MOMBASA WATER SUPPLY AND SANITATION COMPANY LIMITED (MOWASSCO)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

PROJECT REPORT FOR

REHABILITATION OF THE KIPEVU WASTEWATER TREATMENT PLANT

(WWTP, SEWERS AND PUMPING STATIONS)

Volume V

Report Prepared by:

Zamconsult Consulting Engineers

OCTOBER 2018
DECLARATION

LEAD EXPERT

I …………………………………………… on behalf of Zamconsult Consulting Engineers, submit this Environmental and Social Impact Assessment (ESIA) Project Report, for Proposed Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area. This Report has been done with reasonable skills, care and diligence in accordance with the Environmental Management and Coordination Act (EMCA), 1999 and the Environmental Impact Assessment and Audit Regulations, 2003. I hereby certify that the particulars given in this ESIA Report are correct to the best of my knowledge:

Signature: __________________________________________

Date: ______________________________________________

Designation: EIA/Audit Lead Expert Reg. No ……………………

PROPOSENENT

I, ……………………………………………………, on behalf of Mombasa Water Supply and Sanitation Company Limited (MOWASCO), submit this Environmental Impact Assessment Report for Proposed Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area.

Signature: __________________________________________

Date: ______________________________________________

Designation: __________________________________________
ACKNOWLEDGEMENT

We would like to register our sincere appreciations to all those who made the entire Environmental and Social Impact Assessment (ESIA) study a success. In this regard we would first extend our thanks to Mr. Alphonce Okoth – Kipevu Waste Water Treatment Plant Manager and Jared Mjomba – Technical Officer (Networks Waste Water), for the support they gave us during the study period.

Secondly we would like to thank all the Enumerators for the household survey they undertook on behalf of the team, Chiefs, and Assistant Chiefs whom we worked closely in the field in the course of the study.

Third, we would like to appreciate the contribution of all the government officers from all the relevant departments that we interacted with in the course of the ESIA study for Proposed Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area.

Fourth, the tireless efforts of the community representative committee members in the process went a long way in making this process a success.

Fifth is the appreciation of the commitment and tolerance exhibited by all the community members within and outside the project area.

Our sincere appreciations finally go to Mombasa Water Supply and Sanitation Company Limited, the project proponent for having offered us the chance to carry out this Environmental and Social Impact Assessment project report.
MINISTRY OF WATER & IRRIGATION

MOMBASA WATER SUPPLY AND SANITATION COMPANY LIMITED (MOWASCO)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) PROJECT REPORT

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LIST OF ABBREVIATIONS

CWSB - Coast Water Services Board
DWF - Dry Weather Flow
EIA - Environmental Impact Assessment
EA - Environmental Audit
ESIA - Environmental & Social Impact Assessment
GoK - Government of Kenya
HASP – Health and Safety Plan
IDA - International Development Association
M&E - Mechanical & Electrical
MEWNR - Ministry of Environment, Water & Natural Resources
MoWI – Ministry of Water and Irrigation
MOWASCO - Mombasa Water and Sanitation Company Ltd.
NEMA - National Environmental Management Authority
O&M – Operation and Maintenance
PAPs – Project Affected Persons
PPE – Personal Protective Equipment
RAP – Resettlement Action Plan
ToR - Terms of Reference
SoK - Survey of Kenya
WB - World Bank
WHO – World Health Organization
WRMA - Water Resources Management Authority
WSB - Water Services Board
WSP - Water Service Provider
WSS - Water Supply and Sanitation
WSTF - Water Services Trust Fund
WWTP - Waste Water Treatment Plant
EXECUTIVE SUMMARY

Introduction

Mombasa Water Supply and Sanitation Company Limited (MOWASCO) intends to rehabilitate the Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area.

The Scope of the consultancy services covers the design, and preparation and submission of ESIA report. The objective of this ESIA Report is to provide information on the current field environmental and socio-economic status, review and refine as necessary the methodology and the Work Plan for undertaking this work.

The ESIA team relied on designs provided by the consultant which were based on maps provided by MOWASCO, Mombasa County Government, Survey of Kenya as well as information obtained from the private map makers, national government and community leaders. This environmental report aims at addressing the basic environmental concerns that are likely to be affected by the project.

Project Justification

Most developing countries are coping with serious environmental problems. In sub-Saharan Africa, meeting basic needs such as sewer collection and treatment system is a major problem.

The proposed project intends to rehabilitate Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area. Implementation of the project is anticipated to affect certain environmental and social settings in the project area. This includes loss of ecological services coupled with increased pollution, vegetation clearance, soil erosion, inappropriate handling of human wastes among others. This report aims at outlining the environmental and socio-economic potential impacts (positive and negative) emanating from the project implementation.

Objectives of the ESIA

The objectives of the ESIA include

- Conduct an Environmental Impact Assessment to identify both positive and negative impacts of the proposed project and propose most appropriate interventions during construction, operation and decommissioning of the project.
- Collect baseline socio-economic data of the project area and potential impact expected from project construction, implementation, operation and decommissioning.
- To provide the required professional guidance on compliance with the legal frameworks and environmental regulations.
- Develop an Environmental Monitoring Program during construction and operation and present plans to minimize, mitigate, or eliminate negative effects and impacts.
- Describe Environmental Management Plan implementation mechanisms.
- Provide a platform to stakeholders participating in the mitigation of adverse social impacts of the project.
- To seek NEMA Approval for the proposed project.
Scope of Works

Rehabilitation of Existing Kipevu Wastewater Treatment Plant and Rehabilitation of Trunk Sewers and Main Secondary Sewers:

- Chaani Upgrading Scheme
- Chaani Trunk Sewer
- Changamwe Site and Service Scheme
- Changamwe Trunk Sewer
- Hamisi Municipal Estate
- Export Processing Zone (EPZ) Area
- Mikindani Site and Service Scheme
- Mikindani Pumping Station and Rising Main
- Mikindani Trunk Sewer
- Miritini Site and Service Scheme
- Miritini Trunk Sewer
- Miritini Pumping Stations
- Port Reitz Trunk Sewer
- Port Reitz Pumping Station

Project Area Description

The project area is located within the Mombasa West Mainland within Port Reitz, Mikindani, Chaani and Miritini Locations. The Kipevu Treatment Plant is located at GPS co-ordinates 4° 2’ 25”S and 39° 37’ 49” E, in Mombasa County.

Methodology

Following preliminary visits to the project site, the ESIA was commissioned based on documentary review, field assessments and discussions with the project beneficiaries and major stakeholders.
The field assessments involved public participation and bio-physical environment including the following activities:

- Reconnaissance visits.
- Public consultations and stakeholders meetings.
- Review of the proposed project designs.
- Physical investigation of the site.
- Documentary review of the existing project.
- Socio-economic survey

**Legal Framework**

The ESIA team has taken into consideration various legal requirements so as to guide the operation of various activities that are carried out on the environment. Section 58 of the EMCA, 1999 and 2015 provides for the proper management of various environmental resources to promote their integrity and that of the people dependent upon them. In addition, there are various international multilateral agreements that seek to promote the wellbeing of the environment key among them the polluter pays principle, the Kyoto protocol, the principal of inter-generational and intra-generational equity that promotes the sustainability of the environmental resources. Some of the national legal resolutions governing this project include:

- The Constitution of Kenya
- The Environmental Management and Coordination Act (EMCA) 2015
- The Water Act (2016)
- The Environmental (Impact Assessment and Audit) Regulation (LN 101 of June 2003)
- The Conservation of Biological Diversity (BD) Regulations 2006
- Wildlife(Conservation and Management) Act 2013
- The Environmental Management and Co-ordination (Waste Management) Regulations 2006
- The Environmental Management and Coordination, (Water Quality) Regulations 2006
- The Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea shore Management) Regulations 2009
- The Occupational Safety and Health Act, (OSHA) 2007
- The Work Injury Benefits Act (WIBA) 2007
- Land Laws (Amendment) Act 2016
- Land Acquisition Act, CAP 295
- The Physical Planning Act
- The Kenya Roads Board Act
- The National Construction Authority (NCA) Act, 2011

**Public Participation and Consultations**

Public consultations are useful in gathering information from the people most affected by the implementation of project, understanding the likely impacts, determining the local communities norms, preferences and fears, proposing alternatives and designing viable and sustainable mitigation measures and compensations where due. Four public
consultations took place on 11th December 2016 at different locations, data collection place between 10th to 15th December 2016.

**Potential Impacts and the Proposed Mitigation Measures**

The project is set to have both positive and negative impacts with most being the positive.

**i). Positive Impacts**

Some of the positive impacts identified include:-

- Connection to the sewer line of areas with permissible densities which have not been served by the existing sewer line;
- The proposed activities will avert pollution of the Indian Ocean since all waste water will be adequately treated before allowing it to flow to the ocean.
- The proposed activities will cater for projected increase in volume of waste water as a result of increased population in the future.
- Provision of employment opportunities during construction and operation phases- Labour is a must therefore residents will have ready opportunities which shall boost their daily income.
- The rehabilitation will protect the sewer lines from storm water by enhancing storm drains with concrete. The sewer lines shall be protected from exposure and breakages.
- Flushing, cleaning and De silting of the existing sewer line will address the problem of blockages being experienced and also expand the size of the pipes ferrying waste water.
- The proposed project will centralize wastewater treatment system in West Mainland which will make pollution monitoring easy.
- There shall be improved aesthetic value of the area of the area due to cleaning up of the mess that is currently experienced in Storm water drains in the areas of blocked drains.
- Sludge from the Stabilization ponds is a rich resource that can be utilized by the community around as fertilizers for the farm houses,
- Installation of electrical/mechanical equipment ranging from blowers, scrappers, compressors, sludge pumps etc were either vandalized, broken or out of use will play a huge role in achieving acceptable sewerage design standards.
- If the WWTP is established, the pollution created by the current practice of wastewater discharge into the river will stop hence reduction in spread of water borne disease.
- Quality of surface and ground water will improve on public health, and on socio-economic development of the project area, taking into consideration that the current treatment process that discharges untreated raw sewage into rivers and the ocean will have stopped.
- The public health of the community will be upgraded due to improved standard of wastewater management.
- A cleaner environment will encourage the development of eco-tourism and other projects in the project area
ii). Potential Negative Impacts

The following are some of the identified potential negative impacts:

- Traffic Congestion
- Site Related Oil Spills
- Soil-Related Impacts
- Impact on Water Resources
- Socioeconomic Impacts
- Labour influx and its impact on the social and environmental aspects
- Air Quality
- Construction Noise and vibration
- Biodiversity and Conservation Impacts
- Public Health, Safety & HIV & AIDS Impacts
- Service Delivery Impacts
- Lack of gender balance and equity
- Lack of disability mainstreaming
- Impacts on Underground Infrastructure
- Impacts on Workers’ Health and Safety (Accidents and other unforeseen calamities)
- Impact of Waste water and sludge
- Impacts on Incomes and Livelihoods
- Impacts on Odour, Flies and Mosquitoes

Environmental and Social Management Plan (ESMP)

The ESMP addresses concerns that are likely to arise from the project activities and recommend ways to control or mitigate against these throughout the project cycle. The contractor should prepare work plans for environmental management in line with the proposed ESMP. MOWASCO will be responsible for reviewing the general work in accordance with the ESMP, coordinating, and monitoring the implementation of the ESMP and preparation of the environmental progress reports in collaboration with NEMA and other stakeholders.

Conclusion and Recommendations

Most of the identified adverse effects associated with the project implementation could be managed through acceptable levels of implementation of the recommended mitigation measures for the project so that the positive impacts outweigh the negative effects.

The proposed project is seen to not only bring about benefits to the local people but also bring opportunities for development in this area. To ensure the long run sustainability of the project after completion, the County government and local stakeholders should work together in addressing the environmental issues, the Contractor and the Consultant must adhere to the mitigation measures recommended under the ESMP to ensure safety of the operators and neighbouring communities. Safety rules therefore have to be followed strictly to the letter as outlined in the ESMP. There is a need to carry out an elaborate Resettlement Action Plan (RAP) to ascertain the number of Project Affected Persons (PAPs), as this will also go a long way in promoting the project’s acceptance. The report recommends that Mombasa Water Supply and Sanitation Company. (MOWASCO) carries out regular annual EA of the project as required by NEMA.
The legislative framework needs to be taken into consideration during and after the project implementation.
1. **INTRODUCTION**

1. **General**

The Government of Kenya (GoK) through the Ministry of Environment, Water and Natural Resources (MEWNR) has received “credit” from International Development Association (IDA) to undertake the Waste Water Master Plan for Mombasa and Selected Towns within the Coast Region.

Mombasa Water Supply and Sanitation Company Limited (MOWASCO) as part of its mandate intends to improve the sanitation of the Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area.

Zamconsult Consulting Engineers has been contracted to undertake the ESIA and RAP for the proposed Kipevu Wastewater Treatment Plant (WWTP) and the sewers in the West Mainland service area as part of the WaSSIP projects with funding from the World Bank.

2. **Goals and Objectives of this Study**

Goals and objectives are defined in the ToR (Paragraph 7.3) as, “The main goal of the Master Plan is to identify a sound and rational strategy for the development of sewerage services in Mombasa and selected Towns over the next twenty-five (25) years i.e. up to Year 2040, to improve the quality of effluent to rivers, Indian Ocean and groundwater and to safeguard the health of the city’s residents.”

The key objective of the proposed Master Plan is to come up with a phased investment programme for Immediate / Short Term Plan (2015 – 2020), Medium Term Plan (2021 – 2025), Long Term Plan (2026 – 2040) and recommend a treated effluent disposal / reuse strategy for the project Towns.

The specific objectives of the EIA carried out by Zamconsult Consulting engineers were;

- To fulfil the legal requirements as outlined in section 58 to 69 of the Act and Regulation 7 of the EIA Regulations.
- To obtain background biophysical information of the site, legal and regulatory issues associated with the project;
- To assess and predict the potential Impacts during site preparation, construction and operational phases of the project;
- To propose mitigation measures for the potential significant adverse environmental impacts and safety risks;
- To assess the legal and regulatory framework governing the project;
- To allow for public participation;
- To lower project cost in the long term;
- To prepare an Environmental and Social Management and Mitigation Plan
- To prepare an environmental and social monitoring plan; and
- To compile an EIA Project Report for submission to NEMA.
3. Project Description

The proposed project involves physical improvement of existing sewerage system and Kipevu Wastewater Treatment Plant including rehabilitation works, rehabilitation of Existing Pumping Stations (Replacement of 1nr. Pump and Motor at Miritini Pumping Station and 2nr. Pumps and Motor at Port Reitz Pumping Station) and targeted Trunk Sewers and Main Secondary Sewers. The sewers to be rehabilitated are:

- Miritini Trunk Sewer and Main Secondary Sewers within Miritini Site and Service Estate
- Mikindani Trunk Sewer and Main Secondary Sewers within Mikindani Site and Service Estate
- Chaani Trunk Sewer and Main Secondary Sewers within Chaani Estate
- Changamwe Trunk Sewer and Main Secondary Sewers within Changamwe Site and Service Estate
- Port Reitz Trunk Sewer and Main Secondary Sewers within Port Reitz Estate
- Main Secondary Sewers within EPZ Estate
- Main Secondary Sewers within Hamisi Estate

The Rehabilitation Works of the Sewers will mainly comprise of the following:

- Unblocking of sections of the sewer lines that are fully blocked
- Replacement of broken manhole cover slabs
- Exposing buried manholes and raising them above the ground level
- Replacement of missing / damaged or corroded step irons
- Replacement of collapsed sections of the sewer lines, mainly pitch fibre sewer pipes
- Re-routing / reconstruction of sewer lines prone to blockages as a result of inadequate slopes
- Replacement of broken / vandalised manhole covers

3.1. Summary Description of the Main Project Components

The physical improvement of existing sewerage system and Kipevu Wastewater Treatment Plant including rehabilitation works comprise the major components of the project, as further described below.

3.1.1. Chaani Upgrading Scheme

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Benching for all Manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing of the entire system
- Identify, expose and raise above ground levels all buried manholes
- Backfilling eroded sections of the sewer line and protection against erosion
3.1.2. **Chaani Trunk Sewer**

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.1.3. **Changamwe Site and Service Scheme**

The following Rehabilitation Works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Manhole Benching in all the manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Backfilling eroded sections of the sewer line and protection against erosion
- Supply of aluminium telescopic ladder.

3.1.4. **Changamwe Trunk Sewer**

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.1.5. **Hamisi Municipal Estate**

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Manhole Benching in all manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Backfilling eroded sections of the sewer line and protection against erosion
- Supply of aluminium telescopic ladder.

3.1.6. **Export Processing Zone (EPZ) Area**

The following rehabilitation works will be carried out:

- Remove the existing system
- Lay new sewer lines with higher capacities
- Construct new manholes
- Supply of aluminium telescopic ladder.
3.1.7. **Mikindani Site and Service Scheme**

The following rehabilitation works will be carried:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.1.8. **Mikindani Pumping Station and Rising Main**

Mikindani Pumping Station is located on a slope. Rains are gradually eroding the soil along the access road and the northern perimeter wall. Minor rehabilitation works are required at the Miritini pumping station e.g. repair to leaking roof, replacement of light fittings, replacement of door locks etc.

3.1.9. **Mikindani Trunk Sewer**

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.1.10. **Miritini Site and Service Scheme**

The following remedial measures will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Manhole Benching for all Manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Replacement of collapsed sections of the sewer line
- Backfilling eroded sections of the sewer line and protection against erosion

3.1.11. **Miritini Trunk Sewer**

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.
3.1.12. **Miritini Pumping Stations**

Minor rehabilitation works are required at the Miritini Pumping Station e.g. repair to leaking roof, replacement of cable ducts cover, replacement of door locks etc. One pump is reported to be faulty. During the inspection the wet well was full of sewage which was overflowing to a valley downstream of the Pumping Station.

Minor rehabilitation works are required at the Miritini Pumping Station e.g. repair of leaking roof, replacement of light bulbs, replacement of door locks etc.

3.1.13. **Port Reitz Trunk Sewer**

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of Aluminium Telescopic Ladders.

3.1.14. **Port Reitz Pumping Station**

The following rehabilitation works will be carried out:

- Supply and install new pumps
- Replace/ repair the blown pump main circuit breaker
- Repair/ replace the automatic level control
- Service the generator and check where the fault is
- Replace generator if necessary
- Replace the gate Provide security at the station at all times.

3.2. **Kipevu Wastewater Treatment Plant**

The following rehabilitation works are recommended:

- Replace all faulty valves and fittings
- Replace steel works and apply epoxy paint
- Install a new flow measuring device at the Inlet Works
- Repair the gantry at the Inlet Works
- Replace 2Nr. motors of the Final Settlement Tanks
- Replace the scum brushes for one of the differential Settlement Tank
- Install 2Nr. return activated sludge pumps
- Install 1Nr. Surplus sludge pump
- Supply Laboratory Equipment as directed
- Carry out minor repair works to the existing buildings within the Treatment Works Site e.g. repair to plumbing fittings and electrical works, repainting, fixing of window panes etc.
3.3. **Preconstruction Phase**

This phase shall entail the following activities:

- Preparation of project designs
- Securing of all the necessary approvals by the client from local authorities and all relevant institutions
- Preparation of the project EIA report and its approval
- Identification of all persons to be affected by the project
- Preparation of the RAP report to identify all PAPs appropriate resettlement and compensation
- Compensation and Resettlement of PAPs

3.4. **Construction and Operation & Maintenance Phase**

These phases shall entail the following activities

- Contract signing between the client and the contractor
- Procurement by the contractor of a performance bond
- Securing approvals and licenses by the contractor for contractor's installations
- Mobilization of the Contractor's machinery, plant and personnel, construction camp
- Identification/familiarization with materials sources and dump sites
- Demolition and site clearance
- Actual rehabilitation work
- Site reinstatement/clean up after completion of rehabilitation works
- Commissioning/handling over of the project to the client
- Routine and period maintenance of the sewer system during its life cycle

4. **Scope of the Services**

The scope of work for Physical improvement of existing sewerage system and Kipevu Wastewater Treatment Plant including rehabilitation works is:

- To carry out Environmental and Social Impact Assessment based on the government of Kenya regulations and the World Bank Safeguards Operational policies,
- An assessment of positive and negative impacts,
- Prepare Environmental and Social Management Plan (ESMP).

5. **Study Methodology**

5.1. **Data Collection Methods**

The consultant employed the following methods to carry out the study:

5.1.1. **Direct Observation**

The researchers' specified in detail what was to be observed and how the measurements were recorded and monitored all aspects relevant to the study such as the wastewater treatment plant, the trunk sewers, sources of water and its uses, the water supply...
systems, solid waste management, economic activities undertaken, housing patterns, and way of living.
5.1.2. Interview of Key Informants

The study involved use of resource persons as key informants, representing various groups such as local chiefs, village elders, Sub County Departmental Heads, opinion leaders and the community development leaders. The criteria for selection emphasized on gender, both elderly and youth.

![Client Consulting Chief – Chaani Location](image1)
![Client Meeting Chief – Mikindani Location](image2)

![Client Meeting Chief – Miritini Location](image3)
![Meeting the Kipevu Plant Manager](image4)

Photoplate 1: Some of the Stakeholders Consulted

5.1.3. Questionnaires

The Consultant administered questionnaires to randomly selected household units within the project area by use of enumerators who were recruited based on a threshold set by the consultant. The enumerators had to have completed O level education and were selected from each village in the project area. Gender balance was observed during their recruitment. The enumerators were then trained by the Consultant’s socio-economic team before they were sent to administer the questionnaires.

A total of twelve (12) enumerators were recruited and trained to carry out the fieldwork. An enumerator was to cover their village of residence. The questionnaires were interpreted in Swahili to facilitate ease of understanding for the respondents who largely speak Swahili as the main local language.

5.1.4. Review of Available Information

This involved review of various documents which includes; earlier research, reports from projects done in the region, government documents e.g. the design reports, books and
papers with relevant information. This aims at obtaining as much information as possible as regards the project area.
5.1.5. **Screening and Scoping**

*Screening of the project:* a process that evaluated whether the project required a full EIA study under schedule 2 of the EMCA 1999, various environmental components of relevance were evaluated against the proposed activities to be carried out in the project cycle.

*A scoping exercise:* This identified the projects’ key issues of concern to be addressed by ESIA team, both positive and negative concerns that may require further studies. The sewage treatment and management being a new component in the area is anticipated to elicit significant impacts. The ESIA team therefore established that a full study would be necessary because the scope and extent of the project is extensive.

5.2. **Sampling Technique**

A random sampling technique was employed whereby the researcher carried out a reconnaissance study of the project area a day before the actual field survey to accurately determine the distribution of households and determine which households are directly affected by the project. This was achieved through consultation with chiefs and village elders to get an idea on how the villages are distributed. This provided guidance on how the enumerators were to distribute the questionnaires. The enumerators were then instructed to observe randomness in administering questionnaires through skipping one homestead and two homesteads alternatively.

