

**REPUBLIC OF KENYA**



**MINISTRY OF TRANSPORT, INFRASTRUCTURE,  
HOUSING AND URBAN DEVELOPMENT**

**ENVIRONMENTAL AND SOCIAL  
ASSESSMENT PROJECT REPORT  
(ESIA)**

**PROPOSED CONSTRUCTION OF  
PIPELINE RAILWAY STATION**

*Project Ref No.522440*

**August 23, 2017**



## CERTIFICATION

SGS Kenya Limited was commissioned by the Ministry of Transport, Infrastructure, housing and Urban Development to undertake Environmental and Social Impact Assessment for the proposed construction of Pipeline Railway Station in Nairobi County. The Report has been written in accordance with the Environmental Management and Coordination Act no. 8 of 1999 and The Environmental (Impact Assessment and Audit) Regulations, 2003 for submission to the National Environmental Management Authority (NEMA).

SGS Kenya Limited submits this Environmental and Social Impact Assessment Report, to NEMA Kenya. To the best of our knowledge, all the information in this report is true and correct.

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## ACRONYMS

AIDS	Acquired Immune-Deficiency Syndrome
BOQs	Bill of Quantities
BRT	Bus Rapid Transit
CBD	Central Business District
CIDP	County Integrated Development Plan
CRS	Commuter Rail Station
CTS	Commuter Train Study
Db	Decibels
DECs	District Environment Committees
DG	Director General - NEMA
DoNMED	Directorate of Nairobi Metropolitan Development
EA	Environmental Audit
EIA	Environmental Impact Assessment
EHS	Environment, Occupational Health and Safety
EMCA	Environment Management & Coordination Act, 1999
EMP	Environmental Management Plan
ESMMP	Environmental and Social Management & Monitoring Plan
GoK	Government of Kenya
HIV	Human Immuno-Virus
ILUT	Interdisciplinary Land-use & Transportation Metropolitan Analysis
IUCN	International Union of Conservation of Nature
KRC	Kenya Railways Corporation
KSH	Kenya Shilling
LN	Legal Notice
MoT	Ministry of Transport
NCWSC	Nairobi City Water and Sewerage Company
NEMA	National Environment Management Authority
MRTS	Mass Rapid Transit System/ Mass Rapid Transit Study
MRT	Mass Rapid Transit
NaMSIP	Nairobi Metropolitan Services Improvement Project
NEMA	National Environment Management Authority
NIUPLAN	Nairobi Integrated Urban Development Master Plan for the City of Nairobi
NCC	Nairobi City County

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NMR	Nairobi Metropolitan Region
NMT	Non-Motorized Transport
OSHA	Occupational Safety & Health Act
PCT	Project Coordination Team
PRSP	Poverty Reduction Strategy Paper
RE	Resident Engineer
STDs	Sexually Transmitted Diseases
VCT	Voluntary Counselling and Testing
WRMA	Water Resources Management Authority
ToR	Terms of Reference
QW	Quick Win

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## EXECUTIVE SUMMARY

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### Introduction:

The Government of Kenya, through its implementing agency, the Ministry of Transport, Infrastructure, Housing and Urban Development (MTIHUD), has commissioned SGS and VDP Consultants to carry out preliminary and detailed engineering design of improvement of Pipeline Railway Station Quick Win (QW) Project. The QW package contains the following standard modules: Platform and waiting area, Ticketing booth, Turnstile rack, Automatic selling points, Administrative office, Paid toilets, Police office, Security gate, Enclosure and lighting, Pedestrian walkway, Access roads, Parking area, Landscaping, Utilities and access facilities

This Project Report gives the findings of the Environmental and Social Impact Assessment Study (ESIAs) undertaken as an integral part of the design process. The Project highlights salient social and environmental issues associated with the design, construction and operational aspects of the Pipeline Railway Station QW Project.

### Scope of the Project Report:

The Project Report has been prepared in line with: the Environmental Impact Assessment (EIA) Regulation, as described under the Legal Notice 101 of June 2003, the Environmental Management and Coordination Act (EMCA), revised in 2015 and the World Bank Safeguard Policies

The Study Process leading to this Project Report was further designed to address client expectations as stipulated in the Terms of Reference (ToR).

### Objectives of the Project Report Study:

The purpose of the Study is to identify: environmental and social impacts associated with the proposed Pipeline Commuter Railway Station (CRS) Improvement QW Project, evaluate the possible positive and negative impacts related to the interventions and propose sustainable mitigation measures. Furthermore, one of the main objectives of the Study is to develop an appropriate Environmental and Social Monitoring and Management Plan (ESMMP) for the project sustainable development.

### Study Approach and Methodology

The study approach is structured as required by the Environmental Impact Assessment and Audit Regulations. The approach identifies the possible impacts originated from the proposed Pipeline CRS project through an environmental scoping process based on the baseline conditions established during the field work and information obtained from the documents review. A detailed evaluation of the project area was undertaken to focus on significant environmental issues. The communities living near the proposed CRS project coverage area were also involved during consultation meetings and participation processes to get their views and input on the proposed project. The tools that were used included questionnaires, site checklists, photography and discussions with stakeholders and host communities.

The Environmental and Social Monitoring and Management Plan (ESMMP) comprising the impacts mitigation plan was then developed to guide environmental management during all phases of project development.

### Public Participation Process

Diverse approaches were applied in stakeholder engagement as follows:-

**Public Hearing Meetings:** Four public hearing meetings were arranged for residents and traders within the traverse. The meetings were chaired by relevant County and Central Government Staff as the need arose.

**Consultative Forums:** A Consultative forum bringing together the Consultant and Senior Staff of Nairobi County Government was arranged with the aim of agreeing on modalities for engagement between the County and the Consultant during the Project Design Process. On their part, the County Government identified and nominated staff who would provide focal points in respective departments of the County Administration.

**Discussions with the client:** Following submission of the Inception and Feasibility Study Reports, consultative forums were held with the client during which, comments on the content, quality and focus of the environmental reports were made. Such comments have subsequently been used to update subsequent reports.

**Key Informant Interviews:** Key informants to the Study especially stakeholders in Central and County Government were approached and met in respective offices where they were engaged on issues of interest to respective sectors. Essentially, concerns expressed by respective sectors contacted proved to be useful checklists in the analysis of impacts anticipated from railway upgrading. Further, from discussion with key informants, it was possible to identify other stakeholders previously not appreciated by the Study Team and this helped to widen the consultation base and by extension, the checklists for impact identification.

**Outcome of the process:** A total of ten traders and local residents were administered with the questionnaire and gave their views about upgrading of the pipeline railway halt to be a station encompassing all features of a quick win. The commuter railway was identified as a key component in helping fight poverty in the area by creating an environment favorable for attaining sustainable development in line with the Poverty Reduction Strategy Paper and Vision 2030. Jua Kali (informal trade) operators based on the rail reserve were apprehensive that their displacement will put them out of business and thus expose them to poverty. They requested that such livelihoods be secured through provision of alternative trading sites.

It was the wish of the stakeholders that priority of employment opportunities for skilled, semi-skilled and unskilled labour, be given to the local residents. It was agreed that the modalities and quotas for employment for different locations be agreed upon by the local residents, local administration and the contractor. The residents were optimistic that upon completion of the commuter railway project, that more opportunities for business will be realized. Another additional benefit will be improved efficiency of delivery of agricultural produce; livestock to markets within and out of their areas will be more efficient. This means that the returns to the residents will be higher than the current case.

A majority of stakeholders were clear that the proposed project should not lead to environmental degradation and require that comprehensive assessment of potential impact areas be carried out on material borrow areas, civil works sites, fuel storage/maintenance camps all of which should be reported in standalone reports. There was a unanimous suggestion that such sites should be on public land to avoid future conflicts

**Policy, legal and regulatory framework:**

This Project Report has been developed to ensure that the proposed improvement of the Railway Station conforms to national policy aspirations towards securing sustainable development. Specifically, this Report is written in compliance with requirements of the Environmental Management and Coordination Act (EMCA), 2015 and the National Constitution. Section 58 of EMCA requires that all development proposed in Kenya are subjected to environmental assessment in line with the Second Schedule (of EMCA) and the Legal Notice 101 (Regulations for Environmental Assessment and Audit) of June 2003. The entire Study process has been designed to conform to the regulatory framework stipulated by the National Environmental Management Authority (NEMA) that will review and grant the environmental license to the development of this report.

### **Project Justification**

Rapid urbanization has left Kenyan cities and towns with huge unmet demand for critical infrastructure and basic services. The uncoordinated growth has led to massive expansion of overcrowded and impoverished informal settlements congestion at bus stops, and traffic jams due to lack of mass transport. NaMSIP is intended to improve services in the metropolitan area which are critical for economic development that include transport systems through provision of improved modern Commuter Rail Station (CRS) facilities to encourage people living within the area and especially the commuters from neighboring counties and Sub counties to assess faster and efficient mode of transport to and from Nairobi Central Business District (CBD) and to other regions connected to the Railway line.

### **Project Description**

The pipeline railway line runs along the Outer Ring Road which is currently being upgraded so as to better serve residents of Nairobi directly linked to it. The area is fully developed with residential houses such as Pipeline Housing Estate that is mostly developed with high rise buildings. Pipeline area in Nairobi makes up part of the greater Embakasi area with estates such as Tassia and Fedha. Pipeline and Embakasi are both low and middle income housing estates in Nairobi.

Pipeline Station is defined in the ILUT detailed land-use plan as an intermodal node. The detailed land-use concept allows connectivity between different transport modes, such as: buses and matatus (intercity bus), boda-boda (motorbike), private vehicles, bicycles, Bus Rapid Transit (BRT), and Commuter Rail (CR)

On the ground level the intermodal facility allows the connection between these areas:

- Railway platform of 240 m length each
- BRT platform with capacity for 6 bi-articulated buses
- The intermodal platform provides multimodal facilities for:
  - Matatu /Bus Station. 7 stops which can be increased in accordance with the future demand.
  - Taxi Bay. 7 positions
  - Boda-Boda shed
  - Bicycle rack
  - Park and Ride area with a driveway and 6 bays
  - Park and Ride area for 180 vehicles

The intermodal facility also provides for technical areas, such as: electrical rooms, water tanks, pumping rooms, data communication system, etc.; and area available for basic maintenance, like: fuel station, compressed air, and simple mechanical repair. The facility supplies an additional parking area for boda-boda, matatus and taxis.

### **Methodology and Baseline Information**

The preparation of an Environmental and Social Impact Assessment Project report is a multidisciplinary process that requires use of various approaches and data collection methods. In this particular survey, public participation and consultation were widely used and the bottom-up approaches applied. Both scientific and social data collection methods were used and they included observation, photography, interviews and secondary data review of past studies.

The topography of Pipeline area is relatively flat/level terrain. The slope is largely less than 8%. General temperatures are fairly uniform with coolest months occurring from June to August while hottest temperatures typically occur from December to March. Rainfall is bimodal in with long rains occurring from March to June while the short rainy period occurs from October to December.

### **Anticipated Impacts and Mitigation Measures**

#### **(i) Potential positive impacts anticipated:**

The core observation of this Study is that the proposed improvement of the Pipeline Railway station is aimed at opening up County transportation sector by improving connectivity. A more efficient railway service will allow a reduction of the use of private cars and thus an improvement of air quality in all the metropolitan area.

**As such, the project in itself is already an activity in mitigation of an existing concern and this is the prime justification of the proposed investment.**

Other positive impacts of the project include

- It has the potential to create short-term business and employment opportunities to both professional staff and workers during the design phase.
- During construction phase, traders will benefit from opportunities to supply construction material, while locals will be employed for construction works.
- Improved access to the towns and market centers;
- Reduced travel time;
- Improved human productivity through reduced travel time;
- Reduction of road accidents;
- Traders will also benefit through timely delivery of their produce and services, thereby making them more competitive

#### **(ii) Potential adverse impacts:**

The railway station construction activities will introduce nuisances such as dust, noise, vibrations and fumes. Social vices associated with influx of job seekers can disturb the social order and even lay the ground for escalation of HIV/AIDS cases whose impacts are likely to be prolonged in prevalence.

The adverse impacts identified include;

- Noise generated during construction;
- Dust from construction activities and movement of vehicles;
- Potential increase of soil erosion in the area;
- Potential spread of sexually transmitted diseases (STDs) and HIV/AIDS as a result of in-migration by foreign workers;
- Risks of injuries and fatal accidents to workers at work sites;
- Gender inequality and sexual harassment;
- Sanitation and solid waste disposal at the construction camps are issues that could also impact negatively on the environment;
- Increase in solid waste by motorists and passengers, especially near bus stops and on road reserves,
- Child labour issues

**(iii) Residual and cumulative impacts:**

The project has no residual or cumulative impacts as all can be effectively mitigated. The Contractor will however maintain close liaison with the core operators such as Kenya Power, NCWSC, and others to ensure that railway station construction does not impair essential services to the town and County at large.

Proposed mitigation measures include:

- Dust emissions can be reduced during construction by dampening the all areas to be worked on;
- Bumps and clearly marked warning signs should be installed at all access to the site to reduce incidences of accidents and to reduce dust levels;
- The contractor should maintain the plant and equipment regularly according to the manufacturer's specifications;
- The contractor should ensure workers are provided with adequate and proper PPEs;
- The contractor shall prepare a Solid Waste Management plan to be approved by the RE for proper management of solid and liquid waste at the site;
- HIV/AIDS and STD awareness campaigns should be conducted at the worksites as well as in the settlements and trading centers near the construction site;
- The contractor shall ensure that no child is employed at the site;
- The contractor shall be required, to prepare a code of conduct for his employees and enforce it on No Sexual Harassment and Non-Discrimination Policy, in accordance with national laws;
- Diligence on the part of the contractor is essential in mitigating negative impacts, and therefore mitigation measures should be embedded in the conditions of contract.

**Environmental and Social Management & Monitoring Plan**

An Environmental and Social Management & Monitoring Plan has been developed for the project, where mitigation measures, design features, or actual impacts can be monitored to ensure environmental acceptability of the project during and after construction. In some cases, monitoring can be done as part of routine or

periodic maintenance, while other parameters, especially socio-economic or ecological impacts can only be effectively assessed in the longer term. Parameters that should be monitored during and after construction include:

- Efficiency of drainage structures;
- Soil conservation interventions;
- Sanitation at the site;
- Impact on public health (for example due to HIV/AIDS and STDs, dust and clean drinking water);
- Noise quality;
- Air quality
- Impacts on labour influx;
- Occupational Health and Safety;
- Road safety along the access road to the railway station;
- Child labour;
- Sexual harassment and gender equity

Moreover this report requires that the ESMMP is integrated into the Design Report with appropriate allocation of funds in the Bills of Quantities. The contract for construction should bear clauses binding the contractor to implement impact mitigation as part of the civil works. The NaMSIP's Project Coordination Team (PCT) will settle internal monitoring to evaluate environmental and social sensitivity at all stages of the project development.

#### **Document Disclosure**

The final ESIA shall be disclosed on the client's website and the World Bank will also disclose these documents on the Infoshop

#### **Project Cost and Duration**

The proposed project construction period will be 9 months and defect liability of 3 months respectively while the proposed Pipeline Quick Win Railway Station is envisaged to cost approximately **Ksh: 256,750,653.45. The cost of implementation of ESMP is approximated to be Kshs 11,196,955.**

#### **Conclusion and Recommendations**

The environmental and social assessment of the Project ascertains that the Project is unlikely to cause any significant environmental and social impacts. Most of the impacts are short and medium-term or temporary in nature and can be readily addressed by some embedded control measures in the engineering design of the Project as well as additional mitigation measures as suggested in the Environmental Management Plan. The Project received favourable support from local people and other stakeholders during consultations. Based on the ESIA project report, the proposed project is environmentally and socially stable and sustainable.

It is recommended that the project Proponent shall carry out annual environmental audits during construction and during its operation. This will be in compliance with the Environmental Management and Coordination Act, EMCA of 1999 and the Environmental Impact Assessment and Audit Regulations, Legal Notice No. 101 of 2003

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## CHAPTER ONE

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### 1 INTRODUCTION

The Nairobi Metropolitan Region (NMR) is in need of an efficient and coordinated urban spatial/land use and transport planning in order to improve the existing services and create more efficient ones considering the future population and travel growth.

By 2030 the regional population is expected to be more than double to 13 million and the vehicle fleet to quintuple to approximately 2.6 million.

To serve the high travel demand development a strong public transport system is necessary. Activities and policy frameworks create a new environment in the Nairobi Metropolitan Region (NMR) which requires implementation of more interdisciplinary and sustainable urban planning. Of particular relevance to this study is the relationship of urban land use and accessibility in areas around proposed commuter rail stations. Current planning aims to introduce mass transit systems to the existing bus operations, and to greatly upgrade and expand the existing commuter rail services as the backbone of the system.

These intentions have been reflected in plans developed by different agencies; in particular:

- Mass Rapid Transit System Study (MRTS) / Ministry of Transport
- Commuter Train Study (CTS) / Kenya Railways
- Spatial Planning Concept Development Plan (SPC) / Nairobi Metropolitan Development Directorate
- Project on Integrated Urban Development Master Plan for the City of Nairobi (NIUPLAN)
- Nairobi City County
- Two feasibility studies by carried out by the Ministry of Transport (MoT) and Kenya Railways Corporation (KRC)

Since there was inadequate coordination between these studies, the Ministry of Transport engaged a consultant to review and integrate the objectives and plans of the previous work, particularly the MRTS and the CTS. The result was the Mass Rapid Transit System Harmonization Study.

The Harmonization Study accepts NIUPLAN and SPC as the overall guide for government policy on urban growth and development, and becomes the policy guide on regional urban mass transportation. The Harmonization Study prepared an analysis of the commuter rail (CR), BRT, LRT and MRT proposals using the travel demand forecasts from the NIUPLAN study and prepared assignments of public transportation demand specifically for the trunk elements of an integrated metropolitan public transportation system. Based on this, system development was proposed for short, medium terms mainly for BRT and CR, but longer term should be heavy Railway/Commuter Railway. In the meantime it was decided to prepare a plan for development of the Nairobi Central Railway Station, and plans and designs for the other commuter railway stations through new studies. Other studies and newly enacted laws for the urban and transport sectors have some

relation to issues related to spatial development and metropolitan transportation. The above activities and policy framework creates a new environment in the Nairobi Metropolitan Region (NMR) which requires implementation of more interdisciplinary and sustainable urban planning. Of particular relevance to this study is the relationship of urban land use and accessibility in areas around proposed commuter rail stations.

The World Bank assists Nairobi Area Metropolitan Services Improvement Project (NaMSIP) in providing support to various elements of Nairobi's urban development, including support for the Interdisciplinary Land-Use and Transportation (ILUT) Metropolitan Analysis with the Nairobi Metropolitan Region Study. ILUT is the first effort in Nairobi of integrating land use planning with the development of major transportation facilities and consideration of urban design. (Feasibility Study Report, 2015)

## 1.1 Project Background

Through the efforts and studies to execute train transport development mandate in meeting commuter needs, Kenya Railways Cooperation identified commuter train stations as key input for socio-economic growth of the country. To address this problem the agency identified development and construction of stations and associated facilities as a method towards improving railway transportation. The proposed project areas lack commuter train stations, as a result embark and disembark from the train is haphazard posing security and safety challenges to the commuters. The agency also lose out in revenue collection as a result of the present mode of operation since ticketing is always at the main station while those boarding along the way evade paying and if they do the money can't be accounted for. In addition, the system lacks ablution blocks, shops and solid waste disposal facility and as a result leads to uncontrolled waste disposal within the coaches. The demand for commuter train stations continues to increase, driven by the growing population, urbanization and technological development. Urbanization particularly puts a strain on transport mode availability. The attainment of efficient and sustainable national transportation targets continue being a challenge and these calls for innovative approaches to improve service delivery. The Government of Kenya (GoK) has received funds from the World Bank for the development and management of Interdisciplinary Land-Use and Transport Metropolitan Analysis within the Nairobi Metropolitan Region (ILUT). The funding includes development of a commuter rail station component that will include preparation of 2030 detailed land-use plan concepts for 9 selected commuter rail (CR) stations within 1 km radius-study areas. As part of Kenya railways cooperation response to improved and efficient commuter rail transport, the agency resulted to designing and constructing commuter rail stations as well as associated civil works at different sites along the rail networks.

