.5 m² • Population = 1330.25/1.5 = 887 people
	Other facilities	Allow 10,000 l/d of 10m ³ /day	

The total water demand during the operational phase of the proposed project has been computed by the project engineers as approximately **51.61 m³/day**.

Based on the computations illustrated above, the project engineers recommend installation of a Reverse Osmosis (RO) Water Treatment Plant (WTP) of capacity **52m²/day** for clean water supply to the institution.

Technical details of the water demand and waste water generation computations are annexed to this report (**Appendix V**).

The diagram below illustrates a generic model of the water distribution system that will be installed at the proposed project site.

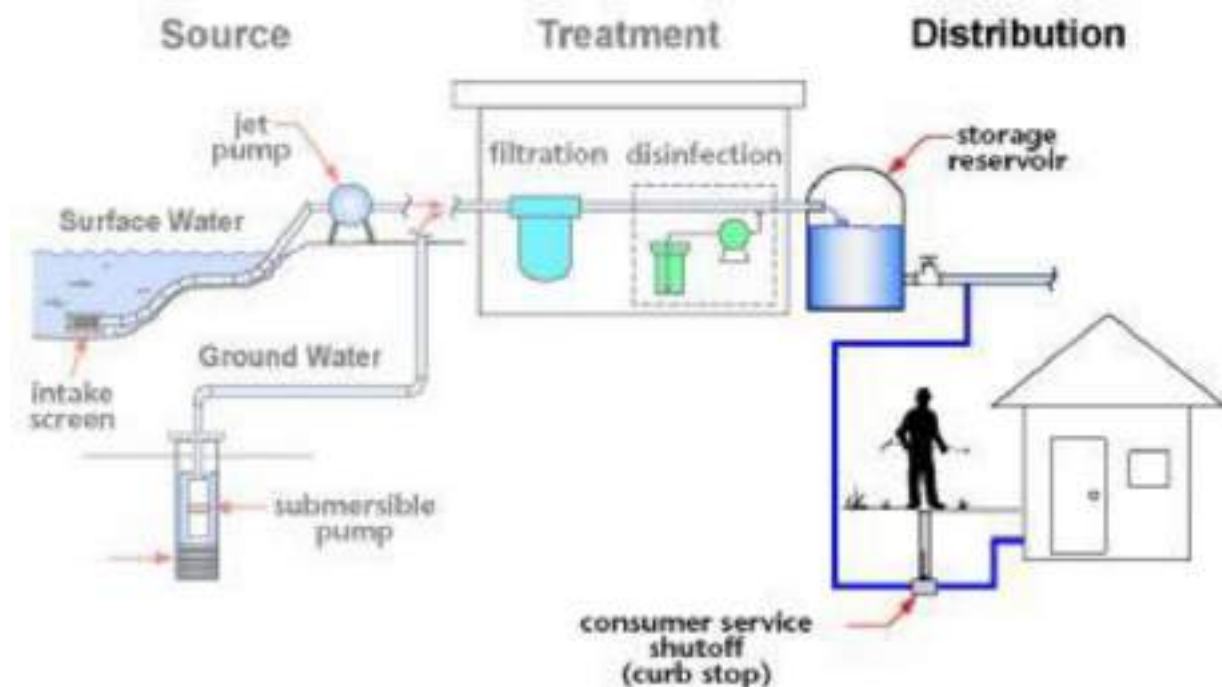


Figure 2-7 The Proposed Water Distribution System Model

Based on the water demand computation and applying a sewage factor of 0.85, the sewage expected to be generated during the occupational phase of the proposed project is computed as = **0.85*52 = 43.9m³/day**. For sewage pipes and waste water treatment plant hydraulic design a peak factor of 2.5 was applied hence **2.5*43.9=109.7m³/day** (approx. 110M³/day). A **Packaged Waste Water Treatment Plant** will be installed for waste water management at the institution. Additionally, septic tanks will be incorporated in the project design to supplement the packaged WWTP depending on distance to the WWTP.

The following merits were given as justification for the Packaged Waste Water Treatment Plant;

- Easy to operate as many are manned for a maximum of two or three hours per day
- Often better at handling organic loading and flow fluctuations, as there is a greater detention time for the nutrients to be assimilated by microbes
- Systems are easy to install, as they are shipped in one or two pieces and then mounted on an on-site concrete pad, above or below grade
- Systems are odour free, can be installed in most locations, have a relatively small footprint, and can be landscaped to match the surrounding area
- Systems have a relatively low sludge yield due to long sludge ages, can be designed to provide nitrification, and do not require a primary clarifier.

Packaged Waste Water Treatment Plant have the following functional components;

- Solids separation; incoming waste-water is passed into a stabilization chamber, where settling of large particles and grit occurs.
- Aeration: waste-water then flows into an aeration chamber. An aerator is installed in the chamber and supplies oxygen to the waste-water thereby creating aerobic conditions necessary for breakdown of decomposable wastes.
- Sedimentation and recycling; the effluent from the aeration chamber flows into the sedimentation chamber in which final settlement occurs. A submersible pump may be installed in this chamber to recycle sludge back into the stabilization chamber. This introduces more micro-organisms into the stabilization chamber hence enhancing the treatment process.
- Filtration; Clear water from the sedimentation tank flows into a clarification chamber comprising a mixed bed of sand media/activated carbon filters after which the treated water is of suitable quality for irrigation use or disposal through a storm drain.

The treated effluent from the treatment plant will be subjected to quarterly qualitative analysis testing to ensure it complies with NEMA standards for effluent discharge to the environment. The client has long term objectives to re-use the water for landscaping, general cleaning and flushing in the ablution blocks.

The table below shows the compliance matrix for the proposed Packaged Waste Water Treatment Plant to NEMA Requirements for On-site Waste Water Treatment Plants for Non-Sewered Developments;

Table 2-6 Compliance Matrix for the Proposed Packaged WWTP

	Requirement	Status
1.	A detailed site layout plan drawn to scale indicating the position, plan and design of the wastewater treatment plant in relation to the project components, facilities, amenities and neighbouring infrastructure and sensitive ecosystems	Figure 12 below shows the location of the WWTP in the general site layout plan for the proposed project.
2.	Detailed analysis of wastewater treatment alternatives and justification of the preferred alternatives.	Refer to Table 4 in this ESIA report.
3.	Comprehensive computations for anticipated waste water generation during the operational phase of the project.	Refer to water demand and waste water generation computations annexed to this report (Appendix V).
4.	A detailed description of the receiving environment from the discharge point including the discharge land area, soils types.	The waste water shall be treated to meet NEMA standards for discharge to the environment. The treated waste water shall be re-used for landscaping and other domestic uses.
5.	The Waste-water treatment plant management plan	Refer to the ESMP matrices (Tables 10,11 and 12)

Figures 12 and 13 below show the location of the PWWTP in relation to the site plan and an illustration of the waste water treatment method/technology for the Packaged Waste Water Treatment Plant respectively.



Figure 2-8 Site plan showing the location of the WWTP

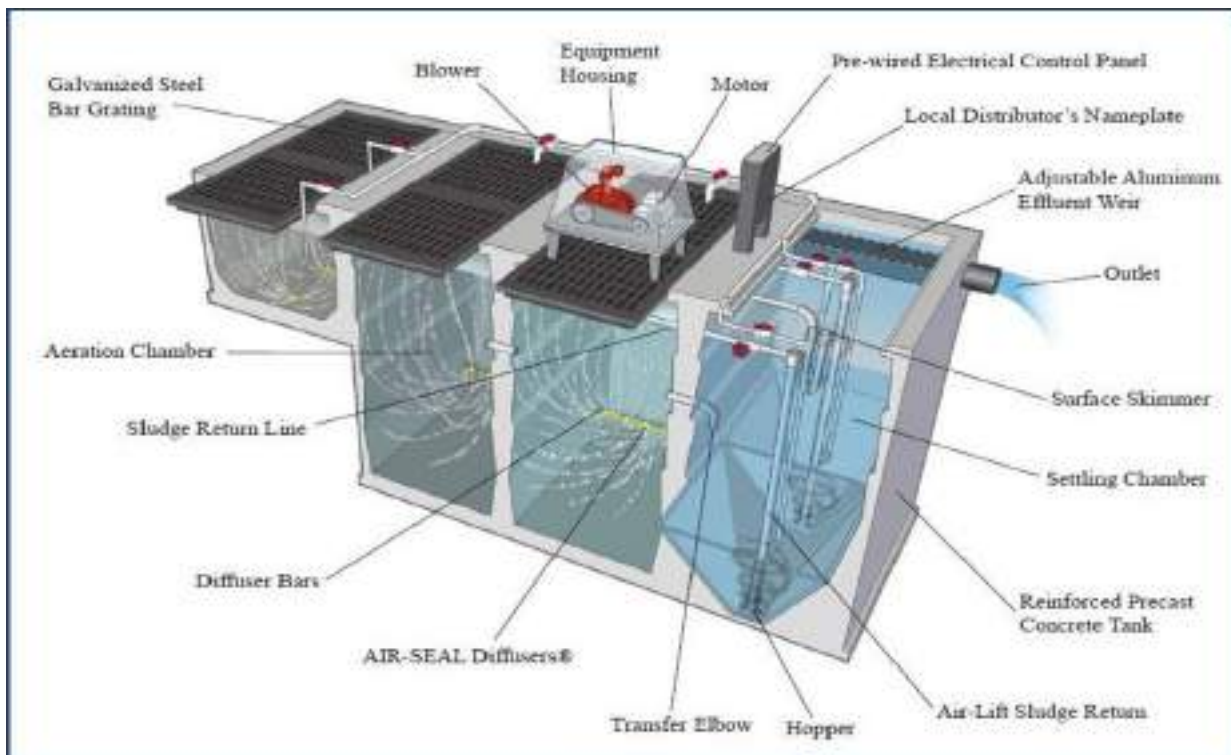


Figure 2-9 The Packaged Waste Water Treatment Plan Model

2.4 Description of the project's activities

2.4.1 Project Planning and Design

During the project planning and design phase, Symbion Kenya Limited; the project's lead consultant constituted a multi-disciplinary consortium of experts to optimize the project design in light of the project objectives. The project design team consists of;

1. Symbion Kenya Limited – Architects
2. Getso Consultants Limited – Quantity Surveyors
3. Merk Associates Limited – Civil and Structural Engineers
4. Maiteri and Associates - Electrical and Mechanical Engineers
5. Richan Eco Consult Limited – Environment and Safety and Health Consultants

The consortium conducted a reconnaissance to the proposed project site to meet with the proponent as well as survey the actual site. A series of design meetings were held. Various project design options were presented to the client for comments. The proposed project design discussed in section 2.3 above was selected as the one that most optimizes the project objectives.

During the project conceptualization, planning and design phase, four official stakeholders Public Involvement and Consultation forums were held to obtain the views, comments and concerns of the project stakeholders in relation to the proposed project. These culminated to the grand PIC meeting held on 20th May 2021 at Southern Palm Beach Resort Hotel – Diani. The deliberations of these meetings are discussed in detail in chapter 6 of this report.

Statutory approvals by relevant lead government agencies including; County Government of Kwale, NEMA, DOSHS and WRA were also sought during the proposed project planning and design phase.

2.4.2 Site preparation works

The proposed project site will be hoarded in line with County Government of Kwale By - Laws. A site office shall be erected to serve as the coordination centre for the project. Notices and safety signage shall be erected to inform the public about the proposed project. The contractor will be required to obtain work site permit from DOSHS as well as prepare the project site to mitigate the risks related to COVID-19.

2.4.3 Excavations

Excavations for the structures will be done under the guidance of the project engineers. Heavy machinery shall be used to perform the excavation works. All excavated material will be used to backfill the newly constructed areas so there shall be limited spoil generation. No electrical or underground cables will be affected. No quarrying activities will be undertaken on site. Deliberate efforts will be made to preserve the coral outcrops so as not to interfere with the marine ecosystem.

2.4.4 Erection of structures

Structures will then be erected as per the architectural details (see section 2.3 above). The project scope also includes installation of a water treatment plant and a packaged WWTP (see section 2.3 above). Finishes including wiring and plumbing work will be finalized in readiness for occupation and the intended use. An occupational certificate shall be acquired prior to commencement of operations.

2.5 Description of the Project's Operational Activities

2.5.1 Training

Upon completion, the proposed Regional Flagship Marine Transport and Port Logistics Centre shall attract students from Eastern Africa and beyond for purposes of learning. The facility shall play an important role in providing skilled labour for International Shipping Lines and Logistics companies, Kenya Port Authority (KPA) and other maritime organizations.

2.5.2 General repairs and maintenance

The facilities will be repaired and maintained regularly during the operational phase of the project. Special consideration shall be made for operation and maintenance of the WTP and the WWTP.

2.5.3 Emergency and Disaster Preparedness

The proponent shall endeavor to provide a safe environment through internal policies and protocols, facility inspection, training of workers, risk mitigation strategies and creating direct links with the relevant civic authorities. In addition, adequate back-up to critical power, water and telecommunications systems, fire control system and a fully operational on site clinic shall be provided in the event of accidents or incidents.

2.5.4 Description of the project's decommissioning activities

When or if the proposed project reaches the end of its life cycle this phase will come into effect and it will involve stopping all its activities and demolishing the structures and substructures and restoring the environment to as close as possible to its original state.

This phase activity will produce a lot of solid waste, which can be reused for other construction works or if not reusable, disposed of appropriately by a licensed waste disposal company. Professionals involved will include those involved in civil works such as plumbers, masons, engineers, contractors/demolition experts, landscapers, waste handlers, managers, environmentalists etc.

2.6 Project Inputs, Outputs, By-products and Waste

2.6.1 Project Inputs

2.6.1.1 Inputs at the construction phase

- **Construction materials** such as: Water, building sand, cement, ballast, building blocks, PVC pipes, metal frames, pipes and wires, tiles, polythene sheeting, timber, glass, plastic, paints, roofing sheets, natural rock, plants for landscaping among others. Choice of materials will be done to ensure that the materials used will be sourced from sites that use environmentally friendly processes, durable and requiring less maintenance i.e. use of renewable materials, Materials choice to favor locally available materials around Kwale County and its environs thus requiring reduced transportation cost, materials associated with low CO₂ emissions over their life and choice of materials associated with low environmental pollution during extraction e.g. natural stones.
- **Construction plant and machinery including;** excavators, compactors, concrete mixture machines, generators, hoist machines, cranes, welding machines, drilling machines, vibrator machines, rollers among others. All plant and machinery shall be inspected and approved by competent persons prior to use. A schedule of maintenance shall also be developed for all the plants and machines.
- **Labor:** Labor inputs shall consist of skilled, semi-skilled and unskilled manpower. Skilled manpower including project managers, consultants, contractor and sub-contractors shall be awarded on strength of competency. Local community members shall however be accorded priority for semi-skilled and unskilled labor.

2.6.1.2 Inputs at the Operational phase

Inputs at the occupation phase will include food, water, energy, stationery, repair and maintenance equipment and materials and cleaning materials.

2.6.2 Project Outputs, By-products and Waste

The project output will be the proposed Regional Flagship Marine Transport and Port Logistics Centre **East Africa Skills for Transformation and Regional Integration Project, at Kenya Coast National Polytechnic** as per the project design. The by-products and wastes to be generated from the development at various stages of the project cycle include:

- a) Soil and gravel from digging of foundations, drainage channels and substructures
- b) Noise and dust from construction activities and delivery of material to the site
- c) Left over construction materials
- d) Food materials
- e) Human waste
- f) Waste-water from wash-rooms
- g) Solid waste from packaging materials and food & drinks containers
- h) Exhaust emissions from trucks delivering construction material and carting away debris and from other construction **machinery such as excavators.**

2.6.3 Estimated Project Investment Cost

The estimated investment cost for the project is US Dollars Five Million and Fifty One Thousand. (USD 5,051,000). The costs will be based on the current building costs and will not take into consideration any future price escalations including, professional fees and finance charges.

3 ANALYSIS OF PROJECT ALTERNATIVE

3.1 Introduction

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

3.2 Relocation Option

Relocation option to a different site is not an option available for the project implementation. At present the selected site is the only viable option that suit the proponent's objectives in terms of size, ownership, accessibility and suitability.

3.3 No Project Alternative

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

- The proponent's objectives for a Regional Flagship Marine Transport and Port Logistics Centre will have to be foregone.
- The positive potential social economic impacts including job creation, knowledge transfer, increase in property value and markets for local businesses will not be achieved.

The 'No Project' alternative is not a viable option to the proponent and to the economy.

3.4 The Proposed Development Alternative

Under the proposed development alternative, the developer of the proposed project would be issued with an EIA approval license. In issuing the approval, NEMA would consent to the proponent's proposed development, provided all environmental protection measures are complied with during the construction period and operational phases. This alternative entails compliance with NEMA regulations and World Bank safeguard policies and World Bank Group EHS guidelines in the management of environmental and social risks

3.5 Analysis of Alternative Construction Materials and Technology

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment and materials that save energy and water will be given first priority without compromising on cost or availability factors. The infrastructure will be erected using locally sourced materials that meet the Kenya Bureau of Standards (KEBS) requirements.

3.5.1 Analysis of Water Treatment Technologies

The proposed project site is not connected to fresh water supply by any service provider; private or public. Therefore, water supply for general use during the construction and operation phases of the proposed project shall be sourced from shallow wells that will be

drilled at site. The proponent carried out a hydro-geological study to determine the efficacy of the boreholes output. Summaries on the study are provided in section 2.3 of the report.

However, secondary data sources show that the general project area has low potential for fresh water due to increased clay content and sea water intrusion. Further, sandstone series which characterize the area is highly mineralized. Water in these catchments therefore is expected to be relatively saline.

Reverse Osmosis (RO) was considered as the option that most optimizes the project objectives because;

- ✓ RO units can remove 90% or more of certain inorganic chemicals. These inorganic chemicals include: fluoride, sulfate, nitrate, total dissolved solids, iron, copper, lead, mercury, arsenic, cadmium, silver and zinc. Water from the shallow wells is expected to have a high concentration of inorganic chemicals.
- ✓ RO systems can be fused with other technologies such as UV treatment to eliminate organic contaminants thus enhance quality of the treated water.
- ✓ RO WTP technology has been widely explored and consequently optimized as compared to other methods of water treatment.
- ✓ Contractors engaged in RO WTP installations are readily available. This optimizes operations and maintenance of the systems.
- ✓ RO WTP systems are comparatively cheaper to install and maintain as compared to other options of water treatment.

A Reverse Osmosis (RO) Water Treatment Plant (WTP) of capacity 52m²/day will be installed at the proposed project site for clean water supply to the institution.

3.5.2 Analysis of Waste Water Treatment Technologies

The table below shows a comparative analysis of the waste water treatment options considered for the proposed project.

Table 3-1 Waste-Water Treatment Options

Treatment Process	Advantages	Disadvantages
1. Waste stabilization ponds	<ul style="list-style-type: none"> ▪ No power requirements ▪ Very low operations and maintenance requirements ▪ No mechanical installations ▪ Very simple method of treatment 	<ul style="list-style-type: none"> ▪ High land requirement ▪ Odour nuisance, particularly from the anaerobic ponds if incorporated in the system ▪ Sensitive to temperature variations ▪ Requires relatively flat or gentle slopes to avoid extensive excavations ▪ May require special lining to avoid groundwater contamination

Treatment Process	Advantages	Disadvantages
2. Constructed wetlands	<ul style="list-style-type: none"> ▪ Have substantial capacity for waste-water treatment 	<ul style="list-style-type: none"> ▪ High land requirement ▪ Requires relatively flat or gentle slopes ▪ Requires specific aquatic plants ▪ Appropriate for small institutions/developments, not for large waste-water treatment
3. Aerated lagoons	<ul style="list-style-type: none"> ▪ Detention time less than in stabilization ponds ▪ Less land requirement as compared to stabilization ponds 	<ul style="list-style-type: none"> ▪ High O&M requirements
4. Activated sludge process	<ul style="list-style-type: none"> ▪ Any degree of treatment is possible ▪ Final effluent is clear and odorless ▪ Low land requirement ▪ Freedom from odour nuisance ▪ Freedom from nuisance due to flies 	<ul style="list-style-type: none"> ▪ Sensitive to organic loading particularly for industrial wastes which result in bulking of sludge ▪ High Operation and Maintenance requirements. ▪ High skilled management ▪ Sensitive to shock loading
5. Trickling filters	<ul style="list-style-type: none"> ▪ Durability in all weather conditions and in the presence of corrosive effluents ▪ Does not upset for variation of hydraulic or organic loading ▪ Low O&M cost 	<ul style="list-style-type: none"> ▪ Limitation in volumetric loading ▪ Significant loss of head ▪ Nuisance due to flies
6. Rotating biological contactors	<ul style="list-style-type: none"> ▪ Can withstand hydraulic and organic shock loads ▪ Low land requirement 	<ul style="list-style-type: none"> ▪ High O&M requirements
7. Decentralized Wastewater Treatment System (DEWATS)	<ul style="list-style-type: none"> ▪ Can be scaled to any size ▪ Adaptable to varying load conditions and climatic conditions ▪ Can treat wastewater with high fat, suspended solids and BOD ▪ Safe re-use of water for non-potable end uses ▪ System cannot be switched off and so it ensures efficient working irrespective of external factors 	<ul style="list-style-type: none"> ▪ Does not address the chemical component of the waste-water hence the influent may require chemical pre-treatment ▪ Requires polishing ponds which will take up more land, lower aesthetic value of the area, and may present odour problems
8. Up flow Anaerobic Sludge Blanket (UASB)	<ul style="list-style-type: none"> ▪ Efficient in the removal of organic material especially for tropical regions (developing countries) ▪ Low construction cost and small land requirements as generally at temperatures >20 degrees high loading rates can be applied ▪ Low operation and maintenance costs, energy consumption is low and little equipment is needed ▪ Lower sludge production as compared to aerobic and physical-chemical treatment processes ▪ Biogas production which can be 	<ul style="list-style-type: none"> ▪ Long start-up period when seed sludge is not available, as the growth rate of methanogenic microorganisms is low ▪ Low pathogen removal - post treatment required to reach the required effluent standards ▪ Low removal efficiency of particulate organic material at low temperatures ▪ Risk of odour nuisance from reduction of sulphate to sulphide

Treatment Process	Advantages	Disadvantages
	used for energy production	
9.Packaged Plant Treatment System – Extended Aeration Plants	<ul style="list-style-type: none"> ▪ Easy to operate as many are manned for a maximum of two or three hours per day ▪ Often better at handling organic loading and flow fluctuations, as there is a greater detention time for the nutrients to be assimilated by microbes ▪ Systems are easy to install, as they are shipped in one or two pieces and then mounted on an onsite concrete pad, above or below grade ▪ Systems are odour free, can be installed in most locations. 	<ul style="list-style-type: none"> ▪ Do not achieve denitrification or phosphorus removal without additional unit processes. ▪ Flexibility is limited to adapt to changing effluent requirements resulting from regulatory changes. ▪ Systems require a larger amount of space and tankage than other "higher rate" processes, which have shorter aeration detention times.