5.3. **Data Analysis and Discussion**

Questionnaires were first coded correctly and checked using a code sheet. They were then captured into the SPSS spreadsheet prepared alongside preparation of the questionnaire. The keyed in data was analyzed using frequencies and cross tabulation which and be used to generate outputs in form of graphs and charts on Microsoft Excel for presentation. The data were analyzed using frequencies and regression analysis.
2. DESCRIPTION OF THE PROJECT AREA

2.1. Project Location

The project area is located within the Mombasa West Mainland within Port Reitz, Mikindani, Chaani and Miritini Locations.

The Kipevu Treatment Plant is located at GPS co-ordinates 4° 2’ 25”S and 39° 37’ 49” E, in Mombasa County.

2.2. The Background of Proposed Project

The first Sewerage System constructed in Mombasa was built in 1952 to serve the Government Housing Estates in the Changamwe area of the West Mainland. In 1957, the piped Sewerage System was extended to serve the Rail-Served Industrial Area. Later, extensions to the network were provided to serve the Oil Refinery and Magongo Housing Estates. The Changamwe Trunk Sewer and the Chaani Trunk Sewer were both built around this time to connect the various Secondary Sewer Networks to a Wastewater Treatment Plant located at Kipevu. In the 1980s and 90s, the Sewerage Systems on the West Mainland was extended to the newly developed areas such as Miritini Site and Service (S&S) Scheme, Mikindani S&S Scheme, and the Port Reitz. These areas were provided with sewers and connected into the main Trunk Sewers.

The Chaani Trunk Sewer and Changamwe Trunk Sewer both convey wastewater separately to the Kipevu Treatment Plant entirely by gravity and no pumping is necessary. Due of the locations of the Miritini and Mikindani S&S Schemes and the Port Reitz Area, including Moi International Airport, the Trunk Sewers serving those areas required the inclusion of Pumping Stations and Rising Mains to transport wastewater to the Kipevu Treatment Plant. Conventional Pumping Stations with one duty and one standby centrifugal pump, and associated Rising Mains were provided on the Miritini, the Mikindani, and the Port Reitz Trunk Sewers. As a result of its length and the flat topography, an intermediate Low-lift Screw Pump Station was also provided on the Miritini Trunk Sewer.

The table below is a summary of the five existing trunk sewers in Mombasa West Mainland:

<table>
<thead>
<tr>
<th>Trunk Sewer</th>
<th>Pipe Diameter (mm)</th>
<th>Pipe Material</th>
<th>Total Length (m)</th>
<th>Number of Manholes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miritini Trunk Sewer</td>
<td>400 – 800</td>
<td>Steel</td>
<td>6,270</td>
<td>93</td>
</tr>
<tr>
<td>Mikindani Trunk Sewer</td>
<td>400</td>
<td>Steel</td>
<td>1,400</td>
<td>25</td>
</tr>
<tr>
<td>Chaani Trunk Sewer</td>
<td>1000</td>
<td>Steel</td>
<td>2,700</td>
<td>41</td>
</tr>
<tr>
<td>Changamwe Trunk Sewer</td>
<td>300</td>
<td>Steel</td>
<td>3,550</td>
<td>70</td>
</tr>
<tr>
<td>Port Reitz Trunk Sewer</td>
<td>300/400</td>
<td>Steel</td>
<td>3,660</td>
<td>58</td>
</tr>
<tr>
<td>Totals</td>
<td>17,580</td>
<td>287</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>-----</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Zamconsult Consulting Engineers
Figure 1: Layout Plan - West Mainland Service Area
2.3. Project Overview

Mombasa County is one of the 47 Counties of Kenya. Its capital and the only city in the county is Mombasa. Initially it was one of the former Districts of Kenya but in 2013 it was reconstituted as a county, on the same boundaries. It is the smallest county in Kenya, covering an area of 229.7 km² excluding 65 km² of water mass. The county is situated in the South Eastern part of the former Coast Province. It borders Kilifi County to the North, Kwale County to the South West and the Indian Ocean to the East. The county population is 939,370 persons, comprising 486,924 males and 452,446 females. This is spurred by rapid population growth in Mombasa in the unplanned areas where land and housing is relatively cheap and characterized by deteriorated or inadequate sanitation infrastructure. The rapid growth in population and urbanization in Mombasa City has exerted relentless pressure on resources and services such as, housing, water supply and sanitation, education and health facilities. The delivery of essential services in the city has failed to keep pace with the increased demand.

The nature of the development in the project area is predominantly medium income residential. Most of the dwellings are single storey traditional Swahili type houses, although there are a few recently constructed multi-storey blocks of apartments. There is no industry and only a few Schools exist within the scheme. Commercial activities common within the project area include small general shops, small furniture and metal fabrication workshops. Many large plots outside the Re-Pooling Scheme are used as transport depots for large container trucks.

Wastewater flows will be generated mainly by the residential dwellings. The anticipated flows will therefore relate to the actual population served with domestic sewage characteristics.

The area is almost fully developed, with little scope for any additional development. Additional settlement can only be accommodated if the existing Swahili style houses are replaced with apartment blocks. However, this is not a prime area for the construction of apartment blocks and it is likely that this type of redevelopment will take place at a slow pace. To make allowance for this, the base figure for the design population has been taken as the 2009 Census population, but the proportion of apartment blocks has been increased to 20%.

Population data and the associated enumeration maps from the 2009 National Census were obtained from the Central Bureau of Statistics in Nairobi. The preliminary sewer layouts were superimposed on top of the enumeration maps and a specific population density obtained from the population data for each potential sewer line. The population densities in the Project Area were found to be relatively high, ranging from 200 persons/ha to 403 persons/ha, with an average of around 280 persons/ha.

Per capita water consumption figures were adopted from Water Demand Assessment Study carried out by the Seureca/MIBP Joint Venture for the design of the Mombasa Water Distribution System.

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1 KNBS…Census 2009
2 Mombasa County First County Integrated Development Plan
West Mainland Sewer Network

The Mombasa County is divided into four main areas namely: South mainland, north mainland, west mainland and Mombasa Island. This ESIA focuses on the West Mainland. The first sewers were built here in 1952 to serve the Government housing estates in Changamwe. In 1957 the piped sewerage was extended to serve the rail served Industrial area and later extensions were provided to serve the oil refinery and parts of Magongo. The Old Changamwe trunk sewer gravitates sewage through Kalahari informal settlement to Kipevu. In the 1980s and 1990s the system was extended to serve the newly developed site and service schemes of Miritini, Chaani and Mikindani and Port Reitz. Diameters range from 200 mm to a maximum of 1000 mm and pipe materials being PVC, steel and concrete. There are over 50Km of main sewers covering nearly 40% of the developed area. The Chaani and Changamwe trunk sewers both convey wastewater separately to the Kipevu treatment plant entirely by gravity.

Blockages occur mostly in small size sewers in built up areas. Miritini and Mikindani Site and Service Schemes and the Port Reitz Area, have pumping stations and rising mains which discharge to the Chaani trunk sewer. A Low lift pump is also provided after the Miritini rising main at Jomvu. A Chamber on the Port Reitz gravity line is provided near the MTC staff houses for screening before sewage reaches Port Reitz pumping station.

Kipevu Sewage Treatment Plant

The Plant is located at Kipevu, adjacent to Kilindini Harbor with an outfall at berth No.14. It is an extended aeration facility, utilizing an oxidation ditch system, constructed under the Phase I of Mombasa Sewerage Project to replace the original Biological Filter Plant. The plant commissioned in the Year 2000, consists of pre-treatment, aeration, clarification, sludge processing and sludge drying units. The plant was designed to serve a population equivalent of 200,000. The inflow is currently at less than 40% of the Design Average Dry Weather Flow of 17100 cm/day.

Need for sewerage infrastructure

Water-borne sanitation through the use of Sewerage System exist only in Mombasa County out of all the Project Towns. Most buildings/establishments are not connected to the sewer lines because of water scarcity and high cost of construction and the current lines were constructed after the construction and hence no provision for connection. Mombasa County comprises of four distinct Service Areas that are physically separated by the creeks that surround Mombasa Island. These Service Areas are Mombasa Island, North Mainland, South Mainland and West Mainland.

The only Serviced Areas in the County where piped sewerage systems have been built are on the West Mainland and Mombasa Island. The Service Areas and sewered sub-service areas on Existing Sewerage System on West Mainland / Mombasa Island including Trunk Sewers, Pumping Stations, Kipevu and Kizingo Wastewater Treatment Works.

The Sewerage System for West Mainland has been continually expanded since its initial construction in 1952. At present, the sewered area within West Mainland is approximately 40% of the developed service area. This sewerage system conveys wastewater to a Wastewater Treatment Plant located at Kipevu (17,000m3/day capacity), adjacent to Kilindini Harbour.
2.4. The Physical Environment

2.4.1. Climate

Mombasa County receives an average annual convective and bimodal rainfall of about 900mm with a marked decrease in intensity in the north and into the hinterland. The average annual mean rainfall in the County ranges from 400mm to 1,100mm. The rainfall pattern is influenced by proximity to the Indian Ocean, relatively low altitudes, temperature and trade winds with the seasons being more pronounced in the south. Long rains occur between the month of April and June (peak in May), while the short rains occur from October to December.

The annual minimum temperatures in the area range between 22.5°C and 24.5°C while the maximum temperatures vary between 26°C and 30°C along the coastal belt. The County is generally hot and humid all the year round with a relative humidity of about 60% due to the high evaporation rate and availability of surface water.

2.4.2. Topography

Mombasa County is within coastal lowland rising gently from flat zones of between 6 – 50m above sea level and becoming undulating westwards on the mainland to about 100m above sea level at Mariakani area. The City of Mombasa Central Business District (CDB) lies wholly on Mombasa Island with commercial and residential areas extending into the mainland areas via Likoni (Mombasa – Lungalunga road), Mombasa – Malindi road and Changamwe (Mombasa – Nairobi road). These areas are fairly developed with commercial and human settlements effectively affecting the surface topography and interfering with the surface drainage.

2.4.3. Geology and Soils

The geology of the Kenyan coast is dominated by rifting and breakup of the Paleozoic Gondwana continent and the development of the Indian Ocean. The Proterozoic gneisses of the Mozambique belt form the basement of an intracratonic basin, filled with continental permo-Triassic classics. The sea level changes, isostatic readjustments and the tectonic movements contribute to the geomorphology of the Kenyan coast.

The region is divided into three main physiographic belts namely the flat coastal plain which includes; Island division, Kisauni on the North mainland and Mtongwe to the South. Next are the broken severely dissected and eroded belts that consist of the Jurassic Shale over lain in places by residual sandy plateau found in Changamwe Sub-County. Finally there is the undulating plateau of sand stone that is divided from the Jurassic belt by a scarp fault.

2.4.4. Hydrology and Drainage and Water Resource

The Indian Ocean is the largest water mass in the area and influences the general surface drainage pattern with all land sloping towards the ocean hence all the surface run-off is expected to drain to the sea through the natural drainage systems. However, due to the dense human settlements and activities the natural drainage systems have been interfered with resulting to frequent flooding. The drainage of the coastal zone generally adjusts to the original slope towards the east that is typical of the general tilt of the Eastern African margin that has been altered by human activities.
Due to the ragged topographic nature upstream and the relatively high soil porosity, drainage is efficient with no possibility of flooding during rains. However, due to dense settlements in the project area, natural drainage systems and channels have been destroyed or blocked by human settlements, roadside economic activities and waste materials.

### 2.4.5. Biodiversity

The project area already has minimal vegetation, due to its highly urban nature, thus little vegetation may be affected by the proposed construction and rehabilitation works.

### 2.5. Infrastructure

#### 2.5.1. Housing Types and Population

The area has a variety of housing types, including single storey dwellings, traditional Swahili houses, double storey dwellings, and 4 storey blocks of apartments. The number of plots that are available for new buildings is very limited and so there is a noticeable, on-going trend towards an increase in the building height, i.e. the number of storeys of new buildings. This will lead to an increase in population density in the future.

The 2009 Population and Housing Census was used to establish the population of the area as well as predict the population growth for the design year.

#### 2.5.2. Commerce and Industry

The project area is an urban area, housing several businesses associated with residential estates. The area houses some of the working class in Mombasa with the residents working in the nearby industries, vehicle yards, the port, the Kenya Pipeline Corporation, as well as the Mombasa Airport.

The major activities on going in the area include shops, green groceries, bars, barber shops etc. some of the businesses are shown in the project area.

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**Yamoke Hotel**

**Dairy Shop Business**

**A private health facility**

**Mixed businesses**
Photoplate 2: Businesses along the Road in the Project Area
2.5.3. Sanitation Infrastructure

The project area is located in close proximity with two trunk mains namely the Mikindani and Miritini Main Sewer Lines. However majority of the area is not sewered, with few developers opting to have personal sewer lines that connect to the trunk mains. Untreated wastewater is discharged into the storm water sewers thus ultimately drain into the ocean, posing environmental hazards and health risks to both the residents of Mombasa and the marine ecosystem. It impairs economic on recreational use of the beaches, releasing obnoxious smell, accumulation of toxic substances, pathogenic organisms and debris in undesirable concentrations at the beaches among other numerous detrimental effects. Untreated wastewater is also known to carry an array of potentially harmful pathogens and toxins.

Photoplate 3: Raw Sewage flowing into water bodies

The project area is also plagued with generation of solid waste, with plastic bags and bottles clogging the existing drainage infrastructure as shown in the photo plate below:
Photo Plate 1: Dumped Plastics in Stormwater sewers in Mikindani Area
2.5.4. Power Supply

The Project Area is served by the national grid under the Kenya Power and Lighting Company (KPLC).

2.5.5. Transport and Communication

The project area, being an urban area, is served by an intricate road network. Most of the roads are to bitumen and cabro standards, with only the foot paths not having any developments on them. In addition, the area experiences high traffic due to the fact that the roads are narrow and most of the heavy trucks that come from their yards near the port make use of the Port Reitz Road while exiting Mombasa.

2.6. The Socio-economic Situation

The socio-economic situation of the area was captured based on findings of a household survey carried out using a structured questionnaire. A sample group of 300 households was interviewed for purposes of the analysis.

Table 2: Sample Size

<table>
<thead>
<tr>
<th>Location</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chaani (Kipevu Plant)</td>
<td>60</td>
</tr>
<tr>
<td>Port Reitz (Pumping Station)</td>
<td>60</td>
</tr>
<tr>
<td>Jomvu (Pumping Station)</td>
<td>60</td>
</tr>
<tr>
<td>Miritini (Pumping Station)</td>
<td>60</td>
</tr>
<tr>
<td>Mikindani (Pumping Station)</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>300</strong></td>
</tr>
</tbody>
</table>

2.6.1. Population Dynamics and Household Characteristics

The study established that 5-18 and 19-35 years (25% and 46% of those interviewed) were the dominant age groups in the area as shown in Figure 2. There is an indication that there are a strong and young people who could provide local and cheap labour on the project that will affect them in the future because they are residents of these areas.

![Figure 3: Age of Population](image_url)
Most of the residents in the project area have attained basic education as indicated in figure 3, with just a mere 7% of the population not having attained any level of education. This is a sign of high literacy levels in the area. The household literacy levels are shown in the chart below:

![Figure 4: Household Literacy Levels](chart)

Source: Survey Data

Christianity is the dominant religion in this region as shown in figure 4 (66%) followed by Islam (32%), while just 2% is traditionalist contrary to the expected norm of most coast region members being muslims.

![Figure 5: Religion of Population](chart)

Source: Survey Data

Charcoal (72%) and kerosene (17%) are the most used sources of fuel as indicated in figure 5. Although the project area is in an urban environment, the fuels mostly used for cooking show that the project area is in a low income urban area as shown in the chart below:

![Figure 6: Source of Energy](chart)

Source: Survey data.
2.6.2. Socio-economic Activities and Land Use Patterns

Being an urban area, Business (54%) and Formal Employment (39%) are the major economic activities in the area. Majority of the project area is made up of housing estates, with most occupants being formally employed in the Mombasa central business district. Other economic activities are shown in the figure below: agriculture comprises of fishing, livestock farming and crop farming.

![Figure 7: Household Socio-economic Activities](source)

Most of the people earn below Kshs.15,000 (49%) and between Kshs.15,001-30,000 (42%) as indicated in figure 7. Most of these are in formal employment and business.

![Figure 8: Average Household Income per Month](source)

Although crop and animal farming only makes up of 5% of the economic activities, majority of the households practicing crop (coconuts, maize, beans and vegetable) and animal farming (chicken, cows and goats) in their rural homes within the county.

The type of businesses owned mostly by residents are Jua Kali (39%) and shops (36%) as indicated in figure 8.

![Figure 9: Type of Business Carried Out](source)
2.6.3. Water Sources and Availability

Boreholes and public water points are the main sources of water in the area. 66% of the households rely on borehole as shown in the figure below. Water Scarcity in the entire coast region contributes to poor sanitation conditions. The Mombasa County Government has rolled out various water projects that could be useful in new sewer connections.

Figure 10: Main Sources of Water for Household Use
Source: Survey data.

Most of the sampled residents feel that the water supply is inadequate (77%) with most of them opting for a water supply project instead of a sewerage project. Being an urban area, majority of the residents fetch water daily for use in their houses since it is not adequate.

2.6.4. Sanitation

Majority of the population relies on garbage collection by local youth as a waste disposal method (36%) while 35% dump in open places. The rest of the population burns or composts their waste, while others rely on council garbage collection services as shown in the chart below.

Figure 11: Common Waste Disposal Methods
Source: Survey data.

Being an urban set up, 99% of households in the project area have toilets within their compounds. 50% of the population in the project area use pit latrines while 23% are connected to the existing sewer lines. The rest of the population relies on septic tanks and mobile toilets. The number of residents using pit latrines in such an urban area is relatively high considering its location. The project may improve the sanitation facilities in the area.
The respondents were willing to be connected to the sewer line and are ready to contribute to through many ways. As indicated in Figure 12 below, majority of the respondents at 85% are willing to be connected to the improved sewer line whereas 15% were not willing to be connected due to water insufficiency cases experienced by the dwellers.

Thirty six percent are willing to contribute to the project costs, seven percent are willing to contribute in kind to through provision of manpower, guarding services and maintenance of the facilities, whereas a larger percentage at fifty seven percent did not respond to this question as shown in Figure 13 below.
2.6.5. **Health Status**

The prevalent diseases in the area are malaria, diarrhoea, eye problems, skin rashes, cholera, respiratory infection and others as shown in the figure below.

![Common Diseases](image)

**Figure 14: Prevalent Diseases in the Area**
Source: Survey data.

Majority of the respondents when sick seek medical attention from a health centre close to where they stay (1-5km), some take herbs and some seek the help of a witch doctor. The health facilities where the people in the area seek help are mainly government health centres (71%) and private hospitals (26%).

![Ownership Status of Health Facilities](image)

**Figure 15: Ownership Status of Health Facilities**
Source: Survey data.

The local hospitals are relatively close with the area being served by the Port Reitz Hospital (government) and Bomu Hospital (private).

Being an urban centre, HIV/AIDS awareness is extremely high with all the respondents interviewed being aware of HIV/AIDS. The Information is mainly got from the media and health workers, taught in schools, informed by friends and relatives or from government signboards and the newspapers. According to the National AIDS Council Report of 2016, Mombasa County HIV prevalence stands at 7.4% against the national prevalence of 6%.

14% of the respondents’ families have been affected by the scourge.
96% of the respondents feel that HIV/AIDS can be prevented while 3% says it cannot be prevented. 1% of the respondents have no idea if it can be prevented.

95% of the respondents know where to go for voluntary counselling and testing for HIV/AIDS, while 5% do not.
2.6.6. Knowledge on the Project and its Environmental Impacts

61% of the residents are aware of the intended rehabilitation works of the project. 83% of the respondents perceived that the rehabilitation works will bring about positive impacts while 17% believe the project will bring adverse impacts.
3. **DESCRIPTION OF THE PROJECT**

3.1. **General**

In order to make best use of the existing infrastructure at Kipevu WWTP, it is recommended that existing sewers on West Mainland be rehabilitated as per the Contract Documents drafted for Immediate Urgent Works. The works will also include rehabilitation of units at existing Kipevu WWTP.

The Kipevu Wastewater Treatment Plant (WWTP) and sewers in the West Mainland service area are poorly managed but have capacity to handle additional volume of wastewater generated if additional areas are sewered. The capacity of Kipevu WWTP is 17,000m3/day.

3.2. **Existing Sewerage System**

Mombasa County comprises of four distinct Service Areas that are physically separated by the creeks that surround Mombasa Island. These Service Areas are Mombasa Island, North Mainland, South Mainland and West Mainland.

The only Serviced Areas in the County where piped sewerage systems have been built are on the West Mainland and Mombasa Island. The Service Areas and sewered sub-service areas on Existing Sewerage System on West Mainland / Mombasa Island including Trunk Sewers, Pumping Stations, Kipevu and Kizingo Wastewater Treatment Works.

The Sewerage System for West Mainland has been continually expanded since its initial construction in 1952. At present, the sewered area within West Mainland is approximately 40% of the developed service area. This sewerage system conveys wastewater to a Wastewater Treatment Plant located at Kipevu (17,000m3/day capacity), adjacent to Kilindini Harbour.

3.3. **Improvement of Existing Sewerage System and Sewage Treatment Plant**

Details of the Works to be executed are summarised in the following sub-sections;

3.3.1. **Rehabilitation of Existing Kipevu Wastewater Treatment Plant**

Due to the failures at the West Mainland Pumping Stations, a substantial amount of sewage from the pumping stations flows to the ocean with very little flowing to the Kipevu Treatment Plant. Most of the operational valves are reported as being faulty and exposed metalwork e.g. handrails, pipes, etc. are corroding.
According to the design report, 2016, the following rehabilitation works are recommended:

- Replace all faulty valves and fittings
- Replace steel works and apply epoxy paint
- Install a new flow measuring device at the Inlet Works
- Repair the gantry at the Inlet Works
- Replace 2Nr. motors of the Final Settlement Tanks
- Replace the scum brushes for one of the differential Settlement Tank
- Install 2Nr. return activated sludge pumps
- Install 1Nr. Surplus sludge pump
- Supply Laboratory Equipment as directed
- Carry out minor repair works to the existing buildings within the Treatment Works Site e.g. repair to plumbing fittings and electrical works, repainting, fixing of window panes etc.

3.3.2. Rehabilitation of Trunk Sewers and Main Secondary Sewers

The physical improvement of existing sewerage system and Kipevu Wastewater Treatment Plant including rehabilitation works comprise the major components of the project, as further described below.

3.3.2.1. Chaani Upgrading Scheme

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Benching for all Manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing of the entire system
- Identify, expose and raise above ground levels all buried manholes
- Backfilling eroded sections of the sewer line and protection against erosion

3.3.2.2. Chaani Trunk Sewer

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.
3.3.2.3. Changamwe Site and Service Scheme

The following Rehabilitation Works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Manhole Benching in all manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Backfilling eroded sections of the sewer line and protection against erosion
- Supply of aluminium telescopic ladder.

3.3.2.4. Changamwe Trunk Sewer

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.3.2.5. Hamisi Municipal Estate

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Manhole Benching in all manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Backfilling eroded sections of the sewer line and protection against erosion
- Supply of aluminium telescopic ladder.

3.3.2.6. Export Processing Zone (EPZ) Area

The following rehabilitation works will be carried out:

- Remove the existing system
- Lay new sewer lines with higher capacities
- Construct new manholes
- Supply of aluminium telescopic ladder.