From the Population Census Report of 2009, the population density of the beneficiary project area is varied. Target area has a high potential with high population density engaged in various economic activities mainly trade, industrialization and commercial activities. The potential benefits of train station will include revenue collection, safety of commuters and employment benefits. This Project, under NaMSIP, involves provision of new facilities and

infrastructure improvements within/around selected commuter rail stations, in order to improve accessibility and functionality of these stations. The rehabilitation will be for ten commuter railway stations in three counties – Nairobi, Kiambu and Machakos – as shown below:

St No.	CR Station	Location
Lot 1	Ruiru (prototype station)	Kiambu County
Lot 2	Kahawa	
Lot 3	Githurai	
Lot 4	Kikuyu	
Lot 5	Mwiki	Nairobi County
Lot 6	Dandora	
Lot 7	Donholm	
Lot 8	Pipeline	
Lot 9	Embakasi Village	Machakos County
Lot 10	Athi River	

### 1.1.1 Kenya Railways Corporation

Kenya Railways was established by an Act of Parliament (Cap 397) of the Laws of Kenya and commenced operations on January 20, 1978. The overall mandate of the Corporation then was to provide a coordinated and integrated system within Kenya of rail and inland waterways transport services and inland port facilities. The Act was amended through The Kenya Railways (Amendment) Act 2005 to make it possible for the Board of Directors to enter into concession agreements or other forms of management for the provision of rail transport services. Following this Amendment, Kenya Railways conceded railway operations to Rift Valley Railways Ltd (K) from November 1, 2006 for 25 years for freight services and 1 year for passenger services.

## 1.2 Project Description

The proposed project is part of the Nairobi Metropolitan Service Improvement Project (NaMSIP) financed by the World Bank. The proposed Railway Station Improvement Project herein referred to as 'quick win' (QW) envisages to:

- Improve circulation for all modes and provide easy and convenient access to the station;
- Enhance access for non-motorized transit modes for a vibrant and safe CBD;
- Raise the level of public services to national / local standards;
- Provide adequate open spaces and environmental buffers;
- Guide phased development / redevelopment with appropriate land-use, scale and design
- Provide attractive and suitable urban icons and urban design linkages.

The QW package contains the following standard modules:

- Platform and waiting area
- Ticketing booth

- Turnstile rack
- Automatic selling points
- Administrative office
- Paid toilets
- Police office
- Security gate
- Enclosure and lighting
- Pedestrian walkway
- Access roads
- Parking area
- Landscaping
- Utilities and access facilities

### **1.3 The ESIA Report**

#### **1.3.1 ESIA Justification and scope**

The proposed Commuter train station intervention projects are expected to have an overall positive impact to the people and the environment. However, project construction phases and other civil associated works are anticipated to have environmental and social impacts that would require to be mitigated. Construction related project including commuter stations are listed in the second schedule of EMCA, as among project that should undergo EIA. The magnitude of the projects further justifies the EIA study to provide an environmental management plan (EMP) for integration into implementation process. In addition, the National Policy on building and construction as well as the building Act calls for environmental impact assessment on construction related projects for long-term sustainability and acceptability by the beneficiaries.

The ESIA report has been conducted in Compliance with Environmental Impact Assessment Regulation as outlined under the Gazette Notice No. 56 of 13th June, 2003 established under the Environmental Management and Coordination Act (EMCA), 1999 of Kenya and repeal in 27th May 2015. All existing facilities, activities and programmes requires that an Environmental Impact Assessment is carried out at the planning stages of any proposed project undertaking that is likely to harm the environment to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the proposed development. This ensures that significant impacts on the environment and the surrounding communities are taken into consideration at all times during the operations of the respective sites.

The EIA study report includes an assessment of impacts of the construction and operations on the following:

- A review of the policy, legal and administrative framework
- Description of the proposed project
- Baseline information (Biophysical and Socio-Economic environment)
- Assessment of the potential environmental impacts of the proposed project on the biophysical, socio-economic and cultural aspects.
- Development of the mitigation measures and future monitoring plans

- Occupational Health and Safety –OHS.

### 1.3.2 Terms of Reference (TOR) for the ESIA Process

The following terms of reference for the proposed Pipeline Railway Station Improvement Project were used by the ESIA expert team.

- Identification of both positive and negative impacts and the most appropriate interventions during construction and operation.
- Collection of baseline socio-economic data of the proposed project area and potential impact expected from project construction, implementation and operation from existing secondary data sources.
- Development of an environmental and social monitoring program (ESMP) during construction and operation and presentation of plans to minimize, mitigate, or eliminate negative effects and impacts.
- Description of implementation of ESMP.
- Identification and consultation with key stakeholders, facilitation of public consultation and conducting interviews with the proposed project beneficiaries.
- Collection of secondary data.
- Maintenance of all correspondences with NEMA relating to the ESIA including improvement orders in close consultation with the client.
- Acquisition of an Environmental and Social Impact Assessment License from NEMA.

### 1.3.3 ESIA Objective

The broad objective of this assessment is to identify potential environment and social impacts of the project and formulate recommendations to ensure that the proposed development takes into consideration appropriate measures to mitigate/minimize any adverse impacts through all phases of its implementation. The specific objectives of this ESIA are to:

- Identify and assess all potential environmental and social impacts of the proposed project;
- Identify all potential significant adverse environmental and social impacts of the project and recommend measures for mitigation;
- Verify compliance with the environmental regulations and relevant standards;
- Identify problems (non-conformity) and recommend measures to improve the environmental management system;
- Generate baseline data that will be used to monitor and evaluate the mitigation measures implemented during the project cycle;
- Recommend cost effective measures to be used to mitigate against the anticipated negative impacts;
- Prepare an Environmental Impact Assessment Report complaints to the Environmental Management and Coordination Act (1999) and the Environmental (Impact Assessment and Audit) Regulations (2003), detailing findings and recommendations.

- Identify and quantify different categories of project-affected people (PAPs) who would require some form of assistance, compensation, rehabilitation or relocation.
- Provide guidelines to stakeholders participating in the mitigation of adverse social impacts of the project.

#### 1.4 ESIA Approach and Methodology

During the screening activities the Consultant sets out to confirm whether or not this project falls within a category that requires EIA prior to commencement. In addition, other considerations during the screening process included a preliminary assessment of the environmental sensitivity of the areas along the train route; this comprised of a desk study involving the analysis of project maps and design, as well as literature review of previous studies on the proposed project. It was determined that infrastructure development activities (such as the development of the proposed commuter train station) are listed under Schedule 2 of EMCA, 1999 among projects requiring an EIA study. The project proponent therefore commissioned this study in line with the provisions of EMCA, 1999. The consultants used screening, scoping and detail analysis methodology for the ESIA study. The approach and methodology applied during the study enabled collection of both primary and secondary data. The consultant used both qualitative and quantitative methods to obtain the primary data. Qualitative data was obtained through filed visits/site walks, photography, and stakeholders' consultation while quantitative data was obtained through the use of predefined questionnaires.

The key activities undertaken during the assessment included the following:

- Consultations with the key project stakeholder including the project proponent, community members, administrative authority, opinion leader and sub-county departmental heads. The consultations were based on the proposed project, site planning and the project implementation plan;
- Physical inspections of the proposed project area which included observation of available land marks, photography and interviews with the local residents;
- Evaluation of the activities around the project site and the environmental setting of the wider area through physical observations and literature review;
- Review of available project documents;
- Report writing, review and submissions.

The approach to this exercise was structured such as to cover the requirements under the EMCA, 2015 as well as the Environmental Impact Assessment and Audit Regulations, 2003. The ultimate goal of this approach was to identify impacts likely to result from the proposed Pipeline CRS project on the basis of the baseline conditions established during the field work and information obtained from the documents reviewed. For subjective predictions of the impacts, the site area was subjected to environmental scoping process. This was a process of evaluating the significance of the project impacts and possibilities of handling the same that led to this report. Detailed evaluation of the project area was being

undertaken to focus on any significant environmental issues. The communities living within the proposed CRS project coverage area were interviewed during consultation meetings and participation processes. The tools that were used included questionnaires, site checklists, photography and discussions with stakeholders. Overall, the study was undertaken through the following stages.

#### 1.4.1 Environmental Screening

Screening process was undertaken to decide whether the proposed CRS project needed to be subjected to an ESIA study or not. **Based on literature review, the proposed project falls under category 2 of projects to be subjected to EISA study as provided for by the second schedule of the Environmental Management and Coordination Act of 2015 and Category B under the World Bank Environmental and Social Safeguards Policies as defined in the Bank's Operational Procedures (OPs).** ESIA is a process for predicting and assessing the potential environmental and social impacts of a proposed project, evaluating alternatives and designing appropriate mitigation, management and monitoring measures. The underlying key principles of an ESIA are that every person is entitled to a clean and healthy environment and he/she has a duty to enhance and safeguard the environment as provided for by the Environmental Management and Coordination Act, 2015 and the constitution of Kenya. The ESIA is both a planning and decision-making tool. As a planning tool, the ESIA presents methodologies and techniques for identifying, predicting and evaluating potential environmental impacts of projects, policies, plans and programs in the project cycle (planning, implementation and decommissioning phases). The ESIA process presents decision-makers with the information necessary to determine whether or not a project should be implemented.

#### 1.4.2 Environmental Scoping

The aim of this stage was to ensure that the ESIA study adequately addresses all the crucial issues of environmental and social concern to the decision-makers. This was done by narrowing down proposed CRS project issues to those requiring detailed analysis. The process involved dialogue with all project stakeholders so as to ensure that this aim was fulfilled. It also involved the collection of primary and secondary data. From an evaluation of this data, a rapid assessment of the project site and its surrounding areas was made.

The key benefits of scoping include:

- Enables early key stakeholders identification and engagement
- Ensures that the assessment focuses on the key likely environmental and social impacts
- Enables the early identification of existing data and data gaps

#### 1.4.3 Documentary Review

Various relevant documents were reviewed for a clear understanding of the terms of reference, environmental status of the project area, data on demographic trends (for the project area, the beneficiary areas and the adjoining towns and counties), land use practices in the affected areas (either as catchments,

irrigation scheme, or the beneficiary areas), development strategies and plans (Local, National and International) as well as the policy, legal and institutional documents. The documents reviewed were:

- Interdisciplinary Land-Use and Transport Metropolitan Analysis within the Nairobi Metropolitan Region (ILUT) Report which had Detailed Design Report for the Proposed CRS Project Sites.
- Relevant Legal, Policy and Regulatory documents; EMCA, 2015
- Nairobi Integrated Urban Development Master Plan for the City of Nairobi
- Kenya National Bureau of Statistics, 2009

#### **1.4.4 Data collection procedure**

Data collection started with a review of available project documents with a view to understanding the scope and focus of the proposed railway upgrading project. Simultaneously, planning reports, baseline reports were reviewed so as to provide an insight into the socio-environmental baseline of the project area. Preliminary opinions formed from such literature review were re-validated during fieldwork undertaken on the ground.

#### **1.4.5 Site Assessment**

A physical inspection of the ground (proposed site and their surrounding environment) was conducted. This was done with an aim of establishing the anticipated positive and negative impacts on the bio-physical environment (hydrology, climatic patterns and geology), socio- economic trends (population trends, settlement trends, economic patterns, cultural setting and linkages, land ownership issues, etc.) and the project affected persons (PAPs) and beneficiaries.

Specific objectives of the field assessment included:

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

#### **1.4.6 Data analysis and impact prediction**

Upon data analysis, potential environmental impacts (both positive and adverse) were predicted based mainly on concerns raised by stakeholder and expert observations on the ground and available tools. The magnitude, significance, and acceptability of predicted impacts were evaluated with a view to determining whether observed adverse impacts are significant enough to warrant mitigation.

Impacts were further screened for occurrence and significance of residual (those which cannot be mitigated satisfactorily) and cumulative impacts with a view to providing a basis of making recommendations on the way forward for the project.

#### **1.4.7 Detailed ESIA Report Activities**

This assignment involved a series of activities carried out in liaison with the Client, relevant Government departments, local authorities, community groups and other organizations in the area with a view to sharing their experiences and information with respect to environmental resources and social aspects. Effective evaluation of the social baseline status was achieved through interviews (consultative discussions) and physical inspection of the entire project area. The baseline conditions provided the starting point for the impacts predictions and benchmark for the mitigation measures.

Details of the activities are listed under the terms of reference, and the outputs for each activity are outlined in the sub-sections below;

1. Review of the proposed Pipeline Commuter Rail Station project details
2. Establishment of the current baseline conditions to provide a documented foundation for the impact predictions and a benchmark for the development of mitigation measures
3. Update of the legislative and regulatory requirements as a basis for drawing a compliance monitoring protocol for the construction and commissioning phases.
4. Environmental and social impacts assessments for the identification of significant impacts to the environment and the nearby communities. Types and levels of impacts as well as criteria for developing suitable mitigation measures were assessed .
5. Environmental and social management plan comprising of mitigation measures, authority responsible for monitoring and evaluating anticipated impacts, timeframes and environmental costs were developed.

#### **1.4.8 Stakeholders Consultations**

It is a Government policy that beneficiaries and members of the public living near new or improvement project sites (both public and private) are consulted to seek their views and opinions regarding the projects before they are implemented. Consultative Public Participation is therefore an important process in ESIA studies. Interaction with the stakeholders and communities living around the project area was undertaken through public participation and consultation. Through this process, the stakeholders had an opportunity to contribute to the overall project design by making recommendations and raising any environmental and social concerns of the project. In addition, the process aimed at creating a sense of responsibility, commitment and local ownership for smooth implementation of the project.

#### **1.4.9 Socio-Economic Survey**

A socio-economic survey was undertaken in all the locations that will be affected/benefit from the project. The main tools of the survey were questionnaires and the sampling unit included community members, station

masters, ward administrators, chiefs and sub chiefs. The main aim of conducting interviews was to find out different opinions of people regarding the proposed project and anticipated impact it would have on the environment and the community at large. The total number of questionnaires that were issued to various community members was 10 and one was issued to the station master. The data collected was analyzed and the findings have been presented as shown on Chapter 5.

#### **1.4.10 Impact Assessment and Mitigation Measures**

The primary function of an environmental impact assessment study is to predict and quantify potential impacts, assess and evaluate the magnitude and their importance to develop an Environmental and Social management plan to mitigate the impacts. Environmental impacts could be positive or negative, direct or indirect, local or regional and also reversible or irreversible. Assessment of impacts depends on the nature and magnitude of the activity being undertaken and also on the type of pollution control measures that are envisaged as part of the project proposal.

For the proposed project, the anticipated impacts are divided into three components of the project: impacts based on Project Location, impacts during Construction phase, and impacts during De-commissioning and Operational phases. The identified positive and negative impacts of the project are presented in Chapter 7 of this report.

#### **1.4.11 Environmental and social Management and Monitoring Plan**

The Consultants have developed an Environmental and social Management and Monitoring Plan (EMMP) to guide the project team in eliminating or reducing the project impacts to acceptable minimum/ standards. The EMMP is based on good environmental practices of project implementation and safety of the operations. The proposed EMMP can be improved through continuous monitoring and audits during project implementation. The plan is provided in a matrix form under EMP section of this report and it identifies the anticipated impact; proposes measures to be undertaken; states monitoring indicators; states the party to implement the measures or control the indicators and states the estimated cost likely to be incurred to undertake the measures.

As part of the study output a monitoring and evaluation program was developed as a means for monitoring compliance during implementation of proposed mitigation measures and to ensure continuous generation of project data and information.

#### **1.4.12 ESIA Output**

Final Environmental and Social Impact Assessment study report for approval by NEMA.

#### **1.4.13 Presentation of the report**

The report is presented as outlined below:

**Chapter 1:** Introduction of the project which include project Background, Scope of the ESIA Study, Study Methodology and Presentation of the report.

**Chapter 2:** Gives the Policy, Legal and Regulatory Framework Policy, Legal, Institutional and Administrative Framework.

**Chapter 3:** Project Description.

**Chapter 4:** Baseline Information of the Study Area.

**Chapter 5:** Outcome of the Public Participation and Consultation process.

**Chapter 6:** Alternatives to the Project.

**Chapter 7:** Identification of Potential Impacts and mitigation measures of the project.

**Chapter 8:** Mitigation Measures of Potential Impacts of the Project.

**Chapter 9:** Environmental and Social Management and Monitoring Plan (ESMMP)

**Chapter 10:** Concludes the Project and recoups the core recommendations.

#### **1.4.14 ESIA Study Team**

The study team composed of members from different professional disciplines.

The team members included:

- Environmental team leader
- Design Engineer
- Sociologist
- Environmental support staff.

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## CHAPTER TWO

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### 2 POLICY, LEGAL AND ADMINISTRATIVE POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This chapter outlines the policy, legal, regulatory and institutional framework in Kenya particularly for environmental management, protection and assessment applicable to the proposed Pipeline Railway Project. The Project will be subject to laws, regulations, guidelines and standards of the Government of Kenya and international institutions (IFC/World Bank). Note that wherever any of the laws contradict each other, the Environmental Management and Coordination Act (EMCA) prevails.

#### 2.1 Government of Kenya Policy Framework

Applications of national statutes and regulations on environmental conservation suggest that the owner of any project has a legal duty and responsibility to discharge wastes of acceptable quality to the receiving environment without compromising public health and safety. This position enhances the importance of an EIA for the proposed extension project to provide a benchmark for its sustainable operation when it is finally commissioned. The Pipeline Railway Project complies with government policy framework by the act of the proponent conducting ESIA study before initiating any civil works on the project

##### 2.1.1 The Constitution of Kenya 2010

The Constitution of Kenya, promulgated into law on 27 September 2010, is the supreme law of the Republic: It provides the broad framework regulating present and future development aspects of Kenya and along which all national and sectoral legislative documents are drawn.

With regard to environment, Section 42 inside the Bill of Rights of the Constitution, states that: every person has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures; particularly those contemplated in Article 69; and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the new constitution provides the main pillars on which the 77 environmental statutes are hinged and covers "Land and Environment" and includes the aforementioned articles 69 and 70. Part 1 of the Chapter dwells on land, outlining the principles informing land policy, land classification as well as land use and property. Part 2 of the Chapter directs focus on the environment and natural resources. It provides for a clear outline of the state's obligation with respect to the environment. The Chapter seeks to eliminate processes & activities likely to endanger the environment.

Article 69 states that the State shall:

- Ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;

- Work to achieve and maintain a tree cover of at least ten percent of the land area of Kenya;
- Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
- Encourage public participation in the management, protection and conservation of the environment;
- Protect genetic resources and biological diversity;
- Establish systems on environmental impact assessment, environmental audit and monitoring of the environment;
- Eliminate processes and activities that are likely to endanger the environment; and,
- Utilise the environment and natural resources for the benefit of the people of Kenya.

There are further provisions on enforcement of environmental rights as well as establishment of legislation relating to the environment in accordance to the guidelines provided in this Chapter.

In conformity with the Constitution of Kenya 2010, every activity or project undertaken within the Republic of Kenya must be in tandem with the state's vision for the national environment as well as adherence to the right of every individual to a clean and healthy environment.

Section 70 provides for enforcement of environmental rights thus:-:

- 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.
- 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
  - (b) To provide compensation for any victim of a violation of the right to a clean and healthy environment.
- For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

Essentially, the New Constitution has embraced and provided further anchorage to the spirit and letter of the Environmental Management and Co-ordination Act (EMCA), 1999, whose requirements for environmental protection and management have largely informed Sections 69 through to 71 of the Document. In Section 72 however, the new constitution allows for enactment of laws towards enforcement of any new provisions of the Supreme Law. The Pipeline Railway station Project complies with the Constitution by proposing a framework in its ESIA on Social, Health, safety and environmental protection

### 2.1.2 The Urban Areas and Cities Act 2011

This law passed in 2011 provides legal basis for classification of urban areas (City) when the population exceeds 500,000; a municipality when it exceeds 250,000; and a town when it exceeds 10,000) and requires the city and municipality to formulate County Integrated Development Plan (Article 36 of the Act). Under Article 36, the integrated development plan so developed is required to be the central pillar in public administration of the city or municipality this forming the basis for:

- the preparation of environmental management; preparation of valuation rolls for property taxation plans;
- provision of physical and social infrastructure and transportation;
- preparation of annual strategic plans for a city or municipality;
- disaster preparedness and response;
- overall delivery of service including provision of water, electricity, health, telecommunications and solid waste management; and
- The preparation of a geographic information system for a city or municipality.

The strategy plan as stated above denotes an annual plan to be adopted in the county assembly following the integrated development plan, and the Act requires the board of town committee to formulate the strategy plan soon after the adoption of the integrated development plan (Article 39).

The integrated development plan as stipulated in the Act has to reflect:

- I. vision for the long term development of the city or urban area;
- ii. An assessment of the existing level of development;
- iii. Any affirmative action measures to be applied; development priorities and objectives;
- iv. Development strategies which shall be aligned with any national or county sectoral plans and planning requirements;
- v. A spatial development framework;
- vi. Operational strategies; and
- vii. Applicable disaster management plans;
- viii. A regulated city and municipal agricultural plan;
- ix. A financial plan and;
- X. the key performance indicators and performance targets (Article 40).