Following a thorough evaluation of the alternatives considered, it was the informed opinion of the project consultants that;

- ✓ The proposed project site best suits the proponent’s objectives in terms of siting, size, ownership, accessibility and suitability.
- ✓ The ‘No Project’ alternative is not a viable option to the proponent and to the economy on a balance of cost – benefits analysis.
- ✓ The proposed project design is the one that best optimizes the project objectives.
- ✓ Reverse Osmosis (RO) plant is the best water treatment alternative to provide 52m²/day water capacity based on the saline nature of water in the proposed project area.
- ✓ For a peak factor of 2.5*43.9=109.7m³/day (approx. 110M³/day) capacity of waste water generated. A Packaged Waste Water Treatment Plant provides the best system for sewage pipes and waste water treatment plant hydraulic design.

4 BASELINE INFORMATION

4.1 Introduction

This section discusses the baseline situation in respect of climate, topography, soils and geology, hydrology, terrestrial ecology, cultural heritage sites and socio-economic structure as well as existing infrastructure and utilities such as water, sewerage, transportation network, electricity, transport and telephone/telecommunications and water sources and adequacy management in the region of the proposed project.

4.2 Topography and Landscape

Mwache River is the main determinant of the drainage in the project area and the immediate adjoining areas. The slope is predominantly west east towards the sea shoreline (Mwache River discharges into Mwache Creek) from Taita hills in the west where Mwache River originates. Ng'ombeni River basin to the north of the Mwache river basin has similar characteristics (discharging into Tudor Creek just north of Changamwe). The two rivers and their tributary streams are seasonal but carry high storm water flows during rains. The general topography is relatively flat with breaks of medium valleys with seasonal flows. The local landforms are influenced by the rivers and mild slopes towards the flood plains.

4.3 Climate of the area

The county has monsoon type of climate which is hot and dry from January to April/May, while the period from June to August is the coolest in the year. Rainfall is bi-modal with short rains being experienced from October to December, while the long rains are experienced from March/April to July. The total annual precipitation varies from 900mm– 1500mm per annum along the coast to 500mm to 600mm per annum in the hinterland. The average annual rainfall ranges from 600mm in the hinterland to 1200mm at the coastal belt.

The coastal belt receives an average annual rainfall of a 1000mm with a marked decrease in intensity to the north and the hinterland. Average temperature ranges from 26.30C to 26.60C in the coastal lowlands, 250C to 26.60C in Shimba Hills, and 24.6°C to 27.5°C in the hinterland.

The precipitation is highest in the months of April and May while no or little precipitation occurs from March to December Annual Average precipitation is about 900mm against an average¹, 860 mm evapo-transpiration in the region with 75% Dependable Annual rainfall equivalent to 610 mm.

4.4 Flora and Fauna

The parcel of land on which the proposed project is to be implemented is currently undeveloped. The vegetation can be characterized as a thicket consisting of an array of trees, shrubs, herbs and grasses. The predominant vegetation species observed at the site included; *Hyphaene coriacea* (Lala palm), palm trees, common guavas, cashews, *Annona senegalensis*, mango trees, *Rubus caesius* (dewberries) and elephant grass. There are no endangered or endemic species in the project influence area. Human activities have interfered with both

terrestrial and aquatic habitats in the project areas. There is no terrestrial wildlife observed in the project areas since most land is already developed. However, limited rodents like squirrels, moles and different bird and insect species among others are found in the area. A section of the vegetation shall be cleared to pave way for construction activities during the proposed project implementation.

4.5 Hydrology and Drainage

Kwale County is well drained by seven major rivers and numerous minor streams. Of the seven (7) rivers, three (3) are permanent. The main rivers and streams are Ramisi, Marere, Pemba, Mkurumuji, Uмба, Mwachema and the Mwache River. Except for Ramisi and Mwachema rivers, the remaining have social and commercial uses related to domestic water, livestock and irrigation. None of these rivers flow close to the proposed project site.

Drainage at the proposed project site in general is influenced by the Indian Ocean that determines the southerly surface slope. The proposed project site is located approximately 1 km from the ocean. The proposed project will thus not have any impact to the ocean.

Ground water potential is a function of rainfall and porosity of the underlying rock. Its quality is largely determined by the geology of the area. The coastal belt has a great potential of potable underground water with six main underground water catchments and/or reservoir. This includes the Tiwi catchment whose aquifer has a width of 20 Km² and has a through flow of 42,000m³/hr. Others are the Msambweni catchment whose aquifer has a width of 42Km² with a through flow of 27,440m³/hr. Further the Diani catchment has an aquifer that covers 19 Km² with a through flow of 1400m³/hr.

The proposed project site lies within the Northern Eastern edge of Tiwi aquifer. There are a number of productive boreholes within the study area, an indication that ground water prospects in the area has fairly good water prospects. On average boreholes located within the coral reef formation yield an average of 2.5 m³/h. Similar or a close value is expected from the proposed boreholes.

Specific capacity values for Tiwi aquifer's Pleistocene Kilindini sands/ coral reef formation range from 20 - 389. Transmissivity for the Tiwi aquifer's Kilindini sands and coral reef formation is estimated to range from 120 - 600 m²/day. Hydraulic conductivity values are estimated between 13 - 36 m/day, this correctly correspond to silty sands/fine sands. Aquifer recharge ratios at Waa - Ng'ombeni area is estimated at 181,000 m³/km²/yr.

4.6 Geology and Soil

The coastal zone is generally underlain by a base rock of sedimentary origin (shells, sandstones and clays). In general, the boundary between the geological systems or groups and their subdivisions run parallel to the coastline, the rocks becoming progressively older as one travels inland. This series could fall into three well-marked divisions as presented below in order of their succession:

- The Duruma Sandstone Series consisting of grits, sandstone and shales. The division is divisible into three broad lithological units with coarse sandstones at the top and bottom of the succession and finer sandstone and shales in the middle.
- The Jurassic rocks that are entirely of marine origin and consists of limestone, mudstones, shales and occasional thin sandy beds. The airport largely lies within this division.
- The Cainozoic rocks that include a thick series of sand and gravels, coral reef with associated lagoon deposits of coral, calcareous sands and beach sands and various subsidiary sandy beds.

4.7 Sources of Water

The proposed project area is not served by the local Municipal water supply network. Ground water shall thus be the main source of water supply for general domestic use during the construction and operational phase of the proposed project. Consequently, the proponent commissioned a hydrogeological survey to establish groundwater conditions at the premise and locate suitable points for drilling and construction of production boreholes.

Geophysical investigations comprised of 2 Electrical Resistivity (ERT) profiles and four 1-Dimensional Vertical Electrical Sounding (VES) at suitably selected points within the proposed project site. The points have herein been referred to as VES 1, VES 2, VES 3 and VES 4. The assessment recommends drilling at VES 1 and VES 4 located at grid references 37M UTM 566944 9536770 and 37 M UTM 566793 9536936 respectively. The report further recommends rehabilitation of the already existing shallow well at grid reference 37M UTM 566876 9536775. The expected yield is estimated from the neighbouring boreholes drilled within the same geologic unit which yield an average of about 2 m³/h. Therefore, the three water sources recommended can yield approximately 6 m³/h; a 10 hours per day abstraction would thus yield 60 m³/h.

Computations by the proposed project consulting engineers estimated the total water demand during the operational phase of the proposed project to be approximately 51.61 m³/day. The ground water potential is thus sufficient to meet the proposed project operational needs. The raw water shall be treated to meet WHO standards for domestic use. A Reverse Osmosis (RO) Water Treatment Plant (WTP) of capacity **52m³/day** shall be installed at the proposed project site for clean water supply to the institution.

4.8 Sanitation

The general proposed project area is not sewered. The local community primarily use pit latrines for human waste disposal. A few institutions have constructed septic tanks for management of their sewage. During the operation phase, significant waste water shall be generated from the ablution blocks, showers, kitchen and domestic routine cleaning activities. A **110m³/day capacity Packaged Waste Water Treatment Plant** will be installed at the proposed project site for waste water management at the institution. The waste water shall be

treated to meet EMCA (Water Quality Regulation), 2006 standards before discharge to the environment. Treated effluent shall be re-used for landscaping and other domestic uses.

4.9 Solid Waste Management

During the construction phase of the proposed project, the proponent shall provide a secure waste holding shed to facilitate segregation and temporary storage of wastes at source before it is collected for off-site disposal or recycling. During the operational phase of the project, solid waste generated will be segregated into labelled receptacles at a designated waste holding area. The wastes will then be collected by a NEMA licensed waste handler for disposal at a registered dumping site or for recycling.

4.10 Energy Supply

The Power line from Mombasa to Ukunda traverses close to the proposed project site. The project's electrical engineers will calculate electricity load requirements for the proposed facilities. Suitable recommendations shall be implemented prior to project commencement to ensure the power supply meets the demands for the proposed facility. Stand by generators shall be installed to substitute the main Kenya Power grid supply during incidents of power outage.

4.11 Communication and Infrastructure

The primary access to the proposed project site is via a 1.5 Km marrum road off the main Likoni – Ukunda Road. The road is accessed from Kombani Shopping Centre (left turn if approaching from Likoni). Recommendations were made during the consultation and public participation meeting to petition the County Government to consider expanding the access road and to convert it to bitumen standard. The County Government was also called upon to provide street lighting along the access road so as to enhance security. The proposed project site is well connected to all major telecommunication channels including Airtel, Safaricom and Telecom. Internet access shall be provided during the operation phase of the project.

4.12 Land Use Patterns

The area around the site is generally characterized by a mixture of residential and commercial establishments. The site's immediate neighbourhood comprises of private residential houses. Institutions in close proximity to the proposed project site include Mekaela Academy, Mekaela Weber School, Waa School and several mosques including Kaya Waa Mosque, Masjid Naswir and Masjid Hairat.

4.13 Social and Economic Setting

4.13.1 Administrative Location and Population

According to the 2019 Population Census, Kwale County had 866,820 residents. Of these, 425,121 were male, 441,681 were female and 18 were intersex. Majority of the populace live in the rural areas at 740,389 compared to 126,431 who have settled in the urban areas. The age distribution is as follows;

- ❖ 0-14 years 382,321
- ❖ 15-64 years 446,434
- ❖ Above 65 years 33,035

Population distribution and settlement pattern in the Coastal region are influenced by infrastructure network such as roads, water, electricity, availability and accessibility of areas of gainful employment, availability of cheap housing, security and land tenure.

4.13.2 Education

There are 8 primary schools, 2 nurseries and 2 secondary schools in Komani Sub-County. School enrolment levels appeared to be generally low and were attributed to acute unemployment and lack of household financial capacity while primary schools' enrolments rose to over 50%, secondary schools and tertiary colleges is quite low (down to 3 -5%). This contributes to very high illiteracy levels in the area. They said that children didn't want to learn due to lack of role models, poor influence and parental irresponsibility. It was pointed out that children from poor families were likely to repeat a grade, be expelled or suspended from school or drop out of high school due to financial problems. Marriage at young age and premature pregnancies are also indicators of poor school enrolment levels.

The proposed project is expected to positively impact tertiary enrolment. Factors such as convenience of access thus eliminating transport costs will motivate more parents to enroll their children into the institution.

4.13.3 Health

The County has a total of three (3) government hospitals, eight health centers and sixty-four (64) dispensaries located in Msambweni, Kwale and Kinango constituencies. The doctor and nurse population ratio stand at 1: 76,741 and 1: 3,133 respectively. In addition, the county has two (2) private hospitals both located in Diani town. The average distance to the nearest health facility within the County is seven (7) kilometers as compared to the required maximum of three (3) kilometers.

There are only 2 health centers in the general Komani Area. These will not be adequate to cater for the health needs of the students during operation phase of the project. A fully equipped health facility has been incorporated into the proposed project design. This will however be implemented during phase 2 of the project.

4.13.4 Economic Activities

The main economic activity for the community bordering the proposed project site is subsistence agriculture. The county has a huge potential for development through embracing opportunities presented by its water resources. The Proposed Regional Flagship for Marine Transport and Port Logistics Centre will open up the county to tap optimally into the Blue Economy.

5 RELEVANT POLICY, INSTITUTIONAL AND LEGISLATIVE FRAMEWORK

5.1 Introduction

There is a wide range of institutional, policy, and legislative framework to address the major causes of environmental degradation and negative impacts on ecosystems emanating from industrial and economic development programmes in Kenya. This chapter includes a summary of the policies, laws, regulations and institutional setup pertinent to this project and relevant to environmental and social management in Kenya. In addition are relevant multi-lateral environmental agreements (MEAs) relevant to the proposed project which Kenya is a signatory.

5.2 Policy Framework

5.2.1 Sustainable Development Goals 2015

At the United Nations Sustainable Development Summit on 25 September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. Some of the goals which are in line to the proposed development include but not limited to;

- *Goal 1 on No Poverty: To end poverty, everyone should have basic healthcare, security and education.*

The proposed Regional Flagship for Marine Transport and Port Logistics Centre at Kenya Coast National Polytechnic shall play into this goal by training competent technical personnel who shall be able to optimize the potential of opportunities presented by the Blue Economy in Kenya and the region. This will consequently result to economic growth in the region leading to improved livelihoods and raise the living standards of communities.

- *Goal 4 on Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*

Education a key strategy to addressing socio-economic challenges associated with poverty. Over the past decade, major progress was made towards increasing access to education and school enrollment rates at all levels, particularly for girls. The proposed Regional Flagship for Marine Transport and Port Logistics Centre at Kenya Coast National Polytechnic fits directly into this goal. Upon completion of the project, the Kenya Coast National Polytechnic shall provide tertiary education to approximately 2,500 students from within and outside the Country, this will potentially lead to enhanced human resource capital thus positively impacting the development of the Country and overall standards of living of the communities.

- *Goal 8: The aim is for sustainable economic growth and decent employment for all.*

The proposed project fits directly into this goal. Enhanced knowledge and skills impacted to the students at the Polytechnic will directly enhance their employability.

5.2.2 The Constitution of Kenya, 2010.

Article 42 of the Bill of Rights of the Kenyan Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other

measures. Under Chapter 5 (Land and Environment), Part 1 is devoted to land. It requires that land be used and managed in 'a manner that is equitable, efficient, productive, sustainable, transparent and cost effective. It should consider sound conservation and protection of ecologically sensitive areas.

Part 2 of Chapter 5 of the Constitution is dedicated to Environment and Natural Resources. Article 69 in Part 2 provides that the state shall;

- i. Ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
- ii. Work to achieve and maintain tree cover of at least ten per cent of the land area of Kenya;
- iii. Encourage public participation in the management of, protection and conservation of the environment;
- iv. Protect genetic resources and biological diversity;
- v. Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
- vi. Eliminate processes and activities that are likely to endanger the environment; and
- vii. Utilize the environment and natural resources for the benefit of the people of Kenya.

The proposed project shall be planned and designed to ensure sustainability. Environmental and social safeguards shall be diligently implemented to guarantee a safe and healthy environment for all stakeholders. Consultations and agreement will be a continuous process with the community and County government before and during the project implementation.

5.2.3 The National Environmental Policy, 2014

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

A coordinated and participatory approach to environmental protection and management will be enhanced to ensure that the relevant government agencies, county governments, private sector, civil society and communities are involved in planning, implementation and decision-making processes.

5.2.4 The Kenya Vision 2030

The Kenya Vision 2030 is a vehicle for accelerating transformation of Kenya into a rapidly industrialized middle-income nation by the year 2030. Kenya aims to be a nation that has a clean, secure and sustainable environment by 2030. The environment sector under vision 2030 has the vision of a 'nation living in a clean, secure and sustainable environment'. The vision is

inspired by the principle of Sustainable Development and by the need for equity in access to the benefits of a clean environment.

The proposed Regional Flagship Marine Transport and Port Logistics Centre will enhance sustainable utilization of the ocean and blue economy resources as an enabler of the Vision 2030 economic blueprint.

5.2.5 HIV/AIDS Policy 2009

The policy identifies HIV/AIDS as a global crisis that constitutes one of the most formidable challenges to development and social progress. The Pandemic heavily affects the Kenyan economy through loss of skilled and experienced manpower due to deaths, loss of man hours due to prolonged illnesses, absenteeism, reduced performance, increased stress, stigma, discrimination and loss of institutional memories, among others.

The Policy will be complied with during implementation of the Project, the Contractor will in cooperate in tender document and implement HIV awareness initiatives during construction of the Project.

5.2.6 Gender Policy 2011

The purpose of the Gender Policy is to institutionalize The Kenya National Policy on Gender and Development (NPGD), within Gender, Children and Social Development. It articulates the policy approach of gender main-streaming and empowerment of women at the ministry level. The policy seeks to have a society where women, men, children and persons with disabilities enjoy equal rights, opportunities and a high quality of life.

This policy will be referred to during Project implementation especially during hiring of staff to be involved in the project, procuring of suppliers and sub consultants and sub-contractors to the project.

5.2.7 Kwale County Integrated Development Plan (2018-2020)

The Kwale County Development Agenda (2018-2022) is informed by the urgent need to increase and expand sustainable development opportunities and build people's capacities to enable them create wealth and transform their lives for growth and prosperity.

The Proposed Regional Flagship Marine Transport and Port Logistics Centre shall significantly contribute to this plan especially in the areas of; Education, Skills, Literacy & Infrastructure, Land Use and Human Resource Development.

5.3 Institutional Framework

In Kenya, the following are some of the key institutions/departments which deal with environmental health and safety issues; the National Environmental Management Authority (NEMA), Kenya Maritime Authority (KMA), Water Resource Authority (WRA), Directorate of Occupational Safety and Health Services (DOSHS), Technical and Vocational Education and Training Authority (TVETA) and others. There are also local and international NGOs involved in environmental issues in the country.

5.3.1 National Environment Management Authority (NEMA)

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment.

Under EMCA, NEMA may delegate any of its powers on the performance of any of its functions to County Environment Committees; NEMA officers (County Environment Officers); its employees or agents. Among others, the functions of NEMA are:

- To coordinate various environmental management activities undertaken by lead agencies;
- To promote the integration of environmental considerations into development actions with a view to ensuring proper management and rational utilization of environmental resources on a sustainable yield basis for the improvement of quality of life.
- To advise the government on legislative and other measures for the management of the environment or the implementation of various international conventions, treaties and agreements in the field of environment;
- To identify development actions for which environmental audit and monitoring must be conducted under the Act;
- To assess and monitor activities to ensure that the environment is not degraded by such activities, that environmental management objectives are adhered to and adequate early warning on impending environmental emergencies is given;
- To cooperate with relevant lead agencies on environmental education and enhancement of public awareness on environmental protection;

In line with the legal provisions, the proponent has appointed a NEMA registered ESIA Lead expert experts to document a comprehensive ESIA report for the proposed project. The ESIA report shall be submitted to NEMA for review and licensing.

5.3.2 Kenya Maritime Authority (KMA)

The functions of KMA are;

- i. Co-ordinate the implementation of policies relating to maritime affairs;
- ii. Advise Government on the implementation of international conventions and treaties;
- iii. Undertake and co-ordinate research, investigations and surveys in the maritime field;
- iv. Discharge flag and Port State responsibilities in an efficient and effective manner;
- v. Develop, co-ordinate and manage a national oil spill contingency plan for both coastal and inland waters;
- vi. Maintain and administer ships register;
- vii. Coordinate Search and Rescue efforts in partnership with other stakeholders;
- viii. Enforce safety of shipping and compliance with construction regulations for safety;
- ix. Conduct regular inspections of ships to ensure maritime safety and prevention of maritime pollution;
- x. Oversee training, recruitment and welfare of seafarers;
- xi. Conduct investigations into maritime casualties including wreck;
- xii. Regulate inland waterways shipping.

Upon completion, the proposed Regional Flagship Marine Transport and Port Logistics Centre at KCNP will play an important role in providing skilled labour for International Shipping Lines and Logistics companies, Kenya Port Authority, Kenya Ferry Services and Other Maritime Organizations. Curriculum and programmes at KCNP will be aligned to provisions of KMA Regulations.

5.3.3 Water Resources Authority (WRA)

This is a state corporation established under Section 11 of the Water Act, 2016. It is mandated through delegated Authority on behalf of the National government to safeguard the right to clean water by ensuring that there is proper regulation of the management and use of water resources, in order to ensure sufficient water for everyone- now and in the future.

The proponent will apply to WRA for a Water Abstraction Permit prior to drilling and extraction of water from the proposed shallow wells. The proponent shall adhere to all conditions of the permit. Requisite payments and timely renewal of the permit shall be made in the course of the project implementation.

5.3.4 The National Construction Authority (NCA)

This Authority was created by the National Construction Authority Act of 2011. The functions of the NCA as specified in section 5 (2) of the Act are to:

- a) promote and stimulate development, improvement and expansion of the construction industry;
- b) advise and make recommendations to the Minister for Public Works on matters affecting or connected with the construction industry;
- c) undertake or commission research into any matter relating to construction industry;
- d) prescribe the qualifications or other attributes required for registration as a contractor under this Act;
- e) assist in the exportation of construction services connected to the construction industry; provide consultancy and advisory services with respect to the construction industry;
- f) promote and ensure quality assurance in the construction industry;
- g) encourage the standardization and improvement of construction techniques and materials;
- h) initiate and maintain a construction information system;
- i) provide, promote, review and coordinate training programmes organized by public and private accredited training centers for skilled construction workers and construction site employers;
- j) accredit and register contractors and regulate their professional undertakings;
- k) develop and publish a code of conduct for the construction industry; and
- l) Do all other things that may be necessary for the better carrying out of its functions under the Act.

The project contractor and sub-contractors must be registered with NCA. The project shall also be registered with NCA prior to implementation.

5.3.5 County Government of Kwale (CGK)

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 have been submitted to The County Government of Kwale - Planning Department for approval.

5.3.6 The Directorate of Occupational Safety and Health Services (DOSHS)

This is the Government agency tasked with regulating safety and health services in Kenya. Developers must comply with all DOSHS requirements to ensure a safe work environment for everyone involved in the proposed project.

The proposed project site will be registered with DOSHS as a workplace. The project plans shall also be submitted to DOSHS for approval.

5.3.7 Technical and Vocational Education and Training Authority (TVETA)

TVET Standard requirements and guidelines for governance and management of VTCs and TVCs in TVET institutions in Kenya covers the following areas:

- Leadership, management and governance
- Physical resources
- Human resources
- Training delivery
- Trainee support
- Innovation, research and cooperation

The proposed project design team reviewed provisions of TVETA standards and guidelines. TVETA requirements on space specifications, number of students per class and requisite licensing for particular disciplines were evaluated and factored in the project design.