3.3.2.7. Mikindani Site and Service Scheme

The following rehabilitation works will be carried:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.
3.3.2.8. Mikindani Pumping Station and Rising Main

Mikindani Pumping Station is located on a slope. Rains are gradually eroding the soil along the access road and the northern perimeter wall. Minor rehabilitation works are required at the Miritini pumping station e.g. repair to leaking roof, replacement of light fittings, replacement of door locks etc.

3.3.2.9. Mikindani Trunk Sewer

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.3.2.10. Miritini Site and Service Scheme

The following remedial measures will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Repair of Manhole Benching for all Manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Replacement of collapsed sections of the sewer line
- Backfilling eroded sections of the sewer line and protection against erosion

3.3.2.11. Miritini Trunk Sewer

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of aluminium telescopic ladder.

3.3.2.12. Miritini Pumping Stations

Minor rehabilitation works are required at the Miritini Pumping Station e.g. repair to leaking roof, replacement of cable ducts cover, replacement of door locks etc. one pump is reported to be faulty. During the inspection the wet well was full of sewage which was overflowing to a valley downstream of the Pumping Station.

Minor rehabilitation works are required at the Miritini Pumping Station e.g. repair of leaking roof, replacement of light bulbs, replacement of door locks etc.
3.3.2.13. Port Reitz Trunk Sewer

The following rehabilitation works will be carried out:

- Replacement of missing / vandalised manhole covers
- Repair of broken manholes
- Unblocking of partially / fully blocked sections of the sewer line and flushing
- Identify, expose and raise above ground levels buried manholes
- Supply of Aluminium Telescopic Ladders

3.3.2.14. Port Reitz Pumping Station

The following rehabilitation works will be carried out:

- Supply and install new pumps
- Replace/ repair the blown pump main circuit breaker
- Repair/ replace the automatic level control
- Service the generator and check where the fault is
- Replace generator if necessary
- Replace the gate Provide security at the station at all times

3.3.3. Kipevu Wastewater Treatment Plant

The following rehabilitation works are recommended:

- Replace all faulty valves and fittings
- Replace steel works and apply epoxy paint
- Install a new flow measuring device at the Inlet Works
- Repair the gantry at the Inlet Works
- Replace 2Nr. motors of the Final Settlement Tanks
- Replace the scum brushes for one of the differential Settlement Tank
- Install 2Nr. return activated sludge pumps
- Install 1Nr. Surplus sludge pump
- Supply Laboratory Equipment as directed
- Carry out minor repair works to the existing buildings within the Treatment Works Site e.g. repair to plumbing fittings and electrical works, repainting, fixing of window panes etc.

3.4. Project Preliminary Cost

Cost estimates have been done with prevailing unit rates in the market. The rates take into account project location, availability of materials, cost of labour, contractor's profits and overheads.
### Table 3: Preliminary Cost Estimates

<table>
<thead>
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<th>S/No.</th>
<th>Description</th>
<th>Amount (Kshs)</th>
<th>Amount (US$)</th>
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<td>BACKLOG OF DEFERRED MAINTENANCE OF SEWERS, SEPTIC TANKS, PUMPING STATIONS AND TREATMENT FACILITIES</td>
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<td>Chaaani Upgrading Scheme</td>
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<td>Rehabilitation of Electro-mechanical Works and Ancillary Works</td>
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<td>B1 Changamwe Re-pooling (A/H6 funding) *</td>
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<td>C1 Rehabilitation of Existing 4N Pumping Stations</td>
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<td>C2 Modification of Existing 4N Pumping Stations Including Emergency Overflow Outfall System</td>
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<td>C3 Construction of 10N Storm Water Headworks and Sea Outfalls</td>
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<td>ABLUTION BLOCKS AND SLUDGE HANDLING FACILITIES</td>
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<td>D2 Construction of Sludge Handling Facilities for North and South Mainland Service Area (2N Total)</td>
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**E**

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<tr>
<td>E1 Operation and Maintenance Equipment and Tools</td>
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<td>E1 Institutional Strengthening and Capacity Building</td>
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**SUB-TOTAL 1** (Less Changamwe Repooling Scheme) *

Add 7% for Sub-total for Preliminary and General

**SUB-TOTAL 2**

486,257,523 + 9,097,083

**SUB-TOTAL 3**

Add 10% for Sub-total 2 for Physical Contingencies

Quick Math: 486,257,523*1.1 = 534,883,375

**SUB-TOTAL 4**

Add 10% for Sub-total 3 for Price Contingencies

Quick Math: 534,883,375*1.1 = 590,371,713

**GRAND TOTAL INCLUDING PRELIMINARY & GENERAL, CONTINGENCIES, DUTIES AND TAXES & CONSULTANCY / SUPERVISION FEES**

1,129,030,763 + 12,108,218

The Exchange Rate Adopted is 1US$ = 93.245 KShs
4. **RELEVANT POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

4.1. **General Overview**

According to the Kenya National Environment Action Plan (NEAP, 1994) the Government recognized the negative impacts on ecosystems emanating from industrial, economic and social development programmes that disregarded environmental sustainability. Following this, the establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been accomplished and/or are in the process of development. The NEAP process recommended environmental assessments in the country with among the key stakeholders being industrialists, business community and local authorities. This culminated into the development of the Policy on Environment and Development under the Sessional Paper No. 6 of 1999. The development of this project is guided and governed by a number of laws, by-laws and policies.

4.2. **Policy Framework**

4.2.1. **Sessional Paper No. 6 of 1999 on Environment and Sustainable Development**

The aim of this policy is to harmonize environmental and development goals so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. The World Commission on Environment and development (The Bruntland Commission 1987) recommends development that produces no lasting damage to the biosphere and to particular ecosystems. Economic sustainable development is that in which progress towards environmental and social sustainability occurs within available financial resources. Similarly, social sustainable development is development that maintains the cohesion of a society and its ability to help its members to work together to achieve common goals while at the same time meeting individual needs of the members.

4.2.2. **Vision 2030**

The Kenya Vision 2030 recognizes the importance of development infrastructure as critical for socio-economic transformation. The Infrastructure Sector aspires for a country, and the in near future counties, with infrastructural facilities that meet international standards to make Kenya a globally competitive and prosperous country.

The strategies and measures to be pursued in the medium term include; supporting the development of infrastructure initiatives around flagship projects, strengthening the institutional framework for infrastructure development, raising the efficiency and quality of infrastructure as well as increasing the pace of infrastructure projects so that they are completed as envisaged, protecting the environment as a national asset and conserving it for the benefit of the future generations and the wider international community.

The Kenya Vision 2030 like its predecessor the ERS calls for a considerable shift in the manner in which the country deploys her resources to acquire the necessary capacity and access to infrastructure services in their wealth creation.

4.2.3. **Constitution of Kenya**

The Constitution underscores the right of every person to a clean and healthy environment. This includes the right to have the environment protected for the benefit of both present and future generations through legislation and other measures. It also includes the rights to have obligations relating to the environment fulfilled as stipulated in article 69 of the Constitution.
In order to address such obligations, the state shall:

- ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources and ensure equitable sharing of the accruing benefits;
- protect genetic resources and biological diversity;
- eliminate processes and activities that are likely to endanger the environment, among other obligations in respect of the environment; and
- establish systems of environmental impact assessment, environmental audit and monitoring of the environment.

4.2.3.1. Environmental obligations and rights

Article 42 states that every person has the right to a clean and healthy environment, which includes the right; (a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
(b) To have obligations relating to the environment fulfilled under Article 70.

Section 43 (d) every person has the right to clean and safe water in adequate quantities;

Under Article 69 (i) The State shall — (a) ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
(b) Work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
(c) Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
(d) Encourage public participation in the management, protection and conservation of the environment;
(e) Protect genetic resources and biological diversity;
(f) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
(g) Eliminate processes and activities that are likely to endanger the environment; and
(h) Utilise the environment and natural resources for the benefit of the people of Kenya.

2. Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

70. (1) If a person alleges that a right to a clean and healthy environment recognised and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

(2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate — (a) to prevent, stop or discontinue any act or omission that is harmful to the environment;
(b) To compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or
(c) To provide compensation for any victim of a violation of the right to a clean and healthy environment.

(3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.
4.2.3.2. Classification of land

Under Article 61 (1) all land in Kenya belongs to the people of Kenya collectively as a nation, as communities and as individuals.

(2) Land in Kenya is classified as public, community or private.

62. (1) Public land is (a) land which at the effective date was unalienated government land as defined by an Act of Parliament in force at the effective date;
(b) Land lawfully held, used or occupied by any State organ, except any such land that is occupied by the State organ as lessee under a private lease;
(c) Land transferred to the State by way of sale, reversion or surrender;
(d) Land in respect of which no individual or community ownership can be established by any legal process;
(e) Land in respect of which no heir can be identified by any legal process
(f) All minerals and mineral oils as defined by law;
(g) government forests other than forests to which Article 63 (2)(d) (i) applies, government game reserves, water catchment areas, national parks, government animal sanctuaries, and specially protected areas;
(h) All roads and thoroughfares provided for by an Act of Parliament;
(i) All rivers, lakes and other water bodies as defined by an act of parliament;
(j) The territorial sea, the exclusive economic zone and the sea bed;
(k) The continental shelf;
(l) All land between the high and low water marks;
(m) Any land not classified as private or community land under this Constitution; and
(n) Any other land declared to be public land by an Act of Parliament; (i) in force at the effective date; or (ii) enacted after the effective date.

(4) Public land shall not be disposed of or otherwise used except in terms of an Act of Parliament specifying the nature and terms of that disposal or use.

Section 63 (1) Community land shall vest in and be held by communities identified on the basis of ethnicity, culture or similar community of interest.

(3) Any unregistered community land shall be held in trust by county governments on behalf of the communities for which it is held.

(4) Community land shall not be disposed of or otherwise used except in terms of legislation specifying the nature and extent of the rights of members of each community individually and collectively.

64. Private land consists of; (a) registered land held by any person under any freehold tenure;
(b) Land held by any person under leasehold tenure; and
(c) Any other land declared private land under an Act of Parliament.

4.2.4. The National Poverty Eradication Plan (NPEP) and the Poverty Reduction Strategy Paper (PRSP)

The National Poverty Eradication Plan has the objective of reducing the incidence of poverty in both rural and urban areas by 50% by the year 2015, as well as strengthening the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and create a healthy, better-educated and more productive population. This plan has been prepared in line with the goals and commitments of the World Summit for Social Development (WSSD) of 1995.
The WSSD themes include poverty eradication, reduction of unemployment, and social integration of the disadvantaged people and the creation of an enabling economic political and cultural environment. The project intends to address the contents of this paper by creating opportunities for everybody for economic advancement.

4.2.5. National Policy on Water Resources Management

This policy requires that development projects be subjected to comprehensive EIAs that will provide suitable measures to be taken to ensure environmental resources and people’s health in the immediate neighbourhood and further downstream are not negatively impacted.

The project will require water in all its extents and in large amount for construction purposes. This policy will ensure the water being utilized is discharged into the receiving water body or system in accordance with the regulation without adverse effects to the surrounding environment. Care should be taken during refilling, collecting and disposing liquid wastes. In relation to this, the National Policy on Water Resources Management and Development (Sessional Paper No. 1 of 1999) was established with an objective to preserve, conserve and protect available water resources and allocate them in a sustainable, rational and economic way. It also desires to supply water of good quality and in sufficient quantities to meet the various water needs while ensuring safe disposal of wastewater and environmental protection.

The policy focuses on streamlining provision of water for domestic use, agriculture, livestock development and industrial utilization with a view to realizing the goals of the Millennium Development Goals (MDGs) as well as Vision 2030.

4.3. Regulatory Framework

4.3.1. National Environment Management Authority (NEMA)

NEMA is the regulatory body charged with management and co-ordination of environmental issues. The object and purpose for which the Authority was established 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.

Regulatory function:

i. co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programmes and projects;

ii. identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under this Act;

iii. monitor and assess activities, including activities being carried out by relevant lead agencies, in order to ensure that the environment is not degraded by such activities.
4.3.2. **International Conventions and Protocols**

i. **The Kyoto Protocol**

The goal of the Kyoto Protocol is to lower the overall emissions of green-house gases over the five-year period between 2008 and 2012. Much as most of the provisions of this protocol apply to developed countries, emissions of these substances, especially carbon dioxide would still occur in the airport due to various activities. Kenya, as a signatory to the Kyoto protocol, is bound to observe its provisions.

ii. **The Basel Convention**

The Basel Convention on the control of trans-boundary movement of hazardous wastes and their disposal is an international treaty that was designed to reduce the movement of hazardous wastes between nations and specifically prevent transfer of hazardous waste from developed to less developed countries. The convention is also intended to minimize the amount of toxicity of wastes generated to ensure their environmentally sound management as closely as possible to the source of generation and to assist the less developed countries in environmentally sound management of hazardous and other waste they generate.

4.3.3. **World Bank Safeguard Policies**

4.3.3.1. **Operational Policy (OP) 4.01: Environmental Assessment, 2001**

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted.

4.3.3.2. **Operational Policy 4.04: Natural Habitats, 2001**

The policy seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present).

4.3.3.3. **The Bank’s Operational Policy 4.12: Involuntary Resettlement**

This is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement.
The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

4.3.3.4. Operational Policy (OP) 4.10 - Indigenous Peoples

This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. For all projects that are proposed for Bank financing and affect Indigenous peoples the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The provide financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples’ communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

4.3.3.5. Operational Policy (OP/BP) 4.11: Physical Cultural Resources

The objective of this policy is to assist countries in preserving physical cultural resources and avoiding their destruction or damage. PCR are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious (including graveyards and burial sites), aesthetic, or other cultural significance. PCR may be located in urban or rural settings, and may be above ground, underground, or under water. The cultural interest may be at the local, provincial or national level, or within the international community. This policy applies to all projects requiring a category A or B environmental assessment, project located in, or in the vicinity of recognized cultural heritage sites. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people’s cultural identity and practices.

Some materials may be discovered during project implementation for which the use of "chance find" procedures will be employed as presented in the ESMMP.

4.3.3.6. Operational Policy (Op)/Bank Procedure (Bp) 7.50: Projects International Waterways

Waterways may affect the relations between the World Bank and its borrowers, and between riparian states. Therefore, the Bank attaches great importance to the riparian making appropriate agreements or arrangements for the entire waterway, or parts thereof, and stands ready to assist in this regard.

In the absence of such agreements or arrangements, the Bank requires, as a general rule, that the prospective borrower notifies the other riparian of the project. The Policy lays down detailed procedures for the notification requirement, including the role of the Bank in affecting the notification, period of reply and the procedures in case there is an objection by one of the riparian to the project.

4.3.3.7. World Bank Policy on Access to Information, 2010
The World Bank policy on access to information sets out the policy of the World Bank on public access to information in its possession. This Policy supersedes the World Bank Policy on Disclosure of Information, and took effect on July 1, 2010.
This Policy is based on five principles:

- Maximizing access to information.
- Setting out a clear list of exceptions.
- Safeguarding the deliberative process.
- Providing clear procedures for making information available.
- Recognizing requesters’ right to an appeals process.

In disclosing information related to member countries/borrower in the case of documents prepared or commissioned by a member country/borrower (in this instance, safeguards assessments and plans related to environment, resettlement, and indigenous peoples, OP/BP 4.01, Environmental Assessments, OP/BP 4.10, Indigenous Peoples, and OP/BP 4.12 Involuntary Resettlement); the bank takes the approach that the country/borrower provides such documents to the Bank with the understanding that the Bank will make them available to the public.

4.4. Legal Framework

Kenya has approximately 77 statutes that relate to environmental concerns. Most of these statutes are sector specific, covering issues such as public health; soil erosion; protected areas; endangered species; water rights and water quality; air quality, noise and vibration; cultural, historical, scientific and archaeological sites; land use; resettlement; etc.

The key national laws that govern the management of environmental resources in the country are briefly discussed below. It is noteworthy that wherever any of the laws contradict each other, the Environmental Management and Co-ordination Act (EMCA) 2015 prevails.

4.4.1. The Environmental Management and Co-ordination Act, 2015 (EMCA) and Related Regulations

The most pertinent and overriding statute that will be evoked is the Environmental Management and Coordination Act (EMCA 2015). EMCA was enacted to harmonize environmental legislation previously scattered among 77 national laws. As the principal environmental legislation in Kenya, EMCA sets the legal framework for environmental management basically as follows:

1. Requirement for Environmental Impact Assessments for all new projects

Section 58 of the Environmental Law requires that an Environmental Impact Assessment (EIA) study precede all development activities proposed to be implemented in Kenya. The Act further requires that EIA studies so designed, be executed in accordance with the Guidelines for Conduct of EIAs and Environmental Audits (Kenya Gazette Supplement No. 56 of 13th June 2003) as published by the National Environmental Management Authority (NEMA). It is for this reason that MOWASCO instructed the consultant to carry out an environmental and social impact assessment on the project. MOWASCO ensures
that for all proposed projects an environmental and social impact assessment is carried out.
2. **Requirement for Annual Environmental Audits**

In order to mitigate and control environmental damage from ongoing projects, Sections 68 and 69 of the EMCA require that all ongoing projects be subjected to annual environmental audits as further expounded in Regulation 35 (1) and (2) of Legal Notice 101 of June 2003. MOWASCO is committed in ensuring environmental safeguard and requires consultants to submit quarterly and annual environmental audit reports for all on-going projects.

The Environmental Impact Assessment is guided by the Environmental Management and Co-ordination Act, through the National Environment Management Authority (NEMA). The preparation of the EIA study and subsequent approval procedures are set out in the EIA Study, legal notice 101 of 2003.

According to the regulations, an EIA study should incorporate but not limited to the following:

- The proposed location of the project
- The objective of the project
- The technology, procedures and process to be used in the implementation of the project.
- The materials to be used in the construction and implementation of the project.
- The products and by-products and waste generated by the project.
- The environmental effects of the project including the socio-cultural impacts, effects and direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- A concise description of national environmental legislative and regulatory framework, baseline information and any other information related to the project.
- A description of the potentially affected environment.
- Alternative technologies and processes available and reasons for preferring the chosen technology and processes.
- An analysis of alternatives including project sites, design and technologies and reasons for preferring the proposed site, design and technologies.
- An Environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, time frame and responsibility to implement the measures.
- The provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities.
- The measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies.
- An identification of gaps in the knowledge and uncertainties which were encountered in compiling the information.
- An economic and social analysis of the project.
❖ An indication of whether the environment of any other state is likely to be affected and the available alternative and mitigating measures.
4.4.2. Environmental Impact Assessment and Audit Regulations 2003.

These regulations stipulate how an EIA should be done and specify all the requirements. It highlights stages to be followed, information to be made available, role of every stakeholder and rules to observe during the whole EIA process. The proposed project must be constructed and operated based on these regulations. It should also be maintained and guided by the same regulations and an environmental audit study will be done periodically to monitor compliance with the set environmental standards.

4.4.3. Environmental Management and Coordination Act (Water Quality Regulations), 2006 (Legal Notice 121)

Parts II, Sections 4 – 5 of these regulations as well as Part V Section 24 are of relevance to the proposed project. Section 4 states that “Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution”. Part V Section 24 states that “No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump or discharge any such matter into water meant for fisheries, wildlife, recreational purposes or any other uses.”

The Regulations provide for the protection of riparian reserves and state that “No person shall undertake any development activity within full width of a river or a stream to a minimum of six meters and a maximum of thirty meters on either side based on the highest recorded flood level.”

The regulations also provide Guidelines/standards for various aspects such as water quality for discharge into the environment, water for recreating purposes, and drinking water. They also provide monitoring schedules and parameters for the same.

4.4.4. Environmental Management and Coordination Act (Waste Management Regulations), 2006 (Legal Notice 121)

The immediate relevance to proposed project is Part II, Sections 4 (1-2), 5 and 6. Section 4 (1) states that ‘No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.’ Sections 4 (2) and 6 explains that the waste generator must collect, segregate (hazardous waste from non-hazardous) and dispose waste in such a facility that shall be provided by the relevant local authority. Section 5 provides methods of cleaner production (so as to minimize waste generation) which includes the improvement of production processes through: conserving raw materials and energy.

4.4.5. Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution Control Regulations, 2009)

Part II section 3 (1) of these Regulations states that: no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment and section 3 (2) states that 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 can be controlled without much effort or expense to the person making the noise.

Part II Section 4 states, “Except as otherwise provided in these Regulations, no person shall (a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or (b) cause to be made excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source.”

Part III, Section 11 (1) states that “any person wishing to (a) operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device; or (b) engage in any commercial or industrial activity, which is likely to emit noise or excessive vibrations shall carry out the activity or activities within the relevant levels prescribed in the First Schedule to these Regulations. Any person who contravenes this Regulation commits an offence”.

Section 13 (1) states that ‘except for the purposes specified in Sub-Regulation (2) hereunder, no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations.’ These purposes include emergencies, those of a domestic nature and/or public utility construction.

Section 14 relates to noise, excessive vibrations from construction, demolition, mining or quarrying sites, and states, ‘where defined work of construction, demolition, mining or quarrying is to be carried out in an area, the Authority may impose requirements on how the work is to be carried out including but not limited to requirements regarding (a) machinery that may be used, and (b) the permitted levels of noise as stipulated in the Second and Third Schedules to these Regulations.’

It further states that, ‘the relevant lead agency shall ensure that mines and quarries where explosives and machinery used are located in designated areas and not less than two kilometres away from human settlements and any person carrying out construction, demolition, mining or quarrying work shall ensure that the vibration levels do not exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source.’


The objective of these Regulations is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. The general prohibitions state that no person shall cause the emission of air pollutants listed under First Schedule (Priority air pollutants) to exceed the ambient air quality levels as required stipulated under the provisions of the Seventh Schedule (Emission limits for controlled and non-controlled facilities) and Second Schedule (Ambient air quality tolerance limits).
4.4.7. The Water Act of 2016

The Act Prohibits pollution of water resources, section 15 and 58 prohibits the discharge of waste water into water resources. Section 108 of the Act prevents a licence holder from polluting or degrading water resources within the licence jurisdiction. Section 143 of the Act prevents the discharge of effluent into water resources in such a way that it causes pollution in the resource. Any licensee or person that pollutes the water resources is required to clean up or make good any harm identified in the order which was caused to any water resource by reason of the contravention or to remove or destroy any works, plant or machinery employed for the purposes of the contravention. Failure to clean or make good, the Water Resource Authority, Water Services Regulatory Board (Institutions established under the Act) or County Government shall take the necessary remedies to mitigate the pollution and recover the expenses through an application to the tribunal as stipulated in section 143. MOWASCO is therefore expected to prevent pollution of the water resources and if it occurs, the company should undertake the necessary measures to mitigate the harm caused.

4.4.8. Water Rules 2002

One of the outcomes of the water sector reforms has been improved regulatory framework for water resource management and use. In addition to the Water Act 2002, the main document outlining the regulations is the Water Resource Management Rules 2005. The rules set out the procedures for obtaining water use permits and the conditions placed on permit holders.