The integrated development plan thus formulated has to be submitted to the county executive committee, and the committee has to submit the plan to the county assembly with an opinion within 30 days (Article 41).

The Urban Areas and Cities Act is thus a powerful strategic tool designed to inject order into the planning and management of urban areas. A CIDP for Nairobi as anticipated in the Urban Areas and Cities Act 2011 has been developed though a County Development Profile laying the groundwork for the CIDP was published in 2013-2017. The Profile identifies infrastructural / road development and

upgrading as a high priority investment towards unlocking the County's economic potential.

*Pipeline Railway Station Project complies with the urban area and other cities act its integrated in the County integrated Development plan through NaMSIP.*

### **2.1.3 The County Government Act 2012**

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

- County integrated development plan
- County Sectoral plans
- County spatial plan
- Cities and urban areas plans as stipulated by Urban Areas and Cities Act

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

The Proponent will ensure the project will be compliant with County Government Act 2012 by controlling all forms of pollution. Additionally an Environmental and Social Management/monitoring plan has been provided in this report with measures for mitigating potential environmental pollution anticipated from the development of the project.

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

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

- (i) Employees of all government ministries, departments, Authorities, and other agencies and employees of private and informal sectors.
- (ii) The information on HIV/AIDS is expected to be treated with confidentiality at the work place and positive attitude towards infected employees.

In allocating contractors to the Pipeline Railway Station Project, the proponent should ensure that the contractor offers such training to the worker as provided by law.

### **2.1.5 The Kenya Vision 2030**

Kenya Vision 2030 is the country's development programme from 2008 to 2030. It was launched on 10 June 2008 by President Mwai Kibaki with the aim to help transform Kenya into a newly industrializing, middle-income country with a consistent annual growth of 10 % by 2030. Developed through an all-inclusive and participatory stakeholder consultative process, involving Kenyans from all parts of the country, the Vision is based on three "pillars": Economic, Social, and Political. The 2030 goal for urban areas, to reach "a well-housed population living in an environmentally-secure urban environment in particular, will be achieved by bringing basic infrastructure and services namely roads, street lights, water and

sanitation facilities, storm water drains, footpaths, and others. It is likewise important the promotion of: environmental conservation and pollution and waste management, through the application of the right economic incentives in development initiatives.

**Under the first Medium-Term Plan (MTP-1) (2008-12) of Kenya's Vision 2030 strategy, significant efforts were made to promote growth and preserve sound economic policies under challenging circumstances.** While reforms were being implemented across the board during 2008-12, the biggest achievements under MTP-1, as noted in the MTP-2, were in improving infrastructure as well as some social indicators, such as school enrolment rates. Though short of the targets set in MTP-1, average annual GDP growth reached 3.8 percent despite the impact of repeated droughts, high international commodity prices, the global financial and economic crisis, and political uncertainty in the run up to the 2013 general elections. Furthermore 2.7 million jobs were created between 2008 and 2012 compared with an objective of 3.3 million.

**Kenya's second Medium Term Plan (MTP-2) covers the 2013-2017 period.** It seeks to build on the successes of the MTP 1, including macroeconomic stability, the enactment of the 2010 Constitution, infrastructure development, the growth of the services sector, and improved access to education. At the same time, it recognizes remaining challenges, including a low and declining share of manufacturing, low agricultural productivity, high energy costs, a still limited transport infrastructure, a narrow export base, and major economic and social disparities across the country. The MTP-2 aims to continue the positive trend in areas where substantial progress was achieved, as well as to increase attention on areas where progress was slower while keeping the same priority sectors.

**The overall objectives of the MTP-2 are to accelerate growth to reach double-digit levels, to create jobs for the Kenyan youth, and to further reduce the still high poverty levels.** The key thematic areas that seek to describe how these objectives will be achieved are: (i) the foundations for national transformation, which cover a broad range of areas including infrastructure, information technology, employment policies, land reform, ending drought emergencies, public sector reform, and national security; (ii) the economic pillar, which identifies the seven sectors that are expected to spur faster growth; (iii) the social pillar; and (iv) the political pillar.

By promoting investment in the priority sectors identified under the Economic Pillar2, Vision 2030 seeks to achieve and sustain annual GDP growth rate at 10% up to 2030 and thereby generating resources required to address other SDGs. This creates the urgent need of investing in both Flagship Projects and requisite infrastructure.

The realization of Pipeline station is a step towards realizing the Vision 2030 as provision of effective and efficient means of transportation to the residents of the project area.

### **2.1.6 Nairobi metro 2030**

Nairobi Metro 2030 was developed in the year 2008 to provide a guide for the NMR play its role in the National growth strategies under the Kenya Vision 2030. It is a transitional document that brings into focus challenges faced under urban growth and development. The document provides forum to achieve sustained rates of economic growth necessary for successful economic and social development. The Metro 2030 provides links with the Central Government through Kenya Vision 2030 and other development plans as well as seeking to strengthen the Local Authorities as part of the devolvement of power and recognizing need for ensuring efficient and effective management of resources at the grassroots.

Nairobi Metro 2030 carries the vision for Nairobi Metropolitan Region to be a World Class African Metropolis supportive to the overall national agenda under the Kenya Vision 2030. The agenda to achieve this vision is the need to enhance mechanisms for economic growth, employment creation, improved lifestyles and improved infrastructure. Therefore Pipeline Railway Station Project contributes to the Nairobi Metro 2030 by providing an efficient transportation alternative.

### **2.1.7 The Sustainable Development Goals**

The 2030 Agenda comprises 17 new Sustainable Development Goals (SDGs), or Global Goals, which will guide policy and funding for the next 15 years, beginning with a historic pledge to end poverty.

The concept of the SDGs was born at the United Nations Conference on Sustainable Development, Rio+20, in 2012. The objective was to produce a set of universally applicable goals that balances the three dimensions of sustainable development: environmental, social, and economic.

The Global Goals replace the Millennium Development Goals (MDGs), which in September 2000 rallied the world around a common 15-year agenda to tackle the indignity of poverty.

The MDGs established measurable, universally-agreed objectives for eradicating extreme poverty and hunger, preventing deadly but treatable disease, and expanding educational opportunities to all children, among other development imperatives.

The MDGs drove progress in several important areas:

- Income poverty
- Access to improved sources of water
- Primary school enrollment
- Child mortality

With the job unfinished for millions of people—we need to go the last mile on ending hunger, achieving full gender equality, improving health services and getting every child into school. Now we must shift the world onto a sustainable path. The Global Goals aim to do just that, with 2030 as the target date.

This new development agenda applies to all countries, promotes peaceful and inclusive societies, creates better jobs and tackles the environmental challenges of our time—particularly climate change.

Nationally, the GOK has taken bold steps to domesticate the SDGs as illustrated by:

- Investment in the Poverty Reduction Strategy Paper (PRSP) process through which participatory mapping of poverty incidence at both District and National Level was undertaken,
- Implementation of the Economic Recovery Strategy for Wealth and Employment Creation, and
- Implementation of projects that directly confront specific aspects of the SDGs. By anchoring the economic Pillar of Vision 2030 which seeks to generate resources needed to address SDGs, implementation development of improving this railway station project is attuned to the national and indeed global agenda for economic and social development.

Pipeline Railway Station Project contributes to the Sustainable Development Goals by providing an affordable means of transport, easing the traffic pressure put on the existing road transportation network in Nairobi and the subsequent decongestion of the Nairobi city traffic.

## **2.2 Legal and Regulatory Framework for Environment**

### **2.2.1 Sessional Paper No 1 of 1996 on Environment and Development**

This is the official statement on national policy on environment and was released in 1996 following recommendations of the National Environment Action Plan (NEAP) of 1994. The NEAP process had been launched earlier in 1992 following the Country's participation in the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro during which Kenya alongside other nations became a signatory to Agenda 21 which called on all nations to pay closer attention to environmental management at national level. Through this Sessional Paper, the Kenya Government guarantees every citizen the right to a clean and healthy environment and commits to pursue a policy strategy of integrating environmental sensitivity into national development planning process.

The broad policy objectives of the Sessional Paper No I of 1996 areas listed below:

- Optimal use of natural land and water resources in improving the quality of human environment;
- Sustainable use of natural resources to meet the needs of the present generations while preserving their ability to meet the needs of future generations;
- Integration of environmental conservation and economic activities into the process of sustainable development;
- Meeting of national goals and international obligations by conserving bio-diversity, arresting desertification, mitigating effects of disasters, protecting the ozone layer and maintaining an ecological balance on earth.
- Among other provisions, Sessional Paper No. 1 of 1996 also sets out sectoral priorities for environmental sustainability which in most cases have been operationalized through formulation of guidelines for quality and environmental management in respective sectors. The Environment Management and Coordination Act (EMCA, 2015) has since been enacted to secure implementation of the national policy on environment.

Natural resources will be highly utilized during construction phase and the biodiversity will be tampered with hence the need to adhere to the policy.

### **2.2.2 National Environment Action Plan**

Sessional Paper No 1 of 1996, as the official statement on national policy on environment, was released in 1996 following recommendations of the National Environment Action Plan (NEAP) of 1994. The NEAP process had been launched earlier in 1992 following the Country's participation in the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro during which Kenya alongside other nations became a signatory to Agenda 21 which called on all nations to pay closer attention to environmental management at national level.

The 2013 revised National Environment Plan policy is: better quality of life for present and future generations through sustainable management and use of the environment and natural resources.

The objectives of this Policy are to:

- (a) Provide a framework for an integrated approach to planning and sustainable management of Kenya's environment and natural resources.
- (b) Strengthen the legal and institutional framework for good governance, effective coordination and management of the environment and natural resources.
- (c) Ensure sustainable management of the environment and natural resources, such as unique terrestrial and aquatic ecosystems, for national economic growth and improved livelihoods.
- (d) Promote and support research and capacity development as well as use of innovative environmental management tools such as incentives, disincentives, total economic valuation, indicators of sustainable development, Strategic Environmental Assessments (SEAs), Environmental Impact Assessments (EIAs), Environmental Audits (EA) and Payment for Environmental Services (PES).
- (e) Promote and enhance cooperation, collaboration, synergy, partnerships and participation in the protection, conservation, sustainable management of the environment and natural resources.
- (f) Ensure inclusion of cross-cutting and emerging issues such as poverty reduction, gender, disability, HIV&AIDS and other diseases in the management of the environment and natural resources.
- (g) Promote domestication, coordination and maximisation of benefit t from Strategic Multilateral Environmental Agreements (MEAs).

### **2.2.3 Sessional Paper No 6 of 1999**

The goal of this policy paper is to harmonize environment and development goals to ensure sustainability. It provides comprehensive guidelines and strategies for government action regarding the environment and development. The key policy objectives of this paper include:

- Ensuring that all development projects at the inception stage and programs, as well as policies consider environmental considerations.
- Ensuring that an EIA report is prepared for any undertaking or development project before implementation.
- Coming up with effluent treatment standards that will conform with acceptable health guidelines
- It's important to note that issues of waste water management and human settlements are given prominence and therefore, the policy recommends re-use and recycling of residues i.e. waste water, use of low waste generation technologies and increasing public awareness on benefits of a clean environment. It also recognizes the role of stakeholders in all these initiatives within their localities.
- The paper encourages better planning in rural and urban areas in provision of needs i.e. water, drainage system, waste disposal facilities et al.

The planning stage of the project has put all this into consideration whereby the waste generated will be recycled/re-used or dumped to designated dumping sites to ensure a healthy and clean environment is maintained.

#### **2.2.4 The Environment Management and Coordination Act No 8, 1999 and the relative Amendment Act No 5, 2015**

The Environment Management and Co-ordination (Amendment) Act 2015 No 5 of 2015 was effective on the 17th June 2015 to amend the Environmental Management and Co-ordination Act 1999. The Act has aligned EMCA Act 1999 with the Constitution of Kenya (2010) to include new structures that the Constitution of Kenya 2012 created particularly entrenchment of county government in environment and natural resource management.

The EMCA is an act of Parliament that provides for the establishment of an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto.

The Act further aims to improve the legal and administrative co-ordination of the diverse sectoral initiatives in the field of environment so as to enhance the national capacity for its effective management. In addition Act seeks to harmonize all the 77 sector specific legislation touching on the environment in a manner designed to ensure protection of the environment.

As the principal environmental legislation in Kenya, EMCA sets the legal framework for environmental management basically as follows:-

Part II of the Act states that every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment.

In order to ensure the achievement, part VI of the same Act directs that any proponent of a new project, activity or operation should undertake an Environmental Impact Assessment (EIA) and a report prepared for submission to the National Environmental Management Authority (NEMA), who in turn may

issue a license as appropriate; while projects already in place will undertake annual Environmental Audits (EA).

Section 58 of the Environmental Law requires that notwithstanding any approval, permit or license under this Act or any other law in force in Kenya, any person being a proponent of a project, shall before financing, commencing proceeding with carrying out, executing or conducting or causing to be financed, commenced, proceed carried out, executed or conducted by another person for any undertaking specified in the second schedule to this Act, submit a project report to the Authority in the prescribed form, giving the prescribed information and shall be accompanied by the prescribed fee.

Section 68 and 69 of EMCA requires all on-going projects to conduct an EA with a view to finding out if the processes and activities have any negative impacts on the environment and to propose any mitigation measures to counter such impacts .EA are further expounded in Regulation 35 (1) and (2) of Legal Notice 101 of June 2003.

Under EMCA 2015, NEMA has gazetted legal tools that govern how EIAs are conducted and general environmental protection. These guidelines are captured in the Contracts for Construction to ensure that contractors are legally bound to undertake mitigation alongside general construction work.

Under EMCA, NEMA has gazetted legal tools that govern conduct of EIAs and general environmental protection. The Proposed project by the NaMSIP falls under the requirement of this Act, and has been screened against these tools with results that (table below) five of the tools will be triggered.

In particular, specifications of these guidelines would require to be captured in the Contracts for Construction to ensure that contractors are legally bound to undertake mitigation alongside general construction work. The EMCA Tools likely to be triggered by the proposed construction of the railway station are briefly reviewed below.

**Table 2-1: Analysis of the Project triggers to the EMCA and its tools.**

Legal Tool	Status	Trigger mechanism
EIA and Audit regulations	Triggered	EIA Study has to conform to these rules
Waste Management Rules	Triggered	Construction likely to generate solid waste
Water Quality rules	Triggered	Water for construction will be drawn from rivers or other sources and have to adhere to ensuring water quality is observed
Conservation of Biodiversity regulations	Not triggered	These regulations focus more on benefit sharing in biodiversity conservation.

National Sand Harvesting Rules	Triggered	Construction works will require concrete mixture which shall include sand
Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61:	Triggered	Both construction activities and construction equipment likely to generate noise
Air Quality Regulation (2014)	Triggered	Both construction activities and construction equipment likely to generate air pollution

### 2.2.5 Environmental Impact Assessment and Audit Regulations, 2003

Environmental impact Assessment (EIA) is a tool for environmental conservation and has been identified as a key component in new project implementation. At the national level, Kenya has put into place necessary legislation that requires EIA be carried out on every new project, activity or programme (EMCA), and a report submitted to the National Environmental Management Authority (NEMA) for approval and issuance of relevant certificates. These Regulations provide procedures for conducting an EIA study and detail the parameters to be evaluated during the study. It also provides guidelines on the payment of the EIA license fees, conducting environmental audits and development of project monitoring plans.

In particular, specifications of these guidelines indicate that no proponent should implement a project which can have a negative environmental impact.

This ESIA report has been undertaken in accordance with the Environment (Impact Assessment and Audit) regulation 2003, which operationalizes the Environment Management & Coordination Act (EMCA) 1999 and its subsequent amendment, the Environmental Management and Coordination Act (Amendment), 2015. The report is prepared in conformity with the requirements stipulated in the Act and its amendment and the Environmental Impact Assessment and Audit regulations 2003 regulation 7 (1) and the second schedule.

### 2.2.6 Environmental Management and Coordination Act (Waste Management) Regulations, 2006

The regulations provide details on management (handling, storage, transportation, treatment and disposal) of various waste streams including:

- Domestic waste
- Industrial waste,
- Hazardous and toxic waste
- Pesticides and toxic substances
- Biomedical wastes
- Radioactive waste

Regulation No.4 (1) makes it an offence for any person to dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.

Regulation 5 (1) provides categories of cleaner production methods that should be adopted by waste generators in order to minimize the amount of waste generated and they include:

i) Improvement of production process through:

- Conserving raw materials and energy
- Eliminating the use of toxic raw materials and waste
- Reducing toxic emissions and wastes

ii) Monitoring the product cycle from beginning to end by:

- Identifying and eliminating potential negative impacts of the product
- Enabling the recovery and re-use of the product where possible
- Reclamation and recycling

iii) Incorporating environmental concerns in the design and disposal of a product.

The Proponent shall ensure that the main contractor adopts and implements all possible cleaner production methods during the construction phase of the project.

Regulation 6 requires waste generators to segregate waste by separating hazardous waste from non- hazardous waste for appropriate disposal.

Regulation 14 (1) requires every trade or industrial undertaking to install at its premises anti-pollution equipment for the treatment of waste emanating from such trade or industrial undertaking.

Regulation 15 prohibits any industry from discharging or disposing of any untreated waste in any state into the environment.

Regulation 17 (1) makes it an offence for any person to engage in any activity likely to generate any hazardous waste without a valid Environmental Impact Assessment license issued by NEMA.

Regulation 18 requires all generators of hazardous waste to ensure that every container or package for storing such waste is fixed with a label containing the following information:

- The identity of the hazardous waste
- The name and address of the generator of waste
- The net contents
- The normal storage stability and methods of storage
- The name and percentage of weight of active ingredients and names and percentages of weights of other ingredients or half-life of radioactive material
- Warning or caution statements which may include any of the following as appropriate.
- the words "WARNING" or "CAUTION";
- the word "POISON" (marked indelibly in red on a contrasting background;

- The words "DANGER! KEEP AWAY / NO ENTRY FOR UNAUTHORIZED PERSONS";
- A pictogram of a skull and crossbones.

Regulation 19 (1) requires every person who generates toxic or hazardous waste to treat or cause to be treated such hazardous waste.

*During the construction phase of the project, the Proponent shall ensure that the main contractor implements the above mentioned measures as necessary to enhance sound environmental management of waste.*

## **2.2.7 Environmental Management and Coordination Act (water quality) Regulation 2006**

The Regulations provides for sustainable management of water resources including prevention of water pollution and protection of water sources (lakes, rivers, streams, springs, wells and other water sources).

It is an offence under Regulation No.4 (2), for any person to throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any such substance in or near it, as to cause pollution.

Regulation No. 11 further makes it an offence for any person to discharge or apply any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit the dumping or discharge of such matter into the aquatic environment unless such discharge, poison, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards for effluent discharge into the environment

Regulation No. 14 (1) requires every licensed person generating and discharging effluent into the environment to carry out daily effluent discharge quality and quantity monitoring and to submit quarterly records of such monitoring to the Authority or its designated representatives.

*The proponent will have to ensure that appropriate measures to prevent pollution of underground and surface water sources are implemented throughout the project cycle.*

## **2.2.8 Air Quality Regulation, 2014**

This regulation is referred to as "The Environmental Management and Coordination (Air Quality) Regulations, 2014". The objective is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air.

It provides for the establishment of emission standards for various sources, including as mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, 1999. It also covers any other air pollution source as may be determined by the Minister in consultation with the Authority. Emission limits for various areas and facilities have been set.

The Regulations prohibits the Proponent from:

- Acting in a way that directly or indirectly cause or may cause air pollution to exceed levels set out in the second Schedule to the Regulations
- Allowing particulates emissions into the atmosphere from any source not listed in the six schedule of the Regulations
- Causing ambient air quality in controlled areas (listed in Schedule Thirteen) to exceed those stipulated under second Schedule.
- Allowing (during construction and demolition) emission of particulate matter above the limits stipulated in second Schedule
- Causing or allowing stockpiling or storage of material in a manner likely to cause air pollution
- Causing or allowing emissions of oxides of nitrogen in excess of those stipulated in the eleventh Schedule of the Regulation

*The Proponent shall observe policy and regulatory requirements and implement the mitigation measures proposed in this document in an effort to comply with the provisions of these Regulations on abatement of air pollution.*

### **2.2.9 Environmental Management and Coordination Act (Noise and Excessive Vibrations Pollution Control) Regulations, 2009**

The regulations define noise as any undesirable sound that is intrinsically objectionable or that may cause adverse effects on human health or the environment. The regulations prohibit any person from making or causing 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.