5.4 Legislative Framework

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

5.4.1 The Environmental Management and Coordination Act, 1999 (Cap 387) Amended 2015

The Act defines the legal and administrative co-ordination of the diverse sectorial initiatives in the field of environment. The Act harmonizes the sector specific legislations touching on the environment in a manner designed to ensure greater protection of the environment. This Act is guided Policy wise by the national environmental council, while the day-to-day enforcement falls under the Director General of the National Environmental Management Authority. Thus, (NEMA) enforces the Act on behalf of the Cabinet Secretary responsible for Environment. It is thus the primary Act governing the proposed construction project

Under EMCA, Cap 387 there are a number of regulations geared towards sustainable development. The applicable regulation to the development project are discussed below

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

Environmental Impact Assessment under the Act is guided by the Environmental Impact Assessment (Assessment and Auditing) Regulations of the year 2003, which is given under legal notice no. 101. The regulations stipulate the ways in which environment impact assessment and audits should be conducted. The project falls under the second schedule of EMCA, Cap 387 section 58 (1), (4) that require an Environmental Impact Assessment project report

It is in under these regulations that the proponent commissioned a NEMA registered Lead ESIA expert to carry out an assessment of the environmental and social impacts, prepare the ESIA report and submit it to NEMA for review and licensing.

5.4.1.2 Environmental Management and Coordination Act (Water Quality) Regulations 2006)

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment.

The proposed project shall include installation of WTP for domestic use water and a packaged WWTP for effluent generated. Water for domestic use shall be treated to meet NEMA's domestic use water standards (EMCA, Water Quality Regulations, 2006 – 1st Schedule). All waste water shall be treated to meet the required standards for discharge into the environment (EMCA Water Quality Regulations, 2006 – 3rd Schedule). The proponent shall also ensure timely application and renewal of the Effluent Discharge License for the facility.

The tables 6 and 7 below show Schedules 1 and 3 respectively of the EMCA (Water Quality Regulations, 2006).

Table 5-1 1st Schedule - Quality Standards for Sources of Domestic Water

Parameter	Guide Value (max allowable)
Ph	6.5 – 8.5
Suspended solids	30 (mg/L)
Nitrate-NO ₃	10 (mg/L)
Ammonia -NH ₃	0.5 (mg/L)
Nitrite -NO ₂	3 (mg/L)
Total Dissolved Solids	1200 (mg/L)
Scientific name (<i>E.coli</i>)	Nil/100 ml
Fluoride	1.5 (mg/L)
Phenols	Nil (mg/L)
Arsenic	0.01 (mg/L)
Cadmium	0.01 (mg/L)
Lead	0.05 (mg/L)
Selenium	0.01 (mg/L)
Copper	0.05 (mg/L)
Zinc	1.5 (mg/L)
Alkyl benzyl sulphonates	0.5 (mg/L)
Permanganate value (PV)	1.0 (mg/L)

Table 5-2 3rd Schedule - Standards for Effluent Discharge to the Environment

Parameter	Max Allowable (Limits)
1,1,1-trichloroethane (mg/l)	3
1,1,2-trichloroethane (mg/l)	0.06
1,1-dichloroethylene	0.2
1,2-dichloroethane	0.04
1,3-dichloropropene (mg/l)	0.02
Alkyl Mercury compounds	Nd
Ammonia, ammonium compounds, NO ₃ compounds and NO ₂ compounds (Sum total of ammonia-N times 4 plus nitrate-N and Nitrite-N) (mg/l)	100
Arsenic (mg/l)	0.02
Arsenic and its compounds (mg/l)	0.1
Benzene (mg/l)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 °C) (mg/l)	30
Boron (mg/l)	1.0
Boron and its compounds - non marine (mg/l)	10
Boron and its compounds -marine (mg/l)	30
Cadmium (mg/l)	0.01
Cadmium and its compounds (mg/l)	0.1
Carbon tetrachloride	0.02
Chemical Oxygen Demand (COD (mg/l)	50
Chromium VI (mg/l)	0.05
Chloride (mg/l)	250
Chlorine free residue	0.10
Chromium total	2
cis -1,2- dichloro ethylene	0.4
Copper (mg/l)	1.0
Dichloromethane (mg/l)	0.2
Dissolved iron (mg/l)	10
Dissolved Manganese(mg/l)	10
E. coli (Counts / 100 ml)	Nil
Fluoride (mg/l)	1.5
Fluoride and its compounds (marine and non-marine) (mg/l)	8
Lead (mg/l)	0.01
Lead and its compounds (mg/l)	0.1
n-Hexane extracts (animal and vegetable fats) (mg/l)	30
n-Hexane extracts (mineral oil) (mg/l)	5
Oil and grease	Nil
Organo-Phosphorus compounds (parathion, methyl parathion, methyl demeton and Ethyl parantrophenyl phenylphosphorothroate, EPN only) (mg/l)	1.0
Polychlorinated biphenyls, PCBs (mg/l)	0.003
pH (Hydrogen ion activity----marine)	5.0-9.0
pH (Hydrogen ion activity--non marine)	6.5-8.5
Phenols (mg/l)	0.001
Selenium (mg/l)	0.01
Selenium and its compounds (mg/l)	0.1

Hexavalent Chromium VI compounds (mg/l)	0.5
Sulphide (mg/l)	0.1
Simazine (mg/l)	0.03
Total Suspended Solids, (mg/l)	30
Tetrachloroethylene (mg/l)	0.1
Thiobencarb (mg/l)	0.1
Temperature (in degrees celious) based on ambient temperature	27.3
Thiram (mg/l)	0.06
Total coliforms (counts /100 ml)	30
Total Cyanogen (mg/l)	Nd
Total Nickel (mg/l)	0.3
Total Dissolved solids (mg/l)	1200
Colour in Hazen Units (H.U)	15
Detergents (mg/l)	Nil
Total mercury (mg/l)	0.005
Trichloroethylene (mg/l)	0.3
Zinc (mg/l)	0.5
Whole effluent toxicity	
Total Phosphorus (mg/l)	2 Guideline value
Total Nitrogen	2 Guideline value

5.4.1.3 Environmental Management and Coordination (Waste Management Regulations of 2006)

The Minister for Environment and Natural Resources gazetted these regulations in 2006. Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. *Secondary to this regulation, the proponent shall ensure all waste generated from the construction and operation of the proposed development shall be handled in line with waste management regulations; waste handling mechanisms for pollution abatement.*

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

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

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

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise.

The proposed development will institute noise and vibration conservation measures including installation of sound barriers and silencers in operational equipment to safeguard the acoustic environment.

5.4.1.5 Environmental Management and Coordination (Air Quality Regulations, 2014)

This regulation is referred to as “The Environmental Management and Coordination (Air Quality) Regulations, 2008”. The objective is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including as mobile sources (e.g., motor vehicles) and stationary sources (e.g., industries) as outlined in the Environmental Management and Coordination Act, 1999. It also covers any other air pollution source as may be determined by the Minister in consultation with the Authority. Emission limits for various areas and facilities have been set. The regulations provide the procedure for designating controlled areas, and the objectives of air quality management plans for these areas.

5.4.2 The Traffic Act, 2012

The Traffic Act, 2012 gives provisions and guidelines that govern the Kenya roads transport sector. These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads hence ensuring the environment; the human being a component is safeguarded. In section 41 The Act demands for installation and certification of speed governors for the commercial vehicles ferrying goods adjusted to the loading condition of such vehicles to a limit of 80 KPH, registration and competence of drivers. Section 26 and 27 of the same discourages engines that emit exhaust gases to the atmosphere without passing via a silencer or expansion chamber

In ensuring safety of all the persons in transit section 56 encourages that every public and commercial vehicle be fitted with inspected and first class first aid box and fire extinguisher.

In ensuring compliance to this Act the proponent shall ensure that all site drivers and all material suppliers to the site satisfy the provisions as stipulated in Act.

5.4.3 Public Health Act (Cap. 242)

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. 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 waste water, discharged from any premises into the public street or into gutter or side channel or water course, irrigation channel or bed not approved for discharge is also termed as nuisance.

The conditions of the waste control facilities within the KCNP should remain compliant to this Act and the proposed development shall not cause creation of more or alterations to these existing infrastructures.

5.4.4 The Land Act, 2019

This is an Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes.

It is important to note that any substantial transaction involving the conversion of public land to private land shall require approval by the National Assembly or county assembly as the case may be.

Part I of the same Act states that title to land may be acquired through—

- (a) allocation;
- (b) land adjudication process;
- (c) compulsory acquisition;
- (d) prescription;
- (e) settlement programs;
- (f) transmissions;
- (g) transfers;
- (h) long term leases exceeding twenty-one years created out of private land; or
- (i) any other manner prescribed in an Act of Parliament.

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

In ensuring that no contravention to this Act, the proposed project site was donated to KCNP by the County Government of Kwale in collaboration with Chitsakmata Development Centre; a local Community Based Association.

5.4.5 Water Act, 2016

The Water Act, 2016 provides the legal framework for the management, conservation, use and control of water resources and for the acquisition and regulation of right to use water in Kenya. It also provides for the regulation and management of water supply and sewerage services. Part IV of the Act addresses the issues of water supply and sewerage. Part II, section 18, of the Water Act 2002, sub-section 3 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 require to be kept by a facility operator and the information thereof furnished to the Authority. With respect to this Act, the contractor to the project shall ensure proper water use, management and conservation.

The proponent will also be required to adhere to this Act by obtaining all the required permits, including when abstracting water from the shallow water wells.

5.4.6 The Energy Act 2019

The Energy Act 2019 was enacted on 28th March 2019, repealing the Energy Act, 2006 (the Repealed Act), the Kenya Nuclear Electricity Board Order No. 131 of 2012 and the Geothermal Resources Act, 1982. It thus consolidated the laws relating to energy in Kenya. Section 121 of

the Act states the need and expression of an entity to conserve and protect the environment and natural resources in accordance to the Environment Management and Coordination Act (Cap 387), moreover, Section 122 of the Act gives provisions for the need to protect health and safety of users of energy by providing an enabling environment of operation that protects the health and safety of users of the service for which the license or permit is required and other members of the public affected by the undertaking. *All workers undertaking the proposed project shall subscribe to relevant protocols for workplace safety when dealing with energy and for energy conservation, including allowing only the trained and certified professionals to carry out the electrical works*

5.4.7 Occupational Safety and Health Act (OSHA 2007)

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

The proponent will ensure safety and health guidelines are implemented to the latter during the project implementation. A full-time EHS officer will be employed during the project construction phase to monitor and supervise the project contractor and the workers.

- **Health:** The work stations shall be kept clean. Food and drinks shall not be partaken in dangerous places or workstations. Suitable protective clothing and appliances including where necessary, suitable gloves, footwear, goggles, gas masks, and head covering are provided and maintained for the use of workers in any process involving expose to wet or to any injurious or offensive substances.
- **Safety:** A full time site safety officer shall be appointed to oversee safety enforcement during the project implementation. The safety officer will be required to maintain a log of any incidents and accidents on site. Training and supervision of workers shall be undertaken. Adequate and suitable means for extinguishing fire shall be provided in addition to adequate means of escape in case of fire. Adequate first aid provisions shall also be provided at strategic places.
- **Welfare:** An adequate supply of both quantity and quality of wholesome drinking water will be provided. Maintenance of suitable washing facilities, accommodation for clothing not worn during working hours shall also be provided. These Health, Safety and Welfare provisions set in place by the project consultants shall be applicable and improved upon where feasible in catering for the aspects of the proposed development within the facility.

5.4.8 Work Injury Benefit Act 2007

The Work Injury Compensation Benefit Act 2007 provides guidelines for compensating employees on work-related injuries and diseases contacted in the course of employment. The Act also requires provision of compulsory insurance for all employees. The Act defines an

employee as any worker on contract of service with employer. It will be important for the Contractor of the proposed project to ensure that all workers contracted during the project implementation phase are provided with appropriate insurance covers so that they can be compensated in case they get injured while working.

5.4.9 The Standards Act Cap. 496

The Act is meant to promote the standardization of the specification of commodities, and to provide for the standardization of commodities and codes of practice; to establish a Kenya Bureau of Standards, to define its functions and provide for its management and control. Code of practice is interpreted in the Act as a set of rules relating to the methods to be applied or the procedure to be adopted in connection with the construction, installation, testing, sampling, operation or use of any article, apparatus, instrument, device or process. All materials and equipment mobilized for works shall be KEBS certified and shall be subjected to the project consultants' internal standardization mechanisms.

5.4.10 Physical Planning Act (Cap 286)

An Act of Parliament to provide for the preparation and implementation of physical development plans and for connected purposes enacted by the Parliament of Kenya Under this Act, no person shall carry out development within the area of a local authority (County Government in this case) without a development permission granted by the local authority under section 33. KCNP through the contracted party shall obtain all necessary permits with respect to this Act.

Architectural, civil and structural plans for the proposed project have submitted to the County Government of Kwale - Planning Department for approval.

5.4.11 Employment Act No 11 of 2007

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the infrastructural sector.

The contractor and the employees' relationship during the construction and later phases of this project shall be guided by this Act and KCNP's Human resource policies and Codes of Conduct. The local community members will be prioritized for non-skilled labour.

5.4.12 County Governments Act, 2012

This Act vests responsibility upon the County Governments in planning of development projects within their areas of jurisdiction be it projects of importance to the local county government or those of national importance.

Section 114 and 115 indicate and give guidelines in planning of projects of national significance and instill the aspect of public participation in every aspect of the planning process through that: clear strategic environmental assessments; clear environmental impact assessment

reports; expected development outcomes; and development options and their cost implications.

The Planning department of the County Government of Kwale, will review and approve the architectural and structural designs and the proponent will ensure compliance and due diligence is done.

5.4.13 Children's Act, 2012

This Act of Parliament provides safeguards for the rights and welfare of the child including the right to parental care, non- discrimination, education, religion, health, care and protection from child labour and armed conflict, among others.

The Act requires that in all actions concerning children, the best interests of the child shall be a primary consideration.

The contractor will be compelled to sign an agreement to this end as part of his contract document. KCNP's Social Safeguards Officer will directly supervise enforcement.

5.4.14 Sexual Offences Act, 2006

This Act of Parliament makes provision about sexual offences and aims at prevention and the protection of all persons from harm from unlawful sexual acts.

The contractor is obligated to put in place mechanisms which are necessary or expedient in order to achieve or promote the objects of this Act, including for instance, a sexual harassment policy.

5.4.15 National Gender and Equality Commission (NGEC) Act, 2011

The over-arching goal for NGEC is to contribute to the reduction of gender inequalities and the discrimination against all women, men, persons with disabilities, the youth, children, the elderly, minorities and marginalized communities.

This Act will be applied during hiring of workforce on site.

5.4.16 Persons with Disabilities (Amendment) Act, 2019.

The Act mandates the Central and County Governments to

- a) develop policies on the protection and promotion of the welfare of persons with disabilities;
- b) undertake investigations, surveys and research into the causes and nature of disabilities and development of new assistive devices;
- c) put in place measures for the prevention of disabilities and rehabilitation of persons with disabilities;
- d) provide facilities and infrastructure for the training of professionals in the rehabilitation and habilitation of persons with disabilities;
- e) promote the integration of persons with disabilities in schools;
- f) promote the inclusion of persons with disabilities in the public service and put in place measures to ensure that at least five per centum of the employment positions are filled by persons with disabilities; The Persons with Disabilities (Amendment) Bill, 2019 3

- g) prescribe minimum standards and guidelines to be adhered to by public transport vehicles, communication service companies and infrastructure developers to facilitate reasonable access by persons with disabilities;
- h) adopt affirmative action in procurement of national government goods and services by implementing preferential procurement for individuals or entities managed by persons with disabilities; and
- i) Ensure access to free basic education and other social amenities to every child with a disability.

The proposed facilities have factored the needs for Persons Living with Disabilities in the project design such as provision of ramps, lifts as well as disabled friendly wash room facilities.

5.5 International Policies and Good Practice

5.5.1 Integrated Environmental and Social Impact Assessment (IESIA) guidelines

The International Development Association (IDA) has adopted an integrated approach to environmental assessment in the so-called Integrated Environmental and Social Impact Assessment (IESIA) guidelines. These guidelines have formed the benchmark guiding the process of implementing this ESIA. The Guidelines' major objective is to provide reference material on how to adequately consider cross-cutting themes while assessing the environmental and social impacts of a project. The IESIA Guidelines assist in the project design, as many potential adverse impacts can be avoided or mitigated by modifying or adding certain project components to the initial design. They also provide guidance on how to adequately consider cross-cutting themes in both the preparation and implementation phases.

This proposed project will strictly adhere to the Integrated Environmental and Social Impact Assessment (IESIA) guidelines

5.5.2 World Bank Safeguard Policies Environmental Assessment (OP/ BP 4.01)

This policy requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. The EA is a process whose breadth, depth, and type of analysis will depend on the nature, scale, and potential environmental impact of the proposed investments under EASTRIP. The EA process considers the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and trans-boundary and global environmental aspects.

OP 4.01 is triggered in the case of the proposed Regional Flagship Marine Transport and Port Logistics Centre at KCNP - EASTRIP, as the Bank will finance civil works projects including the construction of new infrastructure.

When Environmental Assessment policy OP/BP 4.01 is triggered, the World Bank classifies projects into one of three categories (A, B and C), depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. EASTRIP was assigned project category B based on project impacts and risks.

On identification of specific sub-projects, the client undertakes the environmental and social screening using the screening form provided in the ESMF to determine the potential E&S risks and impacts. Based on the identified risks of the sub-project the relevant Environmental and Social assessment such as ESIA/ESMP required for the sub-project is selected and undertaken.

The three project categories are described in table 5 below:

Table 5-3 World Bank ESIA Screening Categories

Category	Description
Category "A" Projects	An EIA is always required for projects that are in this category. Impacts are expected to be 'adverse, sensitive, irreversible and diverse with attributes such as pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbance of the site or surroundings; extraction, consumption or conversion of substantial amounts of forests and other natural resources; measurable modification of hydrological cycles; use of hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances.
Category "B" Projects	When the sub-project's 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 sub-projects. Impacts are site – specific; few, if any, of the impacts are irreversible; and in most cases, mitigation measures can be designed more readily than for Category A subprojects. The scope of environmental assessment for a Category B sub-project may vary from sub-project to sub-project, but it is narrower than that of a Category A sub-project. It examines the sub-project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
Category "C" Projects	If the subproject is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C sub-project.

The proposed Regional Flagship Marine Transport and Port Logistics Centre at KCNP - EASTRIP falls under Category "B" as described above. Applicable requirements as stipulated in OP4.01 shall be adhered to during implementation of the proposed project.

5.5.3 World Bank Group (WBG) Environmental, Health and Safety (EHS) General 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. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. During the preparation of this ESIA project report, the lead ESIA expert reviewed provisions of the EHS guidelines. Mitigation measures recommended for EHS aspects identified during the conceptualization, construction, occupation and decommissioning phases of the proposed project were aligned to the provisions of the EHS guidelines.

5.5.4 Alignment of WB and GOK Policies relevant to this ESIA

Both the World Bank safeguards and Government of Kenya (GoK) legislation are generally aligned in principle and objective:

- i. Both require Environmental Impact Assessment before project construction phase. This also includes an assessment of social impacts.
- ii. Both require public disclosure of EIA reports and stakeholder consultation during preparation.
- iii. While OP 4.01 of World Bank stipulates different scales of EIA for different category of projects, EMCA requires EIA for all sizes of projects listed in Schedule 2.
- iv. Where EMCA requires Strategic Environmental Assessments, OP 4.01 requires that an Environmental Assessment be conducted depending on the project category while an ESMF should be prepared for municipal projects.
- v. EMCA recognizes other sectoral laws while WB has safeguards for specific interests;
- vi. The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project which is consistent to the requirements of EMCA.
- vii. Additionally, statutory annual environmental and social audits are required by EMCA.

In Kenya, it is a mandatory requirement under EMCA 1999 (Amended in 2015) for all development projects (listed in Schedule Two) to be subjected to an EIA study. Thus, under the Laws of Kenya, environmental assessment is fully mainstreamed in all development process consistent with World Bank policies. However, since EMCA provides no minimum size threshold, all projects are screened at identification stage so as to determine level of environmental assessment required under EMCA. Further, in order to fully insure against triggers to World Bank safeguard policies, individual investments are screened against each policy as part of the EIA Study.

6 PUBLIC PARTICIPATION AND CONSULTATION

6.1 Introduction

Public consultation and participation process is a policy requirement by the Constitution of Kenya and a mandatory procedure as stipulated by EMCA Cap 387 section 58, on Environmental Impact Assessment. 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. Stakeholder engagement and information disclosure, purposed to achieve the fundamental principles of sustainable development. The objective of the consultation and public participation was to:

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

6.2 Methodology used during consultation and public participation

The key method used to collect information during the public participation exercise was stakeholders' public meetings.

6.2.1 Stakeholders' public meetings

The following major stakeholders' engagement meetings have been held in relation to the proposed Regional Flagship Marine Transport and Port Logistics Centre – EASTRIP at KCNP;

Table 6-1 Major Public Stakeholders' Involvement and Consultation Meetings Held

No.	Description	Date	Venue
1.	Blue Economy and Maritime Industry Stakeholders Meeting	Wednesday 18 th April 2018	Voyager Beach Resort – Mombasa County
2.	Stakeholders' Round Table Meeting on Maritime Industry and Blue Economy	Friday 7 th December 2018	Fort Jesus – Swahili Port, Mombasa County
3.	Industry Stakeholders' Forum for EASTRIP Project	Wednesday 17 th March 2021	Voyager Beach Resort – Mombasa County
4.	Stakeholders' Public Involvement and Consultation Meeting	Thursday 20 th May 2021	Southern Palm Beach Resort Hotel – Diani, Kwale County

Below are highlights of deliberations during the respective aforementioned public participation meetings;

6.2.1.1 Blue Economy and Maritime Industry Stakeholders Meeting held on Wednesday 18th April 2018 at Voyager Beach Resort – Mombasa County.

Highlights;

- The stakeholders were notified that in January 2018, KCNP was nominated to be a Regional Centre of Excellence in Marine Transport and Port Logistics under the World Bank East Africa Skills for Transformation and Regional Integration Project (EASTRIP).
- The objectives of the meeting were outlined as:
 - i. To promote self-employment and to enhance competence and professionalism of maritime the maritime industry in the country and the region.
 - ii. To seek commitment from the stakeholders that they will participate fully in human capital development of the project.
- The following were cited as challenges for institution engaged in training marine courses in the region:
 - i. Unavailability of Trainers.
 - ii. Courses like Nautical and Marine Engineering take long to train and the trainers are very few and expensive.
 - iii. Inadequate opportunities for internship and/or attachment placement for graduates and student respectively.
 - iv. The onboard training is done by a cadet who are always very busy.
 - v. Lack of accommodations facilities for trainees.
- KCNP was advised to conduct a labour market information survey to determine the potential for job opportunities in the industry.

Detailed minutes of the meeting and the duly signed delegates' attendance list is appended to this report under annex VI.

6.2.1.2 Stakeholders' Round Table Meeting on Maritime Industry and Blue Economy held on Friday 7th December 2018 at Fort Jesus – Swahili Port, Mombasa County during the Pwani Innovation Week.

Highlights

- The Principal Secretary – State Department of Vocational and Technical Training noted that the National Government had in place relevant reforms and policies that promote competencies aimed at tapping and optimizing benefits from the blue economy sector.
- In that regard, delegates were notified that KCNP had been identified to benefit from World Bank funding under the East Africa Skills for Transformation and Regional Integration Project (EASTRIP) to become a Regional Centre of Excellence in Marine Transport and Port Logistics.
- He reiterated that there was need to mobilize and incorporate more stakeholders into the project.