Other sections within the rules imply that Water Resources Management Authority (WRMA) can impose water quality sampling requirements on MoWI from the water sources and impacts to the hydrology, water chemistry and river morphology downstream basin. Approval by WRMA is conferred through a Water Permit. A permit is valid for five years and must be renewed. CWSB will need to obtain a water permit for the sources from WRMA for the intended use.

Section 104 of the Water Resource Management Rules requires certain water permit holders to pay water use charges. The intention of the water use charges was to raise revenue for water resource management, raise revenue for catchment conservation activities, improve efficiency of water resource abstraction and provide a system of data collection on water resource usage.

It sets the standard procedures and rules to be followed in the utilization of water resources including abstraction controls, modes of use and responsibilities in protection of the resources, including effluent treatment standards. MoWI has a direct duty in complying with this law.

Land ammendment laws 2016
An Act of Parliament to amend the laws relating to land to align them with the Constitution, to give effect to Articles 68(c)(i) and 67(2)(e) of the Constitution, to provide for procedures on evictions from land, and for connected purposes. It vests the responsibility to come up with land registration units with the Cabinet Secretary and not the National Land Commission (the Commission). The Cabinet Secretary is however required to consult with the Commission and the respective County Government in performing this task.
The Cabinet Secretary has been granted the power to provide policy direction regarding all classes of land in consultation with the National Land Commission (the Commission) where appropriate; the power to provide to coordinate the development and implementation of a National Land Information System in collaboration with the Commission, and the power to administer and undertake all dealings including registration of private land interests subject to the provisions on compulsory acquisition. The Cabinet Secretary is now empowered to publish guidelines on the penalties for noncompliance with the provisions of Constitution and the respective legislation.

Reservation of public land for a purpose in the public interest is still being carried out by the Commission. The Commission is however now required to do any such reservation upon the request by the National or County Government. The Land Act now also provides that such an allocation does not prevent the reserved land from being allocated or developed.

The act has abolished the Land Compensation Fund. The object and purpose of the abolished fund was to provide compensation to any person who, as a result of the implementation of any of the provisions of the Land Act by the National Government or County Government suffered any loss or deprivation or diminution of any rights or interests in land or any injurious affection in respect of any ownership of land.

4.4.9. Land Act, No. 6 of 2012

(2) Without limiting what the Commission may prescribe under subsection (1), the rules and regulations may contain;
(a) Measures to protect critical ecosystems and habitats;
(b) Incentives for communities and individuals to invest in income generating natural resource conservation programmes;
(c) Measures to facilitate the access, use and co-management of forests, water and other resources by communities who have customary rights to these recourses;
(d) Procedures for the registration of natural resources in an appropriate register;
(e) Procedures on the involvement of stakeholders in the management and utilization of land-based natural resources; and
(f) Measures to ensure benefit sharing to the affected communities.

4.4.10. Land registration under land act, 2012

Under section 5 (1) of the land act, 2012 there shall be the following forms of land tenure-
(a) Freehold;
(b) Leasehold;
(c) Such forms of partial interest as may be defined under this Act and other law, including but not limited to easements; and
(d) Customary land rights, where consistent with the Constitution.
(2) There shall be equal recognition and enforcement of land rights arising under all tenure systems and non-discrimination in ownership of, and access to land under all tenure systems.
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.
Under section 8 (a), the Land Commission shall identify public land, prepare and keep a database of all public land, which shall be geo-referenced and authenticated by the statutory body responsible for survey;
(d) May require the land to be used for specified purposes and subject to such conditions, covenants, encumbrances or reservations as are specified in the relevant order or other instrument.
Section 9 (1) states that any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.
(2) Without prejudice to the generality of subsection (1);
(a) Public land may be converted to private land by alienation;
(b) Subject to public needs or in the interest of defense, public safety, public order, public morality, public health, or land use planning, public land may be converted to community land;
(c) Private land may be converted to public land by;
(i) Compulsory acquisition;
(ii) Reversion of leasehold interest to Government after the expiry of a lease; and
(iii) Transfers; or
(iv) Surrender.
(d) Community land may be converted to either private or public land in accordance with the law relating to community land enacted pursuant to Article 63(5) of the Constitution.
(3) 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.
4.4.11. Land acquisition under land acts 2012

Under section 110 (1) of Land Acts 2012 Land may be acquired compulsorily under this Part if the Commission certifies, in writing, that the land is required for public purposes or in the public interest as related to and necessary for fulfillment of the stated public purpose.

Part 2 of this section states that if, after land has been compulsorily acquired the public purpose or interest justifying the compulsory acquisition fails or ceases, the Commission may offer the original owners or their successors in title pre-emptive rights to re-acquire the land, upon restitution to the acquiring authority the full amount paid as compensation.

Section 111 (1) states that if land is acquired compulsorily under this Act, just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The commission shall make rules to regulate the assessment of just compensation.

Likewise where land is acquired compulsorily, full compensation shall be paid promptly to all persons affected in accordance to section 113 (1). (2) Subject to Article 40 (2) of the Constitution and section 122 and 128 of this Act, an award-

(a) Shall be final and conclusive evidence of-

- The size of the land to be acquired;
- The value, in the opinion of the Commission, of the land;
- The amount of the compensation payable, whether the persons interested in the land have or have not appeared at the inquiry; and

(b) Shall not be invalidated by reason only of a discrepancy which may thereafter be found to exist between the area specified in the award and the actual area of the land.

Section 124 of the Act allows for the temporary acquisition of land for public purpose or public interest; or for, the possession of the land is necessary in the interests of defense, public safety, public order, public morality, public health, urban planning, or the development or utilization of any property in such manner as to promote the public benefit; for utilization in promotion of the public good for periods not exceeding 5 years. At the expiry of the period, the Commissioner of Land shall vacate the land and undertake to restore the land to the conditions it was before as per section 125. The compensation to be paid under section 120 shall be limited to the damage done to trees, plants, growing crops and permanent improvements on the land, together with a periodical sum for diminution in the profits of the land and of adjoining land by reason of that use.

148. (1) Subject to the provisions of this section, compensation shall be payable to any person for the use of land, of which the person is in lawful or actual occupation, as a communal right of way and, with respect to a way leave, in addition to any compensation for the use of land for any damage suffered in respect of trees crops and buildings as shall, in cases of private land, be based on the value of the land as determined by a qualified valuer.
(2) Compensation relating to a way leave or communal right of way shall not be paid to a public body unless there is a demonstrable interference of the use of the land by that public body.

(3) Damage caused as a result of the creation of a way leave shall include any preliminary work undertaken in connection with surveying or determining the route of that way leave, and whether the trees, crops or buildings so damaged were included in the route of the way leave as delineated in the order of the Cabinet Secretary.

(4) The duty to pay compensation payable under this section shall lie with the State Department, county government, public authority or corporate body that applied for the public right of way and that duty shall be complied with promptly.

(5) If the person entitled to compensation under this section and the body under a duty to pay that compensation are unable to agree on the amount or method of payment of that compensation or if the person entitled to compensation is dissatisfied with the time taken to pay compensation, to make, negotiate or process an offer of compensation, that person may apply to the Court to determine the amount and method of payment of compensation and the Court in making any award may, make any additional costs and inconvenience incurred by the person entitled to compensation.

(5) The Commission shall make Regulations prescribing the criteria to be applied in the payment of compensation under this section and to give effect to this section.

4.4.12. The Surveys Act Cap 299

This is an act of parliament that make provisions in relation to surveys and geographical names and the licensing of land surveyors.

Surveyors shall carry out surveying in a manner as to ensure that surveys accords in all respect with the provisions of this Act and regulations made thereunder and shall be responsible for correctness and completeness of every survey carried out by them or under their supervision. Boundaries and bench marks for any land or holding should be shown on the map.

4.4.13. The Public Roads and Roads Access Act (Cap 399)

This is an Act of parliament that provides for public travel and access. The Act provide for the establishment, powers and functions of the Kenya Roads Board. The Board is established to oversee the road network and thereby coordinate its development, rehabilitation and maintenance including advising the Government on all matters related thereto.

During the construction phase, roads in the area, both tarmac and all weather will experience heavy traffic due to the presence of construction vehicles ferrying construction materials to the site. This therefore calls for proper maintenance of routes within the project area that are likely to experience this.

4.4.14. The Public Health Act Cap 24

The Public Health Act is the principal instrument for ensuring health and safety of the people. Its core functions include the prevention of disease, treatment and care of the sick (curative services) and control of nuisance. The Act therefore makes regulations and lays standards for a healthy living environment. It specifically deals with building, sanitation; refuse disposal, water quality for human and industrial use, vector control and
many other aspects that impact on the health of the populace. The Ministry of Health is responsible for the administration of the Act. However, where a local authority is capable of discharging responsibilities under the Act, such an authority is designated a local health authority and the relevant powers under the Act are delegated to it.
Part IX section 115 of the Act states that no person/institution shall cause a nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires Local Authorities to take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable for injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 and include nuisances caused by accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbour rats or other vermin.

The project management and the contractor should emphasize on health and safety of the workers and the community at large during and after construction of the project. During construction, safety should be ensured to avoid unnecessary accidents. Skilled man power should be engaged to operate as well as maintained the machines.

4.4.15. Physical Planning Act (Cap 286)

The Physical Planning Act was enacted in 1996 and commenced operation in 1998. The Act provides for the preparation and implementation of physical development plans and other related purposes. Its provisions apply to all parts of the country except such areas as the Minister may specify. Thus the Act directs, regulates and harmonizes development and use of land all over the country. In addition, the Act provides a vital link with the Environmental Management and Co-ordination Act.

Section 24 of the Physical Planning Act gives provision for the development of local physical development plan for guiding and coordinating development of infrastructure facilities and services within the area of authority of a county, municipal or town council and for specific control of the use and development of land.

The designs provided by MIBP Patners Consulting Engineers will show the manner in which the roads will appear during and after construction. Section 29 of physical Planning Act gives County Councils powers to prohibit and control the use of land, building, and subdivision of land, in the interest of proper and orderly development of its area. The same section also allows them to approve all development applications and grant development permissions as well as to ensure the proper execution and implications of approved physical development plans. On zoning, the act empowers them to formulate by-laws in respect of use and density of development.

Section 30 of the Act states that any person who carries out development within an area of a local authority without development permission shall be guilty of an offence and the development shall be invalid. The Act also gives the local authority power to compel the developer to restore the land on which such development has taken place to its original conditions within a period of ninety days. If no action is taken, then the Council will restore the land and recover the cost incurred thereto from the developer. In addition, the same section also states that no person shall carry out development within the area of a local authority without development permission granted by the local authority.

The Act provides for the participation of the communities in the planning of their areas and accords people affected the right of appeal against adverse decisions of planning authorities. The farmers in the project area have an opportunity to plan and utilize their plots based on the advice from agro-economist and the extension officers.
4.4.16. The County Government Act (Cap 265)

Sections 163 allows County Governments to prohibit all business, which may be or become a source of danger, discomfort, or annoyance due to their noxious nature through smoke, fumes, dust, noise, or vibrations. Section 165 allows the local authority to refuse to grant or renew any license which is empowered in this act or any other written law on the grounds that the activity does not conform to the requirements of any by-laws in force in the area of such local authority the granting of the license would be contrary to the public interest.

Section 170, allows the right of access to private property at all times by local authorities, its officers and servants for purposes of inspection, maintenance and alteration or repairs.


This is an Act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, and provides for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The Act applies to all workplaces where any person is at work, whether temporarily or permanently. The Act seeks to secure the safety, health and welfare of persons at work and to protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the activities of persons.

Part 9 states that the occupier or employer shall establish a health and safety committee where twenty or more people are employed and such an employee shall prepare a written statement of his general policy with respect to the safety and health at the workplace. Further, the occupier shall prepare annual safety and health audits by a qualified person.

The Act has the following functions among others:

- secures safety and health for people legally in all workplaces;
- prevents employment of children in workplaces where their safety and health is at risk;
- encourages entrepreneurs to set achievable safety targets for their enterprises;
- promotes reporting of workplace accidents, dangerous occurrences and ill health with a view to finding out their causes and preventing similar occurrences in future.

4.4.18. The Antiquities and Monuments Act, Cap.251

The Act provides for historical sites and structures, whereby such items and structures are known, or are unearthed by exploration, are protected. Having no sites or structures in the area, chances that the Act will be violated are minimal.

4.4.19. Limitations of Actions Act Cap 22

This Act provides for recognition of squatters and the conditions under which they would have rights for compensation for loss of land. If squatters have been in occupation of private land for over twelve (12) years, then they would have acquired rights as adverse possessors of that land as provided under the Limitation of Actions Act, Section 7. In case
of any such incidents the proponent will undertake a survey and develop a Resettlement Action Plan (RAP) for those who will be affected by the proposed project.
The Proponent shall adhere to the requirements of the Act in dealing with any squatters that will be displaced by the proposed project.

4.4.20. The Building Code 2000

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

Any developer who intends to erect a building as herein proposed must give the respective local authority a notice of inspection before the erection of the structure. On completion of the structure, a notice of completion shall be issued by the local authority to facilitate final inspection and approval. No person therefore shall occupy a building whose certificate of completion has not been issued by the local authority.

Section 194 requires that where a sewer exists, the occupants of the nearby premises shall apply to the local authority for a permit to connect to the sewer line and that all wastewater must be discharged into the sewers. The code also prohibits construction of structures or buildings on sewer lines.

4.4.21. The Conservation of Biological Diversity (BD) Regulations 2006

These regulations are described in Legal Notice No. 160 of the Kenya Gazette Supplement No. 84 of December 2006. These Regulations apply to conservation of biodiversity which includes Conservation of threatened species, Inventory and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit sharing and offences and penalties.


This legislation lays emphasis on management of wetlands resources, river banks, lake shores and sea shores. The legislations provide guidelines for conservation and sustainable use of the wetlands and to promote their integrity on any project taking place on the environment. The current project when in operation will collect more water from the springs which may reduce water running downstream. It is important this legislation is clearly adhered to during the planning, construction and operation of the project.


The subsidiary legislations make a provision for the noise levels that a worker should be subjected to at the workplace. Further, the Act provides for Noise prevention program where noise levels exceed 85 dB (A). The construction phase of the project will involve the use some noisy machines and equipment. This legislation therefore seeks to guard against harmful exposure of excessive noise levels.

This is an Act of Parliament to provide for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes. The Act provides for compensation to employees for work related injuries and diseases contracted in the course of their employment. Employees are compensated for the loss of their wage earning capacity in the work at which they were employed at the time of accident. The workers face several challenges to their health, safety and security from the equipment they use daily. The proposed activities should therefore integrate the relevant provisions while the project takes place.

4.4.25. **The National Construction Authority (NCA) Act, 2011**

This act was assented on 2nd December, 2011 and came into effect on 8th June 2012. The Act provides for the establishment, powers and functions of the NCA and for connected purposes. The Act is expected to bring sanity to the construction industry in Kenya by addressing the flaws experienced in the old order. The National Construction Authority is mandated to oversee the construction industry and coordinate its development.

The NCA will among other things:- i). Accredit and register contractors and regulate their professional undertakings, ii). Accredit and certify skilled construction workers and construction site supervisors, iii). Develop and publish a code of conduct for the construction industry, iv). Promote and ensure quality assurance in the construction industry, v). Encourage the standardization and improvement of construction techniques and materials.

The act requires people carrying out the business of a contractor to be registered under the act. The Act clearly spells out the requirements for registration as a contractor; it defines the meaning of the term contractor as a person that carries on business as a contractor where such person, for reward or other valuable consideration, undertakes the construction, installation or erection, for any other person, of any structure situated below, on or above the ground, or other work connected therewith, or the execution, for any other person, of any alteration or otherwise to any structure or other work connected therewith, and undertakes to supply:-

- The materials necessary for the work, or is authorized to exercise control over the type, quality or use of the materials supplied by any other person;
- The labour necessary for the work, or is authorized on behalf of the person for whom the work is undertaken or any other person, to employ or select workmen for employment for the purposes of the execution of the work, whether under a contract of service or otherwise.

Provided that a person shall not be deemed to be a contractor if the work undertaken:-

- Does not incur a cost exceeding such sum or sums as the Board may from time to time determine; or
- Consists of a residential house for private use, not requiring a structural design.

The act empowers the Board of the authority to register contractors to engage in contract works according to knowledge and experience and sets out guidelines on the conduct and punishments for errant contractors.
In the proposed project the contractor is expected to adhere to all the provisions of this Act in the entire project cycle and especially during the construction of the WWTP and pipe lines.

4.4.26. The HIV and AIDS Prevention and Control Act

This Act commenced in March of 2009. It is an Act of Parliament to provide measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counseling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.

The object and purpose of this Act is to-

(a) Promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS;
(b) Extend to every person suspected or known to be infected with HIV and AIDS full protection of his human rights and civil liberties by- Prohibiting compulsory HIV testing save as provided in this Act; Guaranteeing the right to privacy of the individual; Outlawing discrimination in all its forms and subtleties against persons with or persons perceived or suspected of having HIV and AIDS; Ensuring the provision of basic health care and social services for persons infected with HIV and AIDS;
(c) Promote utmost safety and universal precautions in practices and procedures that carry the risk of HIV transmission; and
(d) Positively address and seek to eradicate conditions that aggravate the spread of HIV infection.

In this Act, unless the context otherwise requires-
"Acquired Immune Deficiency Syndrome (AIDS)" means a condition characterized by a combination of signs and symptoms, resulting from depletion of the immune system caused by infection with the Human Immuno- Deficiency Virus (HIV);
"anonymous testing" means an HIV testing procedure whereby the person being tested does not reveal his true identity but instead, an identifying number or symbol is used which allows the testing center and the tested person to match the test results with the identifying number or symbol;
"Human Immunodeficiency Virus (HIV)" means the virus which causes AIDS;
"Person with HIV and AIDS" means a person whose HIV test indicates, directly or indirectly, that he is infected with HIV and AIDS;
"Positive", in relation to the result of an HIV test, means a result which shows that the person who is tested is infected with HIV or which shows evidence of such infection;
"Post exposure prophylaxis" means the administration of one or a combination of antiretroviral drugs after probable exposure to HIV, for the purpose of preventing transmission;
"post-test counseling" refers to the process of providing a person who submitted themselves for an HIV test with risk-reduction information and emotional support at the time the test result is released;
"pre-test counseling" means the process of providing a person, before such person undergoes an HIV test, with information on the biomedical aspects of HIV and AIDS and emotional support with respect to the psychological implications of undergoing an HIV test;

"self-testing" in relation to HIV infection, means a prescribed test or series of tests carried out entirely by a person on self without the involvement of another person, which determine whether a person is infected with HIV;

"Testing center" means a testing center approved by the Minister under section 16; Part II of the Act stipulates as follows:

4. (1) The Government shall promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS through a comprehensive nationwide educational and information campaign conducted by the Government through its various Ministries, Departments, authorities and other agencies.

(2) The educational and information campaign referred to in subsection (1) shall-

(a) Employ scientifically proven approaches;

(b) Focus on the family as the basic social unit;

(c) Encourage testing of individuals; and

(d) be carried out in schools and other institutions of learning, all prisons, remand homes and other places of confinement, amongst the disciplined forces, at all places of work and in all communities throughout Kenya.

In Part IV - Testing, Screening and Access Health Care Services, it states as follows:-

13. (1) Subject to this Act, no person shall compel another to undergo an HIV test.

(2) Without prejudice to the generality of subsection (1), no person shall compel another to undergo an HIV test as a precondition to, or for continued enjoyment of:

(a) Employment;

(b) Marriage;

(c) Admission into any educational institution;

(d) Entry into or travel out of the country; or

(e) The provision of healthcare, insurance cover or any other service.

(3) Notwithstanding the provisions of subsection (1), a person charged with an offence of a sexual nature under the Sexual Offences Act, 2006 may be compelled to undergo an HIV test.

(4) A person who contravenes any of the provisions of this section commits an offence.

16. (1) No person shall carry out an HIV test except in a testing center approved by the Minister under this section or in the manner specified under paragraph (d) of subsection (4).

(2) No person shall carry out an HIV test unless such person is a healthcare provider approved by the Minister for that purpose.

(3) No person shall provide pre-test or post-test counseling for the purposes of section 17 unless such person is approved by the Minister under this section.

17. (1) Every testing center shall provide pre-test and post-test counseling to a person undergoing an HIV test and any other person likely to be affected by the results of such test.

18. The results of an HIV test shall be confidential and shall only be released-

(a) To the tested person;

(b) In the case of a child, to a parent or legal guardian of such child;

Provided that where any such child consents to an HIV test directly under section 14(1)(b), the results thereof shall be released to the child; or
(c) In the case of a person with a disability which, in the opinion of the medical practitioner undertaking the test, renders him incapable of comprehending such result to-
   (i) The guardian of that person;
   (ii) A partner of that person;
   (iii) A parent of that person; or
   (iv) An adult offspring of that person
In Part V – Confidentiality,
(2) No person shall record, collect, transmit or store records, information or forms in respect of HIV tests or related medical assessments of another person otherwise than in accordance with the privacy guidelines prescribed under this section.
22. (1) No person shall disclose any information concerning the result of an HIV test or any related assessments to any other person except-
   (a) With the written consent of that person;
   (b) If that person has died, with the written consent of that person's partner, personal representative, administrator or executor;
   (c) If that person is a child, with the written consent of a parent or legal guardian of that child:
Part VI - Transmission of HIV
24. (1) A person who is and is aware of being infected with HIV or is carrying and is aware of carrying the HIV virus shall-
   (a) Take all reasonable measures and precautions to prevent the transmission of HIV to others; and
   (b) Inform, in advance, any sexual contact or person with whom needles are shared of that fact.
(2) A person who is and is aware of being infected with HIV or who is carrying and is aware of carrying HIV shall not, knowingly and recklessly, place another person at risk of becoming infected with HIV unless that other person knew that fact and voluntarily accepted the risk of being infected.
(3) A person who contravenes the provisions of subsections (1) or (2) commits an offence and shall be liable upon conviction to a fine not exceeding five hundred thousand shillings or to imprisonment for a term not exceeding seven years, or to both such fine and imprisonment.
(4) A person referred to in subsection (1) or (2) may request any medical practitioner or any person approved by the Minister under section 16 to inform and counsel a sexual contact of the HIV status of that person.
(5) A request under subsection (4) shall be in the prescribed form.
Part VIII - Discriminatory Acts and Policies
31. (1) Subject to subsection (2), no person shall be-
   (a) Denied access to any employment for which he is qualified; or
   (b) Transferred, denied promotion or have his employment terminated, on the ground only of his actual, perceived or suspected HIV status.
(2) Subsection (1) shall not apply in any case where an employer can prove, on application to the Tribunal that the requirements of the employment in question are that a person be in a particular state of health or medical or clinical condition.
33. (1) A person’s freedom of abode, lodging, or travel, within or outside Kenya shall not be denied or restricted on the grounds only of the person’s actual, perceived or suspected HIV status.
(2) No person shall be quarantined, placed in isolation, refused lawful entry or deported from Kenya on the grounds only of the person's actual, perceived or suspected HIV status.

34. No person shall be denied the right to seek an elective or other public office on the grounds only of the person's actual, perceived or suspected HIV status.