Article 13 2(d) of the regulations allows for construction work at night for public utility construction, construction of public works, projects exclusively relating to roads, bridges, airports, public schools and sidewalks, provided noise generated is not caused within a residential building or across a residential real property boundary where such noise interferes with the comfort, repose, or safety of the members of the public. The second Schedule of the Regulations provides for the maximum permissible level of noise at construction sites.

**Table 2-2: Maximum permissible noise levels for construction sites (measurement taken within the facility)**

Facility		Maximum Noise level permitted (leq) in dB (A)	
		Day (6.01am-6.00pm)	Night (6.01 pm-6.00am)
(i)	Health facilities, educational institutions, homes for disabled and residential areas	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribed in (i) and (ii)	75	65

Under section 15, the Regulations require the Proponent during EIA studies to:

- Identify natural resources, land uses or activities which may be affected by noise or excessive vibrations from construction or demolition;
- Determine the measures which are needed in the plans and specifications to minimize or eliminate adverse construction or demolition noise or vibration impacts
- Incorporate the needed abatement measures in the plans and specifications.

It is anticipated that the proposed project will generate noise and/or vibration during the construction phase, that will originate from the construction equipment, vehicles and the workers since the railway station neighbours homesteads and institutions in some sections and it is therefore recommended that the construction team develops mitigations to reduce noise propagation in the project area.

*The provisions of this Act will be applied by the Proponent in the management of the project where the contractor will be required to adhere to the provisions of this regulations.*

### **2.2.10 National Sand Harvesting Guidelines, 2007**

These Guidelines apply to all sand harvesting activities in Kenya to ensure sustainable utilization of the sand resource and proper management of the environment. Among key features, the guidelines empower respective DEC's to regulate sand harvesting within areas of jurisdiction implying that, sand should only be sourced from approved sites and by approved dealers.

*The project will commit to the fulfillment of the guidelines.*

### **2.3 Inter - Sectoral Laws Coordination in Environmental Protection**

In recognition that EMCA is an umbrella law coordinating diverse sectoral statutes all of which are still in force, Legal Notice 101 of EMCA requires that the respective sectors be consulted as Lead Agencies in making decisions pertaining to environmental assessment for projects in respective sectors. This is to ensure that NEMA does not approve projects that contradict sector policies and legislation. In conformity with this requirement, we have screened the proposed development against most relevant statutes to map out the potential triggers. And in sections below, we highlight such sectoral laws and policies likely to be triggered by the proposed rail project.

#### **2.3.1 The Water Act , 2002**

The Act vests the water in the State and gives the provisions for the water management, including irrigation water, pollution, drainage, flood control and abstraction. It is the main legislation governing the use of water.

The proposed project shall require some quantities of water during the construction phase and generation of equally large volumes of surface run-off during operations. The water supplied by the local water provider and local rivers might be the sources of water for construction. The rivers near the railway station will be receiving bodies for the surfaces run-off, as all the drainage systems shall be designed to discharge into them.

*The contractor shall ensure that there will be no pollution to the nearby rivers and streams, and will seek the necessary permits to abstract the water from the rivers, or any other sources, and shall abide by the conditions attached to the permit(s).*

### **2.3.2 The Water Resources Management Rules (2007)**

These Rules are described in Legal Notice Number 171 of the Kenya Gazette Supplementary Number 52 of 2007. They apply to all water resources and water bodies in Kenya, including all lakes, water courses, streams and rivers, whether perennial or seasonal, aquifers, and shall include coastal channels leading to territorial waters.

The Water Resources Management Rules empower Water Resources Management Authority (WRMA) to impose management controls on land use falling under riparian land. It also enables any person with a complaint related to any matter covered by these rules to the appropriate office in WRMA as per the Tenth Schedule which provides a format for report on complaints. WRMA is to reply to the complainant with “copies to all other relevant parties within twenty one days of receiving the complaint, starting with what action is being taken, the position of the Authority on the matter and any recommendation to the complainant.”

*The contractor shall seek the necessary permits to abstract the water from the rivers, or any other sources, and shall abide by the conditions attached to the permit(s).*

*The contractor/proponent will adhere to the provision of this regulation by obtaining relevant water permit from WRMA or consult with the Nairobi City Water and Sewerage Company (NCWSC) for its water sources.*

### **2.3.3 Occupational Safety and Health Act OSHA, 2007**

The Occupational Safety and Health Act, 2007, is an Act of Parliament to provide for the safety, health and welfare of all workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The Act applies to all workplaces and workers associated with it; whether temporary or permanent. The main aim of the Act is to safeguard the safety, health and welfare of workers and non-workers. 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 work place. Further, the occupier shall prepare annual safety and health audits by a qualified person.

*The contractor shall adhere to all Sections of the Act as it relates to this project, such as observing safety guidelines, provision of protective clothing, clean water, and insurance cover are observed so as to protect all from work related injuries or other health hazards.*

### **2.3.4 The Public Health Act (Cap. 242)**

The Public Health Act provides for the protection of human health through prevention and guarding against introduction of infectious diseases into Kenya from outside, to promote public health and the prevention, limitation or suppression of infectious, communicable or preventable diseases within Kenya, to advice and direct local authorities in regard to matters affecting the public health to promote or carry out research and investigations in connection with the prevention or treatment of human diseases. This Act provides the impetus for a healthy environment and gives regulations to waste management, pollution and human health.

Part IX section 115 states that no person shall cause 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 waste pipes, sewers, drains or refuse pits in such a state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health. Any noxious matter or waste water flowing or discharged from any premises into Public Street or into the gutter or side channel or watercourse, irrigation channel or bed not approved for discharge is also deemed as a nuisance. Other nuisances are accumulation of materials or refuse which in the opinion of the medical officer of health is likely to harbour rats or other vermin.

On the responsibility of local authorities, Part XI section 129 of the Act states in part "It shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures for preventing any pollution dangerous to health of any supply of water which the public within its district has a right to use and does use for drinking or domestic purposes, and purifying such supply so polluted". Section 130 provides for making and imposing on local authorities and others the duty of enforcing rules in respect of prohibiting use of water supply or erection of structures draining filth or noxious matter into water supply as mentioned in section 129.

Section 130 provides for making and imposing regulations by the local authorities and others the duty of enforcing rules in respect of prohibiting use of water supply or erection of structures draining filth or noxious matter into water supply as mentioned in section 129. This provision is supplemented by Section 126A that requires local authorities to develop by-laws for controlling and regulating among others private sewers, communication between drains and sewers and between sewers as well as regulating sanitary conveniences in connection to buildings, drainage, cesspools, etc. for reception or disposal of foul matter.

Part XII (Prevention and destruction of mosquitoes) Section 136 states that all collections of water, sewage, rubbish, refuse and other fluids which permits or facilitate the breeding or multiplication of pests shall be deemed nuisances and are liable to be dealt with in the manner provided by this Act.

The operations and activities of the proposed project can be detrimental to human and environmental health and safety in the absence of appropriate measures. For example waste, dust, noise and air emission generated from activities and process of the proposed project can directly or indirectly have adverse impacts on

human and environment. The Act prohibits the Proponent from engaging in activities that cause environmental nuisance or those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.

*The proponent will therefore observe the public Health act to mitigate on the negative environmental health and safety to the public.*

### **2.3.5 The Physical Planning Act (Cap. 286)**

Cap 286 provides for the preparation and implementation of physical development plans for connected purposes. It establishes the responsibility for the physical planning at various levels of government mainly the District Level. The Act provides for a hierarchy of plans in which guidelines are laid down for the future physical development of areas referred to in the specific plan. The intention is that the three-tier order plans, the national development plan, regional development plan, and the local physical development plan should concentrate on broad policy issues. The Act also promotes public participation in the preparation of plans and requires that in preparation of plans proper consideration be given to the potential for economic and social development.

*The proponent has prepared plans and design that have been submitted to the Ministry of Lands and Physical Planning in accordance to the law.*

### **2.3.6 Way Leave Act Cap 292**

Section 3 of the Act states that the Government may carry any sewer, drain or pipeline through, over or under any land whatsoever, but may not in doing so interfere with any existing building. Notice, however, should be given one month before carrying out any such works (section 4) with full description of the intended works and targeted place for inspection.

Any damages caused by the works would then be compensated to the owner as per Section 8 of the Act that states that any person whom without consent causes any building to be newly erected on a way leave, or cause hindrance along the way leave shall be guilty of an offence and any alterations will be done at his/her costs.

*The proponent shall observe this Way leave Act when developing or improving the sewer and drainage system for the project.*

### **2.3.7 The Building Code 2009**

This code was formulated to provide rules and guideline to be observed during construction it requires the proponent to adhere to the set rules and guidelines in the code. The code requires building plans to be approved by county government. It also prohibits;

- Erection, or causing or permitting erection of temporary buildings (e.g. a site office, store, builder's shed etc.) to which the Regulations apply without a permit granted under Regulations and
- Knowingly occupying a temporary building which is erected in contravention to the regulations

*The proponent is committed to developing the proposed project in accordance to the building codes, the national standards and other international building standards and guidelines e.g. as KS 04 general installation of electrical equipment, British standards 8110 structural concrete, NFPA 14 on installation of standpipes and hose systems among others.*

### **2.3.8 Public Roads and Roads of Access Act (Cap 399)**

Sections 8 and 9 of the Act provides for the dedication, conservation or alignment of public travel lines including construction of access roads adjacent to lands from the nearest part of a public road.

Sections 10 and 11 allows for notices to be served on the adjacent land owners seeking permission to construct the respective roads.

*The proponent shall issue notices to land owners adjacent to the project area before construction works begins.*

## **2.4 The Institutional Framework under EMCA 2015**

The Government established the administrative structures to implement EMCA as follows:-

- The National Environmental Council

The National Environment Council (the Council) is responsible for policy formulation and directions for the purposes of the EMCA Act. The Council also sets national goals and objectives, and determines policies and priorities for the protection of the environment.

- The National Environmental Management Authority

EMCA allows for formation of the National Environmental Management Authority (NEMA) as the body charged with overall responsibility of exercising general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment. Under the Act, NEMA was established in 2001 when the first Director General was appointed by the President.

Activities of NEMA are rolled out through three core directorates in charge of Enforcement, Education and Policy. To facilitate coordination of environmental matters at District level as per requirements of EMCA, NEMA has established District Environmental Committees (DEC) traditionally chaired by respective District Commissioners and bringing together representatives from all the ministries; representatives from local authorities within the province/district; two farmers / pastoral representatives; two representatives from NGOs involved in environmental management in the province/district; and a representative of each regional development authority in the province/district. To each DEC in the country was attached a District Environmental Officer who, as the NEMA Officer on the ground was charged with responsibility of overseeing environmental coordination among diverse sectors and while serving as secretary to the DEC. However, in order to align to requirements of National Constitution 2010, NEMA has devolved functions to Counties. Under the New arrangement, EIA licensing for projects will take place at either the County or National level depending on the perceived environmental risk category as per the NEMA advert of 9th July 2012.

The Project Report process has thus been tied up to the NEMA institutional framework at Head Office and County levels.

The Authority shall review this ESIA Report for the proposed project, visit the project site to verify information provided in this report and emanate an ESIA license whether all the relevant issues to the project have been identified and mitigated in accordance to the proposed measures.

#### 2.4.1 Public Complaints Committee

Under EMCA 2015, a Public Complaints Committee has been established to provide an administrative mechanism for addressing environmental harm. The Committee whose membership include representatives from the Law Society of Kenya, NGOs and the business community has the mandate to investigate complaints relating to environmental damage and degradation.

#### 2.4.2 The Directorate of Nairobi Metropolitan Development

In the capacity of Employer, the Ministry of Land, Housing and Urban Development, Nairobi Metropolitan Development through the NaMSIP PCT has administrative jurisdiction over the EIA process.

### 2.5 Guidelines

#### 2.5.1 Wastewater guidelines

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

**Table 2-3: Kenya discharge Guidelines for Waste water**

Parameter	Discharge in public sewers (mg/l)	Discharge into water bodies (mg/l) – Assuming 10% dilution
PH	6.0 – 9.0	6.0 – 9.0
BOD5 (20oC)	500	20
COD	1000	50
Suspended Solids	500	30
Detergents	30	Nil
Heavy metals (combined)	1	0.1
Oils/Grease	50	Nil
Nitrates (TN)	20	10
Phosphates (TP)	30	5
Conductivity	-	1500 uS/cm
4hr PV Value	No limits	20
Faecal Coliforms	No limits	1000/100ml for large water bodies, otherwise <10/ml)
Sulphates	-	500
Dissolved Oxygen	No limits	2
Phenols	-	2

Cyanides	-	0.1
Chlorides	-	1000
PCB	-	0.003
Colour	No limits	5 Hazen Units
Odour	No limits	Not objectionable

Sources: Department of Water Development

## 2.5.2 Noise guidelines

The following guidelines will be used to monitor noise levels, especially during the construction stage of the project.

**Table 2-4 Comparison Between WHO and NEMA Noise Guidelines**

Specific Environment	Critical Health Effects	LAeq dB(A) WHO	Time base (hours)	LAeq dB(A) NEMA	Time base (hours)
Outdoor living area	Serious annoyance	55	16	45	14
	Moderate annoyance	50	16	35	14
Indoor dwelling Inside bedroom	Speech interference	35	16	-	-
	Sleep disturbance	30	8		
Outdoor bedroom	Sleep disturbance	45	8	35	-
School classroom Indoor	Speech and communication	35	During class time	Day 60	14
				Night 35	14
School playground outdoor	Annoyance External	55	During play	45	Day
Hospital, treatment room indoor	night time	30	8	-	-
	daytime	30	16		
Industrial, Commercial and traffic areas	Hearing impairment	70	24	60	12
Ceremonies, festivals entertainment events	Hearing impairment	100	4	-	-

The provisions of this Act will be applied by the Proponent in the management of the project where the contractor will be required to adhere to the guidelines to reduce the possibility of adverse noise and vibration impacts to human health. The regulation stipulates that the acceptable standard day and night noise levels should not exceed 65dBa and 45 dBa respectively.

## 2.6 World Bank Environmental and Social Safeguard Policies

Like in any project financed by, or with financial participation of, the World Bank, the environmental and social safeguards as defined in the Bank's Operational Procedures (OPs) will be respected for the purposes of this project implementation. WB classifies its projects into four Environmental Assessment categories according to the likely impacts on the environment they will have. This classification is as follows (only main conditions mentioned):

- a) Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts.
- b) Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. ***This particular NaMSIP subproject has been categorized as B.***
- c) Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C project.
- d) Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts; this case, in any way, is not applicable to the NaMSIP project.

By virtue of source of funding, the proposed development of commuter Rail stations (CRS) by the Ministry of Land, Housing and Urban Development, and Nairobi Metropolitan Development under the NaMSIP is also subject to World Bank requirements for impact assessment. As such, this Project Report study has been formulated to address and cater for both Kenyan and World Bank requirements for impact assessment. World Bank projects and activities are governed by Operational Policies, which are clearly spelt out in the Bank's Operational Manual ("Bank Procedures" and "Good Practices"). The World Bank's safeguard policies are designed to ensure that projects proposed for Bank financing are environmentally and socially sustainable, and thus improve decision-making. These operational policies include:

- OP 4.01 Environmental Assessment;
- OP 4.04 Natural Habitats;
- OP 4.09 Pest Management ;
- OP 4.11 Cultural Heritage;
- OP 4.12 Involuntary Resettlement;
- OP 4.10 Indigenous People;
- OP 4.36 Forests;
- OP 4.37 Safety of Dams;
- OP 7.50 Projects on International Waterways ;

- OP 7.60 Projects in Disputed Areas.

The table below shows the applicability of World Bank Operational Policies to the Pipeline Railway Station improvement project.

**Table 2-5: Analysis of potential triggers to World Bank Safeguards Policies**

OP	Title	Comments/Impact
4.01	Environmental Assessment	Applicable. As a result of environmental and social screening, the project was identified as a Category B
4.04	Natural Habitats	Not applicable - there no natural habitats at the project site
4.09	Pest Management	Not applicable- the project will not involve any pest management
4.10	Indigenous Peoples	Not applicable- there are no indigenous people at the site or project area
4.11	Physical Cultural Resources	Not applicable. Site inspections and literature searches have not indicated the presence of any cultural (historical, archaeological) sites in the construction area. However, to manage "chance finds" an appropriate procedure is included in this ESIA. Such procedure to be followed by contractors during the construction phase.
4.12	Involuntary Resettlement	Not applicable. The site is currently used as railway station and therefore there are no settlements or economic activities requiring relocation to pave way for the project. Pipeline Railway station is accessible through the Outer ring road which is free from encroachment hence no relocation or compensation issues will arise.
4.36	Forests	Not applicable- there is no forest at the site
4.37	Safety of Dams	Not applicable because the project will not involve construction of dams.
7.50	Projects on International Waters (OP 7.50)	Not applicable- the site does not sit on international waters
7.60	Projects in Disputed Areas	The site is not classified as disputed in the project area.

### 2.6.1 Environmental Assessment (OP 4.01)

OP 4.01 requires Environmental Assessment (EA) for projects proposed for Bank financing to ensure that they are environmentally sound and sustainable, and as a basis for decision making. Under OP 4.01 projects are screened and assigned either of four categories each of which requires different levels of environmental assessment as follows:

a) **Category A:** A proposed project is classified in this category if it is likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented. Moreover, the EA for this category includes examining the project's potential negative and positive impacts in comparison with those of feasible alternatives and recommends any measures required to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. These impacts may affect an area broader than the sites or facilities subject to physical works.

b) **Category B:** A proposed project is classified in this Category if its potential adverse environmental impacts on human populations or environmentally important areas, including wetlands, forests, grasslands, and other natural habitats, are less adverse than those of Category A projects. These impacts are site-specific, few of them are irreversible and in most cases the mitigation measures can be designed more readily than Category A projects.

c) **Category C:** A proposed project is classified in this Category if it's likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for Category C project.

d) **Category FI:** A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary in subprojects that may result in adverse environmental impacts.

The proposed improvement of the railway station has been classified as environmental category B and hence requirement for this Project Report study.

#### **2.6.2 Harmonization of both WB and GOK requirements for social and environmental sustainability**

With regard to the project under review, our experience informs that when proposed projects are subjected to environmental and social impact assessment as stipulated under EMCA 2015 and its tools, the same process simultaneously fully resolves requirements of OP 4.01. Generally both requirements are aligned in principle and objective in that:

- Both require Environmental Assessment before project implementation leading to development of comprehensive Environmental and social Management plans to guide resolution of social and environmental impacts as anticipated.
- Both require public disclosure of Project Report and stakeholder consultation during preparation,
- While OP 4.01 of World Bank stipulates different scales of Project Report for different category of projects, EMCA requires Project Report for all sizes of projects, which are required to be scoped as relevant
- Where EMCA requires consultation of Lead Agencies comprising of relevant sectors with legal mandate under GoK laws, the WB has equivalent safeguards for specific interests.
- The Bank requires that stakeholder consultations be undertaken during planning, implementation and operation phases of the project which is equivalent to the statutory annual environmental audits at the operation phase of projects in Kenya.

The understanding of this Project Report study is that, pursuit of an in-depth Project Report process as stipulated by EMCA 1999 is adequate to address all World Bank requirements for environmental and social assessment. This is a major guiding principle in this study.

Adverse effects, if any, will be limited (some minor and temporally limited noise and dust during construction). Only where drainage and sewage is concerned, measures will have to be taken to prevent indirect adverse effects; such effects could be outside of the project sites. Such effects can clearly be identified during the screening process and mitigated as described in ESMMP.

In keeping with this trend, this Environmental Assessment will be made publicly available to project-affected groups within the entire area of study at places to be specified by NEMA following which, their comments will be incorporated in the final Environmental Assessment and will also influence design of the project

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## CHAPTER THREE

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### 3 DESCRIPTION OF THE PROPOSED PROJECT

#### 3.1 Introduction and project objectives

The Kenyan industrialization led to a rapid and uncontrolled urbanization which has left cities and towns with huge unmet demand for critical infrastructure and basic services. The productivity of businesses has been constrained and the resident's quality of life has been negatively impacted. This uncoordinated urbanization has led to massive expansion of overcrowded and impoverished informal settlements; daily traffic jams due to lack of mass transport; air pollution, uncollected solid waste, which ends up blocking drainage systems, and contributing to periodic flooding; and sewage seeps into ground water, contaminating rivers and streams. Further, most major cities are financially fragile or insolvent, and have weak management structures, while key institutions lack of adequate capacity.