Detailed minutes of the meeting and the duly signed delegates' attendance list is appended to this report under annex VI.

6.2.1.3 Industry Stakeholders' Forum for EASTRIP Project held on Wednesday 17th March 2021 at Voyager Beach Resort – Mombasa County

Highlights

- The aim for EASTRIP was to increase access and improve the quality of TVET training as well as promote regional integration.
- Inter University Council for East Africa (IUCEA) was granted \$8M to enable them control and coordinate the project activities in the region.
- An appointment with the relevant ministry to discuss the tax waiver had been done. MOUs from the institutions must be taken to Solicitor General and Attorney General's office for concurrence since some have financial implications and international issues.
- Delegates were reminded that commitment to safety permeates all shipping operations. And therefore, because shipping is an international activity crossing national and ocean boundaries, the industry is very highly regulated by various United Nations Agencies, chief among which are the International Maritime Organization, the international labour Organization, these organizations have developed a comprehensive framework of safety standards that are uniformly applied and enforced globally.

Table 6-2 below presents a matrix of the main issued raised during the plenary session and respective responses.

Table 6-2 Delegates' Questions/Input and Suggested Solutions

S/No.	Name	Question/Input	Suggested solution
1.	Eng. Mengei	What is the government plan in ensuring that tax exemptions are given to the project equipment?	<p>The CL answered that the tax waiver concern is a government-to-government arrangement and is being followed up.</p> <p>The EASTRIP National Coordinator informed stakeholders that he had sought appointment to discuss tax on equipment.</p> <p>The PS Maritime and Shipping affairs requested to be involved in the tax waiver negotiations.</p>
2.	Mr. Steve Owaki – Seafarers Union of Kenya	What are the sustainability mechanisms in place to ensure that exists after the exit of World Bank Funding?	The CL answered that KCNP has developed a sustainability plan. Enterprise activities will be developed along the centre

S/No.	Name	Question/Input	Suggested solution
			to aid income generation.
3.	Mr. Kennedy Kishawi, KFS	How are you going to address the issue of the sea time?	The CL reported that Arab academy had accepted to offer sea time to KCNP trainees. Railway Training Institute in Kisumu had a vessel which could assist locally. KCNP will also solicit help from stakeholders.
4.	Ms. Winnie Maina, WOMESA	She informed stakeholders that WOMESA should be counted on in cases of capacity building for women in industry to enable life skills in training and mentorship.	It added that WOMESA is part of the marine undertaking and central to operations.
5.	Simon Rialem - Coast Guard Member	Remarked that KCNP should consider bringing in two organizations; Kenya Ship Yard Limited, a ship construction firm based in Kisumu and Mombasa; Kenya Navy;	CL answered that KCNP will make efforts to bring on board Kenya Navy and other institutions.
6.	Sipei Ntome, KPA	He emphasized that it is important for KPA to partner for attachment and recruitment. Invite well trained captains to offer talks and mentorship, training, attachments and placements.	
7.	Harrison, KMFRI (Represented the Director)	He informed that KMFRI operates in Kenyan Waters. KMFRI can offer a platform for research vessels in water bodies. He informed that they are ready for collaborations in research and boat building.	
8.	Ruth Muigai, PMAESA	Highlighted that they have opportunities for staff engagements, exchange programs and are ready for cooperation. They requested KCNP to consider partnering with JKUAT.	
9.	Tendai Mtana, CEC Agriculture and Fisheries – County Government of Mombasa	Remarked that regional integration was important; Institutions should build sustainable workforce for the industry;	
10.	Elizabeth Muli, ZAMARA	The member informed that ZAMARA offers actuarial services, risk	

S/No.	Name	Question/Input	Suggested solution
		and safety plans, pension and retirement options.	
11.	Kenya Association of Manufacturers	Concerned with training equipment standards and quality in relation to industry equipment.	
12.	Representative, Mediterranean Shipping Company (MSC)	Emphasized on the training of the mandatory certificates like STCW; Added that advanced courses like advanced firefighting courses are mandatory in employment.	

6.2.1.4 Stakeholders' public meeting held on Thursday 20th May 2021 at Southern Palm Beach Resort Hotel - Diani.

The public participation and consultation exercise culminated with the stakeholders' public meeting held on Thursday 20th May 2021 at **Southern Palm Beach Resort Hotel - Diani**.

The proposed project received overwhelming support from the delegates/ stakeholders in all the aforementioned stakeholders' public meeting.

The following were cited as the major potential positive impacts for the proposed project;

- The proposed Regional Flagship Marine Transport and Port Logistics Centre will enhance sustainable utilization of the ocean and blue economy resources as an enabler of the Vision 2030 economic blueprint.
- The proposed Regional Flagship Marine Transport and Port Logistics Centre at KCNP will play an important role in providing skilled labour for International Shipping Lines and Logistics companies in the region, Kenya Port Authority, Kenya Ferry Services and other Maritime Organizations.
- The project would open up the area for development
- Property prices in the area would appreciate significantly
- There will be increased enrolment to tertiary institution by the youths in the area. This will progressively position them strategically for gainful employment. Consequently, the livelihoods and standards of living for the community would improve.
- The project would provide significant business opportunities for the community through provision of accommodation for the students and faculty.
- The cottage industry in the community would thrive through provision of essential goods and services e.g., food, groceries and general merchandise to the students and faculty.
- The project will lead to improvement of infrastructure such as power supply, water supply and roads whose benefits will spill over to the community.
- CSR programmes by the institution would directly benefit the community
- The cosmopolitan students and faculty inclusion in the community will promote national and regional integration.

- The community will be disseminated on how to best tap to the blue economy potential in the area.

The general views and concerns raised by the stakeholders during the Public Stakeholders' meeting and the respective responses are summarized in the matrix below;

Table 6-3 Summary of Stakeholders Comments, Views, Concerns and Respective Response

SN	Comment	Response
1.	Mwinyi Ali Mshindo - Chairman - Chitsakamatsa Development Centre	
	<ul style="list-style-type: none"> • On behalf of the community, he supported and endorsed the proposed project 100% • Community very happy that their locality has been considered for implementation of the project. The community leadership have a huge responsibility to 'sale' the project to the local community. • He shall mobilize the community to take ownership of the project. • The main access road to the main gate is very narrow. There is need for its expansion to accommodate the potential surge in traffic especially during the operation phase. • The project design team to consider providing additional access and egress points into the institution in the project design. • The proponent to consider renovation of some dilapidated structures (owned by the community) near the proposed project site. The building can potentially be converted into a commercial centre. Community members can set shop there to supply basic goods and services to the students and staff of the institution. • The 'office' to remain open to address other emerging issues as may be raised by the community. 	<ul style="list-style-type: none"> • The responsible parties at CGK will be notified on the proposal to expand the access road for their planning and implementation. • Symbion responded that three access points have been provided into and out of the project site. • Funds allowing, KCONP will consider renovating the dilapidated structures under their CSR programme. This will however be treated as a long-term goal since all the funds for Phase I of the project have already been committed. • The doors at KCONP polytechnic will remain open to address all emerging issues emanating from the project.
2.	Mwanasiti Athuman Zondu - Chitsakamatsa	Response

SN	Comment	Response
	Development Centre – Member	
	<ul style="list-style-type: none"> • She fully endorses the project • The proposed project will provide opportunities for education for the local youth as costs associated with transport and accommodation costs will be not be a hindrance. • Business opportunities will be generated in the community through the following potential revenue streams; <ul style="list-style-type: none"> ➢ Rental income ➢ Cottage industry ➢ Employment opportunities 	Info
3.	Bakari Omari Chuphi – Chief Waa	Response
	<ul style="list-style-type: none"> • Fully endorses the project • Grateful to the proponent, financier and County Government of Kwale for considering Waa area for implementation of the project. • The area has previously lost many opportunities for implementation of mega projects. • The anticipated environmental and social impacts envisaged are pretty insignificant in his opinion as it was just a construction project • Called on the plenary to deliberate on the potential impacts that may arise as a result of a proposed Cement factory project in the vicinity of the proposed project. How will this impact operations of the proposed Flagship Marine Centre especially during the operation phase? 	<ul style="list-style-type: none"> • The project implementation team will seek NEMA's guidance on how to approach issues from the proposed Cement Factory.
4.	Hamisi Bakari Mwamvyoga – Ass. Chief Waa	Response
	<ul style="list-style-type: none"> • Concerned about security along the main access road (a stretch of approximately 1 km). Proponent to consider installation of street lights. • The undeveloped parcel of land bordering the 	<ul style="list-style-type: none"> • KCNP in collaboration with the CGK will engage on how to effectively address the street lighting issue. • Adequate training and monitoring

SN	Comment	Response
	<p>proposed project site to the south (between the proposed project site and the beach) could act as hideouts for unscrupulous characters. This poses a significant security risk to students accessing the beach through that route.</p> <ul style="list-style-type: none"> • What security measures will be put in place to safeguard the safety of students and faculty from hazards from the ocean e.g., shark attacks while undertaking live training? 	<p>indicators will be incorporated in the curriculum to address potential hazards from the Ocean during live training.</p> <ul style="list-style-type: none"> • KCNP will be required to ensure close liaison with the local <i>nyumba kumi</i> (community policing) initiative and police station and also increase security patrols around the institution to ensure safety of the students.
5.	Amin Noor Mohammed - Chitsakamatsa Development Centre – Member	Response
	<ul style="list-style-type: none"> • Waa area has been generally blessed to be a pioneer for establishment of major development projects in the area notably Waa High School, Islamic Institute and now the proposed Regional Flagship Marine Transport and Port Logistics Centre. • He fully endorses the project. • Consider providing alternative access roads to those blocked by perimeter fencing of the proposed project site. • Road reserves along the main access road to the proposed project site have been encroached. This will pose a challenge for future initiatives to expand the road to accommodate the anticipated surge of traffic; especially during the operation phase. • Power line from Mombasa to Ukunda traverses very close to the proposed project site. This poses significant electrical hazards. • Komani Area experiences frequent power outage. Connection of power supply to the proposed project will overwhelm the existing Kenya Power main grid supply. Consider installing a stand-alone transformer for power supply to the proposed project site. On the same note consider 	<ul style="list-style-type: none"> • Same as previous, CGK on issue of the access roads and encroachment of road reserves. • The Symbion consortium consists of Mechanical and Electrical Engineers. The engineers will calculate electricity load requirements in light of the existing supply. Suitable recommendations shall be implemented prior to project commencement to ensure the existing supply is not overloaded. • A health centre has been conceptualized in the project design. This will however be implemented in the second phase of the project since funds for phase I have already been committed. • KCNP will document and implement a drug abuse policy. The policy shall entail awareness creation of the drug menace in the area during students' orientation • All the facilities at the proposed project site will be user friendly for

SN	Comment	Response
	<p>upgrading of the existing power supply to Komani Area.</p> <ul style="list-style-type: none"> • There are only 2 health centers in the general Komani Area. These will not be adequate to cater for the health needs of the students during operation phase of the project. Consider incorporating a health facility in the project design. • County Government of Kwale to consider expansion of Zote Public Beach to provide recreational services for the anticipated surge in student population. • Drug abuse is a major social menace in the locality. KCNP to consider awareness creation of the same during orientation of their students to the institution to caution them against getting entangled in the vice. • Are the amenities in the project design user friendly for people living with disabilities? 	<p>persons living with disability</p>
6.	Alexander M. Mativo – DCC Matuga	Response
	<ul style="list-style-type: none"> • The National and County Governments respectively fully supports and endorses the project. • The project will lay a good foundation for growth and development in the area. • Consider including a dispensary in the proposed project design. It will be strategic for use even by members of the community. • Consider sinking a borehole to provide water to the local community under the CSR programme. This will enhance acceptability and ownership of the project by the community. • Consider incorporating a chapel and a mosque in the project design to cater for the spiritual needs of the students. • Public participation is a continuous exercise. The 	<ul style="list-style-type: none"> • Same as previous for the dispensary • KCNP will consider sinking a borehole to provide water for the community as a long-term goal under their CSR programme. • A Chapel and a Mosque have been factored for implementation during Phase II of the project. KCNP/Symbion • Same as previous, for religious radicalization

SN	Comment	Response
	<p>project implementation team should be open to more suggestions even as the project progresses.</p> <ul style="list-style-type: none"> • The community should be sensitized to evaluate projects as independent entities. Each project should be judged on its own merits and not compared to others being implemented elsewhere. • Religious Radicalization is a significant social ill in Ngómbeni area. The institution should create awareness for its students accordingly. • He urged the local community leaders to support and ‘sale’ the project to the community. He advised them that history remember them fondly if they steer the community to ensure successful fruition of the project 	
7.	Calvince Rashid K.A – NEMA, Mombasa	Response
	<ul style="list-style-type: none"> • The project implementation team to ensure a thorough consultation and awareness creation for the grass-root community members. This will avert unnecessary delays occasioned by disruptions of activities during the project implementation. • The ESIA report should thoroughly articulate the waste water treatment process. Calculations of the WWTP capacity in light of the students’ population at full capacity should be clearly outlined. • Else, he did not foresee any major impact that would hinder implementation of the project. • He reiterated that the project would generate many positive impacts as articulated by the lead ESIA expert. 	Info
8.	Paul Omolo – KCNP Environment and Social Safeguards Focal Person	
	<ul style="list-style-type: none"> • In liaison with the community leaders, KCNP will continue with public participation forums as the 	Info

SN	Comment	Response
	<p>project progresses.</p> <ul style="list-style-type: none"> All of the major stakeholders of the project were members of the Grievance Resolution Committee. He called upon them to continue 'selling' the project to the community. At all instances, the project team should ensure respect for the culture of the local community. 	

Consultation meetings on the proposed project held are listed in table 6-3 above. Duly filled and signed attendance lists by delegates in the forums/meetings as well as detailed minutes of meetings of the deliberations therein are appended to this report (**Appendix VI**).

6.3 Structured questionnaires

Structured questionnaires were also administered to document the response from the respondents. (See **Appendix VII**)

The photographs below capture proceedings during the Stakeholders Public Participation and Consultation Meetings.



Plate 6-1 Delegates at the PIC meeting held at Swahili Port – Fort Jesus

The photographs below depict proceedings during the PIC Meeting held at **Southern Palm Beach Resort Hotel – Diani on Thursday 20th May, 2021**



Plate 6-2 Senior KCNP officials' in-attendance.



Plate 6-4 Submission by KCNP Centre Leader



Plate 6-3 Architect presenting the project scope



Plate 6-5 ESIA Expert presentation.



Plate 6-6 A Stakeholder responding to the presentation.



Plate 6-7 Delegates during the meeting.

7 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

7.1 Introduction

The environmental and social baseline information and the project characteristics discussed earlier as well as the public consultation process, formed the basis for impact identification and evaluation. The anticipated impacts are either positive or negative and relate to the various project development phases namely; planning and design, construction, operational and decommissioning.

The mitigation measures proposed have been derived based on application of Relevant Statutory Policy, Institutional and Legislative Guidelines, the ESIA team's professional knowledge and experience, feedback from the stakeholders during the CPP Meetings and Desktop studies involving projects of similar character and magnitude.

7.2 Planning and design phase

During the planning and design phase the following activities have been undertaken; design meetings by the project consultants, public participation meeting for stakeholders and capacity building of the community in relation to the proposed project implementation. Statutory approvals from lead government agencies including The County Government of Kwale – Planning Department, NEMA and DOSHS was also undertaken during this phase.

7.2.1 Potential Positive Impacts

7.2.1.1 Job Opportunities

During this phase job opportunity will be created for project consultants including the architects, engineers, quantity surveyor and ESIA experts. Business opportunities will also be created for the hotel providing conferencing and catering services during the CPP meetings.

7.2.1.2 Generation of Revenue for the Government

The levies and taxes paid for approval of the project plans by the County Government of Kwale and the project site registration fees payable to NCA and DOSHS respectively are revenue sources for the government.

7.3 Construction phase

7.3.1 Potential Positive Impacts

7.3.1.1 Job Opportunities

During the construction phase, there will be job opportunities especially for casual workers with the contractor's staff. Apart from casual labourers, skilled employees are also expected to obtain gainful employment during the construction phase. The local youths will be prioritized for non-skilled labour.

7.3.1.2 Provision of Market for Supply of Building Materials

The project will require supply of building materials such as bricks, cement, ballast, building sand, timber, metal bars, plastic pipes, glass, tiles, paints and electric fittings most of which will be sourced locally within Kwale County and its vicinity. This provides ready market for building material suppliers such as hardware shops and individuals with such materials.

7.3.1.3 Increased Business Opportunities for the Cottage Industry in the Surrounding Community

The construction crew will buy various commodities including food, airtime and other basic commodities from the neighbouring business premises. This would boost to the businesses in the community and consequently improve their livelihoods.

7.3.1.4 Knowledge transfer

Students from KCNP will be offered attachment placement during the construction phase of the project. This will serve as an opportunity for them to sharpen their knowledge and skills as they learn hands-on from the best experts in construction management in the country.

7.3.1.5 Improved Infrastructure

If the CGK heeds to the plight of the stakeholders and upgrades the main access road from Komani Centre to the institution to bitumen standards, the general project area will benefit through enhanced accessibility. The local community members will transport their farm produce to markets more efficiently.

7.3.1.6 Enhanced Security

Erection of street lights along the main access road between Komani Centre and the proposed project site will provide sufficient light at night. This will expose the hideouts where unscrupulous characters have been hiding to ambush pedestrians.

7.3.2 Potential Negative Impacts

Most of the potential environmental and social impacts associated with the construction phase will be temporary and can be mitigated with the use of standard environmental management procedures. The potential social impacts or nuisance will be those typically associated with construction activities involving vehicles, equipment, and workers. The predicted impacts include the following: -

7.3.2.1 Removal of Vegetation

Construction activities such as excavation, drilling of the boreholes and paving will necessitate clearing of vegetation. If not handled properly, this can be a significant impact considering the proposed project site is densely vegetated.

Mitigation measures

- Planting of vegetation (trees, shrubs and grass) in open spaces and around the project site and their maintenance.
- Limit excavation to areas earmarked for development
- Incorporate erection of structures to the merge with natural vegetation
- Design and implement an appropriate landscaping programme.
- Ensure protection of the flora and fauna by proper handling of cement during civil works.

7.3.2.2 Disturbance of Soil Geology

This will be as a result of the intensive activities that will be going on in the construction areas especially excavation of foundation and drilling of the boreholes. The heavy equipment and machines that shall be used in the construction process will interfere with the soil structure making it loose hence liable to erosion. Potential soil erosion impacts shall however be minimal. This is because the proposed project site is relatively flat. Potential surface run-off shall thus be relatively contained. The area around the proposed project site also has adequate vegetation. This shall significantly reduce the impacts of potential surface run-off by increasing infiltration.

Mitigation measures

- The top 6 inches of excavated material (a soil-and-rock matrix) must be separated from deeper excavated soils. Soils to be compacted to meet design specifications.
- Provide proper culvert and drainage channels for permanent access roads
- Excavated earth should be held away from areas susceptible to surface run-off of storm waters
- Limit excavations and substructure works including foundation to the approved plan to prevent furthering sub-surface impacts
- Ensure structures are not positioned on water courses or overhanging cliffs
- Compact loose soils on excavated areas and plant adequate vegetation to prevent soil erosion.
- Vegetated stands rich with prioritized species to be retained
- Provide appropriate drainage ways in between structures to offset infrastructural erosivity.
- Incorporate soil conservation methodologies during the whole project cycle e.g. site remediation techniques, re-use excavated soils for backfilling and landscaping.
- Use of minimally invasive drilling technology (rotary machines)
- Ensure geological rock samples are collected at 2 metres interval of drilling
- Refilling of trenches with soil to level after laying pipes
- Planting of vegetation to control soil erosion.

7.3.2.3 Hydrology and Water Quality Degradation

If not well managed, construction activities such as borehole drilling, excavations, compaction, concreting, slabbing and curing can negatively impact the hydrology and ground water quality at the project site area.

Mitigation measures

Several measures shall be put in place to mitigate the impacts that are likely to lead to hydrology and water quality degradation. These include;

- Engage a licensed hydro-geologist to monitor the drilling of boreholes and maintenance of the shallow wells.
- Ensure any sources of water pollution are eliminated. Control land use activities near the borehole well-head before, during drilling activities.
- Waste-water drainage channel should be constructed to lead water away from the pump pad at the boreholes
- Provide adequate waste receptacles and construction of sanitation facilities at KCNP should be at safe distance from well-head,
- Existing water ways or wetlands within and outside the construction zones to be preserved.
- All riparian zones and species next to water ways to be retained.
- Maintain drainage course flows during excavations
- Ensure storm water run-off from construction site is channelled through sieve traps, rocks or hay traps to remove organic pollutants
- Provide proper waste water drainage ways with treatment facilities where necessary
- Install silt traps or other control structures at the outset of the construction
- Stagger construction activities during wet seasons to prevent sedimentation.
- Use of storm water management practices that slow peak run-off flow, reduce sediment load, and increase infiltration.
- Use of vegetated swales; filter strips; terracing; check dams; detention ponds or basins; infiltration trenches; and infiltration basins.
- Where significant oil and grease is expected, using oil / water separators in the treatment activities.
- Regular inspection and maintenance of permanent erosion and run-off control features.
- Paving in dry weather to prevent run-off.

7.3.2.4 Solid Waste Generation

During construction, solid waste will be generated. These include; excavated soil from digging of foundations and drilling of the boreholes, waste papers from construction materials packaging including cement packs, plastic remains, pieces of timber and metal among others. Dumping around the site will interfere with its aesthetic status. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be aesthetic, pest breeding, pollution of physical environment, invasion of scavengers and informal recycling communities.

Effluent waste issue will arise from waste water during storm water run-off and sanitary facilities which could end up into the surface and ground water systems.

Mitigation measures

- Provide suitable and adequate mobile toilet facilities for the construction workers.
- Contractor should prepare a waste management plan prior to commencement of the construction activities
- Secure waste holding shed should be set up to facilitate segregation and temporary storage of wastes.
- Employees should be sensitized on environmental protection and waste management.
- Engage the services of a NEMA licensed solid waste handler to be collecting wastes from the premises.
- Provision of suitable solid waste receptacles on site that encourage waste segregation.
- Wastes should be segregated according to characteristics and their disposal routes will be determined according to the waste hierarchy, taking account of the potential for recycle or recovery for reuse where possible.
- All persons involved working at the proposed project should be provided with adequate and appropriate protective attire.
- Contractor to keep waste tracking forms for all the wastes that leave the site to ensure proper record keeping of waste movement
- Control movement and handling of waste.
- Stringent operational procedures to be put in place to control wastes ending up in landfills.
- Select an appropriate site for waste spoil piles to avoid blocking surface run-off or drainage ditches;
- Cover all spoil heaps or stockpiles during rainy season to prevent erosion and sediment run-off.
- Construction waste should be recycled or reused for backfilling and landscaping wherever feasible.