35. (1) Subject to this Act, no person shall be compelled to undergo a HIV test or to disclose his HIV status for the purpose only of gaining access to any credit or loan services, medical, accident or life insurance or the extension or continuation of any such services.

(2) Notwithstanding the provisions of subsection (1), an insurer, re-insurer or health maintenance organization shall, in the case of life and healthcare service insurance cover, devise a reasonable limit of cover for which a proposer shall not be required to disclose his or her HIV status.

(3) Where a proposer seeks a cover exceeding the no test limit prescribed under subsection (2) the insurer, reinsurer or health maintenance organization may, subject to this Act, require the proposer to undergo an HIV test.


The plan is linked with the National Development Plan and the National Poverty Eradication Plan 1999 – 2015. The overarching theme is Social Change to reduce HIV/AIDS and Poverty. The goal of the KNASP 2005/06-2009/10 is to reduce the spread of HIV, improve the quality of life of those infected and affected and mitigate the socio-economic impact of the epidemic at individual, community, sector and national levels. The priority areas for KNASP 2005/06-2009/10 are three-fold:

**Priority Area 1: Prevention of new infections**

The objective of this priority area is to reduce the number of new HIV infections among both vulnerable groups and the general population.

**Priority Area 2: Improve the quality of life of people infected and affected by HIV/AIDS**

The objective of this priority area is to improve the treatment and care, protection of rights and access to effective services for infected and affected people by HIV/AIDS in Kenya.

**Priority Area 3: Mitigation of socio-economic impact**

The objective of this priority area is to adapt existing programs and develop innovative responses to reduce the impact of the epidemic on communities, social services and economic productivity.

4.4.28. National Legal Provisions on Gender

Gender issues in the country are institutionalized through
The current newly enacted Constitution
Vision 2030 Flagship projects
The Presidential Directive of 2006 on 30% women's’ appointments to all positions of leadership employment and promotions
MTPs handbook has gender outcome indicators
The National Gender Policy 2000
Sessional Paper No.2 of 2006
Gender Department in the Ministry for Gender Children and Social Development. The National Commission on Gender and Development enacted through an Act of Parliament in 2003 is mandated to Monitor Government Implementation of its Commitments to Women’s Rights and Gender issues Employment Act, No. 11 of 2007: the Act prohibits discrimination in access to employment and in employment security on the basis of sex, among others Guarantees equality of opportunity in employment Provides for equal pay for work of equal value Prohibits sexual harassment which the law defines to include use of language, whether written or spoken, of a sexual nature.

A National Framework on Gender-based Violence. The government through the National Commission on Gender and Development has developed a National Framework on Gender Based Violence (February 2009) to form that basis of investigation of instances of sexual violence and strengthen coordination of responses to stem the vice Launch of same on 09.11.2009 by Minister for Gender, children and social development The Sexual Offences Bill FGM Policy being developed


The National Gender and Development Policy provide a framework for advancement of women and an approach that would lead to greater efficiency in resource allocation and utilisation to ensure empowerment of women.

The National Policy on Gender and Development is consistent with the Government’s efforts of spurring economic growth and thereby reducing poverty and unemployment, by considering the needs and aspirations of all Kenyan men, women, boys and girls across economic, social and cultural lines. The policy is also consistent with the Government’s commitment to implementing the National Plan of Action based on the Beijing Platform for Action (PFA).

The overall objective of the Gender and Development Policy is to facilitate the mainstreaming of the needs and concerns of men and women in all areas in the development process in the country.

The Policy’s concerns cover the following critical areas:

i) The Economy; To enable men and women to have equal access to economic and employment opportunities.

ii) Poverty and Sustainable Livelihoods; - To remove obstacles to women’s access to and control over productive assets, wealth and economic opportunities, shelter, safe drinking water, and promote measures for conserving the environment.

iii) Law; - To guarantee Kenyan men and women equality before the law, as provided for in the Constitution and under the obligations of the Kenyan State in international law.

iv) Political Participation and Decision- Making; - To enhance gender parity in political participation and decision - making
v) **Education and Training;** - To enhance and sustain measures to eliminate gender disparities in access, retention, transition and performance in education for both boys and girls
vi) Health and Population; - To achieve the highest attainable standard of health for both men and women through addressing gender inequalities pertaining to access and use of basic health services and facilities at an affordable cost.

vii) The Media; - To increase the participation of women in the media and communications sector and promote gender sensitive portrayal of both men and women in the media

viii) Policy Implementation Framework and Resource Mobilisation- empowering both men and women to be equal partners in development- It focuses on the elimination of existing disparities between the two genders. It also advocates for an affirmative action to address gender disparities.

4.4.30. The New Constitution of August 2010 on Gender

In the New Constitution, Chapter Four—The Bill of Rights, Section 21 (3) All State organs and all public officers have the duty to address the needs of vulnerable groups within society, including women, older members of society, persons with disabilities, children, youth, members of minority or marginalised communities, and members of particular ethnic, religious or cultural communities

Section 27 (3) Women and men have the right to equal treatment, including the right to equal opportunities in political, economic, cultural and social spheres.

Part 2 on the Composition and Membership of Parliament,

Section 97 (1) The National Assembly consists of, a) two hundred and ninety members, each elected by the registered voters of single member constituencies; (b) forty-seven women, each elected by the registered voters of the counties, each county constituting a single member constituency;

Section 98. (1) The Senate consists of— (a) forty-seven members each elected by the registered voters of the counties, each county constituting a single member constituency; (b) sixteen women members who shall be nominated by political parties according to their proportion of members of the Senate elected under clause (a) in accordance with Article 90; (c) two members, being one man and one woman, representing the youth; (d) two members, being one man and one woman, representing persons with disabilities;

Section 100 Parliament shall enact legislation to promote the representation in Parliament of—

(a) Women;

Section 127 (1) There is established the Parliamentary Service Commission.

(2) The Commission consists of—

(a) The Speaker of the National Assembly, as chairperson;
(b) A vice-chairperson elected by the Commission from the members appointed under paragraph (c);
(c) Seven members appointed by Parliament from among its members of whom—

(i) Four shall be nominated equally from both Houses by the party or coalition of parties forming the national government, of whom at least two shall be women;

In Chapter Thirteen, on the Public Service, Part 1—Values and Principles of Public Service
Section 232 (1) the values and principles of public service include—(i) affording adequate and equal opportunities for appointment, training and advancement, at all levels of the public service, of—

(i) Men and women;
(ii) The members of all ethnic groups; and
(iii) Persons with disabilities.

Section 232 (2) the values and principles of public service apply to public service in—
(a) All State organs in both levels of government; and
(b) All State corporations
(3) Parliament shall enact legislation to give full effect to this Article.

In the composition, appointment and terms of office, the new constitution says that the chairperson and vice-chairperson of a commission shall not be of the same gender. In addition clause (8) says that the State shall take legislative and other measures to implement the principle that not more than two-thirds of the members of elective or appointive bodies shall be of the same gender.

The new constitution provides for the elimination of gender discrimination in law, customs and practices related to land and property. Under Kenya's previous law, inheritance was governed by customary law, often preventing women from inheriting property from their parents or laying claim to joint assets when their husbands died.

In summary, the New Constitution provides as follows:
The New Kenyan Constitution ensures that women will be able to pass on citizen ship to their children regardless of whether or not they are married to Kenyans. Article 14 (1)
The New Kenyan Constitution provides that parties to a marriage will be entitled to equal rights at the time of marriage, during the marriage and at its dissolution. Article 45 (3)
The New Kenyan Constitution assures that parental responsibility shall be shared between parents regardless of marital status. Article 53 (1) (e).

The New Kenyan Constitution eliminates gender discrimination in relation to land and property and gives everyone including women the right to inheritance and unbiased access to land. Article 60 (1) (f).

The New Kenyan Constitution provides for the enactment of legislation for the protection of matrimonial property with special interest on the matrimonial home during, and upon the termination of the marriage. Article 68 (c) (iii).

The New Kenyan Constitution maintains a one third requirement for either gender in elective bodies giving women of Kenya at least 1/3 minimum in elective public bodies. Article 81 (b).

The New Kenyan Constitution ensures that gender equality is maintained in political parties providing a basic requirement for political parties as amongst other to respect and promote gender equality. Article 91 (f)

The New Kenyan Constitution provides that Parliament shall formulate law to promote the representation of women, persons of disabilities, ethnic and other minorities and marginalized communities in Parliament. Article 100.
The New Kenyan Constitution ensures that women and men will have the right to equal treatment and opportunities in political, economic, cultural and social spheres without discrimination. Article 27 (3).

The New Kenyan Constitution accords the right to health including reproductive health to all. Article 43 (1) (a). The New Kenyan Constitution affords adequate and equal opportunities for appointment, training and advancement for women and men at all levels within the Public Service Commission. Article 232 (i).

4.4.31. The Sexual Offences Act 2014

An Act of Parliament to make provision about sexual offences, their definition, prevention and the protection of all persons from harm from unlawful sexual acts, and for connected purposes. Section 7 outlines the charges for compulsion or inducement of indecent acts. Section 11 defines the charges of engaging in indecent acts with a child or adult. Section 24 outlines sexual offences relating to positions of authority and persons in position of trust

4.4.32 People With Living Disability Act, 2012

An Act of Parliament to provide for the rights and rehabilitation of persons with disabilities; to achieve equalisation of opportunities for persons with disabilities; to establish the National Council for Persons with Disabilities.

Part III of the act outlines the rights and privileges of persons with disabilities

Section 12 on employment states that:

i) No person shall deny a person with a disability access to opportunities for suitable employment.

ii) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees.

iii) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.

Section 15 on discrimination of employment states that:

(1) Subject to subsection (2), no employer shall discriminate against a person with a disability in relation to—

. (a) the advertisement of employment

. (b) the recruitment for employment

. (c) the creation, classification or abolition of posts

. (d) the determination or allocation of wages, salaries, pensions, accommodation, leave or other such benefits
(2) Notwithstanding subsection (1), an employer shall be deemed not to have discriminated against a person with a disability if—

. (a) the act or omission alleged to constitute the discrimination was not wholly or mainly attributable to the disability of the said person;

. (b) the disability in question was a relevant consideration in relation to the particular requirements of the type of employment concerned; or

. (c) special facilities or modifications, whether physical, administrative or otherwise, are required at the work place to accommodate the person with a disability, which the employer cannot reasonably be expected to provide.

(3) A complaint by a person with a disability that his employer has discriminated against him in a way which is contrary to this Act may be presented to the Industrial Court through the appropriate trade union.

(4) Any contract for employment or for provision of goods, facilities or services, or any other agreement, shall be void insofar as it purports to deny any person any rights or privileges conferred under this Act or in any other way to limit the operation of this Act.

(5) An employer shall provide such facilities and effect such modifications, whether physical, administrative or otherwise, in the workplace as may reasonably be required to accommodate persons with disabilities.

(6) The minimum retirement age for persons with a disability shall be sixty years.

Section 16 provides incentives for employers who employ people living with disability, it states that:

(1) A private employer who engages a person with a disability with the required skills or qualifications either as a regular employee, apprentice or learner shall be entitled to apply for a deduction from his taxable income equivalent to twenty five per cent of the total amount paid as salary and wages to such employee:

Provided that—

(i) such an employer shall present proof certified by the Ministry responsible for labour that the persons with disabilities in respect of whom he claims the deduction are under his employ; and

(ii) the persons with disabilities so employed are accredited with the Council as to their disabilities, skills and qualifications.

(2) A private employer who improves or modifies his physical facilities or avails special services in order to provide reasonable accommodation for employees with disabilities shall be entitled to apply for additional deductions from his net taxable income equivalent to fifty per cent of the direct costs of the improvements, modifications or special services.
4.5. Wastewater Guidelines

Part of the project reporting involves a review of the environmental standards that provides a basis for monitoring and future audits. The table 4 below presents recommended guidelines on waste water quality for discharge into the public sewers and open water bodies.

Table 4: Recommended Guidelines on Waste Water Quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Discharge in public</th>
<th>Parameter</th>
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<th>Parameter</th>
<th>Discharge in public</th>
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<td>1500 us/cm</td>
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<td></td>
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<td>4hr PV Value</td>
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<td></td>
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<td>Faecal Coliforms</td>
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<td>1000/100ml for large water bodies, otherwise &lt;10/ml)</td>
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<td>Sulphates</td>
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5. PUBLIC PARTICIPATION

5.1. Introduction

Public Participation is a facilitative process of strengthening the organizational and management capacities of people in such a way that they become self-reliant in solving their own problems. It connotes the organized action of the people towards the resolution of issues or acquisition of what they desire and what may benefit them. This, then, requires that people, as a group, must have proper ownership of actions and highly organized course of action.

The following objectives were considered:

- to inform the local people, leaders and other stakeholders about the proposed project and its objectives;
- to initiate public involvement processes, in a bid to induce and cultivate a sense of peoples’ belongingness to the project;
- to suggest and facilitate the peoples’ roles in the project’s sustainability, in terms of management, maintenance and productivity;
- to seek views, concerns and opinions of people in the area concerning the project.
- to establish if the local people foresee any positive or negative environmental effects from the project and if so, how they would wish the perceived impacts to be addressed;
- to find out if there are issues or places of cultural/or religious importance to the local communities that could be negatively impacted upon by the project and its infrastructure.

The specific aims of the consultation process are to:

- Improve project design and thereby minimize conflicts and delays on implementation,
- Facilitate the development of appropriate and acceptable entitlement options,
- Increase long term project sustainability and ownership,
- Reduce problems of institutional coordination,
- Make the resettlement process transparent,
- Increase the effectiveness and sustainability of income restoration strategies and improve coping mechanisms.

Effective public participation requires the availability of adequate information in public inputs. The latter involves various values, critiques, questions, information, suggestions and other inputs, which are expressed by individuals, groups or organizations among the general public in an attempt to influence decision-making. Public consultations with Interested and Affected Parties (IAPs) were done with the following aims:

5.2. Legal Requirements

5.2.1. Government Policy on Public Consultation

The overall objective of the Government is to involve communities in policy formulation and implementation at the local level. More specifically, the Community Action Planning Programme objective is to put in place a durable system of intra-community co-operation
through collective action, which creates communal discussion forums for the implementation of development activities.
5.2.2. Persons or Agencies Consulted

The key issues associated with the installation of a sewer line network and related works will often relate to biodiversity, heritage, pollution, disruption of livelihoods, community safety, traffic management, communicable diseases and employment and trade opportunities.

Effort was not spared to contact all with information on the following issues:

- Assessment of the baseline environmental and social conditions
- Consideration of feasible and environmentally &socially preferable alternatives
- Requirements under Kenya country laws and regulations, applicable international treaties and agreements
- Protection of human rights and community health, safety and security (including risks, impacts and management of project’s use of security personnel)
- Protection of cultural property and heritage
- Protection and conservation of biodiversity, including endangered species and sensitive ecosystems in modified, natural and critical habitats, and identification of legally protected areas
- Impacts on affected communities, and disadvantaged or vulnerable groups
- Impacts on project affected persons, and their unique cultural systems and values
- Cumulative impacts of existing projects, the proposed project, and anticipated future projects
- Consultation and participation of affected parties in the design, review and implementation of the project.

5.3. Methodology

Public participation was mainly achieved through direct interviews, observations, questionnaire administration and a public meeting. The ESIA team began the public consultation process by holding preparatory meetings to strategize on how to engage the stakeholders in the ESIA process. This was done in consultation with the County Water Director, who helped in the process of identification of the significant actors/stakeholders who could provide data relevant to the proposed project. The following is a detailed discussion of public consultation methodology used by the ESIA team.

5.3.1. Direct Interviews

Direct interviews were conducted with Coast Water Services Board, Mombasa Water and Sanitation Company, opinion leaders within the community; local politicians; County leaders, Sub-County commissioners; Sub-County officers; area chiefs and their assistants. Others include representative from government ministries. Their comments were sought through engaging them in discussions about the proposed project and the benefits that are likely to accrue as a result of its implementation. This kind of engagement gave the respondents the opportunity to give insights and details about the issue at hand.

5.3.2. Questionnaire Administration

Questionnaires were prepared and administered to the sampled households. The team then organized visits to meet the representatives of all the stakeholders identified,
whom they met and spent considerable time with, and held discussions with them on their opinions about the proposed project.

5.3.3. **Community Consultative Meetings**

Four community consultative meetings were held in four different venues on 11th December 2016 as a way of reaching as many stakeholders as possible. It was meant to give more members of the stakeholder community an opportunity to express their views, fears and expectations, if any, about the proposed project. In attendance were: area chiefs from Chaani, Mikindani, Jomvu and Miritini locations, opinion leaders and representatives from project affected persons.

**Table 5: Summary of the Consultative Forums**

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Venue</th>
<th>Number of Stakeholders Met</th>
<th>Summary of the meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th December 2016 at 10:00 hrs</td>
<td>Jomvu Screw Pump station</td>
<td>18</td>
<td>The project would help employ their youth and conserve the environment</td>
</tr>
<tr>
<td>10th December 2016 at 12:30 hrs</td>
<td>Miritini Pump Station</td>
<td>18</td>
<td>The PAPs are waiting for the project to start so that they can be relieved from the bad odour of the raw sewage</td>
</tr>
<tr>
<td>12th December 2016 from 2:00 hrs</td>
<td>Mukupe open ground</td>
<td>54</td>
<td>The raw sewage drained into the river will be controlled and residents will be in a position to stay healthier from water borne diseases</td>
</tr>
<tr>
<td>12th December 2016 at 15:00 hrs</td>
<td>Chaani Social hall</td>
<td>19</td>
<td>The project will employ most of the youths from the area and the odour from the treatment plant will be mitigated.</td>
</tr>
</tbody>
</table>

The following are sample photographs taken during the consultative forum.

![A Consultative Forum with Jomvu Pumping Station Stakeholders](image1.png)

![A Consultative Forum with Miritini Pumping Station Stakeholders](image2.png)
The following key stakeholders were met:

### Table 6: Key stakeholders met

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESIGNATION</th>
<th>INSTITUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Mr. John Mwaburi</td>
<td>Operations Manager Waste water</td>
<td>Mombasa water and sewerage company (MOWASCO)</td>
</tr>
<tr>
<td>2) Mr. Jared Mjomba</td>
<td>Technical Officer-Waste water</td>
<td>Mombasa water and sewerage company (MOWASCO)-West Mainland</td>
</tr>
<tr>
<td>3) Mr. Alphonse Okoth</td>
<td>Technical Manager</td>
<td>Kipevu waste water treatment plant and pump stations</td>
</tr>
<tr>
<td>4) Mr. William Opiyo</td>
<td>Environment officer- EIA</td>
<td>NEMA- Mombasa County</td>
</tr>
<tr>
<td>5) Mr. Nasoro Bakari</td>
<td>County director of water</td>
<td>Mombasa County Government</td>
</tr>
<tr>
<td>6) Mr. Mohammed Bilafif</td>
<td>County director of Environment</td>
<td>Mombasa County Government</td>
</tr>
<tr>
<td>7) Mrs. Ima Matano Mzee</td>
<td>Chief</td>
<td>Mikindani</td>
</tr>
<tr>
<td>8) Mr. Fredrick Shuma Momachi</td>
<td>Chief</td>
<td>Chaani</td>
</tr>
<tr>
<td>9) Mr. Hussein Matano Kombo</td>
<td>Chief</td>
<td>Miritini &amp; Jomvu</td>
</tr>
<tr>
<td>10) Mr. Robert ONjwang’</td>
<td>Engineer</td>
<td>Coast Water Services Board (COWASB)</td>
</tr>
</tbody>
</table>

The list of the stakeholders from the community is presented in annex 2.
5.4. Comments from Public Consultation

5.4.1. Acceptance of the Project

75% of the people interviewed during the survey did not have any objection to the proposed project. The 25% who objected fear being resettled because they are not sure of compensation and may be displaced completely. Most residents are willing to be connected to the sewer liner and are ready to contribute in terms of cash or contributions.

5.4.2. Resettlement

The PAPs raised concerned of them being displaced by the project. All the project affected persons were assured of being resettled according to World Bank standards.

5.4.3. Infrastructure

The PAPs were informed that only permanent structures constructed on the sewer line will be subjected to compensation and not land as it belongs to the government.

5.4.4. Employment

The proposed project will present many employment opportunities both during construction and operation phases and the community members proposed that people from the households within the affected area should be given priority during recruitment. It was made clear that during the rehabilitation works non technical work will be given to the locals as a way of empowering them as it will increase income potential of the people within the project area.

5.4.5. Operation and Maintenance of the Project

The community was concerned if they will be involved in the construction phase of the project. They were informed that the community will be involved in all phases of the project development and this project can be an avenue for youth involvement.

5.4.6. Raw Sewage Draining into Rivers

The PAPs were concerned with the raw sewage being discharged into the rivers/water bodies as it is the case with the Jomvu, Mikindani and Port Treitz pumping stations. They were informed that once the pumping stations are rehabilitated the raw sewage will be managed and hence not discharged into water bodies.

5.4.7. Improved Sewerage System

Due to rehabilitated trunk sewers, the four pumping stations and the sewerage plant, the sewerage system and the sanitation of the project area will be improved greatly.
6. ANALYSIS OF ALTERNATIVE DESIGNS

6.1. Introduction

This chapter seeks to identify project alternatives that can help achieve the desired objectives of the Project while at the same time causing minimal damage to the environment and the natural resource base. Other considerations include project sustainability in terms of management capabilities and technology used. The purpose of including alternative in the EIA is to identify and evaluate alternative actions that accomplish similar goals and promote sustainability development. Alternatives should be economically feasible with minimal adverse environmental impacts and time delays. Diverse alternatives to the proposed action must be included in the EIA. Alternatives may include both design and location options.

In most cases, the EIA process occurs too late in decision-making to consider a full range of alternatives. This can undermine EIA goals to encourage more environmentally sound and publically acceptable solutions. Allowing new alternatives and objectives to evolve in relation to environmental conditions and public preferences may be a solution to most of the environmental and socio-economic problems associated with the implementation of new projects.

6.2. The Project Design Alternative

Sewerage collection systems are normally designed as one of three different types:

Separate Systems: Storm water and wastewater from premises are collected and transported in two separate systems. In theory, no rainwater is allowed into the foul sewers and the rainwater is collected in a separate surface drainage system of pipes and open drains.

Combined Systems: Storm water and wastewater from premises are collected and transported in one system. In this system, only one network of pipes is provided and those pipes are designed to carry both wastewater flows and rainwater.

Partially Separate Systems: With these systems, the sewerage collection system is designed to carry all of the wastewater together with some rainwater. The bulk of the rainwater is collected in an independent system of pipes and open drains.

A separate system is recommended in Mombasa because;

i. The land is divided into several natural watersheds facilitating storm water run-off to nearby streams, creeks or the sea.

ii. Mombasa experiences short, intense rain storms resulting in large quantities of storm water run-off. These will cause the combined system to be very large and therefore very expensive.