Nairobi Metropolitan Service Improvement Project (NaMSIP) is part of a wide municipal development initiative by the Government and the development partners to address these problems. NaMSIP is an initiative of the Kenya Government with the support of the World Bank under the Country Partnership Strategy (CPS). The CPS emphasizes the themes of growth, equity, and environment, with a special emphasis on governance. NaMSIP contributes to the governance, growth, and improved environmental management agendas. It seeks to strengthen structures of governance in the metropolitan area, including the county administration and the new metropolitan authorities. NaMSIP contributes to the CPS's growth objective by supporting design and implementation of critical urban services—including transport, sanitation, and solid waste management—that will allow the metropolitan area to meet the needs of businesses and residents. Investment in infrastructure also contributes to the growth agenda by improving the competitiveness of Kenya's cities as places to live and invest.

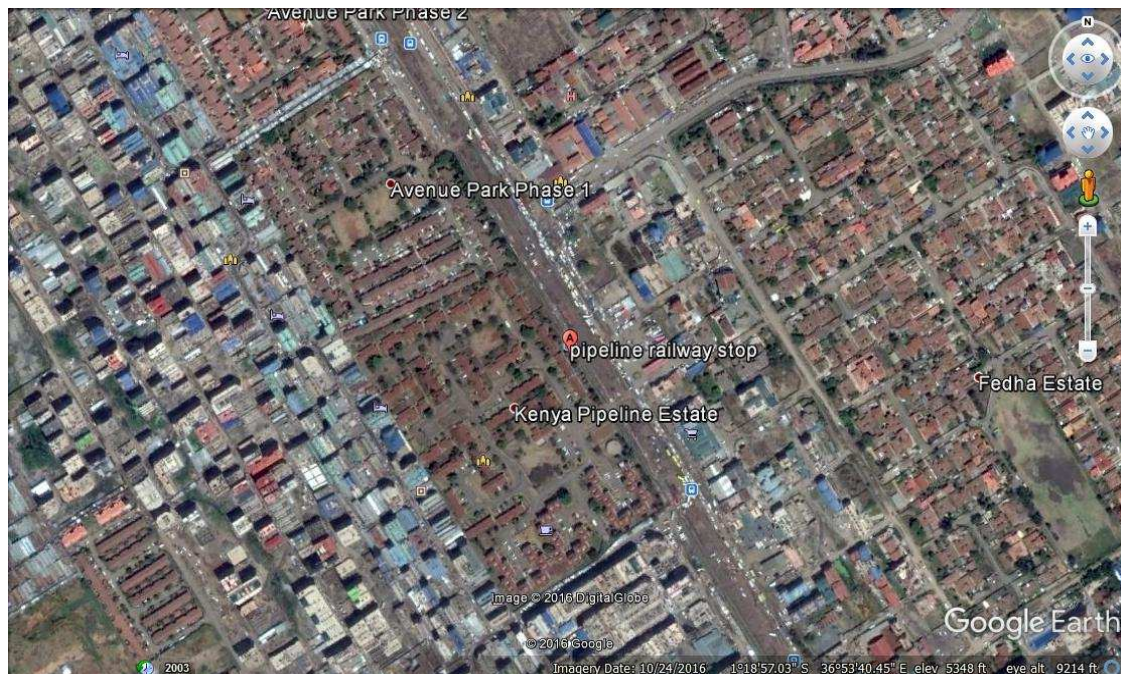
NaMSIP is intended to improve services in the metropolitan area which are critical for economic development that include: solid waste management, transport systems, storm water management, water supply and sanitation, disaster management and security/street lighting among many others. In addition, the implementation of the project will give the Ministry an opportunity to build its human resource and technical capacity in carrying out metropolitan-wide activities. NaMSIP is in line with the Government's national development priorities and policies as well as ongoing public sector reform agenda. The project also supports strengthening of public sector management and accountability.

As part of NaMSIP Project the upgrading of Pipeline Quick Railway station is envisage to improve connectivity within project area and spur economic growth.

#### 3.2 Location of the Project

The pipeline railway line runs along the Outer Ring Road which is currently being upgraded so as to better serve residents of Nairobi directly linked to it. The area is fully developed with residential houses such as Pipeline Housing Estate that is mostly developed with high rise buildings. Pipeline area in Nairobi makes up part of

the greater Embakasi area with estates such as Tassia and Fedha. Pipeline and Embakasi are both low and middle income housing estates in Nairobi. The station is therefore expected to serve these population who are majorly traders. There is no natural vegetation since the plots are all developed as illustrated in the figure below.

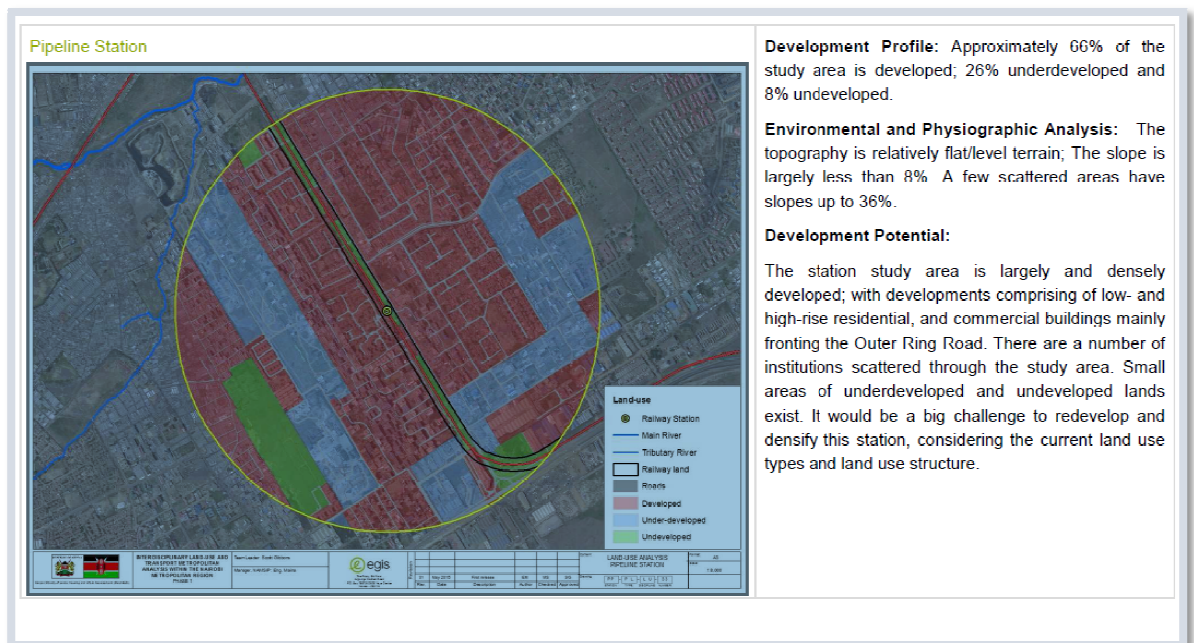


**Figure 3-1:** Map of Pipeline area showing location of the Pipeline Railway Stop  
*Source: Google Earth 2016*

### 3.3 Project description

The Pipeline Commuter Rail Station proposed project area is located in Pipeline area along the Outer Ring Road which is currently being upgraded so as to better serve residents of Nairobi directly linked to it. The area is fully developed with residential houses such as Pipeline Housing Estate that is mostly developed with high rise buildings and overlaps with the Donholm station study area on its Northwestern side.

The study area is 66% developed; 26% underdeveloped and 8% undeveloped; so about 34% of the study area could be available for development. Most of the station study area is already densely developed with high-rise buildings and is located next to an intersection of the Outer Ring Road with the Eastern Bypass and secondly



**Figure 3-2: Proposed Project Area Coverage**

*Source: Feasibility Study Report (2015)*

### 3.4 Approach to Intermodal Facilities Design – Pipeline Commuter Rail Station

Pipeline Station was defined in the ILUT detailed land-use plan as an intermodal node. The detailed land-use concept allows connectivity between different transport modes, such as: buses and matatus (intercity bus), boda-boda (motorbike), private vehicles, bicycles, Bus Rapid Transit (BRT), and Commuter Rail (CR). The detailed land-use plan also provides new access roads, pedestrian facilities and bicycles paths, to improve accessibility of transit facilities as the main criteria for future developments.

The intermodal facility design takes into account all users, including motorists, pedestrians, cyclists, transit riders, and people of all ages and abilities in order to serve all surface transportation users by creating a more interconnected intermodal system. This will emphasize the use of environmentally friendly options such as public transportation, walking, and bicycling. The transit station is the primary interface for passengers with the transit system.

Adopting a station area intermodal facility design which focuses on seamless movement of passengers as they change their modes of transportation at the station, would help accomplish safe and efficient movement of passengers as they access and exit the station area.

Good design principles promote equitable use of transit systems to all users regardless of their mobility levels. In accordance with the detailed land-use plan, the layout allows mixed land-use for commercial and offices uses above the intermodal facilities and the pedestrian esplanade. As a result, the layout shows commercial areas connected with the main pedestrian transit areas, and the offices and a hotel accessible from the intermodal facilities and from the access

roads. Future commercial and office space can be developed based on the market demand while maintaining the layout and connections within the intermodal facilities.

### **3.5 Operational Layout of Intermodal Facilities – Pipeline Commuter Rail Station**

#### **3.5.1 Architectural program**

In the ground level the intermodal facility allows the connection between these areas:

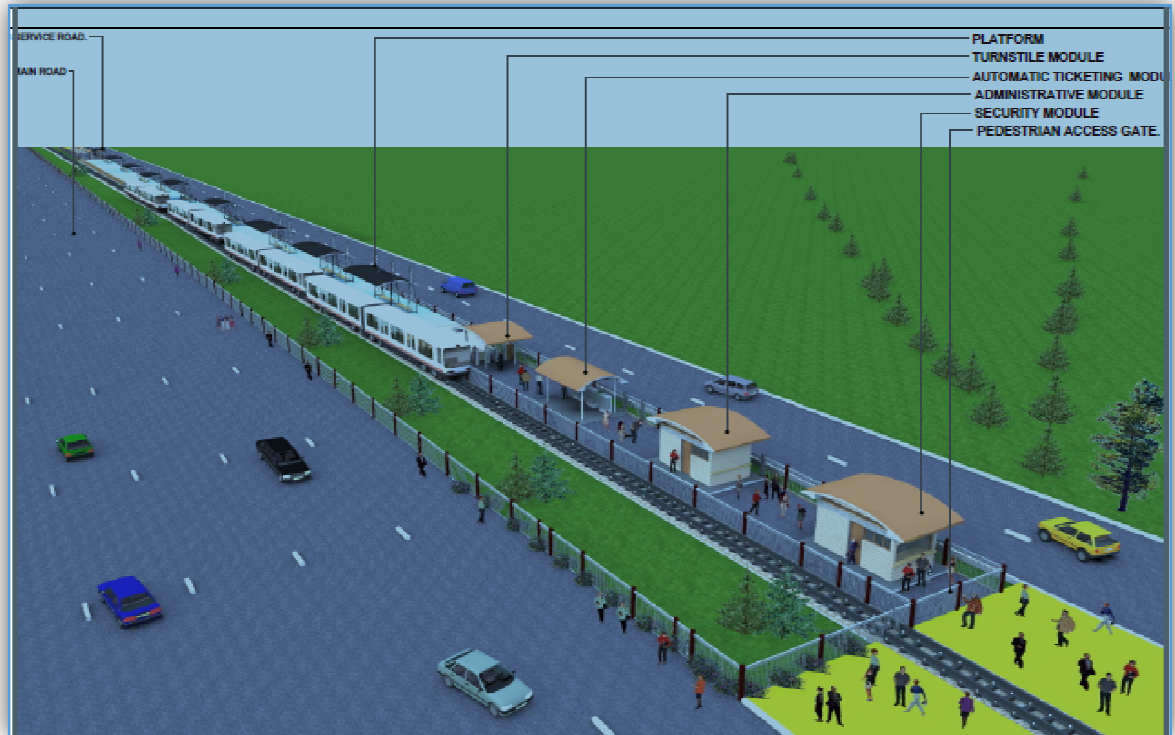
- Railway platform of 240 m length each
- BRT platform with capacity for 6 bi-articulated buses
- The intermodal platform provides multimodal facilities for:
  - Matatu /Bus Station. 7 stops which can be increased in accordance with the future demand.
  - Taxi Bay. 7 positions
  - Boda-Boda shed
  - Bicycle rack
- Park and Ride area with a driveway and 6 bays
- Park and Ride area for 180 vehicles

The intermodal platform, BRT platform and the railway platform are connected with a footbridge to guarantee accessibility to all passengers between any transport modes. The layout shows ticketing and access/administrative areas to support the transport services.

The intermodal facility also provides for technical areas, such as: electrical rooms, water tanks, pumping rooms, data communication system, etc.; and area available for basic maintenance, like: fuel station, compressed air, and simple mechanical repair. The facility supplies an additional parking area for boda-boda, matatus and taxis.

The intermodal facility will add new access roads to the station for the BRT, to the intermodal platform and for kiss and ride.

The design prioritizes the pedestrian access to the different areas. Over the pedestrian esplanade (which is connecting the three main transport platforms) is proposed a commercial passage, which also connects three office towers and a hotel. The real estate project can be tailored to market demand. However, the minimum size for the footprint layout should be maintained. (Figure 3-3) below



**Figure 3-3: Concept design, Intermodal Area for Proposed Pipeline CRS**

Source : Feasibility Study Report (2015)

### 3.5.2 Implementation Phases for Intermodal Facilities

The layout provides the railway line, and the railway platforms with the ticketing system, within 60 meters of the commuter rail corridor in accordance with the TORs. For the area beyond the 60 meters taking advantage of land availability around the station and potential linkages with existing facilities, the layout proposes a BRT interchange, intermodal facilities, park and ride, kiss and ride and pedestrian access. The design allows adaptability of intermodal transfer for a 5 to 20 year horizon, as shown in Table 3-1 below:

**Table 3-1: Design adaptability of Intermodal Transfer for 5 to 20 years horizon**

5 YEARS HORIZON	10 YEARS HORIZON	20 YEARS HORIZON
<ul style="list-style-type: none"> <li>• Railway platforms</li> <li>• Ticketing areas</li> <li>• Pedestrian access</li> <li>• Access roads</li> </ul>	<ul style="list-style-type: none"> <li>• Intermodal facilities</li> <li>• Supporting and technical areas</li> <li>• Pedestrian esplanade</li> <li>• Kiss and ride</li> <li>• Park and ride</li> <li>• Pedestrian access</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial areas</li> <li>• Offices buildings</li> <li>• Hotel</li> <li>• Real-estate development</li> <li>• BRT platform</li> </ul>

### 3.5.3 Module Function and Specifications

The proposed module function and specifications were applied as discussed by component below:

- I. Modular - Low cost of implementation: Every module has standard dimensions in order to optimize the design and implementation process.
- II. Maintainability - Low cost of maintenance: To provide low maintenance cost, selected materials and architecture follow good industrial practice; for example, avoiding plasters and paints, materials with low resistance, etc.
- III. Functionality - Encouraging use of the area: For implementation at all stations, every module is independent and flexible. The basic function of each module will be adapted to the station.
- IV. Comfort - Adequate capacity and performance: Every module provides an appropriate level of comfort in terms of capacity and level of service for the users.
- V. Modern Image - Attractiveness of service: The architecture of the modules provides a positive image in order to attract users to the station and improve the user perception about railway service.

### **Construction Materials**

The consultant presented three options for QW construction materials:

**Option 1** Traditional material. This is primarily represented by concrete structures, and concrete or clay bricks

**Option 2** Steel frame and precast concrete/granite panels

**Option 3** Steel frame and thermo-acoustic aluminum panels

The construction materials selected for the modules by the Client is Option 2 as outlined below:

- Concrete foundation
- Metallic structures for columns, beams and roof
- Thermo-acoustic panel for the roof
- Precast concrete panels
- Security windows
- Metallic doors and louvers
- Granite tiles in the floor and/or concrete finishing non-skid with hardener in the floor

These materials were selected for these advantages:

- Use of recycled materials
- Reduction in noise levels at construction sites
- Reduction in the amount of construction waste
- Reduction in transport cost
- Reduction in site disturbance
- Savings in construction time and cost

### **Standard Components**

The consultant developed standard components, which are generally applicable for all the selected stations. Specific and detailed components for the station will

be determined based on the availability of space and service requirements in consultation with KRC. The components will be located on KRC land with the possible exception of special road access or pedestrian facilities located outside of KRC land. Details of standard modules are presented below. To the extent possible the agreed components (structural components and other facilities such as roofing for the platform and ticketing booths) are of modular design and typical for all stations. This will provide efficiency in construction time and cost.

Architectural facilities such as platforms, ticketing booths, turnstiles, and toilets are designed on paved areas in full coordination with the structural, electrical, mechanical elements of the design.

Designs comply with the minimum specifications for building and civil works in Kenya and other relevant codes of practice, in order to guarantee the basic functions of these facilities.

#### **Administrative module**

The administrative area will be a standard module at the station. This module will be located at every station and adapted for each layout. This module will include designs for architecture (3D model), structures, plumbing and drainage, electrical connections and communications. This structure has 1 floor with 3 workstations, 1 bathroom and 1 kitchen. The structure dimensions are 5 m by 6 m.

#### **Platform**

The boarding and alighting facilities are modular units. The configuration of the platform will be adjusted in accordance with the railway lane on the station (one side, two sides, in the middle). The standard length of the platform is 240 cm with 120 cm height, but may be reduced according to the straight track length. The platform has been designed in accordance with the Standard Dimension 1959 Metre Gauge provided by the Client.

Detailed design includes architecture, structure, rain drainage, electrical and communications. A waiting area with a canopy, installations for signaling and passenger information, and street furniture are also included.

#### **Paid toilets**

This will be a modular unit (with provision for men, women, and handicapped) for the station. Detailed design will be provided for the architecture, structure, plumbing, septic tanks, electrical connections and communications. Detailed design indicates the type of electrical, water and sewerage connection. Where no sewerage connection exists, septic tanks will be included in the design.

#### **Ticketing booth, turnstiles rack and automatic selling points**

This module will be provided for the station. Detailed design is provided for architecture, structure, plumbing, electrical connections and communications. These modules will be located outside of the station building, but within the station area. The ticketing area will be provided outside of the station building for one or two sides. The turnstiles and ticket booth are based on existing KRC designs.

#### **Security gate and police office**

Those are separate standard modules, which will be provided for the station. Detailed design is provided for architecture, structure, plumbing, electrical connections and communications.

#### **Police office**

A police office will be provided at the station. Detailed design is provided for architecture, structure, plumbing, electrical connections and communications.

#### **Fencing and lighting**

Fencing around the station and along the paid and security control areas is provided. Detailed design is provided for architecture, structure and lighting. Fencing will be designed for the station area boundaries in public areas. Walls will be provided in other locations. The enclosed area will have public lighting for which the type of electrical connection and location of mains will be provided.

### **3.5.4 Description of project's construction activities**

**Pre-construction investigation:** The implementation of the project's design and construction phase will start with thorough investigation of the site biological and physical resources in order to minimize any unforeseen adverse impacts during the project cycle.

**Demolition work:** Any wastes or debris arising from any excavations will be transported to licensed sites for disposal.

**Sourcing and transportation of construction materials:** Construction materials will be transported to the project site from their extraction, manufacture, or storage sites using transport trucks. The materials to be used in construction of the project will be sourced from neighboring areas. Greater emphasis will be laid on procurement of construction materials from within the local area, which will make both economic and environmental sense as it will reduce negative impacts of transportation of the materials to the project site through reduced distance of travel by the materials transport vehicles.

**Storage of materials:** Construction materials will be stored on site. Bulky materials such as rough stones will be carefully stored on site. To avoid piling large quantities of materials on site, the contractor should order bulky materials in batches.

**Excavation and foundation works:** Excavation will be carried out to prepare the site for construction of sub-base, pavements and drainage systems. This will involve the use of heavy earthmoving machinery, human effort and appropriate equipment.

**Landscaping:** To improve the aesthetic value or visual quality of the circuit road once construction ceases, the contractor will carry out appropriate landscaping.

**Access roads:** Existing roads will be used for access to the construction site. The selection of such roads will require a public consultation and obtaining all required permits for such road use. At the end of the construction period these roads will be restored for other public uses by the contractor.

### **3.5.5 Description of the Project's decommissioning activities**

Demolition works: The contractor will be required to clear from site all debris, material remnants, and any other related wastes generated from the construction activities.

Site restoration: Once all the wastes resulting from demolition and dismantling works is removed from the site, the site will be restored through replenishment of the topsoil, and landscaping according to the approved architectural drawings.