7.3.2.5 Unsustainable Sourcing of Construction Raw Materials

Sourcing of construction raw materials such as bricks, timber, ballast and sand from unsustainable suppliers contributes to numerous environmental and social-economic issues such as; generation of a huge carbon footprint during mining, processing and transportation of the raw materials, illegal timber logging, drying up of river beds, loss of bio diversity, abuse of labour laws, child labour, gender discrimination and spread of HIV and other STIs.

Mitigation Measures

- Source building materials from local suppliers who use environmentally friendly processes in their operations and are duly registered and licensed by relevant government lead agencies including the County Government, NEMA and KFS.

- Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered.
- Ensure accurate budgeting and estimation of food items during the operational phase to minimize wastage.

7.3.2.6 Impact on Air Quality / Exhaust Emissions

Exhaust emissions are likely to be generated by the construction equipment during the construction phase. Motor vehicles used to mobilize the work force and materials for construction would cause air quality impact by emitting pollutants through exhaust emissions. Because less quantities of building materials are required, such emissions will be minor and thus the impact will only be site specific.

Mitigation measures

- Construction sites and transportation routes (those that are murrum and earth standards) will be water-sprayed on regularly up to three times a day, especially if these sites are near sensitive receptors, such as residential areas or institutions (hospitals, etc.).
- All the vehicles and construction machinery should be operated in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.
- Cover all trucks hauling soil, sand and other loose materials with tarpaulins or require all trucks to maintain at least two feet of free-board.
- Use of protective equipment like dust masks on construction crew.
- Erection of dust nets around the specific work stations.
- Maintain all equipment and machinery as scheduled.
- Vehicle speed of trucks ferrying construction materials shall be limited to a maximum of 10 Km/hr within the construction site.

7.3.2.7 Noise and vibration generation

Significance of noise impacts depends on whether the project would increase noise levels above the existing ambient levels by introducing new sources of noise. Noise impacts would be considered significant if the project would result in the following:

- Exposure of persons to, or generation of noise levels in excess of 85 dB(A)
- Exposure of persons to, or generation of excessive ground-borne vibration or ground-borne noise levels.
- A substantial permanent increase in ambient noise levels (more than 5 dB (A)) in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Mitigation measures

- Use quiet equipment (i.e., equipment designed with noise control elements).
- Install sound barriers within activity areas.
- Construction works should be done during the day when people are away and also the outside environment is also noisy.
- Provide hearing protection PPE for all workers involved in the areas with elevated noise levels.
- Where possible, ensure non-mechanized construction to reduce the use of machinery
- Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace.

7.3.2.8 Risks of oil leaks and spills

Potential oil leaks and spills from construction machinery could lead to land pollution and surface/ground water pollution. If not contained, this could potentially negatively affect the health of the land, ground water and aquatic environments around the proposed project site.

Mitigation measures

- The Contractor should ensure that the employees on site are aware of the company procedures for dealing with spills and leaks from oil storage tanks e.g., using dispersants or adding biological agents to speed up the oil breakdown for the construction machinery through induction and safety training (the contractor will propose a method of clean-up which will be subject to approval). There will be limited use of motorized equipment during the construction with construction work mainly through manual hand-held equipment.
- In case of spillage the contractor should isolate the source of oil spill and contain the spillage to the source of leakage before it leaves the affected area, using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer.
- All areas where fuels and any hazardous chemicals or liquids are stored must be bunded and have the capacity to collect 110% of the volume of the material being stored. Industrial spill kits will be stationed at such locations.
- All vehicles and equipment should be kept in good working order, serviced regularly in accordance to the manufacturer's specifications and stored in an area approved by the Resident Engineer.

7.3.2.9 Traffic Congestion

There is potential for traffic congestion during the construction phases of the project. This will mainly result from vehicle bringing in construction materials and carting away construction rubble. The use of heavy moving construction vehicles and machineries in project sites is generally known to cause traffic reducing movement and flow of vehicles.

Mitigation measures

- The contractor should provide a traffic management plan to provide safety measures for motorists, including alternative routes, road signs and barriers.
- The contractor should choose traffic routes to reduce the impact in the neighborhood avoiding, as far as practical any sensitive areas.
- Provide traffic marshals at junctions at work areas with red and green flags to control the traffic.
- The contractor should provide road signs or notices to indicate ongoing works.
- Plan delivery and collection of construction materials to off-peak hours.
- Provision of adequate parking space within the facility.
- Ensure use of roadworthy vehicles that have been inspected and approved for all activities.
- Ensure all drivers have valid driving licenses.
- Maintain a log detailing every accident at site or associated with the project work activities.
- Ensure all the drivers in and around the site obey a speed limit of 10km/h.

7.3.2.10 Inadequate Consultation with Communities and Stakeholders**Mitigation measures**

- Undertake timely and prior disclosure of relevant project information, including project instruments, sub-project specific plans e.g., GRM, sub-project positive and negative impacts and opportunities.
- Ensure adequate consultations with the community and other relevant stakeholders.
- Ensure all community and stakeholders concerns or grievances raised are responded to in a timely manner.
- Ensure a functional project GRM is in place and accessible.
- Create awareness on project GRM to both community and workers.

7.3.2.11 Increased Security Risks and Conflicts with the Community

The major potential sources of conflicts during the construction phase of the proposed project include; locals not being prioritized for employment opportunities, pressure on existing shared resources especially water sources and access routes. Another potential source of conflict is social vices propagated by influx of workers seeking job opportunities at the proposed project site.

Moreover, project workers such as construction workers face the risk of exploitation, discrimination and other forms of unfair treatment by employers/contractors, e.g. being overworked with no compensation, low wages, and improper provision of proper PPEs and equipment for the works assigned, among others. This has the potential to cause conflicts resulting to workers' unrest. This can easily escalate and lead to injury to persons, damage of property and disruption of operations.

Mitigation measures

- Thoroughly screen workers, suppliers and distributors.
- Ensure 24-hour surveillance by engaging the services of day and night guards.
- Install CCTV cameras in strategic locations of the proposed project site.
- Create awareness on sub-project opportunities and benefits.
- Accord the local people the first priority in employment in both skilled and unskilled labor.
- Put in place a local recruitment plan that is fair and transparent (including recruitment processes that ensure inclusivity of both men and women, vulnerable individuals, ethnic groups and VMGs).
- Create awareness to workers and the community on worker and project grievance redress mechanisms.
- Create awareness to communities and workers on other redress mechanisms available and accessible to them such as the World Bank Grievances Redress Service, and the World Bank Inspection Panel.
- Source materials from local businesses, and where feasible give opportunities to businesses owned or operated by vulnerable individuals.
- Ensure close liaison with the local *nyumba kumi* (community policing) initiative and police station.
- Ensure all workers are registered with the local civil authorities.
- Invite all the stakeholders during public involvement and consultation forums.

7.3.2.12 Increased Incidence in HIV & other STI Infection

There is a potential risk of increase in the prevalence of HIV and other STIs during the construction phase of the project. This will be especially through labor influx induced sex work and potential sexual relations between migrant workers and women and girls in the community.

Mitigation measures

- Ensure all workers are registered with the local civil authorities.
- Ensure workers and community is consistently enlightened on emerging issues and work-related diseases such as HIV/AIDS
- Ensure strictness in work ethics
- Provide routine awareness programmes on HIV including VCT services in conjunction with service provider.
- The contractor, all sub-contractors to be compelled to sign and commit to code of conduct.
- Provide separate sanitary conveniences to workers of both sex.

7.3.2.13 Alcohol and Drug Abuse

The presence of migrant construction and other project workers in the community may lead to the emergence of small business hubs with kiosks for selling foodstuffs, cigarettes, alcohol, etc.

to serve the workers and other members of the community. This is addition to the already existing drug abuse menace in the area.

Mitigation measures

- Institute a “**ZERO TOLERANCE**” policy to drugs or alcohol abuse within the construction site and during working hours.
- Provide an ‘alcohol blow’ to test all workers accessing the construction site on alcohol consumption.
- Erect posters sensitizing workers on the dangers of drugs and substance abuse.

7.3.2.14 Use of Child Labour

There is potential of the contractor employing children who have not reached the employment age, therefore violating the child labour laws of the borrower. 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.

Mitigation measures

- Institutionalize zero tolerance to child labor clause in contractor’s code of conduct
- Where feasible, sensitize target community of child protection laws and child rights
- No child should be allowed to work on site
- Put in place warning signposts like “**NO JOBS FOR CHILDREN**”
- Workers will be educated on the relevant laws and polices protecting children
- Reach out to children in and out of school in the vicinity of the construction sites with a life skills program focusing on HIV/AIDS and sexual abuse prevention among others areas
- Strengthen school based and school led life skills programs targeting any schools near construction sites

7.3.2.15 Labour Influx and Related Impacts (Gender Based Violence (GBV), Sexual Harassment and HIV/AIDS

Due to labour influx for project activities during construction works, the project could exacerbate GBV, sexual harassment and other sexual offenses such as rape. Construction workers may engage in sexual fraternization with wives of other people. In addition to this being a driver of HIV infection, it will lead to domestic conflicts, GBV and domestic violence at household level. Women who seek employment may also face demands for sexual favors before being employed which amounts to sexual harassment. Even when employed, women may face continuous and unwanted demands for sex and risk losing their jobs if they do not give in. Women in the community and places of work may also face the risk being subjected to verbal harassment in the form of insults and demeaning comments in addition to unwanted gestures and touches by construction workers. Sexual harassment of women and girls might also happen as a result of mixing of women and men at the work-site. Outright rape is also a

risk some female employees may face when employed at construction sites. As a result, domestic violence and gender-based violence in homes, where it might have an impact to children who are likely suffer physically and emotionally.

Mitigation Measures

- Create awareness to communities and workers on GBV-SEA/SH, to demystify the stigma associated with GBV-SEA and SH.
- Prioritize hire of locals for skilled and semi-skilled (where feasible) and unskilled labour.
- Proponent to develop a code of conduct highlighting zero tolerance of sexual exploitation and abuse.
- The contractor including all workers to be compelled to sign the code of conduct
- Ensure workers and the community are consistently sensitized on emerging issues and work-related diseases such as HIV/AIDS.
- Put in place a functional project GRM including, awareness creation to communities and workers; and ensure that the GRM allows for confidential reporting of GBV cases.
- The contractor should provide a mechanism where workers are free to report any sexual exploitation and abuse to the senior management without fear of intimidation.
- Where feasible, the community within the vicinity of the polytechnic where construction will take place will also be educated on gender-based violence and sexual offenses such as sexual harassment, rape and defilement in the context of labor influx and the prevention and response measures.
- Partnerships will be established with relevant government agencies and NGOs to ensure survivors of GBV and sexual offenses access survivor centered services such as medical care, psychosocial support, legal redress, safety, etc. as and when necessary.

7.3.2.16 Gender Inequity in Employment

There is a potential risk that gender inequality might be perpetuated during project construction through unequal distribution of work, discrimination against women, and unequal pay for women, among others.

Mitigation measures

- Ensure equal pay for equal work among male and female employees
- Ensure that women are given adequate employment opportunities during recruitment and job postings
- Regular sensitization and awareness campaigns to the workers should be done to promote gender equity in employment during the construction works and during operation.
- Embrace equality in sharing out leadership position for male and female employees
- Provide adequate sanitation facilities for both men and women
- Introduce flexible work schedule for expectant and breastfeeding mothers

7.3.2.17 Non-adherence to National Labour Laws and Good Practices in Management of Workers e.g., forced labour, child labour

If not strictly adhered to, this may result to, this may result to outcry from the community with possible legal action instituted toward the contractor. Consequently, this may significantly derail implementation of the project.

Mitigation measures

- Create awareness on national labor laws and practices.
- Implement a labor management plan which specifies e.g., salary scale for given type of workers, opportunity for women etc.
- Ensure all workers have contracts with terms and conditions that are consistent with national labor laws and policies.
- 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.)
- Put in place a GRM for workers and facilitate workers to form a committee through which their grievances will be received attended to or channelled to management.
- Create awareness on the sub-project policy regarding use of child labour.

7.3.2.18 Non-inclusion of Contractor Responsible Social Risks Mitigation Measures in the Contract Agreement for the Contractor to Execute.

If not well handled, this may result in public unrest which may consequently interrupt operations and by extension timelines on deliverables for the project.

Mitigation Measures

- Ensure all contractor responsible social risk mitigation measures are captured contractually (included in the contractor's contract).
- Link final payment to contract to the requirement of addressing all worker related social risks.
- Ensure the contractor avails qualified and experienced social safeguards focal persons e.g., community liaison officers.
- Ensure the allocation of adequate budgets to manage social risks and impacts.

7.3.2.19 Impacts Related to Occupational Health and Safety

a) COVID-19 Infection and Spread

Concentration of workers mobilized for the construction activities may result in possible increase in the spread of the corona virus disease if one of them carries the virus to the workplace. This is however conditional on the prevalence of the disease.

Mitigation Measures

The contractor, workers, project consultants, proponent and government officers accessing the site will be required to strictly abide by the guidelines provided by WHO, MoH, NCA, WBG and

other line agencies in relation to Prevention of the spread of COVID 19. These include but are not limited to;

- Each construction site shall have an occupational health and safety officer/or a person in charge of the site sensitized on COVID-19 (names to be submitted to the respective NCA regional offices).
- Contractors to create awareness amongst their site workers on COVID-19 (signs and symptoms of COVID-19, how it spreads and how to protect themselves (including; respiratory hygiene, cough etiquette, hand hygiene, effective use of PPE and social distancing) and minimize chances of stigmatization and all construction works to be registered with National Construction Authority through the on-line platform <https://nca.go.ke/developers/project-registration/>).
- Body temperatures of construction workers and any other personnel visiting the site should be taken on arrival at the construction site and when they leave for home using non-contact infrared thermometer.
- Contractors are to employ administrative controls to aid in site worker separation and reducing people density through rotating shifts, separating trades/crews by piecework and other scheduled alternatives in line with the stipulated working hours by the Government of Kenya. For larger projects, separate entry/exit gates may be required.
- Anyone who has a fever or flu-like symptoms, is vulnerable (by virtue of their age or underlying health conditions) or is living with someone in self-isolation should not be allowed access to site. If a construction worker develops a fever or flu-like symptoms while at work, they should be advised accordingly, return home immediately and follow the Ministry of Health's guidelines on self-isolation. The worker should not return to work until their period of self-isolation has been completed and upon clearance by a medical doctor from a government Institution.
- Sites entry systems that require skin contact, such as fingerprint scanners should be removed. Work requiring skin to skin between workers' contact should not be carried out. Sites should not be accessed by non-essential visitors/persons.
- In addition to the normal construction site personal protective equipment (PPE) meant to protect the workers from hazards and dangers on the site, construction workers should be provided with face-masks and long-sleeved aprons for protection against COVID-19 infection from contaminated surfaces. Re-usable PPE should not be shared between workers and should be thoroughly cleaned after use. Disposable PPE should be disposed properly so that it cannot be reused. All equipment, plants and tools must be sanitized at the start of works twice daily, in the morning and at closure of site.
- Appropriate sanitation facilities including hand cleaning facilities should be provided at site entrances and exits. These should have soap and clean running water wherever possible or alcohol-based hand sanitizer if clean running water is not available. All workers should wash or sanitize their hands severally and before entering or leaving the site.
- Site cleaning regime should be increased and enhanced. Communal areas toolboxes and machinery and common contact surfaces should be cleaned and disinfected regularly.

- Mobile money/online banks transfer systems for payment of wages and salaries is highly encouraged. Workers' mobile phones must also be sanitized in the morning.
- The COVID-19 toll free number should be displayed on site.
- Establish a communication campaign in line with MoH guidelines to promote behavior change on site;
- Provide an easily accessible grievance mechanism to raise work place concerns relating to COVID-19; such as encourage reporting of co-workers if they show outward symptoms, such as ongoing and severe coughing with fever, and do not voluntarily submit to testing;
- Assess the workforce characteristics and adjusting work practices; decrease size of teams, avoid concentration of more than 15 persons at one location, where more than one person is gathered, maintain social distancing of at least 1.5 -2 meters

b) Occupational Accidents

The project may experience incidences of occupational accidents amongst workers from high-risk construction activities such as work at heights, confined space entry, rehabilitation of shallow wells, hot works and electrical works. Other potential hazards include slips and falls, burns, cuts and bruises, blunt trauma, and electrocution.

Mitigation Measures

- Documentation and implementation of a safety and health manual for the contractor across all the phases of the project cycle.
- Recruiting a full-time safety and health officer to oversee OSH compliance during the project implementation.
- Documentation and implementation of safe operation procedures (SOPs) including;
 - ✓ Safety orientation for all persons accessing the site
 - ✓ Daily tool box talks on potential OSH hazards and how to mitigate them.
 - ✓ Documentation and implementation of a Permit to Work system for all non-routine hazardous jobs e.g., work at heights, confined space entry, high voltage electrical works and hot works.
 - ✓ Job Safety Analysis (JSAs) for all potentially hazardous tasks.
- Erection of adequate precautionary signage at strategic locations within the proposed project site.
- Composition and training of Emergency Response Teams including; Safety and Health Committee, Fire Marshals and First Aiders.
- Provision of suitable, adequate and serviced fire extinguishers and first aid kits.
- Provision of suitable and adequate P.P.E. including; cover rolls, safety boots, reflector vests, eye protection, hearing protection, fall protection, gloves, dust masks among others.
- Provision of suitable and adequate welfare facilities including; wholesome drinking water, sanitary convenience facilities, first aid facilities, changing areas and rest areas.
- The site must have a functional grievance redress mechanism that allow workers to raise safety issues and propose improvements on site.

- Implementing good housekeeping practices such as cleaning up excessive debris and liquid spills as soon as possible to avoid possible slip and fall.

7.4 Operational Phase

7.4.1 Positive Impacts

7.4.1.1 Employment generation

Employment opportunities are one of the major positive impacts of the proposed project that will be realized after construction. Operation and Maintenance of the facilities will create employment for technicians, electricians, plumbers and other personnel. Job opportunities will also be created for consultants including auditors and inspections. The community members will also benefit through various opportunities created for qualified tutors as well as support staff including cleaners, janitors and security personnel.

7.4.1.2 Human Resource for the Local and Regional Marine Sector

Upon completion, the proposed project at KCNP will be a regional flagship Centre in the region in the disciplines of Marine Transport and Port Logistics. The facilities therein will be state of the art and modelled to address emerging aspects towards promotion of the Blue Economy both at the national and regional levels. KCNP will play an important role in providing skilled labour for International Shipping Lines and Logistics Companies, Kenya Maritime Authority, Kenya Port Authority, Kenya Ferry Services and other Maritime Organizations in the region and beyond. In addition, the recently launched Lamu Port under the Lamu, South Sudan, Ethiopia Transport (LAPSSSET) Corridor Project, will provide job opportunities for the graduates.

7.4.1.3 Increase in Property Value

The project will lead to a substantial appreciation of the property values of the area.

7.4.1.4 Increased Business Opportunities for the Local Community

The influx of students and faculty at KCNP will consequently increase demand for quality housing. Local community members who are able to erect quality hostels and residential buildings will reap big from the insatiable demand for housing. The influx in population will also create market for the local cottage industry for provision of basic commodities and services including food, household items, entertainment and other consumables creating ready markets for the surrounding business community. The ripple effects of this will be improved livelihoods consequently higher of the standards of living for the local community members.

7.4.1.5 Increased Security

The project will generally enhance the security in the locality through installation of street lighting along the access road to the institution.

7.4.1.6 Improved Hygiene and Sanitation

As part of their CSR programme, KCNP plans to provide free clean water to the community at various strategic points. This will consequently result to improved hygiene and sanitation. Consequently, incidents of water-borne diseases will significantly decrease.

7.4.1.7 Increased Enrolment of the Local Community Youths into Tertiary Institutions

Upon inception of operations, KCNP will provide a convenient Institution of Higher Learning to the community. This will remove huddles previously limiting enrollment into tertiary institutions by youths in the community such as transport and accommodation costs. This will improve literacy levels in the community and consequently enhance development.

7.4.2 Negative Impacts

7.4.2.1 Ground Water Depletion

The increased facilities and influx of students and faculty in the area will result to a substantial increase in consumption of water. This will consequently exert more pressure on the available resources which are already diminished.

Mitigation measures

- Adhere to extraction rate as recommended by the hydrogeologist
- Obtain a water permit from WRA prior to commencement of drilling
- Abstraction of water from the borehole should be within allowable conditions of the WRA permits,
- Install a water master meter to monitor consumption/abstraction of water.
- Identify opportunities for water saving
- Install a piezometer and airline to monitor borehole water levels
- Incorporate rain water harvesting technology into the project design.
- Sensitizing the workers, staff on efficient use of water.
- Put in place water conservation measures such as installing auto-shut water taps to reduce on water wastage
- Provide water storage tanks with adequate storage capacity
- Ensure that the water supply system is well maintained
- Ensure prompt detection of leaking water pipes and repair
- Consider reusing treated effluent from the PWWTP.
- Regular inspection of water pipelines and connections and ensure prompt repair and maintenance,

Sensitize the community on water conservation to limit on water wastage,

7.4.2.2 Maintenance Costs and Water User Charges

The project implementation will generate significant cost of maintenance of the water and waste water supply system.

Mitigation Measures

- Provision of budget for optimum maintenance of the water supply system including; borehole, pipelines and water storage structures
- Payment of water user charges as per WRA permit guidelines
- Sensitize the KCNP community on water resource management and conservation
- Encourage good record keeping and documentation including relevant permits and water monitoring records.
- Ensure the pipeline connections and joints are regularly checked to avoid water wastage

7.4.2.3 Increased Energy Demand.

The influx of people during the operation phase of the project coupled with the energy operational needs for the facilities and equipment will result into an increase in energy demand in the area.

Mitigation Measures

- Adopt energy efficiency measures including use of energy saving bulbs, sensor lighting, solar power and regular maintenance of machinery for efficiency.
- Alternative sources of energy such as; solar may be used to pump water from the borehole to the reservoir rather than use of generators,
- Make maximum use of natural ventilation and light.
- Switching off electrical appliances when not in use.
- Adopt use of energy efficient equipment (green star rated).
- Monitor energy consumption and keep records.
- Sensitizing the workers, staff and students on efficient use of energy resources.

7.4.2.4 Pollution to the Ground Water

Ground water pollution is expected from uncontrolled land use activities near the borehole well-heads after drilling activities and poor siting of sanitation facilities. This impact will also be relevant if the packaged WWTP fails or is damaged leading to the spillage of sewerage material to the environment.

Mitigation measures

- Engage a licensed surveyor to peg the riparian zone on all surface water bodies in close proximity to the proposed project site.
- Existing water ways or wetlands within and outside the construction zones to be preserved.
- All riparian zones and species next to water ways to be retained.
- Maintain drainage course flows during excavations
- Ensure storm water run-off from construction site is channeled through sieve traps, rocks or hay traps to remove organic pollutants
- Provide proper waste water drainage ways with treatment facilities where necessary
- Install silt traps or other control structures at the outset of the construction

- Provide adequate waste receptacles and sanitation facilities at the institution.
- Waste water drainage channel should be constructed to lead water away from borehole sites.
- Undertake periodic water quality analysis (chemical and bacteriological tests) in an approved laboratory during project operation phase.
- Document and implement a meticulous maintenance schedule for the WWTP.
- Conduct quarterly analysis of the treated effluent to evaluate its conformance to standards for discharge to the environment as per provisions of the 3rd Schedule under EMC (Water Quality Regulations, 2006).