A summary of the design criteria is given in the table below:
Table 7: Adopted Design Criteria for Mombasa Infill Sewers

<table>
<thead>
<tr>
<th>Design Element</th>
<th>Adopted Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of sewerage system</td>
<td>Separate system</td>
</tr>
<tr>
<td>Sewage contribution factor</td>
<td>80% of the water supplied to the consumers</td>
</tr>
<tr>
<td>Infiltration</td>
<td>Infiltration rate of 0.0025i/s/ha</td>
</tr>
<tr>
<td>Splash allowance</td>
<td>5% considering medium income housing</td>
</tr>
<tr>
<td>Peak flow factor</td>
<td>Babbit formulae adopted</td>
</tr>
<tr>
<td>BODs, per capita</td>
<td>50g/c/d</td>
</tr>
<tr>
<td>Minimum size of sewer</td>
<td>200mm diameter</td>
</tr>
<tr>
<td>Hydraulic design criteria</td>
<td>Manning’s equation with the following design parameters:</td>
</tr>
<tr>
<td></td>
<td>□ Pipe roughness coefficient, n - 0.013</td>
</tr>
<tr>
<td></td>
<td>□ Minimum velocity at peak flow – 0.75m/s</td>
</tr>
<tr>
<td></td>
<td>□ Minimum velocity in exceptional circumstances – 0.6m/s</td>
</tr>
<tr>
<td></td>
<td>□ Maximum velocity – 3.0m/s</td>
</tr>
<tr>
<td>Depth of sewers</td>
<td>Depths range from 0.4m to 3.5m</td>
</tr>
<tr>
<td>Spacing of manholes</td>
<td>60m maximum spacing between manholes</td>
</tr>
<tr>
<td>Pipe materials</td>
<td>□ Upvc pipes, class 41</td>
</tr>
<tr>
<td></td>
<td>□ Flexible jointed concrete pipes at shallow sections or at road crossings are where the pipe diameter is greater than 225mm</td>
</tr>
</tbody>
</table>

6.3. The No Action Alternative

The no action alternative implies that the status quo is maintained. This means that there will be no interference with the environment, however, the socio-economic problems facing the residents of the project area will persist worsening the situation at the moment.

This alternative is crucial in the assessment of impact because other alternatives are weighed with reference to it. This alternative would mean that the project does not proceed. This scenario is not acceptable on either the social or environmental grounds due to this option leading to major negative impacts such as loss of productivity and reduced ability to create wealth.

The proposed project involves rehabilitation of sewer lines and the waste water treatment plant. The “No Action” alternative model helps the proponent and various decision making levels to approximate the impacts of project implementation against the
non-implementation thereby making the right decision regarding project implementation. Some of the specific impacts that would arise as a result of the “No Action Alternative” include:

(i) possible outbreak of waterborne diseases emanating from the raw sewage,
(ii) pollution of the environment from raw sewage from filled up septic tanks or pit latrines,
(iii) contamination of aquatic environment by discharge of untreated raw sewage,
(iv) continued accumulation of persistent contaminants in the environment that would otherwise have been conveyed and treated in a central plant.
These persistent contaminants over time will surpass the toxic threshold levels and result in irreversible major environmental, social and health problems, and further reduce available freshwater and food reserves. In addition economic gains associated with clean water and lack of diseases will deteriorate.

The effects of adopting this model largely indicate that there will be negative impacts. The growing town urgently needs a functioning sewer lines and waste water treatment plant so as to promote the fiscal outputs of the area. The ‘No Action Alternative’ is the least preferred option since the costs far much outweigh the benefits to be accrued.

6.4. Comparison of Alternatives

The proposed action alternative involves the construction of the project components that will trigger environmental impacts during construction. These effects will be of short duration but can adversely affect the environment if not prevented. Mitigation measures are therefore of fundamental nature to ensure that the project is environmentally friendly.

To minimize or to totally circumvent the negative environmental impacts, mitigation measures have to be implemented as well as sound construction and management practices. However, commitment related to development alternative would ensure that the potential effects are minimized to levels of insignificance as envisaged in the Environmental and Social Management Plan.

Under no action alternative, there will be no construction at all. There will be no benefits from the site and on the other hand no insignificant environmental impacts as with the current status of the environment, there are some noticeable environmental impacts e.g. soil erosion.

6.5. Materials to be Used, Products and by-Products and Waste Generated

The construction materials to be used will be in accordance with the engineering design of various sewer structures. The materials therefore are varied and include:

- Cement
- Building sand
- Building stones
- Ballast
- Reinforcement bars
- Pipes and fittings
- Timber

Concrete (cement, sand and ballast), building stones and steel reinforcement bars will be used in the construction of the weir. Valve chambers will also be constructed using these materials.

Pipes and fittings will be used to convey water from the intake through to the farms. The pipes will vary in size and type but most will be GI (Galvanized Iron) and uPVC for trunk sewers.

Timber will be used as shuttering material during the casting of the intake structure whereas building stones will be used in the construction of valve chambers.

Wastes to be generated during the construction phase will include wood chippings, pipe shavings and used cement bags. It is recommended that the wood shavings be
composted and used as manure, while the pipe shavings and the cement bags are recycled.
7. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND PROPOSED MITIGATION MEASURES

7.1. Introduction

Development of this Project is expected to cause some impacts, both positive and negative. They are generally grouped into those affecting soil, water resources, air quality, flora and fauna, community and their economic activities, aesthetics and landscape, noise and human health.

The likely environmental impacts associated with this project will arise from activities associated with the construction works as well as the operation and maintenance of the sewerage system. During rehabilitation the impacts arising are of short duration but can pose a significant impact on the environment if remedial measures are not taken into account. Lack of effective operation and consistent maintenance of the system is likely to impact negatively on the project area and its environs.

During construction of tanks and sewage plant and the general piping system; cement, sand, ballast, gravel, timber, pipes among other materials and their joinery and fittings will be used in great quantities. Trucks and other machinery will also be used. Large skilled and unskilled labour will be employed and wastes are likely to be generated. Issues that may arise will be sanitary waste from workers, spoilt and damaged construction materials, used containers especially plastic and sand bags. Liquid wastes like oil, grease, paints, sewage sludge and other solvents, nails, timber remains, Injuries and accidents are anticipated. Decommissioning of the project may occur as a result of various factors such as lack of capital to maintain or non-compliance with approved maintenance and monitoring requirement leading to condemnation and closure. The possible negative aspects associated with construction be they environmental or socio-economic should be mitigated for.

The operations of the facility will generate both positive and negative social economic and environmental impacts. The analysis of these impacts is carried out in this section resulting in development of mitigation measures that shall enhance the positive impacts and reduce the effects of the negative impacts. The impacts from this project have been discussed as those probable during the construction, maintenance and decommissioning phases of the project. This report encourages implementation of mitigation measures that enhance positive impacts.

The possible impacts assessed cover the direct and any indirect effects and positive and negative effects during construction, operation and possible decommissioning. The likely impacts are based on the identification and prediction of the magnitude of any impact caused by the project on (i) a receptor (e.g. human beings and community facilities), or (ii) an environmental resource, and on (iii) any process which is essential to the functioning of human or natural systems. The identified impacts were classified as positive and the negative. These impacts were documented and rated as shown in table 5.

Table 8: Environmental Impact Rating

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Low impact</td>
</tr>
<tr>
<td>Rating</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Medium impact (Short term)</td>
</tr>
<tr>
<td>2</td>
<td>High impact (Long term)</td>
</tr>
</tbody>
</table>
7.2. Potential Positive Impacts

The following positive impacts are anticipated during planning, construction and operation phases of the project:

i. Connection to the sewer line of areas with permissible densities which have not been served by the existing sewer line;
ii. The proposed activities will avert pollution of the Indian Ocean since all waste water will be adequately treated before allowing it to flow to the ocean.
iii. The proposed activities will cater for projected increase in volume of waste water as a result of increased population in the future.
iv. Provision of employment opportunities during construction and operation phases- Labour is a must therefore residents will have ready opportunities which shall boost their daily income.
v. The rehabilitation will protect the sewer lines from storm water by enhancing storm drains with concrete. The sewer lines shall be protected from exposure and breakages.
vi. Flushing, cleaning and De silting of the existing sewer line will address the problem of blockages being experienced and also expand the size of the pipes ferrying waste water.
vii. The proposed project will centralize wastewater treatment system in West Mainland which will make pollution monitoring easy.
viii. There shall be improved aesthetic value of the area of the area due to cleaning up of the mess that is currently experienced in Storm water drains in the areas of blocked drains.
ix. Sludge from the Stabilization ponds is a rich resource that can be utilized by the community around as fertilizers for the farm houses,
x. Installation of electrical/mechanical equipment ranging from blowers, scrappers, compressors, sludge pumps etc were either vandalized, broken or out of use will play a huge role in achieving acceptable sewerage design standards.
xi. If the WWTP is established, the pollution created by the current practice of wastewater discharge into the river will stop hence reduction in spread of water borne disease.
xii. Quality of surface and ground water will improve on public health, and on socio-economic development of the project area, taking into consideration that the current treatment process that discharges untreated raw sewage into rivers and the ocean will have stopped.
xiii. The public health of the community will be upgraded due to improved standard of wastewater management.
xiv. A cleaner environment will encourage the development of eco-tourism and other projects in the project area

7.3. Potential Negative Impacts

Against the background of the above positive impacts, there will be negative impacts emanating from the construction and subsequent operation activities of the facility.
7.3.1. **Planning Phase Impacts**

These are commonly associated resettlement of people along the sewer lines. The design engineer carried out a conclusive design that ensured a minimal number of people would be displaced by the sewer lines. All of the sewer lines are located within existing road reserves and will be placed in the middle of foot paths to avoid resettlement. However there will be minimal displacement of the following assets:

i) Structures along the sewer line within road reserves  
ii) Trees and Crops along the sewer lines routes along the road.  
iii) Fences along the sewer line.  
iv) Livelihoods along the sewer line routes.

**Mitigation measures**

- The sewer lines will be located within existing roads and paths in order to avoid resettlement, however PAPs will be identified in accordance to a Resettlement action plan report.  
- Project affected persons to be identified by type of loss through a detailed resettlement action plan.  
- The affected persons to be compensated for loss of houses and ancillary buildings, trees, livelihood productivity, affected cultural sites and land improvements  
- MOWASCO to agree with the local community on the form of compensation for loss of structures, trees, crops, cultural sites and livelihood (such as free connection to the sewer lines etc.). Once the community is fully compensated the contractor may move to site.  
- On construction completion, all roads will be reinstated to their pre-project conditions for both people and animals.  
- The mitigation measures for social impacts are to ensure that the affected persons’ livelihood is at least maintained after implementation of the project.

7.3.2. **Construction Phase Impacts**

Most of the potential environmental and social impacts associated with the construction phase will be negative and 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:

1. **Traffic Congestion**

Traffic congestion is anticipated from site related traffic from Contractor vehicles as well as interaction with the existing trailer traffic in the area. This may interfere with socio-economic activities which majorly rely on the transport network affected by the construction activities. The project area is relatively busy with trailers and matatus using
the several roads within the project area, the area already experiences congestion thus the construction processes are bound to add to the existing congestion.
Mitigation measures

☐ The Contractor should provide temporary road signs or notices to indicate ongoing works;

☐ Contractor to hire traffic controller to ensure no traffic build up along the roads

☐ The Contractor together with the Resident Engineer should Plan itineraries for site traffic on a daily basis and avoid peak traffic periods;

☐ The Contractor should effect traffic controls and cleanliness to avoid congestion and truck accidents on roads;

☐ The Resident Engineer has to ensure that transportation vehicles are operated during night-time and off-peak hours to avoid peak traffic. With proper vehicle operation control, adverse impacts on the environment and traffic by the transportation will be minimal;

☐ The Resident Engineer and Contractor should choose traffic routes to reduce the impact in the neighborhood avoiding, as far as practical any sensitive areas;

☐ For the site traffic the Contractor has to ensure that they

  i. Only park in designated parking areas;

  ii. Don't block pedestrian routes;

  iii. Don't block traffic routes;

  iv. Obey the speed limit

  v. The resident Engineer has to ensure that the Contractor:

    ☐ Introduces segregated pedestrian walkways;

    ☐ Introduces speed limits;

    ☐ Reduces the need for reversing vehicles, by introducing a one way system;

    ☐ Uses a qualified BANKSMAN to control deliveries and reversing vehicles;

    ☐ Designates loading/unloading areas.

2. Site Related Oil Spills

During construction, oil spills may result from construction site equipment and storage.

Mitigation Measures

☐ The Contractor develop, sensitize workers and display a work instruction for oil spills and leaks from storage tanks for the construction machinery though induction and safety training;

☐ In case of spillage the Contractor should isolate the source of oil spill and contain the spillage using sandbags, sawdust, absorbent material and/or other materials approved by the Resident Engineer;
☐ The Resident Engineer and the Contractor should ensure that there is always a supply of absorbent material such as saw dust on site during construction, readily available to absorb/breakdown spill from machinery or oil storage;

☐ All vehicles and equipment should be kept in good working order, serviced regularly and stored in an area approved by the Resident Engineer;

☐ The Contractor should assemble and clearly list the relevant emergency telephone contact numbers for staff, and brief staff on the required procedures.

☐ All vehicle works should be done in one place to avoid chances of spillage in different parts of the camp.

☐ The Contractor is supposed to hire a licensed used oil transporter to remove the used oil from the site to avoid spills. Prior to collection the used oil should be stored well and labelled.
3. **Soil-Related Impacts**

All construction activities have some minor impacts on the soil. However, these are localized and restricted locally to the excavation of trenches for the sewer lines. It is expected that these impacts are also short-lived during construction and mitigation measures are recommended. The key impacts will revolve around soil erosion, contamination, disturbance of the natural soil structure, piling of soil along public access routes, improper replacement of soil to its original position, mixing of layers and compaction thus reducing the ecological function of the soil.

**Mitigation Measures**

- The valuable top soil containing organic material, nutrients as well as seeds and the soil fauna would be excavated separately and piled in an adequate manner for re-use.
- In cases where it is identified that during construction there is a danger of increased run-off or erosion of trenches, temporary drainage channels or holding ponds can be employed.
- After completion of the construction works, immediate restoration spreading piled top soil.
- There shall be sewer connection or septic tank in the campsite to avoid direct discharge of waste water.
- All chemicals should be stored well to avoid spills.
- The contractor should develop, sensitize workers and display emergency response work instructions for accidental oil and chemical spills.

4. **Impact on Water Resources**

Potential environmental impacts associated with water resources include sedimentation, foreign material spills, pollution slumping and disturbance to drainage. Solid waste, if allowed to accumulate in water ways, may cause localized pooling and flooding.

Improper handling of construction wastes and increased waste water production may cause pollution of area and eventually the Indian Ocean.

**Mitigation Measures**

- Construction materials and other debris (lime, cement and fresh concrete, etc.) shall be prevented from entering existing drainage infrastructure.
- Ensure protection of the ocean ecosystem by proper handling of cement during civil works.
- There shall be sewer connection or septic tank in the campsite to avoid direct discharge of waste water.
- Develop and display emergency response work instructions for accidental oil and chemical spills.

5. **Social - Economic Impacts**
During construction the project will have clear benefits with regard to local employment opportunities. The project will additionally require various skills and services which may not be available on the local level but certainly on the regional level, e.g. pipe fitters, plumbers, etc. for which appropriate personnel will be contracted.

The increase in employment will temporarily lead to an overall increase of income directly and indirectly (through increased demand of other local services). New businesses will grow such as food vending to construction workers.

Immigration of people from different regions may lead to behavioral influences and this may increase the spread of diseases such as HIV/AIDS.
Mitigation Measures

- Unskilled construction and skilled (if available) labor to be hired from the local population as far as possible to minimize on influx of foreigners into the community.
- Use of manual labor during trenching works where possible to ensure more employment of locals and hence ensure project support throughout the construction process.
- Sensitize workers and the surrounding community on awareness, prevention and management of HIV / AIDS through staff training, awareness campaigns, multimedia, and workshops or during community Barazas.
- The contractor shall develop a code of conduct of workers and translate it to the local language. The workers should periodically be sensitized on the code of conduct.
- All documents shall be translated in a language understood by the locals and if possible in a disability format.
- The contractor should consider skilled and unskilled people living with disability and women during employment and hire of service provision.
- The contractor shall develop a camp site grievance redress committee.
- The contractor shall undertake meetings with the local community and schools regarding labor influx to prepare them on the influx of non locals and the likely negative impacts as well as mitigation measures.

6. Air Quality

Construction activities of materials delivery, trench excavation and construction traffic will generate a lot of noise and dust especially during the dry seasons. The area is predominantly dry thus dust is already a pre-existing problem.

Vehicular traffic to the proposed sites is expected to increase especially during delivery of raw materials. Vehicular traffic emissions will bring about air pollution by increasing the fossil fuel emissions into the atmosphere.

Mitigation Measures

- Use protective clothing like helmets and dust masks on construction crew.
- Construction sites and transportation routes 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.
- All the vehicles and construction machinery should be operated in compliance with relevant vehicle emission standards and with proper maintenance to minimize air pollution.
- Digging of trenches should be done manually so as to avoid too many trucks and machines in the area. The use of manual labor will also benefit the community socio-economically.
- Use of other dust palliative measures to reduce dust emissions.

7. Construction Noise and vibration
Noise and vibration generated during construction by heavy construction machinery, such as excavators, bulldozers, concrete mixers, and transportation vehicles. Generally, construction noise exceeding a noise level of 70 decibels (dB) has significant impacts on surrounding sensitive receptors within 50m of the construction site.
Mitigation Measures

☐ Avoid night time construction when noise is loudest. Avoid night-time construction using heavy machinery, from 2200 to 0600hrs near residential areas.

☐ No discretionary use of noisy machinery within 50 m of residential areas and near institutions such as schools and hospitals

☐ Good maintenance and proper operation of construction machinery to minimize noise generation.

☐ Installation of temporary sound barriers if necessary.

☐ Selection of transport routes to minimize noise pollution in sensitive areas.

☐ Where possible, ensure non mechanized construction. This includes, employing locals during the trench excavation.

8. Biodiversity and Conservation Impacts

The project area already has minimal vegetation, due to its highly urban nature, thus whatever little vegetation may be affected by the proposed construction work.

Mitigation Measures

☐ Re-plant the indigenous vegetation as much as practical once work is completed.

☐ Spare the vegetation that must not necessarily be removed such as trees.

☐ Minimize the amount of destruction caused by machinery by promoting non-mechanized methods of construction.

☐ The contractor shall develop, sensitize workers and display work instructions for cement, concrete, oil and chemical spills

☐ Prior to undertaking any works in environmentally sensitive areas the contractor shall seek approval from the relevant authorities and comply to the conditions provided


Construction staff and the general public will be exposed to safety hazards arising from construction activities. The risk of accidents is bound to increase as a result of the construction works.

The project works will expose workers to occupational risks due to handling of heavy machinery, construction noise, electromechanical works etc. Construction activities of materials delivery, trench excavation and concrete mixing and construction traffic will generate a lot of dust and this may affect the respiratory system.

The high temperatures in the area will expose the workers to difficult working conditions.

Construction sites may be a source of both liquid and solid wastes. If these wastes are not well disposed these sites may become a breeding ground for disease causing pests.
such as mosquitoes and rodents. At the concrete mixing plant the exposure of human skin to cement may lead to damage of the skin.

Immigration of people from different regions may lead to behavioral influences which may increase the spread of diseases such as HIV/AIDS. Improper handling of solid wastes produced during and civil works such as spoil from excavations, scrap metal, mortar, paper, masonry chips and left over food stuff present a public nuisance due to littering or smells from rotting. Open trenches during the project duration pose a risk to the general public as they access the different sides of the trenches.
Improved sanitation to the area will lead to improved public health and quality of life through reduced risk of waterborne and water-related diseases; and increased public satisfaction.

**Mitigation Measures**

- Ensure that all construction machines and equipment are in good working conditions to prevent occupational hazards.
- Establish a Health and Safety Plan (HASP) for both civil works.
- Appoint a trained health and safety team for the duration of the construction work.
- Train at least 5 workers on basic or emergency first aid.
- Use of dust masks while working in dusty environment to avoid respiratory related sicknesses.
- Provide workers with appropriate personal protective equipment (PPE).
- Provide workers with adequate drinking water and breaks.
- Provide workers training on safety procedures and emergency response such as fire, oil and chemical spills, pipe bursts and other serious water loss risks.
- Roads passing through population centers will be water sprayed to reduce dust.
- Sensitize workers and the surrounding communities on awareness, prevention and management of HIV/AIDS through staff training, awareness campaigns, multimedia and workshops or during community Barazas. Provide information, education and communication about safe uses of drinking water.
- Work to minimize or altogether eliminate mosquito breeding sites.
- Provide appropriate human and solid waste disposal facilities.
- Provide crossing points along the trenches to allow people to maintain their normal activities, also cautionary signage should be provided along the trenches.
- Provide clean toilets for workers.
- Hire a licensed waste collector for solid, hazardous, e waste and used oil.

10. **Service Delivery Impacts**

The construction activities will cause disruption of services such as water supply and transportation within the project area. Where the sewer lines cross roads, excavation of trenches and laying down of the sewer lines may cause disruption of transport within the project area. Trucks with heavy loads of construction materials may damage the various roads during the construction process.

The current water storage facilities may not be enough to handle emergencies brought on by the interruption in water supply. Areas of special attention include the learning and health care institutions.

**Mitigation Measures**
- Provide appropriate signage to warn motorists and other road users of the construction activities, diversion routes to ward off traffic accidents.
- The contractor should communicate any intended disruption of the services to enable the people to prepare e.g. by having emergency water storage and provision facilities.
- Areas being trenched to be temporarily cordoned off to avoid people and animals accidentally falling into open trenches.
- In the event that delivery trucks damage parts of the road, repair the spots in consultation with the local authorities.
- Notice given to residents in case of any disruption in provision of services.
11. Gender Empowerment Impacts

There is need to promote gender equality in all aspects of economic development and more so in construction. Women roles in construction are mainly confined to supply of unskilled labor and vending of foodstuffs to the construction workers. Where available skilled women will be used.

**Mitigation Measures**

- Ensure equitable distribution of employment opportunities between men and women
- Provide toilets and bathrooms for both male and female workers on site

12. Impacts on Underground Infrastructure

During excavation for laying the trunk sewer there are risks of damaging underground individual and community water pipes, telecommunication or power lines. This could result in disruption of essential services especially within the Mombasa Mainland area.

**Mitigation measures**

- Consultation with other essential service providers prior to construction to establish location of these infrastructures should be sought to avoid interference.
- Where it must occur, then prior communication aimed at informing consumers of such disruption must be planned and effected at less critical periods and within very short durations.
- Any infrastructural material damaged during project implementation should be replaced/repaired.

13. Impacts on Workers’ Health and Safety (Accidents and other unforeseen calamities)

The noxious gas emissions are likely to be emitted which may have adverse effects on the health of the population.

Accidents that happen in construction sites could be mild or fatal depending on various factors. During the implementation of the proposed project, accidents could be due to negligence on part of the workers, machine failure or breakdown or accidental falls. Cuts by machines and other tools can also occur during pipes and sewer installations. These incidents can be reduced through proper work safety procedures.

**Mitigation Measures**

- There should be adequate PPE to all workers and they should be worn all the time.
- There should be adequate provision of the requisite sanitation facilities for human waste disposal.
□ The workers should receive requisite training especially on the operation of the machinery and equipment
□ There should be adequate warning and directional signs.
□ Provide clean drinking water for the employees.
Develop a site safety action plan detailing safety equipment to be used, emergency procedures, restriction on site, frequency and personnel responsible for safety inspections and controls.