### 3.6 Project Justification

**The broad aim of upgrading Pipeline Commuter Railway Station is to enhance mobility, accessibility and transport within Nairobi Metropolitan Region.** The project has laid emphasis on the provision of improved modern Commuter Rail Station (CRS) facilities to encourage people living within the area and the commuters from neighboring counties and Sub counties to assess faster and efficient mode of transport to and from Nairobi CBD and to other regions connected to the Railway line. The project is also aimed at providing the access to the Railway Station, and the areas around, and to improving the parking facilities for motorized traffic within Pipeline area and at the Railway station area.

### 3.7 Construction Period

The works are estimated to be completed within a construction period of 9 months with 3 months defect liability period during which the contractor is expected to maintain the system and carry out repair works which may occur to the satisfaction of the project engineers.

### 3.8 PROJECT COST

Based on the final designs carried out for the project works, cost estimates have been derived for the proposed work. The proposed Pipeline CR Station is envisaged to cost approximately **Ksh: 256,750,653.45**. **The cost of implementation of ESMP is approximated to be Kshs 11,196,955.00..** The summary page of the BoQ is provided in the following table:

**Table 3-2: BoQ Summary**

<b>PIPELINE STATION SUMMARY PAGE</b>		
<b>BILL NO.</b>	<b>DESCRIPTION</b>	<b>AMOUNT in (Kshs)</b>
1	Civil works	88,487,249.22
2	Structures	69,847,688.66
3	Electricals	22,003,350.00
4	Mechanicals	24,785,840.00
5	Structures prime cost and provisional sums	8,834,750.00
6	Sub-total for pipeline railway station.	213,958,877.88
7	Add 10% of subtotal (a) above for variation of price (financial contingencies).	21,395,887.79
8	Allow 10% of subtotal (a) above for physical contingencies.	21,395,887.79
	<b>Total for pipeline station carried to grand summary page.</b>	<b>Kshs. 256,750,653.45</b>

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## CHAPTER 4:

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### 4 BASELINE INFORMATION

#### 4.1 Introduction

This chapter of the report addresses the Environmental, Social and Economic profile of Pipeline area where the project is located. The proposed Pipeline Commuter Railway station project is expected to bring changes that are more positive to the residents of Pipeline and surrounding areas in terms of improving level of modern transportation within the Nairobi Metropolitan Region (NMR) with other parts of the country, ease of conducting business, access to markets, medical facilities, schools and other social facilities.

Currently Pipeline operates as a train halt. The halt is not developed into a full functional Railway Station with infrastructures such as security lights, proper sanitation facilities, waiting area with a shade are inadequate or are not provided.

Baseline conditions cover all the biophysical and socio-economic conditions in the project area. Gathering of baseline data is necessary to meet the following objectives:

- To *understand* key biological, physical, ecological, social, cultural, economic, and political conditions in areas potentially affected by the proposed project;
- To *provide data* to predict, explain and substantiate possible impacts;
- To *understand* the expectations and concerns of a range of stakeholders on the proposed development;
- To *inform* the development of mitigation measures;
- To *benchmark* future socio-economic changes/ impacts and assess the effectiveness of mitigation measures.

#### 4.1 Environmental Baseline Conditions

##### 4.1.1 Geographical Location

Pipeline railway station study area is located along the Outer Ring Road on the Pipeline Estate in Nairobi County and overlaps with the Donholm station study area on its Northwestern side. The study area is 66% developed; 26% underdeveloped and 8% undeveloped; so about 34% of the study area could be available for development. Most of the station study area is already densely developed with high-rise buildings and is located next to an intersection of the Outer Ring Road with the Eastern Bypass. The ongoing expansion of the Outer Ring Road will make this location increasingly attractive.

##### 4.1.2 Hydrology and Climate

Pipeline area has fairly uniform with coolest months occurring from June to August while hottest temperatures typically occur from December to March.

Rainfall is bimodal in with long rains occurring from March to June while the short rainy period occurs from October to December. The mean annual rainfall in Nairobi ranges between 800 mm and 1,300 mm per annum. Since Nairobi lies close to the Equator but being 1680 m above sea level, its temperatures are altitude modified tropical, but not torrid. The mean annual is 17°C and mean daily maximum and daily minimum are 23°C and 12°C respectively. On the other hand, the mean annual rainfall is 1080 mm falling in two distinct seasons: long rains from March to May and short rains from mid-October to December.

Most sections in the project area are located on relatively flat terrain and this influences the surface drainage. The Pipeline section is mostly flat and hence poorly drained. Most road side drains along the railway line have been highly compromised from social and economic development activities. As such, the contractor must ensure storm water from the station is directed to the drainage channels currently being done on the Outer Ring Road under construction

#### **4.1.3 Topography**

Pipeline area traverses predominantly flat terrain with a few rolling sections especially at bridge locations.

#### **4.1.4 Geology and Soils**

The site is underlain by Cenozoic volcanic and sediments with the lavas showing an easterly flow direction away from the Great Rift Valley. The formations are quite deep, resting directly on the basement rock and are considered to be part of post-Miocene era. The volcanics are represented by Kerichwa valley series (thinly bedded, impermeable strata), Nairobi Trachytes (thin flows with inter bedded sediments tuffs), Ngong Basalts, Upper Athi series (sandy sediments, tuffs and welded tuffs with subordinate quantities of clay) and the Mbagathi phonolitic trachyte (vesicular, porphyritic rock with crowded feldspar laths in a rusty brown fine grained matrix). The soils in the area are black cotton soils with calcareous and non-calcareous variants

However the soils of the project site have been greatly modified by the current commercial and residential building and infrastructure e.g. railway and roads in the area.

#### **4.1.5 Water Resources**

The project site depend on water supplied by Nairobi City Water and Sewerage Company (NCWSC). Since the water supply is inadequate, some residents depend on private individuals water vendors who are few and cannot suffice the community water demand. (Source Nairobi Mavoko Kitengela-Water-Supply-Project-Feasibility-Study-Report 2015)

#### **4.1.6 Biological Environment (Flora and Fauna)**

The natural vegetation along the railway corridor has been greatly modified due to the development of the railway and the neighbouring commercial development. The proposed development is however expected to landscape its area of influence thereby improving on the floral composition of the area. There is no

notable wild animal's presence in the project area, mainly due to human habitation and extensive economic activities.

#### **4.1.7 Land Use**

Land use is a primary indicator of the extent and degree of the impact man has made on the surface of the earth. It reflects political, social, and economic aspects of the intensity of human lifestyles. The relationship between land, soil, and physical conditions on the one hand and human activities on the other hand may be used to evaluate land use conditions. Pipeline area is majorly built environment that has generally modified and replaced the natural conditions. It is a largely a residential estate with commercial outlets such as shops and hardwares. A majority of the population own these businesses while the working class commute to their place of work in Nairobi CBD via both road and railway as means of transport

### **4.2 Socio – Economic Baseline Conditions**

#### **4.2.1 Economic Activity**

Economic activities in the proposed site generally entail large scale commercial activities, shops, and few open-air markets. The proposed development will act to boost the economic activities in the area by providing auto services to the local population and the country at large. The informal sector include retail trade activities that are mostly prevalent in the low class estates and consist of informal trade (Green groceries, "juakali", hawking). 50% of the residents are engaged in businesses, 22% are employed and the rest are engaged in various activities. These businesses consist of both small scale and large scale informal establishments undertaking transport, storage, Fruit vending, shop-keeping, hotel and restaurants as well as furniture and general wares. Others include Shoe shiners/menders, Firewood selling, maize roasting, sale of credit cards and sweets, welding, charcoal dealers, newspaper and textile (mostly second hand cloth) vendors.

#### **4.2.2 Population and Demographic Characteristics**

Pipeline area is among the highest populated estates in Nairobi County even making the provision of utilities by the service providers difficult. There has been an increase in population which is as a result of national growth and immigration, mostly of labour force from other parts of the country. The high population has impeded the provision of services like water, schools and health services and therefore the need to a corresponding increases or expansion on these facilities. The overall concern of the Government of Kenya (GOK) with regard to population is to implement appropriate policies, strategies and programs that will consistently match the country's population growth with the available resources over time in order to improve the well-being and quality of life.

The population of the areas served by the project railway is ethnically mixed with all tribes of the country being represented. The population is dominated by people in the age bracket of 20-30years (46.4%). 30-40 years (25.2%). Those below 20years and over 60years comprise 4.6% and 2.3% respectively. The population

along the railway line corridor is predominantly traders who will ultimately benefit from the railway station.



**Figure 4-1: Average height of flats along the project corridor consist of seven floors**

#### **4.2.3 Infrastructure and Social Services**

##### **✓ Water and Sewerage**

Pipeline area is connected to the Nairobi Water Supply mains and the main sewerage reticulation system for the City that follows the natural drainage system that drains through the area. Approximately 98% of all properties along the railway line are on main sewer. The same neighbourhoods are supplied with water from common stand pipes where the residents buy water for domestic use. Water is supplied by Nairobi City Water and Sewerage Company (NCWSC)

##### **✓ Water and Sanitation**

Garbage collection is in-adequate and there are mounds of un-collected garbage along the drainage corridors and along the railway line. A mound of un-collected garbage that is generated from the neighbourhoods and the trading activities in the vicinity is evident along the project area



**Figure 4-2: Littering next to the existing railway line**

✓ **Health**

Health facilities within the Pipeline area comprises of public facilities sponsored by the central government or the Nairobi City County. There are also health facilities sponsored by religious organizations where services are offered at cost or private clinics that are distributed within the estate which is the vicinity of the project site. Most of the health facilities are within walking distance for minor ailments and emergency cases except referral cases where the services are only available at the main hospitals of Kenyatta, Aga Khan, M.P. Shah and Mater Hospitals. The principal mode of transport to health facility is walking where the distances are less than 1km and public transport where the distances are greater. The farthest distance to hospital is 10km, being the distance to Kenyatta National Hospital. Most of the facilities are less than 1km. from the residences.

✓ **Electricity**

There is adequate electricity supply in the proposed project site. Residents in the area also mainly depend on kerosene and diesel and solar powered systems for lighting purposes.



**Figure 4-3: Electricity supply within Pipeline Estate**

✓ **Socio Cultural Profile**

Pipeline area depicts a population with ethnic cosmopolitan and residents are bilingual in English and Swahili. In addition, a large percentage speaks their ethnic tribal mother tongue. Composition of the many ethnic groups resident along the project areas differ from one area to another. However the dominant ethnic groups include the Kikuyu, Luhya, Luo, Kalenjin, Kamba, Kisii and Meru. There are also few non-Africans consisting of Asians, Europeans and Arabs.

✓ **Infrastructure**

The Nairobi metropolitan area has three main types of transport infrastructure. These include Roads, Railway and air. In pipeline area, the road system is the most predominant with railway supplementing the road transport. The major concentration of people and activities are along these road and railway corridors. Traffic of the regional towns is characterized by high intensity of walk trips, long trip lengths by vehicles, high share of work trips and high dependence on public transport modes, primarily the matatus (mini buses and light vehicles). In addition, there are light transport means including motor bikes and bicycles as well as pedestrian walking – commonly known as route eleven. The pipeline area is fully covered by all service providers including Telkom, Safaricom and Airtel and Cyber cafes are common in the urban areas.

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## CHAPTER 6:

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### 5 PUBLIC PARTICIPATION AND CONSULTATION

#### 5.1 Introduction

Public participation is concerned with involving, informing and consulting the public in planning, management and other decision making activities. Public participation tries to ensure that due consideration is given to public values, concerns and preferences when decisions are made. It encompasses the public actively sharing in the decisions that government and other agencies make in their search for solutions to issues of public interest.

Public consultation in this project was carried out with the following aims:

- To inform the local people, leaders and other stakeholders about the proposed project and its objectives.
- 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 impacts from the project and if so how the impacts can be addressed.

#### **Public Meeting**

A public meeting was convened at Railway line Pipeline on 1/12/2016 at 3.00 to 4.00 pm. The participants included Sociologist, Community living around the Embakasi Railway Stop and business community in the area

#### 5.2 Identification of Stakeholders

Like in all civil works projects, the core stakeholders comprise people to be directly served by the proposed project and then comprise residents along the CRS corridor, motorists, businessmen and service providers who rely on the railway station, etc. This is the group that is likely to benefit or be affected by the proposed development.

This study also identified a second category of stakeholders comprised of government officers (proponent) in charge of diverse sectors, which are likely to be impacted by the CRS project. This category was also consulted as key informants on sectoral policy and to advise this ESIA team on mitigation measures to be put in place so as to minimize adverse impacts in respective sectors. Each category of stakeholders called for a different approach to consultation.

#### 5.3 Approach to Public Participation and Consultation

The Environmental Management and Coordination Act (EMCA, 2015) and its subsequent Environmental Impact Assessment and Audit Regulations, 2003 underscores the need for stakeholder participation in the ESIA process. Residents of a proposed project have to live with the project if implemented. They have the most to gain if the project impacts are beneficial to them. Conversely,

they have the most at stake if the project goes awry. Not just residents but for projects whose impacts have a wide geographical spread, distant communities need to be involved. Stakeholder input is thus vital at the earliest stage possible in project development and should continue throughout the project cycle. In case of the Proposed CRS Project, public consultations followed several steps as follows:

### 5.3.1 Modalities of Consultation and Participation

The following techniques and instruments were used for public participation and consultation;

#### ➤ **Photography and direct observation**

Photography was particularly useful as it captured the real situation on the ground that was relevant to the study. Direct observation involved site viewing of the proposed project location to see the extent of development on it and the condition of the existing railway halt.

#### ➤ **Questionnaires**

Structured questionnaires were used to collect information from key informants like households in the study area and institutions like KRC

#### ➤ **Residents Consultations**

- The bulk of stakeholders along this railway are small scale traders. Others are corporate stakeholders who rely on the rail to provide service. Consultation involved talking to representative samples of all the diversity of traders.

#### ➤ **Scheduled interviews**

- Public participation and consultation was conducted by the ESIA team via interviews and discussions under the guidance of one set of questionnaires developed to capture the Project Affected Persons and residents' concerns, comments and issues

#### ➤ **Consultation with secondary stakeholders**

Under this category, a cross section of stakeholders were met and these included; civil servants, local government officials and the local residents. Consultations took place in respective offices and in the field where possible. Consultations were made either with individual officers or in Focus Group Discussions involving several officers in a group. For this category of stakeholders, a semi-structured questionnaire was used. After discussion, the traders were requested to fill and sign the form administered by the consultant. This system was deemed useful and as a strategy to cut down on paperwork work while capturing signed comments of target informants.

## 5.4 Outcome of Consultation Process

A total of ten traders and local residents were administered with the questionnaire and gave their views about upgrading of the pipeline railway halt to be a station encompassing all features of a quick win. In the interviews held, the project has

mixed public support. As it is seen to have positive and negative impacts as follows:

- Though discussions with stakeholders in Government, it was clarified that GoK is committed to creating an environment favorable for attaining sustainable development in line with the PRSP and Vision 2030. In the PRSP and the District Development Plans (DDPs), the commuter railway was identified as a key component in helping fight poverty in the area. The construction of the modern railway will be one of the ways that this area will open up to enable efficient transportation of farm produce, hence generate wealth for residents.
  - Jua Kali (informal trade) operators based on the rail reserve were apprehensive that their displacement would put them out of business and thus expose them to poverty. They wished that such livelihoods be secured through provision of alternative trading sites.
  - It was the wish of the stakeholders that priority of employment opportunities for skilled, semi-skilled and unskilled labour, be given to the local residents. However, if the local residents do not have adequate or none at all of the skilled labour, then these can be sourced from outside the region. It was agreed that the modalities and quotas for employment for different locations be agreed upon by the local residents, local administration and the contractor.
  - The residents were optimistic that upon completion of the commuter railway project, more opportunities for business would be realized. Another additional benefit would be improved efficiency of delivery of agricultural produce; livestock to markets within and out of their areas would be more efficient. This meant that the returns to the residents would be higher than the current case.
  - Many stakeholders were quite clear that the proposed project should not lead to environmental degradation and required that comprehensive assessment of potential impact areas be carried out on material borrow areas, civil works sites, fuel storage/maintenance camps all of which should be reported in standalone reports. There was a unanimous suggestion that such sites should be on public land to avoid future conflicts.
- i. Project acceptance and support - All the residents who were interviewed were in full support and in acceptance of the Proposed CRS project.

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## CHAPTER SIX

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### 6 ANALYSIS OF PROJECT ALTERNATIVES

Alternatives to the project, including the no action alternative will be presented in this section, as well as the historical use of the overall area in which the project site is located. These alternatives will be discussed from environmental and socio-economic perspectives.

#### 6.1 Introduction

The Environmental and Social Impact Assessment Study should identify and assess alternatives to the proposed development/project. Only the best alternative (one with the least adverse impacts) should be selected based on less negative impacts and cost-benefit analysis. An important alternative to be analyzed always is the “no project”. This is a very important analysis because it helps the proponents measure the impacts from the project against those which would have taken place without the project. This section analyses the project alternatives in terms of site, technology and waste management options.

#### 6.2 Relocation Option

Relocation option to a different site is not an option available for the project implementation as this project is to improve accessibility and mobility to the already established railway line in Pipeline area. Relocation is also not an option because it's an upgrade project for the existing Pipeline Railway Halt

#### 6.3 No Project Alternative 'ZERO'

The no-project alternative is often defined by the baseline information and is crucial in the assessment of impact because other alternatives are weighed with reference to it. From the qualitative analysis and the summary of the proposed site for the project, there will not be any significant negative effect on either the bio-physical or the socio-cultural environment of the proposed project. Without the project, the environmental situation will neither improve nor can we say that it will necessarily deteriorate. The no-project option will however lead to the following (general) major negative and long term impacts:

- ✓ The economic status of Kenyans and the local people would remain unchanged.
- ✓ The railway station would remain largely under-utilized as it is currently.
- ✓ No employment and business opportunities will be created for thousands of Kenyans local citizens who will work in the project area.
- ✓ Discouragement for investors and loaners
- ✓ Development of infrastructural facilities (roads and associated infrastructure) will not be undertaken.
- ✓ Likely Levels of Poverty will increase or remain the same

*The No Project alternative is therefore not a viable alternative as the proposed CRS project will relieve the Railway Transport problems people within Pipeline and Nairobi Metropolitan Region in general.*

## **6.4 Analysis of Alternative Construction Materials and Technology**

The proposed project will be constructed using modern, locally and internationally accepted materials to achieve public health, safety, security and environmental aesthetic requirements. The railway station works will be made using locally sourced materials that meet the Kenya Bureau of Standards requirements.

The alternative technologies available include the conventional concrete roads, prefabricated concrete panels, or even temporary structures. These may not be desirable from a cost and durability perspective. The technology to be adopted will be the most economical and one sensitive to the environment.

### **6.4.1 Solid Waste Management Alternatives**

A lot of solid wastes will be generated from the proposed project. An integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the materials. This option will demand a solid waste management awareness programme in the management and the staff. Recycling and reuse options of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The third priority in the hierarchy of options is combustion of the waste that is not recyclable. Finally, the proponent will need to establish agreement with Nairobi City County authority to ensure regular waste removal and disposal in an environmentally-friendly manner. In this regard, a NEMA registered solid waste handler would have to be engaged. This is the most practical and feasible option for solid waste management considering the delineated options

### **6.4.2 Fundamental Alternatives**

Fundamental alternatives are developments that are totally different from the proposed project and usually involve a different type of development on the proposed site, or a different location for the proposed development. The proposed project targets at construction of Quick Wins Commuter Rail Station in Pipeline area for its residents. The Pipeline Community is in need of efficient and reliable rail station thus the need.

*The fundamental alternative of a development other than the proposed CRS is therefore not feasible in this instance. For this reason no alternatives will be considered.*

### **6.4.3 Incremental Alternatives**

Incremental alternatives are modifications or variations to the design of a project that provide different options to reduce or minimize environmental impacts. There are several incremental alternatives that can be considered, including: The design or layout of the activity. The technology and materials to be used in the activity as discussed above and below.

### **6.4.4 Layout alternatives**

The current layout of the station has constrained different layouts to be considered due to the existing railway line, which will not be changed at this time. However, different layouts were considered during the design, which looked at the space available, estimated number of commuters to be served by the railway,

environmental and social impacts, and other amenities to be incorporated in the stations such as the parking, security, access roads, etc. The different layouts were discussed at length with the project proponent and the final designs agreed upon that maximized on the space available, and in considerations of the other requirements and environmental and social aspects of the project. The layouts were also presented to the key stakeholders during consultations and there were no issues raised regarding the final layouts. The final layout are presented in Annex 3 of this report.