7.4.2.5 Increased Generation of Solid Waste

Solid waste (biodegradable and non-biodegradable) generated during operation and maintenance activities will include; waste paper, food wastes and wastes from the general operations of the institution.

Mitigation measures

- Secure central waste holding shed should be set up to facilitate segregation and temporary storage of wastes.
- Employees should be sensitized on environmental protection and waste management.
- Institute waste reduction/minimization strategies within the institutions
- Engage the services of a NEMA licensed solid waste handler to be collecting wastes from the premises.
- Provision of suitable solid waste receptacles on site that are large enough.
- Track the wastes disposed from the institution and keep records.

7.4.2.6 Increased Generation of Storm Water and Impacts on Drainage

The proposed project will increase the amount of impermeable surface area, which increases the rate of surface water run-off. The increased or excess run-off could overwhelm local drainage system including the nearby stream with potential for increasing downstream flooding, damage to property, roads and crops. Flooding downstream can also become a health hazard by creating breeding ground for mosquitos.

Mitigation measures

- Use of storm water management practices that slow peak run-off flow, reduce sediment load, and increase infiltration.
- Use of vegetated swales; filter strips; terracing; check dams; detention ponds or basins; infiltration trenches; and infiltration basins.
- Where significant oil and grease is expected, using oil / water separators in the treatment activities.
- Regular inspection and maintenance of permanent erosion and run-off control features.
- Paving in dry weather to prevent run-off.

7.4.2.7 Fire Risks

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

Mitigation measures

- 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.
- Sensitization of all staff and students on fire safety, including fire prevention and fire-fighting.
- Conducting periodic fire drills.
- Provision of smoking guidelines.
- Develop and implement a fire safety policy.
- Ensure all flammables are stored in fire resistant areas.
- Erect “No Smoking Zones” signs especially in areas where flammable substances are stored
- Provide water reservoir to fight fire.
- Designate and mark a fire assembly points.
- Provision of emergency fire exits.
- Ensure all fire exit doors open outwards.
- Constitute and train fire marshals.
- Enhance security and vigilance at all times

7.4.2.8 Occupational Hazards and/or Accidents

These may result from unsafe acts and unsafe conditions if proper safety and health management systems are not documented and implemented during the operational phase of the project.

Mitigation Measures

- Constitute and train emergency response teams including safety and health committee, fire marshals and first aiders and facilitate the teams to undertake their respective mandates.
- Undertake statutory annual safety and health audits and adhere to the recommendations.

7.4.2.9 Inaccessibility of Project Benefits where project is not Disability and Elderly Sensitive

This may result in public outcry, civic unrest and potential legal action which may ultimately derail implementation of the project.

Mitigation Measures

- Ensure that the facilities are user-friendly for PWDs and the elderly, in consultation with all community segments.
- Ensure a functional and culturally appropriate GRM is in place and accessible.

7.4.2.10 Drug and Substance Abuse

During the stakeholders' engagement forums, it was reported that drugs and substance abuse was prevalent around the proposed project area.

Mitigation Measures

- Create awareness to the students about the drug abuse menace in the locality and related impacts.
- Establish peer to peer mentorship teams to champions against drug and substance abuse
- Form coalitions with the local community in the fight against drug abuse.
- Establish a training and counselling center with competent personnel at the institution.
- Incorporate Drug Abuse Resistance Education (DARE) in the students' curriculum.
- Introduce behavioral modelling and behavioral modification strategies/programmes at the institution.
- Introduce students' mentorship programmes.
- Enhance security at the entry points into the institution.
- Erect signs and posters sensitizing students on the dangers of drugs and substance abuse

7.4.2.11 Religious Radicalization

During the stakeholders' engagement forums, it was reported that religious radicalization was prevalent around the proposed project area.

Mitigation Measures

- Create awareness to students about the menace of radicalization in the local community and its related impact.
- Collaborate with the local community associations on security issues.
- Conduct open days in the institute to show case some of the achievements made by the youth
- In collaboration with the government security agencies, support community resilience to violent extremism programmes/campaigns

7.5 Decommissioning phase

7.5.1 Positive Impacts

7.5.1.1 Employment Opportunities

Several employment opportunities will be created for the demolition staff. Business will also be generated for scrap metal dealers and other recyclable debris where reuse is undesirable.

7.5.2 Negative Impacts

7.5.2.1 Solid Waste Generation

Demolition of the project structures will result in moderate quantities of solid waste. The demolition waste will however generally be less harmful to the environment since they are composed of inert materials.

Mitigation measures

- Similar measures as outlined in **section 7.3.2.4** above.
- Provide suitable and adequate mobile toilet facilities for the construction workers.
- Contractor should prepare a waste management plan prior to commencement of the demolition activities
- Secure waste holding shed should be set up to facilitate segregation and temporary storage of wastes.
- Employees should be sensitized on environmental protection and waste management.
- Provision of suitable solid waste receptacles on site that encourage waste segregation.
- Wastes should be segregated according to characteristics and their disposal routes will be determined according to the waste hierarchy, taking account of the potential for recycle or recovery for reuse where possible.
- All persons involved working at the proposed project should be provided with adequate and appropriate protective equipment
- Contractor to keep waste tracking forms for all the wastes that leave the site to ensure proper record keeping of waste movement
- Control movement and handling of waste.
- Stringent operational procedures to be put in place to control wastes ending up in landfills.
- Select an appropriate site for waste spoil piles to avoid blocking surface run-off or drainage ditches;
- Construction waste should be recycled or reused for backfilling and landscaping wherever feasible.
- All installations, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible
- All foundations must be removed and recycled, reused or disposed of at a licensed disposal site,
- Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site
- Donate reusable demolition waste to charitable organizations, individuals and institutions

7.5.2.2 Air/Dust Pollution

Dust will be generated during demolition works. This localized generation of dust and particulate matter will affect demolition staff but hardly the neighbouring community

Mitigation measures

- Similar measures as outlined in **section 7.3.2.6** above.
- Construction sites and transportation routes (those that are murrum and earth standards) will be water-sprayed on regularly up to three times a day, especially if these sites are near sensitive receptors, such as residential areas or institutions (hospitals, etc.).

- All the vehicles and construction machinery should be operated in compliance with relevant vehicle emission standards and manufacturer's specification to minimize air pollution.
- Cover all trucks hauling soil, sand and other loose materials with tarpaulins or require all trucks to maintain at least two feet of free-board.
- Use of protective equipment like dust masks on construction crew.
- Erection of dust nets around the specific work stations.
- Maintain all equipment and machinery as scheduled.
- Vehicle speed of trucks ferrying construction materials shall be limited to a maximum of 10 Km/hr within the construction site.

7.5.2.3 Noise and Vibration

The demolition works will lead to mild deterioration of the environment within the project site and the surrounding areas through noise and vibrations.

Mitigation measures

- Similar measures outlined in **section 7.3.2.7** above.
- Use quiet equipment (i.e., equipment designed with noise control elements) during demolition
- Install sound barriers within activity areas.
- Demolition works should be done during the day when people are away and also the outside environment is also noisy.
- Provide hearing protection PPE for all workers involved in the areas with elevated noise levels.
- Where possible, ensure non-mechanized machinery to reduce the use of machinery
- Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace.

7.5.2.4 Occupational Health and Safety Hazards

Decommissioning activities could generate potential safety and health impacts including falls from heights, falling debris, noise, dust, mechanical hazards, and ergonomic hazards resulting from poor manual handling. Misidentified electrical utilities could also cause electric shocks or even electrocutions.

Mitigation measures

- Similar measures outlined in **section 7.3.2.19 b** above.
- Documentation and implementation of a safety and health manual for the contractor during decommissioning phase
- Recruiting a full-time safety and health officer to oversee OSH compliance during the demolition
- Documentation and implementation of safe operation procedures (SOPs) including;
 - ✓ Safety orientation for all persons accessing the site

- ✓ Daily tool box talks on potential OSH hazards and how to mitigate them.
- ✓ Documentation and implementation of a Permit to Work system for all non-routine hazardous jobs e.g., work at heights, confined space entry, high voltage electrical works .
- ✓ Job Safety Analysis (JSAs) for all potentially hazardous tasks.
- Erection of adequate precautionary signage at strategic locations within the proposed project site.
- Composition and training of Emergency Response Teams including; Safety and Health Committee, Fire Marshals and First Aiders.
- Provision of suitable, adequate and serviced fire extinguishers and first aid kits.
- Provision of suitable and adequate P.P.E. including; cover rolls, safety boots, reflector vests, eye protection, hearing protection, fall protection, gloves, dust masks among others.
- Provision of suitable and adequate welfare facilities including; wholesome drinking water, sanitary convenience facilities, first aid facilities, changing areas and rest areas.
- The site must have a functional grievance redress mechanism that allow workers to raise safety issues and propose improvements on site.
- Implementing good housekeeping practices such as cleaning up excessive debris and liquid spills as soon as possible to avoid possible slip and fall.

7.5.2.5 Soil and Water Contamination from Decommissioning of the WWTP

If not well handled the decommissioning of the WWTP could result to contamination of soil and ground water from seepage of remnant effluent, oils and grease.

Mitigation measures

- Provide adequate waste receptacles and construction of sanitation facilities
- Use of storm water management practices that slow peak run-off flow, reduce sediment load, and increase infiltration.
- The Contractor should ensure that the employees on site are aware of the procedures for dealing with spills and leaks using dispersants, adding biological agents to speed up the oil breakdown or use oil / water separators in the treatment activities.
- In case of spillage the Contractor should isolate the source of oil spill and contain the spillage to the source of leakage before it makes it leaves the affected area, using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer.
- Regular inspection and maintenance of permanent erosion and run-off control features.
- Compact loose soils after demolition and plant adequate vegetation to prevent soil erosion.
- During decommissioning of the borehole, care should be taken to avoid contamination of the remaining water in the aquifer.

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

8.1 Introduction

The proponent of the proposed project acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health and safety of its employees, the wider public as well as the local residents. Thus, the focus will be on minimizing/ mitigating the negative impacts and enhancing the positive impacts associated with the project activities through a programme of continuous improvements.

An environmental and social management/monitoring plan has been developed to assist the proponent in mitigating and managing environmental health and safety as well as the negative social impacts associated with the proposed project activities. The ESMP has been developed to provide a basis for an Environmental Management System (EMS; ISO 14001 principles) for the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESMP. As such, the ESMP will be subject to a regular regime of periodic review.

8.2 Role of Project Stakeholders in ESMP implementation

The ESMP has also allocated responsibilities to the divergent project stakeholders as follow;

8.2.1 Contractor

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

8.2.2 Supervising Consultants

- Review the contractor environment and Social Management Plan (C- ESMP) and other EHS plans prepared by the contractor and provided the required guidance
- Supervision consultant will be required to have an EHS officer on day-to-day guidance on project matters on environment, social, health and safety issues
- Responsible for approvals of the construction materials to be used in the project
- Ensure compliance with the ESMP and other plans prepared through supervision and monitoring of environmental and social issues and reports to KCNP

- Provide information to KCNP related to HSE (Health, Safety and Environment) performance, and immediately report any significant environmental incident or worker accident,
- Responsible for compiling the environment health and safety monitoring reports and share with KCNP.

8.2.3 Kenya Coast National Polytechnic (KCNP)

- Ensure the environmental and social requirements are prescribed in contractors bidding documents
- Take overall responsibility of ensuring that the mitigation measures proposed in the ESIA/ESMP and CESMP are implemented
- 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,
- Ensure a functioning grievance redress mechanism and follow-up all environment and social issues raised,
- Share the monthly and quarterly monitoring reports with the Bank.
- Report immediately to the World Bank upon occurrence of any significant environmental, social, or health and safety incidents
- Develop and fully implement including the necessary resources, all operational phase EHS plans

8.2.4 The National Environment Management Authority (NEMA)

- To review the ESIA project report and ensure its compliance with statutory environmental legislative framework; primarily EMCA 1999 amended in 2015 and her subsidiary legislations.
- Develop conditions for implementation of the project to ensure sustainability and conformance with statutory legislative requirements.
- Issue the ESIA license authorizing commencement of the project following review and approval of the ESIA project report.
- Conduct periodic inspection of the project site to monitor adherence with the ESMP developed during the ESIA process.

8.2.5 The Directorate of Occupational Safety and Health Services.

- Registration of the project site as a workplace and issuance of registration certificate.
- Conduct periodic inspection of the project site to monitor compliance with OSH requirements.
- Arbitrate any compensation claims for workers in the project occasioned by incidents of occupational diseases or accidents.

8.2.6 County Government of Kwale (CGK).

- Reviews and approvals of the project architectural and structural plans/drawings.
- Implementation of the Kwale County by laws relevant to the project implementation.
- Supervise the implementation of the approved project design

8.2.7 The National Construction Authority

- Registration of the proposed project site.
- Quality assurance for the proposed project activities at site.
- Supervision of the project contractor.

8.2.8 World Bank

- Overall supervision of the project to ensure alignment with the project's objectives and terms of reference.
- Review of the ESIA document to ensure conformance with the Bank's Environmental and Social Safeguards.
- Periodic monitoring of the project to ensure conformance with WBG guidelines, and the safeguard instruments prepared for the project.

Tables 8-1, 8-2 and 8-3 below form the core of this ESMP for the design and construction, operational and decommissioning phases of the proposed project respectively. In general, the tables outline the potential safety, health, environmental and social risks associated with the project and detail all the necessary proposed mitigation measures, their associated costs, as well as the persons responsible for their implementation and monitoring. The ESMP will be used as a checklist in future environmental, social and safety and health audits.

8.3 Construction Phase ESMP

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction phase the proposed project are outlined in **Table 8-1** below.

Table 8-1 ESMP for the Design and Construction Phase of the Proposed Project

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
1. Social Impacts				
Stakeholders Involvement and Participation	<ul style="list-style-type: none"> Develop a Stakeholder Engagement Plan for affected proximal developments - Ensure all stakeholders and the public are involved in the planning process. 	KCNP, Contractor & Project Consultants	Satisfactory settlements of any complaints raised by the project stakeholders	50,000
Social ills and spread of diseases including HIV/AIDS, and STD	<ul style="list-style-type: none"> Develop a comprehensive STDS, HIV and AIDs control programme. Provision of STDs, HIV and AIDS prevention measures to workers. Creation of awareness of STDs, HIV/AIDS in workers' camps. Organize moonlight Voluntary Counselling and Testing (VCT) sessions for the workers in conjunction with local service providers. 	KCNP, Contactor & Project Consultants	No new STD/HIV infection incident linked to the proposed project.	50,000

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Child Protection	<ul style="list-style-type: none"> • Institutionalize zero tolerance to child labor clause in contractor's code of conduct. • Where feasible, sensitize target community of child protection laws and child rights. • No child should be allowed to work on site. • Put in place warning signposts like "NO JOBS FOR CHILDREN". • Workers will be educated on the relevant laws and policies protecting children. • Reach out to children in and out of school in the vicinity of the construction sites with a life skills program focusing on HIV/AIDS and sexual abuse prevention among others areas. • Strengthen school based and school led life skills programs targeting any schools near construction sites. • Ensure visibility of signage and information, education and communication materials on such issues in the construction site. 	KCNP, Project & CGK Contractor, Consultants	No child labor incidents linked to the proposed project.	20,000

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Gender Inclusivity.	<ul style="list-style-type: none"> • Ensure equal pay for equal work among male and female employees. • Ensure that women are given adequate employment opportunities during recruitment and job postings. • Regular sensitization and awareness campaigns to the workers should be done to promote gender equity in employment during the construction works and during operation. • Provide adequate sanitation facilities for both men and women • Introduce flexible work schedule for expectant and breastfeeding mothers. • Embrace equality in sharing out leadership position for male and female employees. 	KCNP, Contractor	No gender-based violence reported at the proposed project site	In the project cost

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA).	<ul style="list-style-type: none"> • Create awareness to all community segments and project workers on GBV/SEA-SH, to demystify the stigma associated with GBV/SEA and H including prevention and management. • Ensure a code of conduct highlighting zero tolerance of sexual exploitation and abuse is signed by all project workers with physical presence on site. • The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases. • Create awareness on project GRM to all community segments and project workers. • The contractor to communicate to workers that there should be no interaction with the students. • Map all GBV service providers and document referral services for survivors. • Contractor to prepare and enforce a No Sexual Harassment Policy in accordance with national law where applicable. • Where feasible map out all the GBV/SEA service providers as well as referral pathways. • Partner with relevant government agencies and NGOs to ensure survivors of GBV and sexual offenses access survivor centered services such as medical care, psychosocial support, legal redress, safety, etc. as and when necessary. • Provision of gender disaggregated data, separate bathing, changing, sanitation facilities for men and women 	KCNP, Contactor & Project Consultants	No incident of gender-based violence or sexual harassment record linked to the proposed project	100,000

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Employment - Labour issues	<ul style="list-style-type: none"> The contractors should as far as possible engage the local skilled and unskilled labour within the project area during construction stages Ensure that the local communities are given priority in relation to employment -all unskilled labour should be contracted or obtained from the local community if possible. Ensure that all workers have contracts with terms and conditions that are consistent with national labour laws and polices Every worker should also sign a code of conduct as an annex to the employment contract - covering issues such as zero tolerance of unacceptable conduct in the community, GBV, sexual harassment, sexual exploitation and abuse of children, etc. Facilitate workers to form a committee through which their grievances will be received attended to or channeled to management 	KCNP, Contactor & Project Consultants	Satisfactory resolution of any labour related issues arising from the proposed project.	In project cost
Increased Security Risks	<ul style="list-style-type: none"> Thoroughly screen workers, suppliers and distributors. Ensure 24-hour surveillance by engaging the services of day and night guards. Install CCTV cameras in strategic locations of the institution. Accord the local people the first priority in employment. Ensure close liaison with the local Police Department. 	KCNP, Contractor & Project Consultants	Satisfactory resolution of any security related risks arising from the proposed project.	In project cost
Inaccessibility to project benefits.	<ul style="list-style-type: none"> Ensure the facilities are accessible to PWD and elderly persons. Create awareness on project GRM. 	KCNP, Contractor	Fully incorporated PWD facilities in the proposed project	In the project cost

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Non-inclusion of contractor responsible social risks mitigation measures.	<ul style="list-style-type: none"> • Ensure all contractor responsible social risk mitigation measures are captured contractually (included in the contractor's contract). • Link final payment to contract to the requirement of addressing all worker related social risks. • Ensure the contractor avails qualified and experienced social safeguards focal persons e.g., community liaison officers. • Ensure the allocation of adequate budgets to manage social risks and impacts. 	KCNP, Contractor	No complaints regarding employees' payment linked to the proposed project.	In the project cost
Conflicts/grievances caused by: d. Non employment of locals. e. Inadequate stakeholder consultation on project activities. f. Nonpayment/delayed payment of workers.	<ul style="list-style-type: none"> • 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. • Ensure careful documentation of all grievances received; processed, resolved and closed out. • Ensure that anonymous complaints are documented and addressed to the satisfaction of the affected parties. • 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. • Document and disclose all stakeholder consultation for the proposed project. 	KCNP, Contractor	Properly developed GRM	In the project site

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
<p>Non adherence to national labor laws and good practices in the management of workers.</p>	<ul style="list-style-type: none"> • Create awareness on national labor laws and practices. • Implement a labor management plan which specifies e.g., salary scale for given type of workers, opportunity for women etc. • Ensure all workers have contracts with terms and conditions that are consistent with national labor laws and policies. • 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.) • Sensitize project workers on actual meaning and implication of the Code of conduct before signing it. • Put in place a GRM for workers and facilitate workers to form a committee through which their grievances will be received attended to or channeled to management. • Put in place a GRM for project workers and facilitate project workers to form a committee through which their grievances will be received attended to or channeled to management. • Create awareness on the sub-project policy regarding use of child labour to all community segments and project workers. • 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. • Ensure no children are allowed on sub-project sites and put visible signage on site “No Jobs for children”. • Ensure a functional and easily accessible project GRM is in place. • Create awareness on project GRM to all community segments and project workers. 	<p>KCNP, Contractor</p>	<p>Adherence to national labour laws</p>	<p>In the project cost</p>

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
2. Changes in geological environment				
Disturbance of soil geology: (Change of local aspect, increased erosivity index, impact on underlying bedrock, soil compaction and patterns of pressure release.	<ul style="list-style-type: none"> The top 6 inches of excavated material (a soil-and-rock matrix) must be separated from deeper excavated soils. Soils to be compacted to meet design specifications. Provide proper culvert and drainage channels for access roads at the institutions Excavated earth should be held away from areas susceptible to surface runoff of storm waters Limit excavations and sub-structure works including foundation to the approved plan to prevent furthering subsurface impacts Ensure structures are not positioned on water courses Plant adequate vegetation to prevent washing away of top soil by storm water Rich vegetated stands of prioritized species to be retained Provide appropriate drainage ways in between structures to offset infrastructural erosivity. Incorporate soil conservation methodologies during the whole project cycle e.g., site remediation techniques 	KCNP, Contractor, Project Consultants, NEMA	No activities recorded from the proposed project that arise to soil erosion	100,000
Removal of vegetation	<ul style="list-style-type: none"> Plant vegetation (trees, shrubs and grass) in open spaces and around the project site and their maintenance. Limit excavation to areas earmarked for development. Incorporate erection of structures to merge with natural vegetation. Design and implement an appropriate landscaping programme. 	Proponent, Contractor	Well designed and landscaped area	In the project cost
3. Interruption of Natural Water Courses				

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
<p>Interruption of natural water courses: stream pollution, impacts on hydro fauna and flooding impacts</p>	<ul style="list-style-type: none"> Engage a licensed surveyor to peg the riparian zone on all surface water bodies in close proximity to the proposed project site. Existing water ways or wetlands within and outside the construction zones to be preserved. All riparian zones and species next to water ways to be retained. Maintain drainage course flows during excavations Ensure storm water run-off from construction site is channelled through sieve traps, rocks or hay traps to remove organic pollutants Provide proper waste water drainage ways with treatment facilities where necessary Install silt traps or other control structures at the outset of the construction Stagger construction activities during wet seasons to prevent sedimentation 	Proponent & Contractor	No incidents of surface water pollution or negative impacts on hydro fauna recorded during the proposed project implementation.	100,000

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Ground water Pollution	<ul style="list-style-type: none"> • Ensure that screens are placed against the optimum aquifer zones • Ensure the well is cased and screened with good quality material (uPVC of high open surface area) • After installation, gravel packed sections should be sealed off top and bottom with clay (2 m) • The annular space should be backfilled with an inert material • The top 5 metres should be grouted with cement to ensure that no surface water at the well head can enter the water bore and cause contamination • Ensure efficient well development and cleaning after completion of the borehole (air or water jetting is preferred) 	Proponent & Contractor	Water quality analysis parameters that meet WHO standards for domestic water	10,000 every quarter
Increased generation of storm water	<ul style="list-style-type: none"> • Use of storm water management practices that slow peak run-off flow, reduce sediment load and increase infiltration. • Use of vegetated swales, filter strips, terracing, check dams, detention ponds or basins, infiltration trenches and infiltration basins. • Regular inspection and maintenance of permanent erosion and run-off control features. 	Proponent & Contractor	Adequate storm water drainage facilities for run off flow.	100,000
4. Minimize extraction site impacts and ensure efficient use of raw materials in construction				