A sign board warning on HIV/AIDS and drugs and alcohol abuse be erected and displayed at the construction camp sites

Rehabilitate excavated sites soon as construction is complete.

Train workers on the use of fire-fighting equipment.

Provide first Aid kit within the construction site.

Recording of all injuries that occur on site in the incident register, corrective actions for their prevention are instigated as appropriate.

Contractor to ensure compliance with the Workmen’s Compensation Act, ordinance regulations and union agreements.

Guide all workers in Safety Health and Environment (SHE).

14. Impacts on fire outbreaks

During construction and implementation of the project fire outbreaks are anticipated emanating from machines, smoking and even from domestic use. Such fires may cause physical and mental damage to the workers. In order to minimize occurrence of such situations, the contractor and workers should adhere to the following mitigation measures.

Mitigation measures

- Put “No Smoking Signs” in areas where inflammables are stored.
- Guide all workers in Safety Health and Environment (SHE).
- Provide adequate fire fighting equipment capable of fighting all classes of fire.
- Provide first Aid kit within the construction site.
- Label all inflammable materials and store them appropriately.
- There should be adequate PPE to all workers and should be worn all the time.
- Conduct regular fire-fighting drills.
- Develop a fire fighting emergency plan.
- Train one member of staff on fire preparedness.

15. Impact of Waste water and sludge

Waste water types generated by the construction activities are likely to include general refuse from the work force, and chemical waste from the maintenance of construction plant and equipment. Wastes generated by the operational activities would include sludge. These wastes should be carefully handled to minimize possible outbreaks of diseases.

Mitigation Measures

- Provided that these wastes are handled, transported and disposed of using approved methods and that the recommended good site practices are strictly followed, adverse environmental impacts are not anticipated during the construction and operation phases.
- To prevent potential emission of microbes during transportation, storage and handling of dewatered sewage sludge into surrounding water bodies, proper design of the STF will be conducted and the recommended “risk control measures” will be implemented.
16. **Impacts on Incomes and Livelihoods**

There is potential for economic displacement as some of these projects will be located in areas that are densely populated and with low incomes.

**Mitigation measures**

Preparation and implementation of livelihood restoration framework and compensation in accordance with WB policies which should be provided in the RAP Report.

17. **Impacts on Odour, Flies and Mosquitoes**

Potential Odour emissions from the sewerage plant would be the main concern during the operation phase. The most common nuisances caused by poor maintenance of wastewater stabilization ponds are odour, flies and mosquitoes.

**Mitigation measures**

- The volumetric BOD loading should lie between 100-400 g/m³ in order to maintain anaerobic conditions and at the same time control odour release.
- To reduce odour, flies and mosquitoes, routine maintenance tasks must be attended to punctually.

This involves the following:

- Removal of screenings and grit from the inlet system to reduce blockage.
- Regular cutting and disposal of grass and other herbaceous plants.
- Removal of floating scum and floating macrophytes from the pond surface.
- Removal of accumulated debris and other solids at the inlets and outlets.
- Repair of embankment which are eroded by rainfall or damaged by rodents and livestock grazing.
- Destruction and expulsion of burrowing animals and their nests in the embankment walls.

7.3.3. **Impacts during Operation & Maintenance**

During the operation of the constructed water supply project no substantial negative environmental and social impacts and risks are anticipated.

1. **Socio-economic potential positive or beneficial impacts**

Numerous socio-economic potential positive or beneficial impacts from successful implementation of the project will include:

- Better access to sewerage facilities thus reduced waste water flowing freely in the residential area;
- Improvements in domestic hygiene and a reduction in health risks that were associated with water borne diseases;
The program will contribute to increase in local development and employment as the local population are likely to be employed during the construction phase and after construction due to maintenance;

- Increase in land value due to availability of services
- Introduction of metering and administrative billing procedures;
- The program is expected to contribute to poor communities well-being associated with improved services, stability, and health.
- Employment creation will be the key positive environment impact as operation and maintenance personnel will be required for the rest of the project life.

Other potential impacts typically associated with operation and maintenance activities are such as:

2. Impact on Biodiversity and Conservation

During construction and rehabilitation works both flora and fauna are likely to be destroyed, injured or eliminated. The project area already has minimal vegetation, due to its highly urban nature, thus whatever little vegetation may be affected by the proposed construction work.

Mitigation Measures

The following measures are recommended:

- Re-plant the indigenous vegetation as much as practical once work is completed.
- Spare the vegetation that must not necessarily be removed such as trees.
- Minimize the amount of destruction caused by machinery by promoting non-mechanized methods of construction.

3. Leaks and bursts

During the project duration there may be leaks and bursts caused by various reasons such as blockages due to sand and solid waste, illegal connections, among others

Mitigation Measures

- A program of leak detection to be put in place to identify aging pipes for replacement to avoid major bursts and frequent repairs. In case of unavoidable major repairs, mitigation measures similar to those applied during construction to reduce the impacts of noise, dust, disturbance of flora and fauna.
- Leaks and pipe bursts to be promptly repaired to avoid leakage of untreated waste water into the environment.
Constant policing of network to check for illegal connections

4. Noise

Noise nuisance from vehicles and repair equipment. During O&M activities vehicles are required for inspection of sewer lines to detect any leakage and repair equipment is required in case need arises and in the process of these activities undesirable noise will be generated.
Mitigation Measures

- During normal operations the noise generated from vehicles has insignificant impact. However during major repairs the equipment used can generate unacceptable levels of noise and mitigation measures similar to those applied during construction to be used.

5. Socio - Economic Impacts

The expected improvements in metering and administrative billing procedures are likely to cause social and economic impact as this may result in higher water bills and sewer bills due to an improvement in the services.

Mitigation Measures

- The project is currently making use of the respective WSP approved rates and this impact is not foreseen.

7.3.4. Impacts during De-commissioning

De-commissioning of the Project is not envisaged. Project components however will be rehabilitated over time having served their useful life.
8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

8.1. Introduction

Environmental and Social Management and Monitoring Plan (ESMMP) of a project provides a logical framework within which identified negative impacts shall be mitigated and monitored. ESMMP assigns responsibilities of actions to various actors and provides timeframe within which mitigation measures are to be carried out. The ESMMP is a vital output of an Environmental Impact Assessment as it provides a checklist of project monitoring and evaluation. It assigns responsibilities and allocates costs in prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction phase of the proposed project.

At completion of construction, ownership of the wastewater project will be transferred to the proponent. The proponent will be responsible to implement environmental management measures associated with operation of the wastewater project.

Table 10 shows the environmental management and monitoring plan. It outlines corresponding management strategies proposed in earlier chapter that will be employed to mitigate potential adverse environmental impacts and assigns responsibility for the implementation of the mitigation measures.

Mitigation measures should be reflected in the Conditions of Contract and Bills of Quantities. It is the responsibility of the Supervising Consultant to ensure enforcement of these measures during construction.

The Project Team will comprise of the following:

- Project Manager/Designer/Supervising Consultant;
- Project Engineers
- Project Contractor(s).

Prior to mobilization, the Contractor should include all proposed mitigation and management measures in his schedule of works, and the Project Manager / Supervising Consultant should ensure that the schedule and environmental management and monitoring plan is complied with.

8.2. Responsibilities of the ESMMP

To ensure the effective development and implementation of the ESMP, it will be necessary to identify and define responsibilities and authorities with various persons and organizations that will be involved in the project. The following entities should be involved in the implementation of the ESMMP:

- Coast Water Services Board,
- MOWASCO
- Project manager
- Contractor
- Consultant
- Line Government ministries
- NEMA
Residents in the project affected areas
8.3. Environmental Management during Planning

This involves studying the specified environmental concerns and adopting the environmental management plan (EMMP) to the site. The design consultant should ensure that the specified mitigation measures in the EMMP are incorporated in the design, and tender documents.

8.4. Environmental Management during Construction

Environmental due diligence should be incorporated into the project implementation as follows:

- Control of health and safety risks of the contractor’s workmanship;
- Prevention of negative environmental impacts during construction;
- Control of the residual risk of accidental environmental damage.
- Training and awareness creation on all environmental issues;

As part of the construction progress reports, environmental considerations should be covered and progress indicated on the implementation of mitigation measures, as outlined in the EMP.

Upon completion, all temporary buildings, including concrete footings, formwork and slabs, all construction materials and debris will be removed from the site and the area rehabilitated as per the decommissioning stage requirements.

Construction aspects to be monitored will include, but will not be limited to the following issues:

- Construction of intake works
- All erosion and sediment control;
- Handling of hazardous materials as part of construction activities;
- Movement of machinery;
- Occupational health and safety;
- Collection and disposal of wastes;
- Management of pollution incidents.

8.5. Environmental Management during Commissioning and Operation

8.5.1. Management of the Project

During the commissioning and operation of the development, environmental due diligence will be incorporated into the management procedures to minimize any negative environmental impacts. The management of the project will have the primary responsibility for environmental health and safety issues.

Environmental Audit should be carried out annually to ascertain the status of the environment based on the baseline information presented in the EIA. The management of the project therefore will have to engage an Environmental Auditor or an Audit Firm to carry out the exercise.
The commissioning and operation risks to be monitored will include, but will not be limited to the following issues:

- Waste handling and disposal;
- Noise management;
- Operation and maintenance;
- Occupational health and safety.
- Societal conflicts of interests.

The following activities will be undertaken after completion of the construction phase:

- Close-down audit to verify that the proposed mitigation measures have been implemented;
- Inclusion of an environmental monitoring and management programme for maintenance.

All technical information on materials used, saving and environmental performance should be outlined and highlighted during hand-over. These will be incorporated into the environmental management plan for the schemes’ intake works and the entire system.

8.5.2. Maintenance of the Project

It should be demonstrated that all facilities comply with the standards as set out in the tender documents and technical specification. Furthermore repair materials are available in the event that a replacement or maintenance works are required. The maintenance team will develop a programme of regular maintenance and ensure that the relevant skills are always available.

8.6. Interventions for management of the proposed project

8.6.1. Engineering interventions

i. Incorporate environmental impact considerations in the design, construction and operation.
ii. Improve maintenance of the wastewater infrastructure
iii. Construct drainage facilities
## Table 10: Environmental and Social Monitoring Plan

<table>
<thead>
<tr>
<th>Total suspended particles</th>
<th>Frequency</th>
<th>Applicable regulation and standards</th>
<th>Monitoring indicator</th>
<th>Location</th>
<th>Oversee</th>
<th>Estimated Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total suspended particles</td>
<td>Daily during construction</td>
<td>NEMA guidelines</td>
<td>Suspended particulate</td>
<td>Where there are settlements</td>
<td>-Contractor -Client</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Noise levels on the dB (A)</th>
<th>Frequency</th>
<th>Applicable regulation and standards</th>
<th>Monitoring indicator</th>
<th>Location</th>
<th>Oversee</th>
<th>Estimated Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise levels on the dB (A)</td>
<td>As directed by Contractor</td>
<td>NEMA guidelines on noise levels</td>
<td>Stress levels</td>
<td>Site</td>
<td>-Contractor -NEMA officials</td>
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<table>
<thead>
<tr>
<th>Soil pH</th>
<th>Frequency</th>
<th>Applicable regulation and standards</th>
<th>Monitoring indicator</th>
<th>Location</th>
<th>Oversee</th>
<th>Estimated Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil pH</td>
<td>Before planting season</td>
<td>Soils report</td>
<td>Crops productivity</td>
<td>Composite samples from various mineral Soils</td>
<td>-CWSB MOWASCO</td>
<td>600,000</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Compensation as per the RAP</th>
<th>Frequency</th>
<th>Applicable regulation and standards</th>
<th>Monitoring indicator</th>
<th>Location</th>
<th>Oversee</th>
<th>Estimated Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation as per the RAP</td>
<td>Monthly until completion of construction</td>
<td>-RAP</td>
<td>Resettlements Plans</td>
<td>Affected Sites</td>
<td>-Local administration -Contractor - Client</td>
<td>As per the Resettlements Plans Master Roll</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Groundwater depth</th>
<th>Frequency</th>
<th>Applicable regulation and standards</th>
<th>Monitoring indicator</th>
<th>Location</th>
<th>Oversee</th>
<th>Estimated Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater depth</td>
<td>Monthly During the dry season</td>
<td>WRMA guidelines</td>
<td>Water availability in springs</td>
<td>At designated sites</td>
<td>-Contractor -WRMA</td>
<td>500,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Groundwater depth</th>
<th>Frequency</th>
<th>Applicable regulation and standards</th>
<th>Monitoring indicator</th>
<th>Location</th>
<th>Oversee</th>
<th>Estimated Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater depth</td>
<td>Monthly</td>
<td>WRMA guidelines</td>
<td>Quality of surface water</td>
<td>Sewage site</td>
<td>-Contractor -PHO</td>
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<tr>
<td>Water turbidity</td>
<td>During and after rains</td>
<td>NEMA guidelines</td>
<td>Water colour</td>
<td>-Sites -River banks</td>
<td>-Contractor -Agricultural officers</td>
<td>100,000</td>
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</tr>
<tr>
<td>Slag, domestic wastes, metallic scraps, sludge</td>
<td>Quarterly per Year</td>
<td>NEMA guidelines</td>
<td>Waste disposal sites</td>
<td>Waste disposal sites</td>
<td>-Contractor -NEMA</td>
<td>1,000,000</td>
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<tr>
<td>Vegetation Structure and biodiversity</td>
<td>Twice per year</td>
<td>ESMP</td>
<td>Project areas</td>
<td>Vegetation prevalence</td>
<td>-County government -Local community -KFS</td>
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<tr>
<td>Location rehabilitation carried out</td>
<td>At the completion of construction</td>
<td>ESMP</td>
<td>Trenches and pits locations</td>
<td>Rehabilitated sites</td>
<td>Contractor -NEMA</td>
<td>As per contract</td>
</tr>
<tr>
<td>-Safety training for workers, Reported accident incidents</td>
<td>Till completion of construction</td>
<td>ESMP</td>
<td>Project areas</td>
<td>Reported incidences of accidents</td>
<td>-Contractor</td>
<td>As per contract</td>
</tr>
<tr>
<td>Community sensitization meetings Prioritizing locals in employment</td>
<td>Till completion of construction</td>
<td>ESMP</td>
<td>Project areas</td>
<td>Grievance redress committee reports Employment records</td>
<td>Contractor</td>
<td>As contract</td>
</tr>
<tr>
<td>Reported incidences</td>
<td>Regularly till Completion</td>
<td>ESMP</td>
<td>Project’ area</td>
<td>Illnesses reports</td>
<td>- Contractor -NEMA</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Vehicles and instances</td>
<td>Regularly till Completion</td>
<td>ESMP</td>
<td>Number of vehicles</td>
<td>Project roads</td>
<td>- Contractor Traffic police</td>
<td>As per contract</td>
</tr>
<tr>
<td>Seeps and leaks</td>
<td>Regularly till</td>
<td>NEMA guidelines</td>
<td>Water quality in bodies</td>
<td>Rivers and the oceans</td>
<td>NEMA CWSB Local community</td>
<td>As per contract</td>
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<tr>
<td>Peoples behaviour</td>
<td>Completion</td>
<td>ESMP</td>
<td>Project areas</td>
<td>Reported incidences</td>
<td>-Contractor</td>
<td>As per contract</td>
</tr>
<tr>
<td>Reported incidences</td>
<td>Regularly till</td>
<td>NEMA guidelines</td>
<td>Project areas</td>
<td>Reported incidences</td>
<td>-Contractor</td>
<td>As per contract</td>
</tr>
<tr>
<td>Number of women involved in any set up</td>
<td>Completion</td>
<td>ESMP</td>
<td>Project areas</td>
<td>Reported incidences</td>
<td>-Contractor</td>
<td>As per contract</td>
</tr>
<tr>
<td>Reported incidences</td>
<td>At occurrence</td>
<td>ESMP</td>
<td>Project areas</td>
<td>Reported incidences</td>
<td>-Contractor</td>
<td>As per contract</td>
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<tr>
<td>Disease prevalence rates</td>
<td>Regularly</td>
<td>NEMA guidelines</td>
<td>Project areas</td>
<td>Reported incidences</td>
<td>-Contractor</td>
<td>As per contract</td>
</tr>
</tbody>
</table>

**Notes:**
- ESIA: Environmental and Social Impact Assessment
- contractor: Responsible party for implementation
- NEMA: National Environment Management Authority
- CWSB: County Water and Sanitation Board
- MoH: Ministry of Health
- KFS: Kenya Forest Service
- NALSA: National Land Settlement Authority
- UWA: Uganda Wildlife Authority
- ESMP: Environmental and Social Management Plan
8.7. Monitoring Activities

8.7.1. General

Environmental monitoring is envisioned as an important process in project management. It reveals changes and trends brought about by presence and operations of a project. Such information will be useful in the formulation of sustainable project management, operation strategies and action plans.

The basic activities for a sound monitoring programme should at least include the following parameters:

- collection and analysis of relevant environmental data of the project area;
- preparation of periodical reports on the environmental status of the project area and
- liaison with other agents and stakeholders;
- identification of unexpected environmental impacts;
- formulation of counter-measures to mitigate against the unexpected negative impacts.

8.7.2. Environmental Monitoring During Construction

Environmental due diligence should be incorporated into the project implementation as follows:

- control of health and safety risks of the contractor’s work force;
- prevention of negative environmental impacts during construction;
- control of the residual risk of accidental environmental damage;
- training and awareness creation on all environmental issues.

As part of the construction progress reports, environmental considerations should be covered and progress indicated on the implementation of mitigation measures, as outlined in the EMMP.

Upon completion, all temporary buildings, all construction materials and debris will be removed from the site and the area rehabilitated as per the requirements.

Construction aspects to be monitored will include, but will not be limited to the following issues:

- rehabilitation of the sewer lines;
- soil erosion and sediment control;
- handling of hazardous materials as part of construction activities;
- movement of machinery;
- occupational health and safety;
- collection and disposal of wastes;
- management of pollution incidents.

All relevant technical information, indicating that the construction was undertaken in compliance with the set design standards and noting any deviations, as well as environmental conservation measures undertaken should be provided to the property owner.
All technical information on materials used, saving and environmental performance should be outlined and highlighted during hand-over. These will be incorporated into the environmental management and monitoring plan for the wastewater Project.

8.7.3. Environmental Monitoring During Commissioning and Operation

8.7.3.1. Management of the Project

During the commissioning and operation of the development, an environmental monitoring plan should be incorporated in the system to minimize any negative environmental impacts. The management of the project will have the sole responsibility of ensuring environmental health and safety issues are adhered to.

The risks to be monitored will include, but not limited to the following issues:

- waste handling and disposal;
- noise pollution control;
- operation and maintenance;
- occupational health and safety.

The following activities will be undertaken after completion of the construction phase:

- close-down audit to verify that the proposed mitigation measures have been implemented;
- inclusion of an environmental monitoring and management programme for maintenance.

8.7.3.2. Maintenance

It should be demonstrated that all facilities comply with the standards as will be set out in the tender document and technical specification. The rehabilitation team will develop a programme of regular maintenance and ensure that the relevant skills are always available.
9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Conclusions

The project upon completion would realize several positive impacts, most significant of which being reduction of public health hazard as result of improved drainage and sewerage conditions in the service area. The project has been planned in full cognizance of the requirements of the West Mainland where it is to be implemented and all standard planning considerations have been taken into account and given the attention they deserve. The following conclusions were arrived at:

- The project does not pose any serious environmental concern, other than those mentioned with mitigation measures that accompanies any development;
- The positive environmental impacts the project will realize far out-scales the negative ones, which can be contained by following the prescribed ESMMP;

9.2. Recommendations

This environmental examination process therefore establishes a negative determination of the impacts on the environment and hence recommends that the proposed rehabilitation and immediate extension works be implemented with full adherence of the Environmental and Social Monitoring and Management Plan

Having considered the information collected, collated and analyzed through field study and literature review, the following recommendations were arrived at:

- The project proponent should commence the project immediately once this report is approved;
- Ensure that worker’s occupational health and safety standards are maintained through capacity building, proper training, providing protective clothing and managing their residential camps up to the required health standards;
- The local community should be sensitized to abate stealing of pipes and metals of the sewerage system, and;
- Once the project is complete, there is a need to develop plans to recycle waste for power production;
- The design should ensure comprehensive waste water treatment to allowable limits by NEMA and WHO standards and the World Bank Environmental Health and Safety Guidelines, before releasing into the ocean;
- Involvement of all relevant stakeholders is proposed throughout the process to ensure project acceptability;
  All construction waste will be properly disposed off in a timely manner, the excavated material wherever possible will be used as raw material for a range of activities, such as road repair or construction, and for use as building material e.g. stones, and;
  Annual environmental audits should be carried out on the project in order to ensure compliance of the project with the mitigation measures outlined in the Environmental and Social Management Plan (ESMMP);
- There is need to have all the safety measures put in place so as to promote the well-being of the workers especially at the construction phase and the pipe laying phases.
The contractor tasked with carrying out the sewerage rehabilitation should use the local labour during the project cycle to empower the communities financially and also build their capacity in their general maintenance. These personnel should be trained to effectively manage the project once construction is completed. A RAP is necessary so as to ascertain the number of PAPs.
REFERENCES


ANNEX 1: HOUSEHOLD QUESTIONNAIRE

PROPOSED WORKS CONTRACTS UNDER COAST WATER SERVICES BOARD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SURVEY QUESTIONNAIRE

An Environmental and Social Impact Assessment Survey is being carried out for the proposed __________________________ on behalf of the Coast Water Services Board (CWSB). The aim of this survey is to form a realistic and up to date picture of the Environmental and Social situation in the area. We need your honest and accurate information during this discussion. Your inputs will assist in the understanding of your needs for improvement. The answers you provide will be kept confidential.

SECTION 1 DETAILS

1. Name of the Enumerator: .................................................................
2. Signature of the Enumerator: ..............................................................
3. Name of the Respondent: ...............................................................
4. Telephone number of the respondent: ................................................
5. ID Number of the respondent: ............................................................
6. Date: ...................... Time of interview: ..............................................
1.4 Respondent place of resident: (1) Village .................... (2) Location .............
........................................ (3) Sub-County ................... (4) County..............................

SECTION 2 BASIC HOUSEHOLD SETUP

1. Name of the household head: .................................................................
2. ID Number of the household Head .................... Telephone Number of the Household Head ..............
3. How many members do you have in this household: ................................................
4. How many members of your household fall under each of the following age groups?
   (1) 0 – 5yrs......................... (2) 6 – 18yrs................... (3) 19-35yrs .................... (4) 36-49yrs.................
   (5) 50-65yrs ............ (6) Over 66yrs .....................
5. How many of your household members have attained each of the following education levels?
   (1) None .................. (2) Primary .................. (3) Secondary .................. (4) College/university ..............
6. What is the occupation/economic activity of the household head
   (1) Crop farming ............... (2) Livestock farming ............... (3) Formal employment ..............
   (4) Business ............ (5) Fishing ............ (6) Mining ............ (7) Others (specify) ..............
   (6) Coconut ............ (7) Others ..............
8. If livestock farming what animals?
(1) Cow........... (2) Sheep ........... (3) Goats .......... (4) Donkeys .......... (5) Others .................
10. What is the average combined household income per month? (tick) (1)Less than 15,000.......... (2) 15,000-30,000......... (3)30,000-50,000.......... (4) Above 50,000 .........
12. Type of fuel mostly used for cooking: (tick) (1)Firewood ............ (2)Charcoal ............... (3) Kerosene ............... (4) LPG(Gas) ............. (5)Electricity ............... (6) Others (specify) ............