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## CHAPTER SEVEN:

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### 7 ENVIRONMENTAL AND SOCIAL IMPACTS

#### 7.1 Introduction

This chapter provides an analysis of the potential impacts likely to emerge from implementation of project activities, therefore development of a checklist of environmental impacts. The impacts were interpreted based on a ranking system of high, moderate and low depending on the nature, scope (temporal and geographical) and resilience of the impacts. They can be positive or negative, direct or indirect and the magnitude of each impact is described in terms of being significant, minor or negligible, temporary or permanent, long-term or short-term, specific (localized) or widespread, reversible or irreversible. Generally, temporary impacts having no obvious long-term consequences are regarded as being minor but those with long-term repercussions are classified as significant. Significant positive impacts are usually associated with improved access, which is the prime objective of the Pipeline railway station project.

The impacts of the project during each of its life cycle stages (construction, operation and decommissioning) are categorized into: impacts on the biophysical environment; health and safety impacts and socio-economic impacts.

#### 7.2 Methodology

This chapter identifies and discusses the potential impacts associated with the proposed construction Project. The impacts are identified across the three phases namely: Construction Phase (including impacts due to project location), Operational Phase and Decommissioning Phase.

Environmental impacts may result from the activities that are undertaken during the respective project phases discussed in section 2.6 of this Report.

##### 7.2.1 Impact Identification and Assessment

Several environmental impacts (positive and negative) associated with the proposed project were identified through field work, desktop analysis and the use of experts' judgment method. The following section highlights the impacts anticipated throughout the lifecycle of the proposed project. The impacts identified have been rated using a specific methodology elaborated in this chapter.

##### 7.2.2 Steps of Impact Assessment

The potential impacts of the proposed project were assessed using the following steps:

- Characterization of the baseline conditions or rather the existing conditions before the Project is undertaken and any effects are generated;
- Description of the Project components throughout the Project lifespan (construction, operation and decommissioning);
- Evaluation of alternatives to the Project to see if impacts can be reduced;

- Identify sources of impacts and the impacts themselves that are generated by any aspect of the Project;
- Rating of impacts before any mitigation (for negative impacts) or enhancement (for positive impacts) is implemented;
- Identification of mitigation and enhancement measures to address the impact; and
- Rating impacts after mitigation to produce a “residual” impact rating

### **7.3 Positive Impacts**

#### **7.3.1 Construction stage**

During the construction period, there is a likelihood of having the following impacts:

##### ***7.3.1.1 Creation of employment opportunities***

Many job opportunities will be available for construction workers during the construction phase of the project. Employment opportunities are a benefit both in economic and social sense. For the construction development non-skilled labour, from the local community, will be hired. Although only during the duration of the project, several workers including casual labourers, masons, carpenters, joiners, electricians and plumbers are expected to work on the site during the construction.

##### ***7.3.1.2 Increased trade with construction workers:***

The construction workers required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as shop owners, accommodation providers and food vendors near the project site.

##### ***7.3.1.3 Business opportunities in supply of materials and utilities***

The project will require supply of large quantities of construction materials which will increase revenue for local businesses at Pipeline area, such as cement, steel, and other miscellaneous materials required for construction that can be sourced locally.

#### **7.3.2 Operational phase**

During the operation phase the following positive impacts are foreseen:

##### ***7.3.2.1 Enhanced delivery of services***

This is a long-term impact due to the opening of the railways station, consisting in improving access to social services e.g. health facilities.

##### ***7.3.2.2 Improved transport efficiency for people and cargo***

The opening of the railways station will improve efficiency of transportation of people, delivery of agricultural products to market centers. It will also ease connectivity within the Nairobi Metropolitan other major towns served by the railway line and beyond.

### **7.3.2.3 Attraction of new investors in the area:**

The improvement of the railway station means Pipeline will be easily accessible, thereby attracting new investors and traders in the area. This translates to economic growth in the area near the railway station. Increase in investors has the potential to increase in land value for property owners near the railway station's area of influence.

### **7.3.2.4 Improved trade:**

The trade from and to the city will be improved and this will also give an opportunity of opening up the area around the project site to trade. More to opening up the trade centers, the delivery of farm produce, like vegetables, fruits livestock to market centers will be more efficient. Livestock and crop trade is expected to increase because of the ease of transportation coupled with the reduced cost and time of travel.

### **7.3.2.5 Reduction of air pollution from vehicle emissions**

One of the aims of this project is to decongest the highways, and decrease the car circulation within the Nairobi Metropolitan through an efficient railway transport. Reduction and decongestions of vehicles on the highways translate to reduction of air pollution brought about by emissions from vehicles.

### **7.3.2.6 Aesthetic quality**

The new railway station, with its associated access road and other amenities will improve the aesthetics of the area, better than its current situation.

### **7.3.2.7 Revenue to national and local governments**

Through payment of relevant taxes, rates and fees to the government and the local authority, the project will contribute towards the national and local revenue earnings from those using the improved facilities, and any increase from economic activities brought about by the improved station.

### **7.3.2.8 Improved Drainage**

One of the key enhancements of the railway station is the drainage system in the area that has been causing floods during heavy rains. The new railway station will improve the drainage in the area, through proper channeling of the stream nearby and flood waters thus reducing flood damage and potential soil erosion in the area.

### **7.3.2.9 Improved Security**

The access road to the railway station and its amenities such as pedestrian footpaths, street and flood lights will enhance the security in the area, which is currently lacking for commuters accessing the station. This will encourage more commuters served by the station and the surrounding areas to use the railway transport.

## **7.4 Negative Impacts**

### **7.4.1 Impacts Due to Project Location**

#### **7.4.1.1 Impacts on cultural heritage**

Within the project influence area, there is no known historical or archaeological property located within a 10km radius. There are no graves or cemetery noted at the project site, hence no impact arising from the project activities is anticipated. If any archeological properties are discovered during construction activities, care will be taken to either preserve them, or contacting the related ministry of cultural heritage through the Museum of Kenya for “chance finds” to ensure preservation and or collection of the properties

#### **7.4.2 Construction stage**

##### **7.4.2.1 Disruption and damage of public utilities:**

There is potential for a few disruptions of public utilities, especially the electric power and some water lines, especially the ones that might be located along the access road to the station. Although minimal, disruption of electric power will occur during connection of power to the station. During transportation of materials to construction site, the use of already existing tarmacked roads to the site may lead to damage on paved surfaces if axle load weight is not observed, resulting to poor roads, and spending more money repairing the affected roads.

##### **7.4.2.2 Pressure on water resource and on public water supply**

The construction activities and the workers influx will require substantial quantities of water that is not easily available in the area, which will create additional demand for water to the existing demand. Although short term, the high demand may strain the current water resources and needs for the local people.

##### **7.4.2.3 Air Quality Degradation**

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

- Activities likely to generate dust include: cement production and use, excavation of dry grounds excavation, construction, leveling works, and to a small extent, transport vehicles delivering materials.
- Activities likely to generate particulate matter include loose material transportation, vehicle and machines exhaust emissions, operations at the batching plant, stone crushing machines, fire among others. Some of the particulate matter to be generated include sand, soot, cement, gravel and murrum, among others; and
- Exhaust emissions likely to be generated include smoke, hydrocarbons and nitrogenous gases among others pollutants from vehicles, machinery and equipment exhausts. Such emissions can lead to several environmental impacts including global warming and health impacts.

Quantities of building materials are required, some of which are sourced outside Pipeline, and such emissions may affect a wider geographical area. The impacts

of such emissions can be greater in areas where the materials are sourced and at the construction site as a result of frequent running of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

All of these emissions may lead to significant impacts on construction workers and the local residents, with the risk of suffering respiratory diseases. The emissions expansion will be accentuated during dry weather conditions from January to March.

The movement of trucks and other equipment in the project area during the works implementation will cause dust if the works will be in dry weather. This noise and dust may also affect the schools/hospitals in the vicinity of the construction works.

#### **7.4.2.4 Exposure to noise and vibrations**

Levels of noise and vibrations typical of construction works will be generated during the construction phases.

They will be generated during transportation and building processes i.e. from the use of machinery/equipment including bulldozers, generators, tippers and concrete mixers and the heavy trucks delivering construction materials.

This might contribute to high levels of noise and vibration within the construction site and the surrounding area during their operation.

Elevated noise and vibration levels within the site are adverse to the health and safety of the project workers, the residents, passers-by and other persons and animal within the vicinity of the project site.

Vibration resulting from heavy earth moving equipment is expected to impact on human settlements, educational institutions, health facilities and commercial centers. This effect will however be localized and temporary in duration.

#### **7.4.2.5 Soil Erosion**

Removal of soil cover and excavation works associated with this project may lead to increased soil erosion at the project site and release of sediments into the drainage systems especially if construction works are done during the rainy seasons. Soil erosion may also pollute local streams/rivers from contaminants carried with or attached to soil particles and it may also negatively affect the soil fertility of the affected land.

This is a long-term impact. The structures need to be developed to reduce soil erosion during railways station construction.

Their impacts are classified as short term; however, they can be long term depending on the disposal mechanism used.

#### **7.4.2.6 Impacts on Biodiversity**

Construction activities at the project site will require stripping of top soils and clearance of any trees and vegetation where the facilities will be located. Although minimal, a few species such as grasses will be cut/stripped to pave way for new facilities. They will be replaced after the project is complete.

Furthermore, the construction of the proposed development should observe minimal and selective removal of the existing vegetation covers. The vegetation in the area does not include the endangered species listed under the IUCN.

#### **7.4.2.7 Solid Waste Generation**

Solid waste will be generated at the site during construction of the railways station and related infrastructure. Such waste will consist of demolition and excavated materials, metal drums, surplus spoil materials, empty paint and solvent containers, paper bags, empty cartons, waste oil, and waste bitumen, among others. At the end of the construction stage waste will be generated due to the demobilization of contractors and RE's camps. Such waste will consist of demolition, rejected materials, paper bags, and empty cartons, among others.

This may be accentuated by the fact that some of the waste materials contain hazardous substances, are not biodegradable and can have long-term and cumulative effects on the environment.

#### **7.4.2.8 Possible Pollution from Waste Oil and Fuel Spills**

Poor maintenance and operation of heavy trucks and equipment might lead to oil and fuel spills at the construction site which may contaminate land and water resources in the area. Other wastes include waste from paints and their cans and bitumen during paint works and road construction respectively. Release of hydrocarbons to the environment has several impacts including sub-soil and groundwater contamination; air pollution, fire and effects on human health due to dermal contact, inhalation or ingestion.

#### **7.4.2.9 Construction works induced traffic**

Activities related to construction works will undoubtedly induce uncharacteristic levels of additional vehicular traffic at the site and roads leading to the site. Related issues of vehicle congestion and reckless driving by truck drivers delivering construction materials to the site will be sources of potential accidents to road users and pedestrians, disturbance of normal living conditions to the local population, dust pollution, etc. during the construction phase.

#### **7.4.2.10 Increased energy consumption**

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

The project will also use electricity supplied by the Pipeline branch of Kenya Power (KP) Ltd. Electricity in Kenya is generated mainly through natural resources, namely, water and geothermal resources. In this regard, there will be need to use electricity moderately since high consumption of electricity negatively impacts on these natural resources and their sustainability.

#### **7.4.2.11 Induced informal settlements**

There is a likelihood of induced settlement during construction activities for small traders such as food kiosks and informal settlements created by the needs and demand of such services by the construction workers near the project area. This informal settlement might go beyond construction period, posing a threat to future development of the area through settlement on public land and facilities such as road corridors.

#### **7.4.2.12 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.

#### **7.4.2.13 Social unrest from local population if locals are not recruited**

There is potential of local people if there people from the area are not considered for employment. This can bring negative publicity to the project during the construction period of the project, including stoppage of works that can delay the project progress.

#### **7.4.2.14 Possible proliferation of social vices**

The project will attract new people to the area, especially unskilled construction workers, and increase the amount of disposable cash in the area, especially for local traders and business people. This may lead to increase of crime in the area.

#### **7.4.2.15 Sanitation concerns for the construction crew**

Workers at the construction site will require sanitation facilities during construction period, which if not well maintained and cleaned, may lead to outbreaks of illnesses such as cholera, hepatitis, typhoid etc.

#### **7.4.2.16 Occupational Health and Safety Issues**

Construction workers will be exposed to risks of accidents and injuries during construction activities. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of objects and risk of vehicular accidents. Other injuries or fatalities may result from workers operating equipment without adequate training or with lack of PPE, or extended exposure to outdoor weather resulting in heat related lethargy. This is considered a short-term impact that has potential long-term implications. Risks of injuries and accidents may also happen to local people if the site is not well secured through falls at excavated areas and by construction vehicles.

#### **7.4.2.17 HIV/AIDS and Sexually Transmitted Infections (STIs)**

Construction projects are associated with an increase in sexually transmitted diseases such as STIs and, HIV/AIDS due to the influx of immigrant workmen interacting with the local people. Construction teams, as well as the greater number of drivers, who are expected to pass through the trade centers and settlements, can also cause social upheaval among communities near the site.

#### **7.4.2.18 Child protection**

The laws of Kenya prohibit contractors from “employing children in a manner that is economically exploitative, hazardous, and detrimental to the child’s education, harmful to the child’s health or physical, mental, spiritual, moral, or social development. It is also important to be vigilant towards potential sexual exploitation of children, especially young girls. The contractor should adopt a ‘Child Protection Code of Conduct’; that all staff of the contractor must sign, committing themselves towards protecting children, which clearly defines what is and is not acceptable behavior.

#### **7.4.2.19 Gender equity and sexual harassment**

There is a potential that gender inequality might occur during project construction through unequal distribution of work, discrimination against women, and unequal pay for women, among others. Sexual harassment against women might also happen as a result of mixing of women and men at the construction site.

### **7.4.3 Operational phase**

#### **7.4.3.1 Increased storm water**

Storm water from the roof catchment and surface run-off may pose some environmental issues which can lead to increased erosion or flooding in the neighboring areas if not adequately mitigated.

#### **7.4.3.2 Induced Development**

The project influence area is not heavily developed, and with the construction of the proposed project, it is expected that the area will grow; therefore the demand for housing will rise drastically in the near future to meet the housing and commercial requirement of the people settling along the area. Therefore, lack of controlled development might induce mushrooming of informal settlement and sub-standards housing around the project’s influence area.

#### **7.4.4 Construction Camp**

Construction camp will be set up in the project site. This camp will be used as site office and as storage facility. The contractor should develop an ESMP for the Camp site.

### **7.4.5 Decommissioning Activities**

#### **7.4.5.1 Solid Waste Generation:**

After construction, the contractor will be required to remove and clear away all the remaining construction materials and stores from the site. This will generate some solid waste which he will have to dispose to his yard or at an approved

dump site. Although minimal, negative impacts anticipated include generation of dust, and some noise during demolition process.

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## CHAPTER EIGHT

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### 8 THE ENVIRONMENTAL & SOCIAL MANAGEMENT AND MONITORING PLAN

#### 8.1 Significance of ESMMP

The purpose of the Environmental and Social Management and Monitoring Plan is to initiate a mechanism for implementing mitigation measures for the potential negative environmental impacts and monitor the efficiency of these mitigation measures based on relevant environmental indicators. The ESMMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures can be implemented, supervised and monitored. Further, it provides a checklist for project monitoring and evaluation. The objectives of the ESMMP are:

- To provide evidence of practical and achievable plans for the management of the proposed project.
- To provide the Proponent and the relevant Lead Agencies with a framework to confirm compliance with relevant laws and regulations.
- To provide community with evidence of the management of the project in an environmentally acceptable manner.

The ESMMP outlined below will address the identified potential negative impacts and mitigation measures on the following project stages:

- Pre-construction and Construction Phases ESMMP
- Operation Phase ESMMP and
- Decommissioning Phase ESMMP.

#### 8.2 The Environmental and Social Management Plan

The construction Contractor will be responsible for the implementation of the construction phase ESMP. The Contractor will identify responsibilities and organization required to implement the accountabilities of the construction phase ESMP. The construction phase ESMP will apply to the Principal Contractor and all Sub-contractors.

The Contractor will also be responsible for developing and implementing a site specific induction for all construction workers. This induction will include all EHS hazards and their control measure. The Contractor will ensure that all construction workers are trained and competent and hold the appropriate certification for the tasks that they will be undertaking.

A preliminary environmental management and monitoring outline has been developed for the project works. Responsibility for the incorporation of mitigation measures for the proposed project lies with the Proponent, who must ensure specified mitigation measures are implemented and monitored.

The table below summarizes the environmental, social monitoring and management plan for the proposed project. They describe parameters that can be monitored, and suggest how monitoring should be done, how frequently, and who should be responsible for implementation and monitoring. The estimated

costs for the various mitigation measures have been provided where possible. It will be noted that most of these measures will be part of the project's operational costs.

### **8.2.1 Pre-construction and construction Phases ESMMP**

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the construction phase of the project is as outlined below:

**Table 8-1: Environmental Management and Monitoring Plan**

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
Loss of vegetation	<p><b><u>CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Minimize clearing of unnecessary areas at the construction site</li> <li>◆ Replant vegetation through landscaping upon completion</li> </ul> <p><b><u>OPERATION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Replenish vegetation at the station regularly</li> <li>◆ Proper maintenance of trees and other vegetation at the station</li> </ul>	Design Engineer, Project Engineer and Contractor	(c) check and follow specifications in the drawings and plans (c) Minimal clearance of vegetation and soil stripping	Project Engineer  Contractor	Continuous during construction & operation phases	Included in the BoQ under excavations Kshs. 3,496,955.00
soil erosion	<p><b><u>CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Construct efficient drainage structures (culverts, mitre drains, scour checks etc.)</li> <li>◆ Control earthworks through cascading</li> </ul>	Design Engineer, Project Engineer and Contractor KRC	(c) and (o) ◆ Soil erosion levels	Contractor	During rainy seasons	Included in the BoQ under Drainage Structures  Normal

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<p>gabions and distribution channels for storm water</p> <ul style="list-style-type: none"> <li>◆ Protect excavated sections of the route of storm water during heavy rains</li> <li>◆ Provide erosion channels to natural drains and rivers/streams to minimize erosion</li> <li>◆ Design to incorporate existing drainage pattern and avoid disturbing the same</li> </ul> <p><b><u>OPERATION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Regular cleaning and proper maintenance/repair of drainage structures</li> </ul>					maintenance budget of the station during operation
<b>Disruption of Public Utilities</b>	<b><u>DESIGN and CONSTRUCTION PHASE</u></b>	Project Engineer	(c) Down time of utilities	Contractor	(c) daily	Budget under

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<ul style="list-style-type: none"> <li>◆ Design to incorporate existing public utilities and avoid disturbing the same</li> <li>◆ Contractor to generate utility management plan</li> <li>◆ Contractor to minimize damage to public utilities</li> </ul>	and Contractor Utilities providers	affected <ul style="list-style-type: none"> <li>◆ Complaints from the local residents</li> <li>◆ No of disruptions</li> </ul>			provisional sums of Utilities
Air Pollution	<p><b><u>CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Speed control of vehicles accessing the site</li> <li>◆ Construction of bumps along access road to the station</li> <li>◆ Regular watering of access roads and work sites</li> <li>◆ Proper maintenance of construction equipment per the manufacturer's requirements</li> </ul>	Project Engineer, Contractor, Traffic police	inspection / observation <ul style="list-style-type: none"> <li>◆ Dust level – particulate matter</li> <li>◆ Exhaust fumes from the vehicles</li> <li>◆ Maintenance levels of plant and equipment</li> </ul>	Contractor	daily/random	<ul style="list-style-type: none"> <li>◆ Equipment - costs build in the planning and administration costs of the contractor equipment</li> </ul>

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
Noise pollution	<p><b><u>CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Regular Sensitization of workforce and residents on potential noise levels</li> <li>◆ Controlled operation of construction plant and equipment</li> <li>◆ No blasting shall be done on site</li> </ul>	Project Engineer and Contractor	inspection / observation <ul style="list-style-type: none"> <li>◆ Noise level at the construction site</li> <li>• Number of Complaints from the residents</li> </ul>	Contractor	<u>daily</u> /random	Costs build in the planning and administration costs of the contractor
Water Resources Usage	<p><b><u>CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Develop water abstraction plan to minimize conflict with local residents</li> <li>◆ Manage use of piped water and other water sources mainly used by local people</li> <li>◆ Abstraction licenses should be obtained from the required authority (WARMA)</li> </ul>	Project Engineer and Contractor  WARMA	Inspection /method of waste collection <ul style="list-style-type: none"> <li>◆ Complaints from the neighbouring communities or the authorities</li> <li>◆ Amount of water abstracted</li> </ul>	Contractor Wrma	(c) monthly	Costs build in the planning and administration costs of the contractor
	<b><u>OPERATION PHASE</u></b>			Contractor		