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
High Demand of construction raw materials	<ul style="list-style-type: none"> Source construction materials from local suppliers who use environmentally friendly processes in their operations Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered Ensure that damage or loss of materials at the construction site is kept minimal through proper storage. 	KCNP, Contractor, Project Consultants, NCA	Sustainable sourcing of construction raw materials.	In project budget
5. Minimize solid waste generation and ensure efficient solid waste management during construction				

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Increased solid waste generation	<ul style="list-style-type: none"> 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. Through accurate estimation of the sizes and quantities of materials required, order materials in the sizes and quantities they will be needed rather than cutting them to size, or having large quantities of residual materials Ensure that construction materials left over at the end of construction will be used in other projects rather than being disposed off. 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 Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements Purchase of perishable construction materials such as paints should be done incrementally to ensure reduced spoilage of unused materials 	Contractor, Project Consultants, KCNP & NEMA	Efficient solid waste management as per the provisions of EMCA, (Waste Management) Regulations, 2006.	200,000
6. Reduce dust emissions				
Dust emission	<ul style="list-style-type: none"> Water all loose material regularly during extremely dry weather events. Cover all unconsolidated materials with dust nets/ hessian bags and demarcate the site boundaries using dust nets and other screening technologies. Provide suitable and adequate personal protective equipment to be worn by workers 	KCNP, Contractor, NEMA & DOSHS	Satisfactory resolution of any complaints arising from the proposed project neighbours.	200,000
7. Minimization o of exhaust emissions				

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Exhaust emission	<ul style="list-style-type: none"> Vehicle idling time shall be minimized Alternatively fueled construction equipment shall be used where feasible, equipment shall be properly tuned and maintained 	KCNP, Contractor, Project Consultants & NEMA	Conformance to provisions of EMCA (Air Quality) Regulations, 2009.	0
8. Minimization of Noise and Vibration				
Noise and vibration	<ul style="list-style-type: none"> Sensitize construction vehicle drivers and machinery operators to switch off engines of vehicles or machinery not in use. Ensure that construction machinery is kept in good condition to reduce noise generation Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels The noisy construction works will entirely be planned to be during daytime when most of the neighbours will be at work Comply with the provisions of Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace 	KCNP, Contractor, NEMA & DOSHS	Conformance to provisions of EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009	100,000
9. Minimization of energy consumption				

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Increase Pressure on energy resources/increased energy demand.	<ul style="list-style-type: none"> • Ensure electrical equipment, appliances and lights are switched off when not being used • Ensure planning of transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts • Monitor energy use during construction and set targets for reduction of energy use. • Promote the use of energy efficient bulbs (LED) in the proposed project structures • Switch off lights when not in use. • Install electricity meters to monitor the consumption of electricity in workers' camps. • Erect energy conservation signage at strategic locations. 	KCNP, Contractor, Project Consultants, NEMA	Sustainable utilization of energy resources.	In project budget
10. Minimize water consumption and ensure more efficient and safe water use				
Increased pressure on ground water resources	<ul style="list-style-type: none"> • Adhere to extraction rate as recommended by the hydro-geologist • Obtain a water permit from WRA prior to commencement of drilling • Install a water meter to monitor consumption • Identify opportunities for water saving • Install a piezometer and airline to monitor borehole water levels • Provide water storage tanks with adequate storage capacity • Ensure that the water supply system is well maintained • Recycle the treated effluent from the WWTP 	KCNP, Contractor, Project Consultants, NEMA	Sustainable utilization of water resources.	In project cost
11. Minimize Occupational Safety and Health Risks				

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Risk of spread of COVID-19	<ul style="list-style-type: none"> Each construction site shall have an occupational health and safety officer/or a person in charge of the site sensitized on COVID-19 (names to be submitted to the respective NCA regional offices). Contractors to create awareness amongst their site workers on COVID-19 (signs and symptoms of COVID-19, how it spreads and how to protect themselves (including; respiratory hygiene, cough etiquette, hand hygiene, effective use of PPE and social distancing) and minimize chances of stigmatization and all construction works to be registered with National Construction Authority through the online platform https://nca.go.ke/developers/project-registration/). Body temperatures of construction workers and any other personnel visiting the site should be taken on arrival at the construction site and when they leave for home using non-contact infrared thermometer. Contractors are to employ administrative controls to aid in site worker separation and reducing people density through rotating shifts, separating trades/crews by piecework and other scheduled alternatives in line with the stipulated working hours by the Government of Kenya. For larger projects, separate entry/exit gates may be required. 	KCNP, Contractor, NCA, DOSHS	Satisfactory containment of any COVID 19 incidents recorded at the proposed project site.	50,000

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
	<ul style="list-style-type: none"> • Anyone who has a fever or flu-like symptoms, is vulnerable (by virtue of their age or underlying health conditions) or is living with someone in self-isolation should not be allowed access to site. If a construction worker develops a fever or flu-like symptoms while at work, they should be advised accordingly, return home immediately and follow the Ministry of Health's guidelines on self-isolation. The worker should not return to work until their period of self-isolation has been completed and upon clearance by a medical doctor from a government Institution. • Sites entry systems that require skin contact, such as fingerprint scanners should be removed. Work requiring skin to skin between workers' contact should not be carried out. Sites should not be accessed by non-essential visitors/persons. • In addition to the normal construction site personal protective equipment (PPE) meant to protect the workers from hazards and dangers on the site, construction workers should be provided with face-masks and long-sleeved aprons for protection against COVID-19 infection from contaminated surfaces. Re-usable PPE should not be shared between workers and should be thoroughly cleaned after use. Disposable PPE should be disposed properly so that it cannot be reused. All equipment, plants and tools must be sanitized at the start of works twice daily, in the morning and at closure of site. • Appropriate sanitation facilities including hand cleaning facilities should be provided at site entrances and exits. These should have soap and clean running water wherever possible or alcohol-based hand sanitizer if clean running water is not available. All workers should wash or sanitize their hands severally and before entering or leaving the site. 			

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
	<ul style="list-style-type: none"> Site cleaning regime should be increased and enhanced. Communal areas toolboxes and machinery and common contact surfaces should be cleaned and disinfected regularly. The COVID-19 toll free number should be displayed on site. Establish a communication campaign in line with MoH guidelines to promote behavior change on site; Provide an easily accessible grievance mechanism to raise work place concerns relating to COVID-19; such as encourage reporting of co-workers if they show Mobile money/on-line banks transfer systems for payment of wages and salaries are highly encouraged. Workers' mobile phones must also be sanitized in the morning. outward symptoms, such as ongoing and severe coughing with fever, and do not voluntarily submit to testing; Assess the workforce characteristics and adjusting work practices; decrease size of teams, avoid concentration of more than 15 persons at one location, where more than one person is gathered, maintain social distancing of at least 1.5 -2 meters 			
Unapproved architectural plans and designs	<ul style="list-style-type: none"> Ensure that all plans are approved by the CGK Physical Planning Department and the local Occupational Health and Safety Office 	KCNP, Project Consultants, Contractor, CGK, DOSHS	Provision of plans duly approved by all requisite Government Lead Agencies	Ongoing
Social Evils/Crime.	<ul style="list-style-type: none"> Provide security at the construction site. Ensure adequate checking of visitors to the site. Engage management of polytechnic in hiring workers as they have more knowledge of local people. Engage CCTV camera in appropriate places. 	KCNP, Contractor	Provision of 24/7 security at the proposed project site	In the project cost

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Increased traffic	<ul style="list-style-type: none"> • Document and implement a traffic management plan. • Plan delivery and collection of construction materials to off-peak hours. • Provision of adequate parking space within the facility. • Provide adequate signage in liaison with traffic authorities. • Ensure use of roadworthy vehicles that have been inspected and approved for all activities. • Ensure all drivers have valid driving licenses. • Maintain a log detailing every accident at site or associated with the project work activities. 	KCNP, Contractor	Documented traffic management plan	In the project cost

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Incidents, accidents and dangerous occurrences.	<ul style="list-style-type: none"> • Documentation of a safety and health plan for the contractor across all the phases of the project implementation. • Recruiting a full-time safety and health officer to oversee OSH compliance during the project implementation. • Documentation and implementation of safe operation procedures (SOPs) including; • Safety orientation for all persons accessing the site • Daily tool box talks on potential OSH hazards and how to mitigate them. • Documentation and implementation of a Permit to Work system for all non-routine hazardous jobs e.g., work at heights, confined space entry, high voltage electrical works and hot works. • Job Safety Analysis (JSAs) for all potentially hazardous tasks. • Erection of adequate precautionary signage at strategic locations within the proposed project site. • Composition and training of Emergency Response Teams including; Safety and Health Committee, Fire Marshals and First Aiders. • Provision of suitable, adequate and serviced fire extinguishers and first aid kits. • Provision of suitable and adequate P.P.E. including; cover rolls, safety boots, reflector vests, eye protection, hearing protection, fall protection, gloves, dust masks among others. • Provision of suitable and adequate welfare facilities including; wholesome drinking water, sanitary convenience facilities, first aid facilities, changing areas and rest areas. • The site must have a functional grievance redress mechanism that allow workers to raise safety issues and propose improvements on site. • Implementing good housekeeping practices such as cleaning up excessive debris and liquid spills as soon as possible to avoid possible slip and fall 	KCNP, Contractor, DOSHS	Low incidence of accidents and dangerous occurrences recorded at the proposed project site.	In project cost

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Occupational accidents or diseases	<ul style="list-style-type: none"> Ensure that the premises are insured as per statutory requirements third party and workman's compensation (WIBA Cover) 	Contractor, DOSHS	WIBA cover provided for all workers at the proposed project site.	To be computed based on no. of workers on site.
Occupational hazards	<ul style="list-style-type: none"> Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented Not more than 6 months after constitution, committee must receive statutory training on: Basic OSH practices, Fire safety and First aid 	Contractor, DOSHS	An active and operational safety and health committee duly constituted and trained.	100,000
Faulty Machinery/equipment safety	<ul style="list-style-type: none"> Ensure that machinery, equipment, personal protective equipment, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations Reports of such examinations must be presented in prescribed forms, signed by the examiner and attached to the general register 	Contractor, DOSHS	Duly maintained, inspected and adequately tagged machines and equipment operating at the proposed project site.	200,000
Improper Storage of materials	<ul style="list-style-type: none"> Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse 	Contractor	Materials stored in accordance to legal guidelines.	20,000

Potential Negative Impacts/ issues of concern	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Safe means of access and safe place of employment	<ul style="list-style-type: none"> All passages of the project premises must be of sound construction and properly maintained Securely demarcate or cover all openings on grounds Ensure that construction workers are not locked up such that they would not escape in case of an emergency All ladders used in construction works must be of good construction and sound material of adequate strength and be properly maintained 	KCNP, Contractor, Project Consultants	Properly mapped access and egress routes at the proposed project site.	In project budget
Emergency situations	<ul style="list-style-type: none"> Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency Such procedures must be tested at regular intervals Ensure that adequate provisions are in place to immediately stop any operations where there is an imminent and serious danger to health and safety and to evacuate workers Ensure that the most current emergency telephone numbers posters are prominently and strategically displayed within the construction site Provide measures to deal with emergencies and accidents including adequate first aid arrangements 	KCNP, Contractor, Project Consultants	Emergency Response Procedures for the proposed project site duly documented and communicated.	In project budget
Lack of First Aid kits	<ul style="list-style-type: none"> Provision of well stocked first aid box which is easily available and accessible should be provided within the project Provision must be made for persons to be trained in first aid, 	Contractor, Project Consultants	Adequate and fully kitted first aid boxes provided at the proposed project site. Availability of duly trained first aiders	100,000
12. Environmental Monitoring of the Project				

Environmental concern during the construction phase	<ul style="list-style-type: none"> The proponent will liaise with the environmental consultants throughout the construction phase and ensure that the conditions of approval are adhered to. 	KCNP, Contractor and Project Consultants	Adherence to this ESMP	In project budget
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8.4 Operational Phase ESMP

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the operational phase of the project are outlined in **Table 8-2** below.

Table 8-2 ESMP for the Operation Phase of the proposed project

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
1 Minimise risks of waste water release into environment				
Waste water release into the environment	<ul style="list-style-type: none"> • Ensure quarterly effluent analysis as per provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006 • Document a maintenance schedule for the WWTP and ensure it is strictly adhered to • Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006 	Proponent (KCNP)	Quarterly testing of the treated effluent against standards for discharge to the environment	100,000
2 Minimization of health and safety impacts				

Expected Negative impact	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Occupational Safety and Health Hazards	<ul style="list-style-type: none"> Document, communicate and implement a safety and health policy. Conduct annual statutory safety and health audits, fire safety audits and risk assessment reports and abide by the recommendations. Constitute and duly train emergency response teams including Safety and Health Committee, Fire Marshals and First Aiders. Provide adequate fire detection and firefighting equipment including smoke detectors, fire alarms, hose reels and fire extinguishers. Continue to follow MOH guidelines on COVID 19 management as provided in section 8.1.5 Provide adequate well stocked first aid kits. 	Proponent (KCNP)	Presence of serviced fire equipment /extinguishers Fully stocked first aid kit Availability of duly trained first aiders Reports on OHS audits COVID -19 measures in place (hand washing stations, signs/posters for awareness creation)	1,000,000
3 Ensure environmental compliance				
Increased Solid Waste generation	<ul style="list-style-type: none"> Provide well labelled waste skips for segregation of wastes. Reduce, reuse and recycle solid waste wherever possible. Contract a NEMA registered solid waste handler for off-site disposal of solid waste. Track all wastes collected from the facility and keep records. Establish targets for waste minimization. 	KCNP	Availability of waste receptacles at strategic locations Records on Waste Management,	100,000

<p>Water and power consumption</p>	<ul style="list-style-type: none"> • Establish targets for conservation of power and water. • Monitor monthly consumption of water and power and keep records. • Erect signage strategically on conservation of water and power. 	<p>KCNP</p>	<p>Water and power consumption records</p> <p>Signage on water/power conservation</p>	<p>-</p>
<p>4. Change of geological environment</p>				
<p>Disturbance of soil geology: (Change of local aspect, increased erosivity index, impact on underlying bedrock, soil compaction and patterns of pressure release.</p>	<ul style="list-style-type: none"> • Provide proper culvert and drainage channels for access roads at the institutions • Excavated earth should be held away from areas susceptible to surface runoff of storm waters • Limit excavations and sub-structure works including foundation to the approved plan to prevent furthering subsurface impacts • Ensure structures are not positioned on water courses • Plant adequate vegetation to prevent washing away of top soil by storm water • Rich vegetated stands of prioritized species to be retained • Provide appropriate drainage ways in between structures to offset infrastructural erosivity. • Incorporate soil conservation methodologies during the whole project cycle e.g., site remediation techniques 	<p>KCNP</p>	<p>No activities recorded from the proposed project that arise to soil erosion</p>	<p>50000</p>
<p>5. Interruption of Natural water courses</p>				

<p>Interruption of natural water courses: stream pollution, impacts on hydro fauna and flooding impacts</p>	<ul style="list-style-type: none"> • Engage a licensed surveyor to peg the riparian zone on all surface water bodies in close proximity to the proposed project site. • Existing water ways or wetlands within and outside the construction zones to be preserved. • All riparian zones and species next to water ways to be retained. • Maintain drainage course flows during excavations • Ensure storm water run-off from construction site is channelled through sieve traps, rocks or hay traps to remove organic pollutants • Provide proper waste water drainage ways with treatment facilities where necessary • Install silt traps or other control structures at the outset of the construction. • Stagger construction activities during wet seasons to prevent sedimentation 	<p>Proponent</p>	<p>No incidents of surface water pollution or negative impacts on hydro fauna recorded during the proposed operation.</p>	
<p>Increased generation of storm water</p>	<ul style="list-style-type: none"> • Use of storm water management practices that slow peak run-off flow, reduce sediment load and increase infiltration. • Use of vegetated swales, filter strips, terracing, check dams, detention ponds or basins, infiltration trenches and infiltration basins. • Regular inspection and maintenance of permanent erosion and run-off 	<p>Proponent</p>	<p>Well maintained infiltration trenches and basins</p>	<p>In project cost</p>
<p>6. Minimize water consumption and ensure more efficient and safe use</p>				

<p>Increased pressure on water resources/ground water depletion.</p>	<ul style="list-style-type: none"> • Adhere to extraction rate as recommended by the hydrogeologist. • Obtain a water permit from WRA prior to commencement of drilling. • Abstraction of water from the borehole should be within allowable conditions of the WRA permits. • Install a water master meter to monitor consumption/abstraction of water. • Identify opportunities for water saving. • Install a piezometer and airline to monitor borehole water levels. • Incorporate rain water harvesting technology into the project design. • Sensitizing the workers, staff on efficient use of water. • Put in place water conservation measures such as installing auto-shut water taps to reduce on water wastage. • Provide water storage tanks with adequate storage capacity. • Ensure that the water supply system is well maintained. • Ensure prompt detection of leaking water pipes and repair. • Regular inspection of water pipelines and connections and ensure prompt repair and maintenance. • Sensitize the community on water conservation to limit on water wastage. 	<p>Proponent</p>	<p>Sustainable utilization of water resources</p>	<p>In the project cost</p>
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<p>Maintenance costs and water user charges.</p>	<ul style="list-style-type: none"> • Provision of budget for optimum maintenance of the water supply system including; borehole, pipelines and water storage structures. • Payment of water user charges as per WRA permit guidelines. • Sensitize the KCNP community on water resource management and conservation. • Ensure the pipeline connections and joints are regularly checked to avoid water wastage. • Encourage good record keeping and documentation including relevant permits and water monitoring records. 	<p>Proponent</p>	<p>Availability of records of water usage</p>	<p>In the project cost</p>
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<p>Ground water Pollution.</p>	<ul style="list-style-type: none"> • Ensure any sources of water pollution are eliminated. Control land use activities near the borehole well-head before, during and after drilling activities. • Provide adequate waste receptacles and sanitation facilities at strategic places. • Construction of sanitation facilities at KCNP should be at safe distance from well-head. • Ensure that screens are placed against the optimum aquifer zones. • Ensure the well is cased and screened with good quality material (uPVC of high open surface area). • The top 5 meters should be grouted with cement to ensure that no surface water at the well head can enter the water bore and cause contamination. • Waste-water drainage channel should be constructed to lead water away from the pump pad. Ensure efficient well development and cleaning after completion of the borehole (air or water jetting is preferred). • Ensure proper storage, handling of hazardous waste (waste oil, lubricants, oil filters and fuel) and disposal by use of licensed hazardous waste contractor. The drilling team should be aware of the procedures to be followed when dealing with spills and leaks. 	<p>Proponent</p>	<p>No activities recorded from the proposed project that arises to ground water pollution</p>	<p>50,000</p>
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<p>Risk of water pollution, water-borne diseases and vectors thrive.</p>	<ul style="list-style-type: none"> • Carrying out water quality analysis (chemical and bacteriological tests) in an approved laboratory before project commissioning and incorporation of water treatment component in the project design based on analysis results. • Protection of the borehole from pollution; provide adequate waste receptacles and sanitation facilities at strategic places. Construction of sanitation facilities should be at safe distance from well-head. • Protection of water in the reservoir tank from contamination. • Regular cleaning of the storage tanks. • Educating water consumers on boiling water before consumption. • Enhance security at the borehole and storage tanks to ensure clean water provision. 	<p>Proponent</p>	<p>Water quality parameters that meet WHO standards for domestic water</p>	<p>10,000 (every quarter)</p>
<p>7. Minimization of energy consumption</p>				

<p>Increase Pressure on energy resources/increased energy demand.</p>	<ul style="list-style-type: none"> • Adopt energy efficiency measures including use of energy saving bulbs, sensor lighting, solar power and regular maintenance of machinery for efficiency. • Alternative sources of energy such as; solar may be used to pump water from the borehole to the reservoir rather than use of generators. • Make maximum use of natural ventilation and light. • Switching off electrical appliances when not in use. • Adopt use of energy efficient equipment (green star rated). • Sensitizing the workers, staff and students on efficient use of energy resources. • Monitor energy consumption and keep records. 	<p>Proponent</p>	<p>Sustainable utilization of energy resources</p>	<p>In project cost</p>
<p>8. Ensure efficient use of raw materials</p>				
<p>High demand of Raw materials use.</p>	<ul style="list-style-type: none"> • Source raw materials from local suppliers who use environmentally friendly processes in their operations. • Ensure accurate budgeting and estimation of actual construction material requirements to ensure that the least amount of material necessary is ordered. • Ensure accurate budgeting and estimation of food items during the operational phase to minimize wastage. 	<p>Proponent</p>	<p>Sustainable sourcing of raw materials.</p>	<p>In project cost</p>

9. Minimization of exhaust emissions				
Emission of air pollutants. (Fumes).	<ul style="list-style-type: none"> All equipment should be maintained for efficient operation. Commission air quality monitoring surveys for ambient air and stack emissions during the operational phase in conformity with NEMA guidelines. Using efficient machines with low emission technologies for the ones that burn fossil fuels. Educate and raise awareness of workers on emission reduction techniques. Use of clean fuels e.g., unleaded and de-sulphurized fuels. 	Proponent	Conformance to provisions of EMCA (Air Quality) Regulations, 2009	100,000
10. Efficient traffic management				
Increased traffic.	<ul style="list-style-type: none"> Document and implement a traffic management plan. Provision of adequate parking space within the facility. Provide adequate signage in liaison with traffic authorities. Ensure use of roadworthy vehicles that have been inspected and approved for all activities. Ensure all drivers have valid driving licenses. Maintain a log detailing every accident at site or associated with the project work activities. 	Proponent	Evidence of a well-documented traffic-plan	
11. Minimize Occupational Safety and Health Risks				