SECTION 3  WATER AND SANITATION

3.1 What is the common source of water in this area? (1) Private tap .......... (2) Public Tap .......... (3) Bore hole .......... (4) Shallow well ............ (5) Protected spring/river .......... (6) Water pan ............ (7) Others (specify) ............
3. What is the general quality of the water? (Tick) (1) Good ............ (2) Fair ............ (3) Bad ............
4. How often do you Fetch water? (1) Every day .......... (2) Every alternate day of the week .......... (3) Once a week ..........
5. Do you pay for water? (1) Yes................ (2) No................
6. If yes how much per 20 litre jerrican in Ksh. (1) Ksh. 2............. (2) Ksh. 5 ............ (3) Ksh. 10............. (4) Above Ksh. 10 .............
7. What is the common mode of transporting water in this area? (1) Carrying on the head ............ (2) Hand driven carts/wheelbarrow ............ (3) Bodaboda (bicycle/motorbike) ............ (4) Pack animals (Donkeys/Camels) ............ (5) Animal drawn carts ............ (6) Trucks ............ (7) Others (specify) ............
8. How do you dispose of your household waste? (Tick) (1)Compost pit/burying ............ (2) Collection by the council ............ (3) Recycling ............ (4) Burning ............ (5) Dumping in open areas ............ (6) Others (specify) ............
9. Does the household have a toilet? (1)Yes ............ (2) No ............
10. If yes, type of toilet: (tick) (1) Flush system connected to the sewer line ............ (2) Flush system with Septic tank ............ (3) Pit latrine ............ (4) Mobile toilet ............ (5) Any other (Specify) ............
11. Are you aware of the proposed Works under Coast Water Services Board? (1) YES ............ (2) NO ............
12. How will proposed Works under Coast Water Services Board affect the community here? (Tick) (1) Positively ............ (2) Adversely (negatively) ............

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13. If positively, in what way? (Tick)
   (1) Overall improvement in sanitation due to proper wastewater management
   (2) Reduced cases of waterborne diseases due to reduced contamination of water
   (3) Improved hygiene
   (4) Improved business during construction
   (5) Improved sanitation will increase land values
   (6) Employment opportunities during construction and operation of the plant
   (9) Others (please specify)

14. If negatively, in what ways? (Tick)
   (1) Dust and noise during construction
   (2) Demolition of structures
   (3) Loss of farm land/trees/crops
   (4) odours during operation of the plant
   (5) Proliferation of scavenger species, e.g. birds during operation
   (6) Spread of diseases (STD, HIV/AIDS)
   (7) Interruption of services (road access, electricity, etc.) during construction
   (8) Others (specify)

15. What do you think should be done to minimize or mitigate these negative impacts?
   (1) Inform the public about any interruption of services
   (2) Proper maintenance of treatment works during construction
   (3) Avoid night time construction
   (4) Educate the public and the construction crew on health and safety
   (5) Compensate the structure/Land/crop/trees owners
   (6) Others (specify)

SECTION 4  HEALTH

4.1 Which diseases have members of your household suffered from in the past six months? (Tick)
   (1) Malaria
   (2) Malnutrition
   (3) Measles
   (4) HIV/AIDS
   (5) Eye problems
   (6) Diarrhea
   (7) Cholera
   (8) Intestinal worms
   (9) Respiratory infections
   (10) Skin rashes
   (11) Others (specify)

2. What do you do when you are sick?
   (1) Seek medical attention from a health centre
   (2) Prayed for
   (3) Take herbs
   (4) Visit a traditional doctor
   (5) Others (specify)

3. What is the ownership status of the health facilities attended by your household members? (Tick)
   (1) Public
   (2) Private
   (3) Faith based
   (4) NGO
   (5) Traditional

4. How far is the health facility visited by your household members in km?
   (1) Less than 1km
   (2) 1 - 3km
   (3) 3 - 5km
   (4) Above 5km

SECTION 5  KNOWLEDGE AND ATTITUDE ON HIV/AIDS

1. Have you ever heard of HIV/AIDS? (Tick)
   (1) Yes
   (2) No

2. If yes, what source did you hear it from? (Tick)
   (1) Radio/TV
   (2) Billboards
   (3) Posters
   (4) Religious leaders
   (5) Relative/friend
   (6) Health worker/Clinic
   (7) NGO/CBOs
   (8) Newspaper
   (9) Other (Specify)
5.3 Has any of your household members been affected by HIV/AIDS?
   (1) Yes .................. (2) No ..................
5.4 Do you think HIV (AIDS) can be prevented?
   (1) Yes .......... (2) No .............
   (3) Do Not Know ..........
5.5 Do you know where to go for voluntary counseling and testing for HIV/AIDS?
   (1) Yes .......... (2) No .............

SECTION 6  ENVIRONMENTAL

6.1 What environmental issues are of concern to the people of this area?
   (1) Water shortage ............ (2) Invasive species .................. (3) Overgrazing ............ (4) Extinction of endangered species ............ (5) Mosquitoes and malaria spread ............ (6) Solid waste ..................
   (7) Deforestation ................ (8) Drought .................. (9) Poor Sanitation (10) others (please specify)..................
2. What are the environmental conservation initiatives in the area?
   (1) Tree planting ............ (2) Educating the public ............ (3) Cleaning of mosquito breeding sites ............
   (4) Collection of solid wastes.................................. (5) Construction of toilets (6) others (please specify)..................................
3. Who are carrying out these activities?
   (1) Women groups .......... (2) County council.......... (3) Non-governmental organization ................ (4) Community based organizations........ (5) Youth groups.......... (6) Others (please specify)..................
6.4 Will the completion of the proposed Works under Coast Water Services Board help in the conservation of the environment in the area?
   (1) Yes ................. (2) No ............
6.5 If yes in what ways? ..................................
## ANNEX 2: LIST OF PARTICIPANTS (CONSULTATIVE FORUMS)

### List of participants

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<td>AMINNA ABIDI</td>
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<td>SIMON CHEGA</td>
<td>MWAMULI 5332093</td>
<td>0701777756</td>
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<tr>
<td>LEONARA AGAMA</td>
<td>MWAMULI 20978456</td>
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<tr>
<td>DAISY JUMA</td>
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<tr>
<td>SOFIA SUAI</td>
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<td>NYANZIWA S KAGUMA</td>
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<td>MAMEND CHITANGI</td>
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<td>ABDULLAH MOHAMED</td>
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<td>MALEKHANI NGALI</td>
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<td>MWESEWA MUHINDA</td>
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<td>CHOBU BELA MIRI</td>
<td>MWAMULI 205421908</td>
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<tr>
<td>ROBECA MIRI</td>
<td>MWAMULI 2504714</td>
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List of participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Village</th>
<th>ID Number</th>
<th>Mobile No.</th>
<th>Signature</th>
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<tr>
<td>Rashid Hamisi Harun</td>
<td>Estate</td>
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<td>Lena Jimmy Boma</td>
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<td>06120281</td>
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<td>DAS</td>
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<td>Sabauer Mbone</td>
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<td>Machel Banya Yaa</td>
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<td>Merziwa Ramadhun</td>
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<tr>
<td>Gona Nzala</td>
<td>Msulini</td>
<td>29022918</td>
<td>0733535713</td>
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<tr>
<td>Mwangtume Hamisi Harun</td>
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<td>Hamisi Harun Hamisi</td>
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<tr>
<td>Hamisi Shere Miousa</td>
<td>Nkonza</td>
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<tr>
<td>Charles M. Mwamonge</td>
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<tr>
<td>Mtindu Isgatay</td>
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<td>Stephen M.K. Mbuju</td>
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<td>Rehema Fue</td>
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<tr>
<td>Nabwami Buni</td>
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<td>Agina Khamusi</td>
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<td>Stephen Lusaka Naka</td>
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<td>Mwanza Niwa Chare</td>
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<td>Marango H. Kombo</td>
<td>Msulini</td>
<td>0253012</td>
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ANNEX 3: STAKEHOLDERS MINUTES

CONSULTANCY SERVICES FOR THE PROPOSED SUBPROJECTS UNDER THE SECOND WATER & SANITATION SERVICES IMPROVEMENT PROJECT (WaSSIP-2)

MINUTES OF PUBLIC STAKEHOLDER MEETING HELD ON 11TH DECEMBER 2016 FROM 10:00 HRS AT JOMVU SCREW FARM PREMISES.

PRESENT: All members who attended the meeting are annexed to this minutes. The meeting was called to order by the area chief at 10:30am and prayers were conducted by Abdul Rahman Ngal.

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<th>Minute Deliberation</th>
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Introduction of Consultant’s Team

The area chief introduced the stakeholders and the consultant team that was present and gave a short brief of the purpose of the meeting.

Opening Remarks

Elijah Kimani gave opening remarks on the project and requested questions to be directed to the consultant members present. He also emphasized on the importance of community participation and encouraged the participants to be free and open as their input was very valuable.

Outline of the RAP process

Elijah Kimani briefed the stakeholders on the RAP process; history/background of the project; what necessitated the proposed works, the follow-up process of RAP process and the measures put in place for the smooth transition of the process.

Presentation of the proposed project to the stakeholders

Elijah Kimani explained the existing main sewer system of the area and the problems that had been identified in the trunk system and also in the pumping stations in the west mainland. He also outlined articulately on the proposed works that intended to fix the existing problems. He then encouraged the participants to give their comments, opinions and views on the proposed works.

Question & Answer session

Q1: Sophia Rada from Rabai Ndogo asked

a. Will the project include the local community in their works?

A: Elijah Kimani assured her that all project work will involve the community and will be sympathetic to them. The community will be utilized in the non-technical works so that they can own the project and be responsible in taking care of it.

Q2: Ramadhan Ali Ngudi from Mwamlai village asked

a. What environmental impact will the project have on them?

A: Elijah Kimani responded to this and stated that the project had put all necessary measures to cushion the community on the negative impact of the project. A comprehensive EIA report was conducted and its recommendations will be followed to the letter to ensure their safety and the preservation of their environment.
MINUTES OF PUBLIC STAKEHOLDER MEETING HELD ON 11TH DECEMBER 2016 FROM 12:00 HRS AT MIRITINI PUMP STATION PREMISES.

PRESENT: All members who attended the meeting are annexed to this minutes.

The meeting was called to order by the area chief at 12:00pm and prayers were conducted by Charles Mwang’ombe.

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<tbody>
<tr>
<td>1.</td>
<td><strong>Introduction of Consultant’s Team &amp; stakeholders</strong></td>
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<tr>
<td></td>
<td>The area chief welcomed all participants the consultant team that was present and gave a short brief of the purpose of the meeting. The other stakeholders introduced themselves too.</td>
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<tr>
<td>2.</td>
<td><strong>Opening Remarks</strong></td>
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<td></td>
<td>Elijah Kimani – the lead consultant gave opening remarks on the project he outlined the current status of the project and the proposed immediate works needed to restore the sewer system. He also emphasized on the importance of community participation and encouraged the participants to be free and open as their input was very valuable.</td>
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<tr>
<td>3.</td>
<td><strong>Outline of the RAP process</strong></td>
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<td></td>
<td>Elijah Kimani briefed the stakeholders on the RAP process; history/background of the project; what necessitated the proposed works, the follow-up process of RAP process and the measures put in place for the smooth transition of the process.</td>
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<td>4.</td>
<td><strong>Presentation of the proposed project to the stakeholders</strong></td>
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<td></td>
<td>Elijah Kimani explained the existing main sewer system of the area and the problems that had been identified in the trunk system and also in the pumping stations in the west mainland. He also outlined articulately on the proposed works that intended to fix the existing problems. He then encouraged the participants to give their comments, opinions and views on the proposed works.</td>
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<td>5.</td>
<td><strong>Question &amp; Answer session</strong></td>
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<tr>
<td>Q1:</td>
<td>Stephen Katana from Miritini Misufini asked</td>
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<td></td>
<td>b. <em>Will the project cause bad odor that will affect them?</em></td>
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<tr>
<td>A:</td>
<td>Elijah Kimani assured her that all project work will cushion all persons involved from air and general pollution to the environment. Elijah Kimani further stated that the project had put all necessary measures to cushion the community on the negative impact of the project. A comprehensive EIA report was conducted and its recommendations will be followed to the letter to ensure their safety and the preservation of their environment.</td>
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<tr>
<td>Q2:</td>
<td>Hamisi Harun from World Bank Village asked</td>
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<td></td>
<td>b. <em>Is the project handling a new line and what happened to previous rehabilitations?</em></td>
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<tr>
<td>A:</td>
<td>Joy Wasirimba stated that this was not a new project and that it was rehabilitation of the existing waste water system. There were areas that had been rehabilitated and those are not going to be in this project since they do not have any issues. All areas in the main trunks and the pumping stations that have issues are the ones that are going to be handled by this project.</td>
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MINUTES OF PUBLIC STAKEHOLDER MEETING HELD ON 11TH DECEMBER 2016 FROM 02:00 HRS AT MKUPE-MIKINDANI PUMPING STATION PREMISES.

PRESENT: All members who attended the meeting are annexed to this minutes.
The meeting was called to order by the area chief at 02:00pm and prayers were conducted by Rashid Juma.

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<tbody>
<tr>
<td>1.</td>
<td><strong>Introduction of Consultant’s Team</strong></td>
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<tr>
<td></td>
<td>The area chief – Ima Matano Mzee introduced the stakeholders and the consultant team that was present and gave a short brief of the purpose of the meeting.</td>
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<tr>
<td>2.</td>
<td><strong>Opening Remarks</strong></td>
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<tr>
<td>3.</td>
<td>Elijah Kimani gave opening remarks on the project and requested questions to be directed to the consultant members present. He also emphasized on the importance of community participation and encouraged the participants to be free and open as their input was very valuable.</td>
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<td>4.</td>
<td><strong>Outline of the RAP process</strong></td>
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<td></td>
<td>Elijah Kimani briefed the stakeholders on the RAP process; history/background of the project; what necessitated the proposed works, the follow-up process of RAP process and the measures put in place for the smooth transition of the process.</td>
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<td>5.</td>
<td><strong>Presentation of the proposed project to the stakeholders</strong></td>
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<td></td>
<td>Elijah Kimani explained the existing main sewer system of the area and the problems that had been identified in the trunk system and also in the pumping stations in the west mainland. He also outlined articulately on the proposed works that intended to fix the existing problems. He then encouraged the participants to give their comments, opinions and views on the proposed works.</td>
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<tr>
<td></td>
<td><strong>Question &amp; Answer session</strong></td>
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<tr>
<td><strong>Q1:</strong></td>
<td>Anderson Were from Bangladesh settlement asked</td>
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<td>c.</td>
<td>Some projects take long to be implemented, how long will this take to start?</td>
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<tr>
<td><strong>A:</strong></td>
<td>Elijah Kimani stated that the project works are stated to be ‘immediate’ because they are urgent works hence they will not take long. He further said that the project works are intended to start by March 2016.</td>
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<tr>
<td><strong>Q2:</strong></td>
<td>Paul Simba from Bangaldesh village asked</td>
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<tr>
<td>b.</td>
<td>What impact will the project have on them?</td>
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<tr>
<td><strong>A:</strong></td>
<td>Elijah Kimani responded to this and stated that the project had put all necessary measures to cushion the community on the negative impact of the project. A comprehensive EIA report was conducted and its recommendations will be followed to the letter to ensure their safety and the preservation of their environment.</td>
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MINUTES OF PUBLIC STAKEHOLDER MEETING HELD ON 11TH DECEMBER 2016 FROM 04:00 HRS AT CHAANI SOCIAL HALL.

PRESENT: All members who attended the meeting are annexed to this minutes. The meeting was called to order by the area chief at 04:00pm and prayers were conducted by Kepha Kisingadi.

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<tbody>
<tr>
<td>1.</td>
<td>Introduction of Consultant’s Team</td>
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<tr>
<td></td>
<td>The area chief representative-Kepha Kisingadi introduced the stakeholders and the consultant team that was present and gave a short brief of the purpose of the meeting.</td>
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<tr>
<td>2.</td>
<td>Opening Remarks</td>
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<tr>
<td></td>
<td>Elijah Kimani gave opening remarks on the project and requested questions to be directed to the consultant members present. He also emphasized on the importance of community participation and encouraged the participants to be free and open as their input was very valuable.</td>
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<tr>
<td>3.</td>
<td>Outline of the RAP process</td>
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<td></td>
<td>Elijah Kimani briefed the stakeholders on the RAP process; history/background of the project; what necessitated the proposed works, the follow-up process of RAP process and the measures put in place for the smooth transition of the process. He further explained that the importance of this process to the success of the project.</td>
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<td>4.</td>
<td>Presentation of the proposed project to the stakeholders</td>
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<td></td>
<td>Elijah Kimani explained the existing main sewer system of the area and the problems that had been identified in the trunk system and also in the pumping stations in the west mainland. He also outlined articulately on the proposed works that intended to fix the existing problems. He then encouraged the participants to give their comments, opinions and views on the proposed works.</td>
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<tr>
<td>5.</td>
<td>Question &amp; Answer session</td>
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<td></td>
<td>Q1: Richard Mutua from Kalahari asked</td>
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<td>d. Compensation is always a source of conflict in many projects, how will this project compensation scheme be handled.</td>
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<td>A: Elijah Kimani explained that part of his assignment was to develop a resettlement action plan (RAP) to identify who and what was to be affected. This then would inform and advise the compensation and grievance redress procedures for the project which would direct the compensation.</td>
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<td>The compensation criteria will be determined by the extent of damage to the structure, holders of titles among others.</td>
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<td></td>
<td>The compensation plan the will include all those affected by the proposed works and it will be assed and conducted fairly to all affected without discrimination.</td>
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ANNEX 4: PICTORIAL PRESENTATION

Mkupe (Mkindani) Consultative meeting held on 11th December 2016

Figure 10 Chaani (Chaani social hall) Consultative meeting held on 11th December 2016
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Figure 11 Miritini (Miritini pump station) Consultative meeting held on 12th December 2016

Figure 12 Jomvu (Screw pump compound) Consultative meeting held on 12th December 2016
Figure 10 Chaani (Chaani social hall) Consultative meeting held on 11th December 2016
Figure 11 Miritini (Miritini pump station) Consultative meeting held on 12th December 2016

Figure 12: Jomvu (Screw pump compound) Consultative meeting held on 12th December 2016
ANNEX 5: GRIEVANCES AND APPEALS

Introduction

The proposed project will infringe on peoples’ right to property and/or livelihood and readjustment to new life conditions as such the resettlement process is bound to elicit grievances from the PAPs or from other interested parties. It is therefore imperative to have a workable grievance redress mechanism to take care of any such disputes arising from the resettlement so that they do not have an adverse effect on the project. This chapter briefly outlines a mechanism for settling the anticipated disputes.

Possible Sources of Grievances

Some of the issues that may elicit disputes in the resettlement process include:

- Failure to understand the essence of the project and the need for the proposed resettlement
- Clerical errors in data entry that leads to delays in processing of compensation for the PAP
- Emerging issues such change in estate administration of affected properties causing delays to payment of compensation
- Disputed ownership of an affected asset particularly where documentation is not reliable
- Rejection of a compensation award considered not adequate and representative of market value
- Handling of cultural issues where there are no clearly agreed precedents such as relocation of graves or payment for compensation in a polygamous marriage

Role of the Grievance Redress Committee (GRC)

The main function of the Grievance Redress Committee is to provide a forum for the PAPs to air their dissatisfaction arising from the compensation or implementation process of the project. This is an informal forum within the Resettlement Committee to fast-track addressing of emerging issues in a project that can derail a smooth implementation of a project. The Committee will be receiving complaints from the PAPs through the project office either verbally or in writing and will then endeavour to address the issue to the satisfaction of the complainant. If the matter cannot be addressed to the satisfaction of the complainant within the prescribed period, the complainant then may have recourse to the Resettlement Committee. Failure to be satisfied, the complainant reserves the right to seek redress from the Court of law that is lengthy and costly in most cases.

The GRC will compile registers of all complaints received from the PAPs at the project office, the actions taken and the decisions arrived at. Initially, the Resident Engineer and his staff with secretariat of the GRC will handle the complaint. Failure to arrive at a satisfactory answer, then the RE will refer the matter to the GRC that meets periodically. Whereas the GRC is constituted of people outside the Project Office of the Resident Engineer, the latter will be a co-opted member together with the Contractors representative for expeditious resolution of the complaints regarding the project.
Grievance Redress Sub-Committee

A Grievance Redress Sub-Committee will be formed within the Project Resident Engineers Office. They shall address the issues in the following manner:

- Register the grievances raised by the PAPs; and
- Address the grievances forwarded by the RC/PAPs representatives.

The Grievance Redress Sub-Committee shall try as much as possible to arrive at a compromise on complaints raised. This may be obtained through a series of mediation and negotiation/arbitration exercises conducted with the individual PAP. If the PAP accepts the recommendations made by the committee, the committee along with a PAP who is willing to take part in these proceedings may hold mediations at the appointed places.

Dispute Procedure

The filing of grievances for accurate record keeping is important. If the complainant is not able to express his/her complaint in writing, he/she can be assisted by a local leader (preferably who is also a member of the Committee) to file the complaint at the complaints desk in the project office. To ease follow-up, each complaint will be registered and assigned a unique reference number. The Office will then evaluate the application and determine whether the issue can be handled administratively or the Committee has to meet over the matter.

Where the Committee has to be convened, all its proceedings are recorded and minutes prepared of the deliberations. The minutes have to be confirmed at the next meetings and authenticated by the full sitting. All the signed minutes and the resolutions of the GRC are implemented as agreed and without delay so as not to impact negatively on the project implementation plan. Some issues that arise in-course of the project implementation are dealt with as they arise.

Initially, it is proposed that the Grievance Redress Committee should meet on scheduled days per week that the public is aware of to receive and address any complaints that are filed by the community and the PAPs. The Committee should also receive reports on any matters that have been dealt with administratively, having been considered not necessary to receive their participation. The frequency of the meetings will diminish as the issues to be addressed decrease and the meetings may now be scheduled on periodic basis until the project is completed.

Failure to Resolve Disputes

If the Grievance Redress Sub-Committee fails to resolve the disputes with the PAPs, an independent third party will be sought so as to resolve the issue. This party may be an arbitrator. If the matter is still not resolved, the aggrieved parties may move to court to settle the matter. However all legal fees for each party must be met by the party members.
Role of PAP’s Representatives in Grievance Redress Committee

The PAPs officials headed by a chairman elected by the PAPs shall carry out the following responsibilities as regards redressing grievances:

- Hear the grievances of the PAPs and provide an early solution to those they are able to;
- Immediately bring any serious matters to the attention of the RC; and
- Inform the aggrieved parties about the progress of their grievances and the decisions made by the RC.