<p>Incidents, accidents and dangerous occurrences.</p>	<ul style="list-style-type: none"> • Documentation and implementation of safe operation procedures (SOPs) including; • Daily tool box talks on potential OSH hazards and how to mitigate them. • Documentation and implementation of a Permit to Work system for all non-routine hazardous jobs e.g. work at heights, confined space entry, high voltage electrical works and hot works. • Job Safety Analysis (JSAs) for all potentially hazardous tasks. • Erection of adequate precautionary signage at strategic locations within the facility. • Composition and training of Emergency Response Teams including; Safety and Health Committee, Fire Marshals and First Aiders. • Provision of suitable, adequate and serviced fire extinguishers and first aid kits. • Provision of suitable and adequate P.P.E. including; cover rolls, safety boots, reflector vests, eye protection, hearing protection, fall protection, gloves, dust masks among others. • Provision of suitable and adequate welfare facilities including; wholesome drinking water, sanitary convenience facilities, first aid facilities, changing areas and rest areas. 	<p>KCNP, DOSHS</p>	<p>Low incidence of accidents and dangerous occurrences recorded at the proposed project site.</p>	<p>In project cost</p>
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Occupational accidents or diseases	<ul style="list-style-type: none"> Ensure that the premises are insured as per statutory requirements third party and workman's compensation (WIBA Cover) 	Proponent, DOSHS	WIBA cover provided for all workers at the.	
Occupational hazards	<ul style="list-style-type: none"> Provisions must be put in place for the formation of a Health and Safety Committee, in which the employer and the workers are represented Not more than 6 months after constitution, committee must receive statutory training on: Basic OSH practices, Fire safety and First aid 	Proponent, DOSHS	An active and operational safety and health committee duly constituted and trained.	50,000
Faulty safety Machinery/equipment	<ul style="list-style-type: none"> Ensure that machinery, equipment, personal protective equipment, appliances and hand tools used in construction do comply with the prescribed safety and health standards and be appropriately installed maintained and safeguarded Ensure that equipment and work tasks are adapted to fit workers and their ability including protection against mental strain All machines and other moving parts of equipment must be enclosed or guarded to protect all workers from injury Arrangements must be in place to train and supervise inexperienced workers regarding construction machinery use and other procedures/operations Reports of such examinations must be presented in prescribed forms, signed by the examiner and attached to the general register 	Proponent/DOSHs	Duly maintained, inspected and adequately tagged machines and equipment operating at the proposed project site.	100,000

<p>Improper Storage of materials</p>	<ul style="list-style-type: none"> • Ensure that materials are stored or stacked in such manner as to ensure their stability and prevent any fall or collapse 	<p>Proponent</p>	<p>Materials stored in accordance to legal guidelines.</p>	<p>20,000</p>
<p>Safe means of access and safe place of employment</p>	<ul style="list-style-type: none"> • All passages of the project premises must be of sound construction and properly maintained • Securely demarcate or cover all openings on grounds • Ensure that construction workers are not locked up such that they would not escape in case of an emergency • All ladders used in construction works must be of good construction and sound material of adequate strength and be properly maintained 	<p>KCNP</p>	<p>Properly mapped access and egress routes in the building.</p>	<p>In project budget</p>
<p>Emergency situations</p>	<ul style="list-style-type: none"> • Design suitable documented emergency preparedness and evacuation procedures to be used during any emergency • Such procedures must be tested at regular intervals • Ensure that adequate provisions are in place to immediately stop any operations where there in an imminent and serious danger to health and safety and to evacuate workers • Ensure that the most current emergency telephone numbers posters are prominently and strategically displayed within the construction site • Provide measures to deal with emergencies and accidents including adequate first aid arrangements 	<p>Proponent</p>	<p>Properly mapped access and egress routes at the proposed project site.</p>	<p>In project budget</p>

<p>Social ills and spread of diseases including HIV/AIDS, and STD</p>	<ul style="list-style-type: none"> • Develop a comprehensive STDS, HIV and AIDs control programme. • Provision of STDs, HIV and AIDS prevention measures to workers. • Creation of awareness of STDs, HIV/AIDS in workers' camps. • Organize moonlight Voluntary Counselling and Testing (VCT) sessions for the workers in conjunction with local service providers. 	<p>Proponent</p>	<p>No new STD/HIV infection incident linked to the proposed project.</p>	<p>50,000</p>
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<p>Drug and Substance Abuse</p>	<ul style="list-style-type: none"> • Create awareness to the students about the drug abuse menace in the locality and related impacts. • Establish peer to peer mentorship teams to champions against drug and substance abuse. • Form coalitions with the local community in the fight against drug abuse. • Establish a training and counselling center with competent personnel at the institution. • Incorporate Drug Abuse Resistance Education (DARE) in the students' curriculum. • Introduce behavioral modelling and behavioral modification strategies/programmes at the institution. • Introduce students' mentorship programmes. • Enhance security at the entry points into the institution. • Sensitize workers on no drug or alcohol abuse within the construction site and during working hours. • Provide "No Smoking" signage within the project site. • Worker under the influence of drugs or alcohol should not be allowed into the construction site. • Provide posters sensitizing workers on the dangers of drugs and substance abuse. 	<p>Proponent</p>	<p>No new cases of drug abuse linked to the proposed project.</p>	<p>In the project cost</p>
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<p>Religious Radicalization.</p>	<ul style="list-style-type: none"> • Create awareness to students about the menace of radicalization in the local community and its related impact. • Collaborate with the local community associations on security issues. • In collaboration with the government security agencies, support community resilience to violent extremism programmes/campaigns. • Conduct open days in the institute to show case some of the achievements made by the youth. 	<p>Proponent</p>	<p>No incident of violent recorded that is linked to the proposed project</p>	<p>50,000</p>
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<p>Fire Safety</p>	<ul style="list-style-type: none"> • 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. • Sensitization of all staff and students on fire safety, including fire prevention and fire-fighting. • Conducting periodic fire drills. • Provision of smoking guidelines. • Develop and implement a fire safety policy. • Ensure all flammables are stored in fire resistant areas. • Provide water reservoir to fight fire. • Designate and mark a fire assembly points. • Provision of fire exits. • Ensure all fire exit doors open outwards. • Constitute and train fire marshals. 	<p>Proponent</p>	<p>Provision of firefighting equipment within the proposed project site premises.</p>	<p>200,000</p>
<p>Increased Security risks.</p>	<ul style="list-style-type: none"> • Thoroughly screen workers, suppliers and distributors. • Ensure 24-hour surveillance by engaging the services of day and night guards. • Install CCTV cameras in strategic locations of the institution. • Accord the local people the first priority in employment. • Ensure close liaison with the local Police Department. 	<p>Proponent</p>	<p>Satisfactory resolution of any security related risks arising from the proposed project.</p>	<p>In the project cost</p>

Risk of spread of COVID 19.	<ul style="list-style-type: none"> • Sensitize all community segments and project workers on Covid 19 and precautionary measures that need to be observed. • Adhere to the MoH and World Bank guidelines on Covid-19 management. • Ensure a functional and easily accessible GRM is in place. • Create awareness on project GRM to all community segments and project workers. 	Proponent	Satisfactory containment of any COVID 19 incidents recorded at the proposed project site.	50,000
Gender Inclusivity.	<ul style="list-style-type: none"> • Ensure equal pay for equal work among male and female employees. • Ensure that women are given adequate employment opportunities during recruitment and job postings. • Regular sensitization and awareness campaigns to the workers should be done to promote gender equity in employment during the construction works and during operation. • Provide adequate sanitation facilities for both men and women • Introduce flexible work schedule for expectant and breastfeeding mothers. • Embrace equality in sharing out leadership position for male and female employees. 	Proponent	No gender related issues reported	In the project cost

<p>Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA).</p>	<ul style="list-style-type: none"> • Create awareness to all community segments and project workers on GBV/SEA-SH, to demystify the stigma associated with GBV/SEA and H including prevention and management. • Ensure a code of conduct highlighting zero tolerance of sexual exploitation and abuse is signed by all project workers with physical presence on site. • The contractor should provide a functional and culturally appropriate GRM is in place and accessible and provides for confidential reporting of GBV cases. • Create awareness on project GRM to all community segments and project workers. • Map all GBV service providers and document referral services for survivors. • Where feasible map out all the GBV/SEA service providers as well as referral pathways. • Partner with relevant government agencies and NGOs to ensure survivors of GBV and sexual offenses access survivor centered services such as medical care, psychosocial support, legal redress, safety, etc. as and when necessary. 	<p>Proponent</p>	<p>No incident of gender based violence or sexual harassment recorded</p>	<p>50,000</p>
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<p>Conflicts/grievances caused by:</p> <p>g. Non employment of locals.</p> <p>h. Inadequate stakeholder consultation on project activities.</p> <p>i. Nonpayment/delayed payment of workers.</p>	<ul style="list-style-type: none"> • 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. • Ensure careful documentation of all grievances received; processed, resolved and closed out. • Ensure that anonymous complaints are documented and addressed to the satisfaction of the affected parties. • 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 time-frame that enables meaningful consultations. 	<p>Proponent</p>	<p>Well documented GRM</p>	<p>In the project cost</p>
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<p>Non adherence to national labor laws and good practices in the management of workers.</p>	<ul style="list-style-type: none"> • Create awareness on national labor laws and practices. • Implement a labor management plan which specifies e.g., salary scale for given type of workers, opportunity for women etc. • Ensure all workers have contracts with terms and conditions that are consistent with national labor laws and policies. • 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.) • Sensitize project workers on actual meaning and implication of the Code of conduct before signing it. • Put in place a GRM for workers and facilitate workers to form a committee through which their grievances will be received attended to or channeled to management. • 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. 	<p>Proponent</p>	<p>Conformance to national labour laws, Formulated GRM for workers.</p>	
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8.5 Decommissioning Phase ESMP

In addition to the mitigation measures provided in **Tables 8-1 and 8-2**, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the project have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project are outlined in **Table 8-3** below.

Table 8-3 ESMP for the Decommissioning Phase

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
1. Demolition Waste Management				
Demolition waste	<ul style="list-style-type: none"> • Use of an integrated solid waste management system i.e., through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling. • All installations, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible • All foundations must be removed and recycled, reused or disposed of at a licensed disposal site • Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site • Donate reusable demolition waste to charitable organizations, individuals and institutions 	KCNP	Efficient demolition waste management as per the provisions of EMCA, (Waste Management) Regulations, 2006.	100,000
Occupational hazards	<ul style="list-style-type: none"> • Document and adhere to SOPs developed. • Provision of suitable and adequate PPE • Provision of adequate first aid facilities • Adequate supervision and monitoring of OSH performance. 	Contractor, KCNP	Same as above	50,000

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Monitoring Indicator	Cost (Ksh)
Soil and water contamination from decommissioning of the WWTP, borehole and the shallow wells	<ul style="list-style-type: none"> • The Contractor should ensure that the employees on site are aware of the company procedures for dealing with spills and leaks using dispersants or adding biological agents to speed up the oil breakdown • In case of spillage the Contractor should isolate the source of oil spill and contain the spillage to the source of leakage before it makes it leaves the affected area, using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer. • Provision of adequate and suitable personal protective equipment. • During decommissioning of the borehole, care should be taken to avoid contamination of the remaining water in the aquifer. 	Contractor, KCNP	Same as above	200,000

9 GRIEVANCE RESOLUTION MECHANISM

9.1 Introduction

Grievance redress mechanisms (GRM) provides a formal avenue for ensuring that complaints/grievances associated with project activities are efficiently and effectively responded to. Grievances are any complaints or suggestions about the way a project is being implemented. They may take the form of specific complaints for damages/injury, concerns about routine project activities, or perceived incidents or impacts. Identifying and responding to grievances supports the development of positive relationships between projects and affected groups/communities, and other stakeholders.

Grievance mechanisms should receive and facilitate resolution of the affected institutional or communities' concerns and grievances. World Bank standards states the concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts and risks presented by a project.

Grievances can be an indication of growing stakeholder concerns (real and perceived) and can escalate if not identified and resolved. The management of grievances is therefore a vital component of stakeholder management and an important aspect of risk management for a project. Projects may have a range of potential adverse impacts to people and the environment in general, and identifying grievances and ensuring timely resolution is therefore very necessary.

The following sections describe the proposed procedures that will be followed to address complaints or concerns submitted by people who may benefit from or impacted by EASTRIP sub-projects. It intends to provide clarity and predictability on how complaints will be received, assessed, sorted, resolved and monitored.

9.2 Grievance Redress Mechanism Principles

Effective GRMs usually embody six core principles;

- **Fairness.** Grievances are treated confidentially, assessed impartially, and handled transparently.
- **Objectiveness and independence.** The GRM operates independently of all interested parties in order to guarantee fair, objective, and impartial treatment to each case. GRM officials have adequate means and powers to investigate grievances (e.g., interview witnesses, access records).
- **Simplicity and accessibility.** Procedures to file grievances and seek action are simple enough that project beneficiaries can easily understand them. Project beneficiaries have a

range of contact options including, at a minimum, a telephone number (preferably toll-free), an e-mail address, and a postal address. The GRM is accessible to all stakeholders, irrespective of the remoteness of the area they live in, the language they speak, and their level of education or income. The GRM does not use complex processes that create confusion or anxiety (such as only accepting grievances on official-looking standard forms or through grievance boxes in government offices).

- **Responsiveness and efficiency.** The GRM is designed to be responsive to the needs of all complainants. Accordingly, officials handling grievances shall be trained to take effective action upon, and respond quickly to, grievances and suggestions.
- **Speed and proportionality.** All grievances, simple or complex, shall be addressed and resolved as quickly as possible. The action taken on the grievance or suggestion is swift, decisive, and constructive.
- **Participatory and social inclusion.** A wide range of project-affected people— community members, members of vulnerable groups, project implementers, civil society, and the media - shall be encouraged to bring grievances and comments to the attention of project authorities. Special attention is given to ensure that poor people and marginalized groups, including those with special needs, are able to access the GRM.

9.3 Grievance Handling Mechanism Structure

Members of the Grievance Redress Committee (GRC) at project Level
Composition of members is as follows:

1. Representatives of the proponent (KCNP - EASTRIP team).
2. Student leaders.
3. Local political leaders (primarily the area MCA and Ward representative).
4. Local civic leaders including the area Chief and *nyumba kumi* leadership.
5. Kwale County Director of Environment – NEMA.
6. Kwale County Secretary for Environment.
7. The County Director for Education.
8. TVETA representative.
9. Representative from the local WRUA
10. Members of Chitsakamatsa Development Centre (local CBO)
11. Community opinion setters

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.

A Grievance Resolution Committee (GRC) has already been established with representatives from each of the stakeholders from the above list. The committee has already been formed, trained and is fully functional. The committee is chaired by KCNP Chief Principal – Mrs. Anne M. Mbogo. KCNP’s Environment and Social Safeguards Officer – Mr. Paul Omolo is the secretary to the committee. Letters of appointment of the GRM committee members are appended to this report (**Annex VIII**).

9.4 Key Staff Coordinating Grievance Redress

The KCNP Environmental and Social Safeguards specialist will be designated as the person in charge of Grievance Redress with the following responsibilities;

- Coordinate formation of Grievance Redress Committees (GRCs) before the commencement of construction to resolve issues.
- Serve as the Focal Point Person for Grievance Redress at KCNP
- Create awareness of the Grievance Redress Mechanism (GRM) amongst all the stakeholders through public awareness campaigns.
- Assist in Redress of all Grievances by coordinating with the concerned parties.
- Maintain information of grievances and Redress.
- Monitor the activities on Redress of Grievances.
- Prepare monthly/quarterly reports on all grievances received and processed.
- Provision of resources to cover the operational costs of the GRM.

9.5 Receiving Complaints

The various points of receiving complaints would be as follows:

- Regional Government administration;
- Local chief’s office;
- Registry at KCNP
- Contractor or Consulting team
- Ministry of Education
- Representative at the community level

9.6 Mode of Receipt and Recording of Complaints

Complaints can be made in writing, verbally, over the phone, by fax, emails or any other media. The stakeholders will be informed of various grievance uptake points during the grievance sensitization workshops. KCNP will designate an officer to receive, record and collate all the complaint/grievance from these points on a regular basis. As soon as the officer receives a complaint, he /she would issue an acknowledgement receipt to the complainant 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 KCNP Environmental and Social Safeguard specialist on the receipt of the complaint

9.7 Grievance Redress Mechanism Process

A three tier Redress structure is proposed to address complaints under KCNP project as shown in the flow chart below;

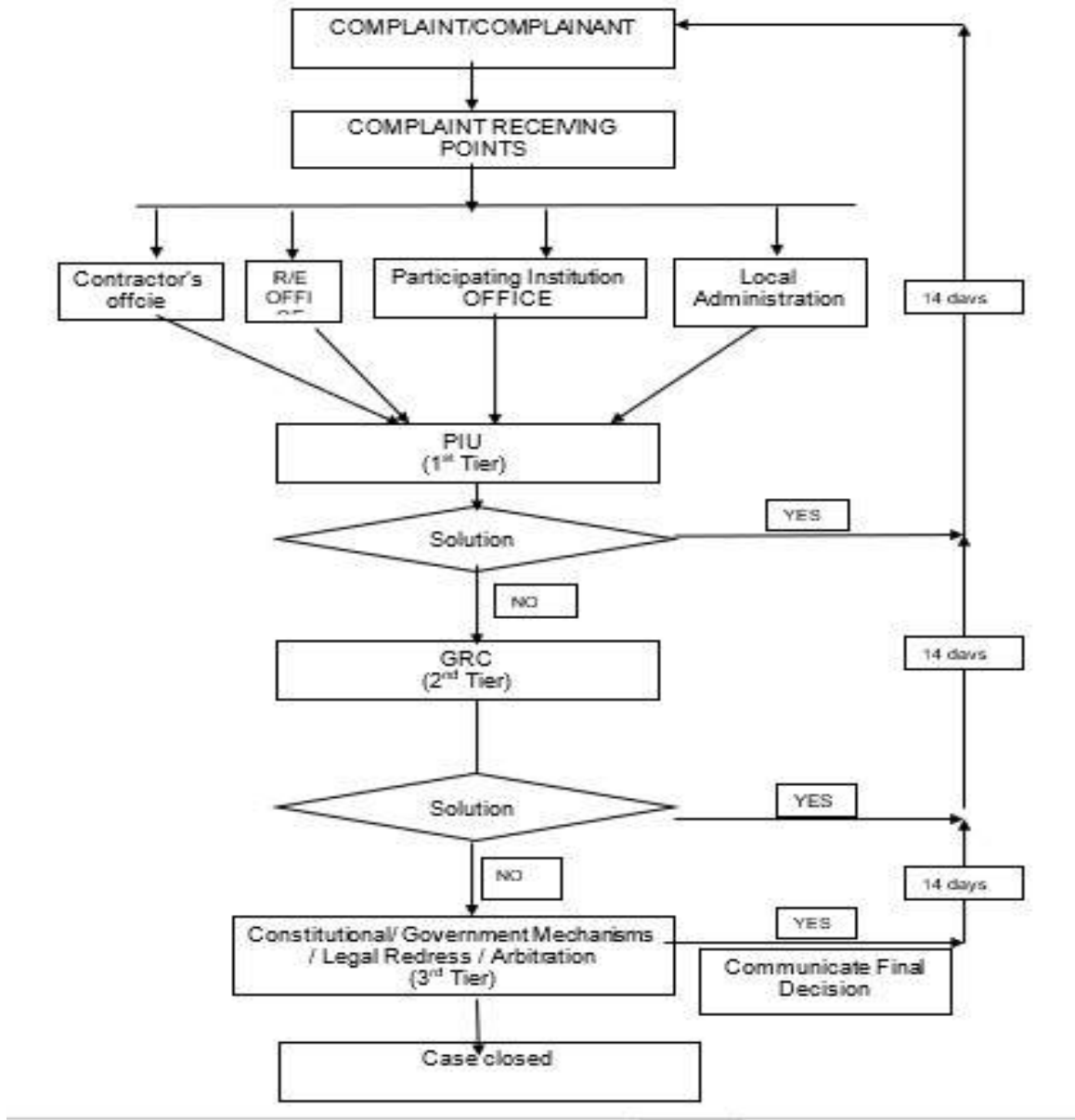


Figure 9-1 The Grievance Redress Mechanism Process

a) First Tier of Redress

The first level for grievance redress will be at the institutional level where the KCNP Environmental and Social Safeguard Specialist (KCNP ESSS) is designated as the person in charge of Grievance Redress. The KCNP ESSS will be responsible for maintain the Grievance records and ensuring the register/log book is kept up to date. After registering the complaint, 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. 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 resolution at the first tier will be done within 14 working days and notified to the concerned through a disclosure form. If the Grievance is not resolved within this period, this would be referred to the next level of Grievance Redress. However, if the ESSS feels that adequate solutions are worked out but it would require a few more days for actions to be taken, he 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) constituted by KCNP will be the second tier for grievance management. All grievances that cannot be resolved at the first tier will be referred to this level for redress. It is important to ensure that the GRC is constituted prior to commencement of the project. The KCNP ESSS will coordinate with the 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 KCNP ESSS will coordinate the convening of the meetings of the GRC. He 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 ESSS. 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 where there are strong possibilities of finding an amicable solution, it can be retained to a maximum 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 the complainant will be offered the option of reaching out to 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 ESSS will collect all the details of the Grievance including the deliberations of first tier efforts and of the GRC and present it to the 3rd level tier. The 3rd tier structure will deliberate upon the issue and give suitable recommendations. The minutes of the meetings will be recorded and kept at the ESSS office.

The decisions of the 3rd 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 3rd 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.

9.8 Registry and 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:

- No of complaints received.
- No and % of complaints that have reached agreement.
- No and % of complaints that have been resolved.
- No and % of complaints that have gone to mediation
- 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.

9.9 GRM Jurisdiction

The proposed GRM is project specific and scaled to the risks and impacts of the Project. It is meant to solve the project's concerns by the stakeholders or any project affected person. The proposed GRM is however not intended to replace any Governments' own existing redress process; rather it is intended to ensure that affected people's concerns and complaints associated with project activities are addressed promptly and at the lowest level possible.

10 CONCLUSIONS AND RECOMMENDATIONS

The ESIA report has established that the Proposed Regional Flagship Marine Transport and Port Logistics Centre - EASTRIP to be implemented at KCNP is a worthwhile investment which has broad benefits of national and regional significance. However, the assessment has established that the proposed project may also generate undesirable impacts though relatively minor and site specific in nature. These can be sufficiently mitigated through implementation of the ESMP developed. KCNP is thus committed to putting in place several measures to mitigate the negative environmental, safety, health and social impacts associated with the life cycle of the project.

It is expected that the positive impacts that result from proposed activities shall be maximized as much as possible as comprehensively outlined within this ESIA report. These measures will go a long way in ensuring the best possible environmental health and safety compliance and performance standards.

It is the consultant's recommendation that the project be approved to proceed provided the mitigation measures outlined in the report and those already in place at site are adhered to, Environmental and Social Management Plan (ESMP) is implemented, and the developer adheres to the conditions of approval of the project. An environmental and social audit should be commissioned at least 12 months upon operation of the project. The environmental audit's objective is to evaluate the efficacy of the ESMP in mitigating the environmental and social impacts identified herein. The audit shall also serve to identify other emerging aspects during the project operation phase and advise revision of the recommendations as appropriate.

REFERENCES

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APPENDICES

Appendix I	Lead Expert NEMA Practicing License Lead Expert EIK Certificate
Appendix II	KCNP Operating Licenses; MoEST Registration Certificate TVETA Registration Certificates
Appendix III	Land Ownership Documents; Title Deed and Land Donation Agreement
Appendix IV	Architectural Plans
Appendix V	Proposed WTP & WWTP Computations
Appendix VI	Duly signed attendance lists and Minutes of Public Involvement and Participation Meetings
Appendix VII	Duly filled Public Consultation Questionnaire
Appendix VIII	Grievance Resolution Mechanism documentation
Appendix IX	Hydrogeological report
Appendix X	Water & Waste Water Management Layout