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<ul style="list-style-type: none"> <li>◆ Monitor water wastage and usage during operational stages of the station</li> <li>◆ Install pressure taps that minimize and time usage</li> <li>◆ Repair damaged taps and toilets to minimize waste</li> </ul>	KRC	Inspection <ul style="list-style-type: none"> <li>◆ Amount of water used</li> <li>◆ Repairs and damaged water facilities</li> </ul>		(o) monthly	Normal maintenance budget
Water Pollution	<p><b><u>DESIGN and CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Incorporate erosion control measures during construction at the site</li> <li>◆ No oils and fuels should be stored on the construction site – small works</li> <li>◆ Maintenance, re-fuelling and cleaning of equipment should NOT be done at construction site by the contractor – but in a licensed garages outside the station area</li> <li>◆ The station design to</li> </ul>	Project Engineer and Contractor  Sub-County Health & Environmental Officer, NEMA, WARMA KRC	Inspection <ul style="list-style-type: none"> <li>◆ Discharge into water bodies</li> <li>◆ Complaints from the neighbouring communities or the authorities</li> <li>◆ Inspection status of streams, rivers and wetlands in the area of influence</li> </ul>	Contractor	(c) daily  (o) regularly	Costs build in the planning and administration costs of the contractor & Maintenance costs of the station

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	incorporate oil sumps at the parking areas to isolate oil spills from parked vehicles that might spill to the storm drains ♦ No solid waste, fuels or oils shall be discharged on land surface, into drains or streams <u><b>OPERATION PHASE</b></u> ♦ Monitor oil spills and other leakages at the station and parking lots ♦ Regular cleaning of oil sumps and storm water drains at the station					
Traffic safety	Contractor to prepare a Traffic Management Plan for approval to address the following issues;	Project Engineer and Contractor  Local Police, KRC	Inspection and accident reports  ( c ) & (o) - No of accidents	contractor	Monthly	Costs build in the planning and administration costs of the

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<ul style="list-style-type: none"> <li>◆ Initiation of a safety program and measures by creating awareness and educational campaigns for workers and local communities</li> <li>◆ Installation of appropriate road signage, speed signs, and other warning signs at the site and access roads</li> <li>◆ Copies of insurance policies for the contractor’s drivers and vehicles should be provided to the Supervision Consultant.</li> <li>◆ The contractor’s vehicles and equipment must be in proper working condition and have registration plates, and numbering.</li> <li>◆ The contractor ensures</li> </ul>		<p>( c ) &amp; ( o ) - Complaints from the local people</p> <p>( c ) Adherence of insurance and traffic Act requirements</p>			contractor

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<p>proper driving discipline by its employees, and sanctions those in breach.</p> <ul style="list-style-type: none"> <li>◆ Excavated sites, embankments, and dangerous locations are protected with proper safety barriers, tape and warning signs.</li> <li>◆ Maintain a log detailing every violation and accident on site or associated with the project work activities, including the nature and circumstances, location, date, time, precise vehicles and persons involved, and follow-up actions with the police, insurance, families,</li> </ul>					

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	community leaders, etc. (including during operation stages)					
Settlement/Induced settlement changes	<p><b>CONSTRUCTION PHASE</b></p> <ul style="list-style-type: none"> <li>◆ Ensure the station is fenced off to discourage informal settlement and trading within the premises</li> <li>◆ Discourage informal settlement near the station</li> </ul>	KRC, Local sub-county Authorities	Inspection/observation Number of informal settlements coming up near the project	Proponent (KRC)	monthly	No direct costs
Social Issues - employment	<p><b>CONSTRUCTION PHASE</b></p> <p>The proponent/contractor to prioritize hiring locals <b>and</b> women must be encouraged to be involved in construction work</p> <p>The contractor shall ensure</p>	Contractor, Project Engineer	<p>(c ) observation /reports</p> <ul style="list-style-type: none"> <li>▶ Number/percentage of local workers from the local communities</li> <li>▶ Complaints from local residents</li> <li>▶ Number of females employed</li> <li>▶ Checking identity card</li> </ul>	Contractor	Monthly	No direct costs to EMMP, costs build in the planning and administration costs of the contractor

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<p>compliance to the gender balance as required by the 2/3 gender rule</p> <p>The contractor shall comply to the provisions of IFC PS 2: Labour and Working Conditions and WIBA 2007</p> <p>The contractor must ensure avoidance of employment and discrimination and harassment of minors at the site.</p>		<p>for all employees</p> <ul style="list-style-type: none"> <li>▶ Grievances issues related to child offences and employment of minors in the GRM reports</li> <li>▶ Reports from local law enforcement agencies.</li> </ul>			
Workers and commuters health and sanitation	<ul style="list-style-type: none"> <li>◆ Contractor to provide clean and adequate sanitation facilities for the workers at all times</li> <li>◆ Contractor shall also</li> </ul>	<p>Contractor, Project Engineer</p> <p>KRC</p>	<p>Inspection/observation/ reports</p> <ul style="list-style-type: none"> <li>◆ Number of sanitation facilities</li> </ul>	contractor	<p>Daily</p> <p>Monthly reports</p>	<p>No direct costs to EMMP, costs build in the planning and administration</p>

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	provide clean drinking water at the construction site for his workers at all times <b>OPERATION PHASE</b> ♦ Project proponent to provide clean and adequate sanitation facilities for the commuters		♦ Sanitation facilities cleanliness ♦ Number of disease outbreaks			costs of the contractor & Normal maintenance costs during operation
Security and Crime	♦ Proper design incorporating lighting to enhance security at the station ♦ Sensitize the construction workers, locals, and security to be on the lookout on suspicious activities near the station ♦ Liaise with the administration units (County and sub county)	Contractor, Project Engineer Local police KRC	Reporting ♦ Number of crimes reported	Contractor	Monthly	No direct costs to EMMP, costs build in the planning and administration costs of the contractor & Normal operational costs during operation

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	governments, Police, DO, chiefs, etc.) to provide regular surveillance and patrols to protect workers and commuters					
HIV/AIDS, STDs,	<p><b>CONSTRUCTION PHASE</b></p> <ul style="list-style-type: none"> <li>◆ 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;</li> <li>◆ Reduce risk of transfer through provision of male and female condoms for all workers;</li> <li>◆ Provide free STI and HIV/AIDS screening, diagnosis, counseling for</li> </ul>	Contractor, Project Engineer  Sub-county Health & Environmental Officer, local sub-county authorities	observation / reports <ul style="list-style-type: none"> <li>◆ No of HIV/AIDS programs conducted by the contractor</li> <li>◆ No of testing, counseling provided</li> <li>◆ Prevalence of prostitution, HIV/AIDS and STDs in the area during construction period</li> </ul>	Contractor	Monthly	a) HIV/AIDS awareness campaign b) HIV/AIDS prevention campaign  Approx Kshs 2,500,00.00

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<p>workers and local people near the site</p> <p><b><u>OPERATION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Maintain a continuous awareness program on health issues related to STDs and HIV/AIDS at the station, e.g. installing posters at the station</li> </ul>	Environmental Unit/proponent	<p>observation / reports</p> <ul style="list-style-type: none"> <li>◆ Information flow, dissemination and awareness on HIV/AIDS</li> <li>◆ No of posters at the station</li> </ul>	Contractor	<p>Continuous</p> <ul style="list-style-type: none"> <li>◆ Response to HIV/AIDS issues</li> </ul>	
Solid Waste	<p><b><u>CONSTRUCTION PHASE</u></b></p> <ul style="list-style-type: none"> <li>◆ Establish a well-planned method of solid disposal of debris/ garbage at the camp site</li> <li>◆ Develop an ESMP for the camp site</li> </ul>	Contractor and Project Engineer	<p>Inspection</p> <ul style="list-style-type: none"> <li>◆ Disposal methods of solid waste from the site</li> <li>◆ Complaints on health and safety aspects related to construction activities</li> <li>◆ Site cleanliness</li> <li>◆ Amount of waste/debris on</li> </ul>	Contractor	weekly	Costs build in the planning and administration costs of the contractor

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<p><b>OPERATION PHASE</b></p> <ul style="list-style-type: none"> <li>◆ Provision of disposal bins at designated areas at the station</li> <li>◆ Regular collection and disposal of garbage by the project proponent</li> <li>◆ Clean storm water drains to minimize clogging</li> </ul>	KRC Local Sub-county council	<p>site</p> <ul style="list-style-type: none"> <li>◆ Adherences to ESMP for the camp site developed by the contractor</li> </ul> <p>Inspection</p> <ul style="list-style-type: none"> <li>◆ Accumulation of garbage at the station</li> <li>◆ Complaints by commuters</li> <li>◆ Number of drainage areas clogged</li> <li>◆ Facilities cleanliness</li> </ul>	Contractor	daily	KRC budget
Occupational Health and Safety	<p><b>CONSTRUCTION PHASE</b></p> <ul style="list-style-type: none"> <li>◆ Provide medical and insurance cover for all workers</li> <li>◆ Provide adequate and</li> </ul>	Project Engineer and Contractor Sub-county Health & Environmental	<p>inspection</p> <ul style="list-style-type: none"> <li>◆ No of PPEs provided</li> <li>◆ Workers OHS compliance (use</li> </ul>	Contractor	Monthly	Standard conditions of contract for WIBA

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	right safety tools, and enforce use of PPEs to all workers ♦ Appoint a fulltime OHS personnel ♦ Ensure provisions of first aid for staff , insurance, and access to ambulance service at all worksites, and arrangement to access local hospital/dispensary with qualified medical staff by workers ♦ The site shall be fenced off and provided with security at the access gates to reduce potential accidents and injuries to the public	Officer	and adequacy) ♦ Number of construction activities related accidents			Health & Safety for Workers and Equipment - Kshs 5,200,000
Child protection	<u><b>CONSTRUCTION PHASE</b></u> ♦ Ensure no children are	Contractor,	observation /reports/random checks	Contractor	Regularly	No Direct costs

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	employed on site in accordance with national labor laws ♦ Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police	Project Engineer,	♦ Inspection of employees working at the site ♦ Labour Records by the contractor			
Gender equity and Sexual harassment	<u><b>CONSTRUCTION PHASE</b></u> ♦ Contractor to prepare and enforce a No Sexual Harassment Policy in accordance with national law where applicable ♦ Contractor and implementing agency to prepare and implement a Gender Action plan to include at minimum, in conformance with local laws and customs, equal	Contractor, Project Engineer,	observation /reports ♦ Number of incidences ♦ Number of women employed ♦ Labour Records by the contractor	Contractor	monthly	No direct costs to EMMP, costs build in the planning and administration costs of the contractor

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	opportunity employment, gender sensitization ♦ Provision of gender disaggregated bathing, changing, sanitation facilities ♦ Grievance redress mechanisms including non-retaliation					
Loss of life, injury, or damage to people and private property	<b>CONSTRUCTION PHASE</b> ♦ Contractor shall maintain records and making reports concerning health, safety and welfare of persons, and damage to property, as the RE may reasonably require ♦ Insuring against liability for any loss, damage, death or bodily injury which may occur to any	Contractor, Project Engineer,		Contractor		No direct costs to EMMP, costs build in the planning and administration costs of the contractor

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	<p>physical property or to any person which may arise out of the contractor’s performance of the contract</p> <ul style="list-style-type: none"> <li>◆ Insuring against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the contractor or any other of the contractor’s personnel.</li> <li>◆ The construction site shall be fenced off to prevent access to members of the public</li> </ul>					
Chance Finds	The contractor should have and implement the Chance	Contractor,	Construction phase	Contractor	Constant monitoring	No cost

Project Environmental and Social Impact	Proposed Mitigation and Aspects for Monitoring	Responsibility for intervention and monitoring during design, construction and defects liability period	Parameters for Monitoring/ Indicators (c) – construction (o) - operations	Responsibility for monitoring	Timing - Recommended frequency of monitoring	Estimated Mitigation & Monitoring costs to be included in the BoQ (Kshs)
	Finds Procedure set out in Appendix 9 in the event that cultural heritages is discovered	proponent, NCG			during excavation	implication
	<b>TOTAL APPROXIMATE COSTS OF ESMMP</b>					<b>Kshs 11,196,955</b>

### **8.2.2 Grievance redress Mechanisms (GRM)**

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

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

A sample grievance process has been provided in Annex 6 of this report.

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## CHAPTER TEN

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### 9 CONCLUSION AND RECOMMENDATIONS

#### 9.1 Conclusion

This environmental and social assessment of the Project ascertains that the Project is unlikely to cause any significant environmental and social impacts. Most of the impacts are short and medium-term or temporary in nature and can be readily addressed by some embedded control measures in the engineering design of the Project as well as additional mitigation measures as suggested in the Environmental and Social Management Plan. The Project received favourable support from local people and other stakeholders during consultations. Stakeholders appreciated that in addition to improving commuter rail services in the area, the Project will have several other benefits such as supporting economic growth in the region by opening avenues for further development, employment (direct and indirect) and improving local infrastructure. The critical importance of the proposed project is to develop Pipeline CRS so as to develop a strong commuter rail service in the NMR that will serve the high travel demand. Further, completion of the project will lead to road traffic decongestion. As such, the project in itself is already an activity in mitigation of an existing concern and this is the prime justification of the proposed investment.

During the construction phase of the Project, the key environmental issues are noise and dust generation. There is a risk of soil erosion as result of removal of soil cover, excavation and movement of heavy construction vehicles and equipment. Contamination of soil, groundwater could occur also result from accidental spills and leaks of hazardous materials (e.g. oil) during handling, transportation, and storage at the site.

The adverse impacts identified are generally manageable through good housekeeping and a diligent implementation of the ESMP by the Contractor and its supervision by the Proponent. The nearest air quality and noise sensitive receptors will be a focus for monitoring of any impact arising due to the construction activities.

The assessment also found that the Project is unlikely to cause any major social impacts. The Project does not involve any physical and economic displacement of families. The positive social impacts identified include employment and business opportunities for the local people, reduction of travel time and comfort, improved security, decongestion of already congested roads within the project area and Nairobi metropolitan area, thereby reducing air emissions from vehicles, increased trade in the area translating to increased revenue generation to national and local governments, among others

On the other hand, the possible negative impacts include conflicts and social concerns such as: antagonism from local population if locals are not recruited; proliferation of food kiosks and informal settlement near the station, disruption of public utilities, potential spreading of STIs and HIV/AIDS, risks of injuries and accidents to workers and members of the public, among others. Most of the adverse impacts are short-term or temporary and will be more felt during the construction phase of the project. However, most of them can be mitigated with appropriate mitigation measures built in as part of the Project planning process.

## 9.2 Recommendation

Environmental monitoring is essential to track and sustain the effectiveness of the mitigation measures proposed in this report. An environmental monitoring plan has been prepared as part of the ESMP, to be used during the implementation of the proposed project. The focus areas of monitoring cover air, noise, Water and energy resources, occupational health and safety as well as local employment and economy. The burden of monitoring and mitigation largely lies with the Project Contractor under supervision by the Proponent. The Contract for CRS improvement should bear relevant clauses binding the contractor to institute environmental mitigation as recommended in this study. Thus, in this case, the core monitoring strategy for this project will be through site meetings, in which case, it is recommended that the County Environmental Officers be invited to such meetings. Other stakeholders such as the County Labour Officer should also attend such meetings regularly to ascertain that measures towards securing the health and safety of workers have been put in place.

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

**The tentative budget allocated to implementation of mitigation measures and in addition to the provisions of BOQ was calculated to be approximately Kenya Shillings 9,500,000.** It is the responsibility of the project proponent to allocate this budget to facilitate diligent implementation of the mitigation measures and minimize potential negative impacts at construction and operational phases of the project.

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

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

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## REFERENCES

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- Kenya Republic, The Water Act 2002
- Kenya Republic, Public Procurement and Disposal Act 2005
- Kenya Republic, Public Roads and Roads of Access Act (Cap 399)

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**ANNEXES**

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**Annex 1 PHOTOGRAPHS**



**Part of the existing Pipeline Railway**

**Annex 2: Minutes of the Meetings and attendance list**

**Venue: The railway line pipeline. Date: 4<sup>th</sup> December 2016 (3:00pm to 4:00pm)**

The meeting included the people conducting business and the hawkers at the railway reserved land along the railway line. The meeting was called to order at 3:00PM by the sociologist team who welcomed the participants.

**Sociologists' presentation**

After an opening prayer conducted by Caroline Mueni, the sociologists introduced themselves to the people gathered for the meeting. They explained the proposed project as follows;

*Nature of the project;*

- Security area – There will be a designated post for security personnel to enforce order and security at the site and the proposed project.
- Landscaped area – This area will be layered and beautified by having flowers planted to make the site look appealing.
- Platform Stage – This area will provide passengers boarding the train an area to rest and shield them from sun and rain when waiting for transport.
- Parking Area – The area will allow commuters in the area with cars to leave their cars safely at a designated area for the time they will be away in other towns
- Ticketing booth – Passengers travelling on train will pay for their tickets for travel at the area.
- Administration post – An administration post will be set up in the station where personnel will be available for dealing with issues that arise during operations.

*Advantages of the project;*

- Direct and indirect employment – Construction of the station will require both skilled and unskilled man power therefore the people in the area will be provided with adequate employment opportunities.

- Traffic Management – The station will allow more commuters to be open to the idea of travelling to Nairobi town in train thus ease up traffic jams in major road entries into the town.
- Ease transport – Commuters and travellers to different regions will be able to travel faster and at an easier cost because the train is cheaper than personal car driving and public transport on the road.
- Provide Security – Due to the planned security post in the proposed project design, the residence and the users of the station will be provided will apple security. Commuters also leaving their cars at the station to board the train will be able to do that safely due to the security provided.

*Negative impacts;*

- Interruption of businesses – the people conducting business in the reserved land where the project will be constructed will have to vacate the premises. Their businesses with therefore be interrupted and it will cost them to relocate to a different site.
- Noise pollution – the mechanical equipment used during construction, the lorries ferrying materials to and from the site and the bulldozers doing the actual construction will cause noise pollution in the area affected the residents around the proposed project.
- Dust pollution – The vehicles involved in the construction and the mechanical equipment also used in construction will cause rising of dust in the area which will affect the residents in the area.

### **OPEN SESSION**

This session provided the participants of the meeting to ask questions, raise fears and concerns and give their views and opinions about the proposed project and how it will affect their livelihood.

These are some of the opinions received;

Name of participant	Question	Comment	Answer given by sociologist

Dancun Muindi	Who will be affected by the railway station project?	The people who will be affected should be made aware early enough.	The people to be affected by the project will be given early notice to vacate their business premises
Martin Mwangangi	When will the project begin?	The project should begin as soon as possible and not evict people before the project starts	Before the project begins, the people will be given six months notice before the project will begin therefore enough notice of commencement
Dominic Musembi	Will the locals be provided with job opportunities?	The locals affected by the project should be given first priority during employment	There will be enough job opportunity notice for skilled and unskilled labour so the people should be vigilant in acquiring these jobs.
Caroline Jumba	Will everyone be able to access the train station?	They should provide a section for hawkers to conduct their businesses	The people allowed to access the train station are those that have acquired the tickets at the ticketing booth and those who have rented a space at the stalls
Phillip Odhiambo	Will construction the railway station affect road users	The people should be given prior notice during construction of projects	The people will be given due notice before construction of the various projects

Annex 3: List of Public Participation & Consultation

CONSULTATIVE PUBLIC PARTICIPATION LIST - PIPE LINE						
SUB-LOCATION		VENUE	DATE			
NO.	NAME	SUB-LOCATION	ECONOMY/ACTIVITY	MOBIL. No.	ID NUMBER	SIGNATURE
1	STREPBICK NJOROGIE	PIPELINE	SECTOR	0712-2000000000000		
2	EMILY KIMANI	PIPELINE	WATER SUPPLY	0724222000	202000	
3	MICHAEL KIMANI	PIPELINE	WATER SUPPLY	0724222000	202000	
4	CAROLINE WAMBUI	PIPELINE	ROAD	0712222000	222222	
5	MARSHAL WANGUI KIMANI	PIPELINE	ROAD	0712222000	222222	
6	NEEM WANGUI KIMANI	PIPELINE	ROAD	0712222000	222222	
7	MARSHAL WANGUI KIMANI	PIPELINE	ROAD	0712222000	222222	
8	REBECCA KIMANI KIMANI	PIPELINE	KIPANDA	0712222000	222222	
9	ESTHER KIMANI WANGUI	PIPELINE	HOTEL	0712222000	222222	
10	PETER KIMANI	PIPELINE	PROPERTY	0712222000	222222	
11	MARSHAL WANGUI KIMANI	PIPELINE	ROAD	0712222000	222222	
12	PETER KIMANI	PIPELINE	HOTEL	0712222000	222222	

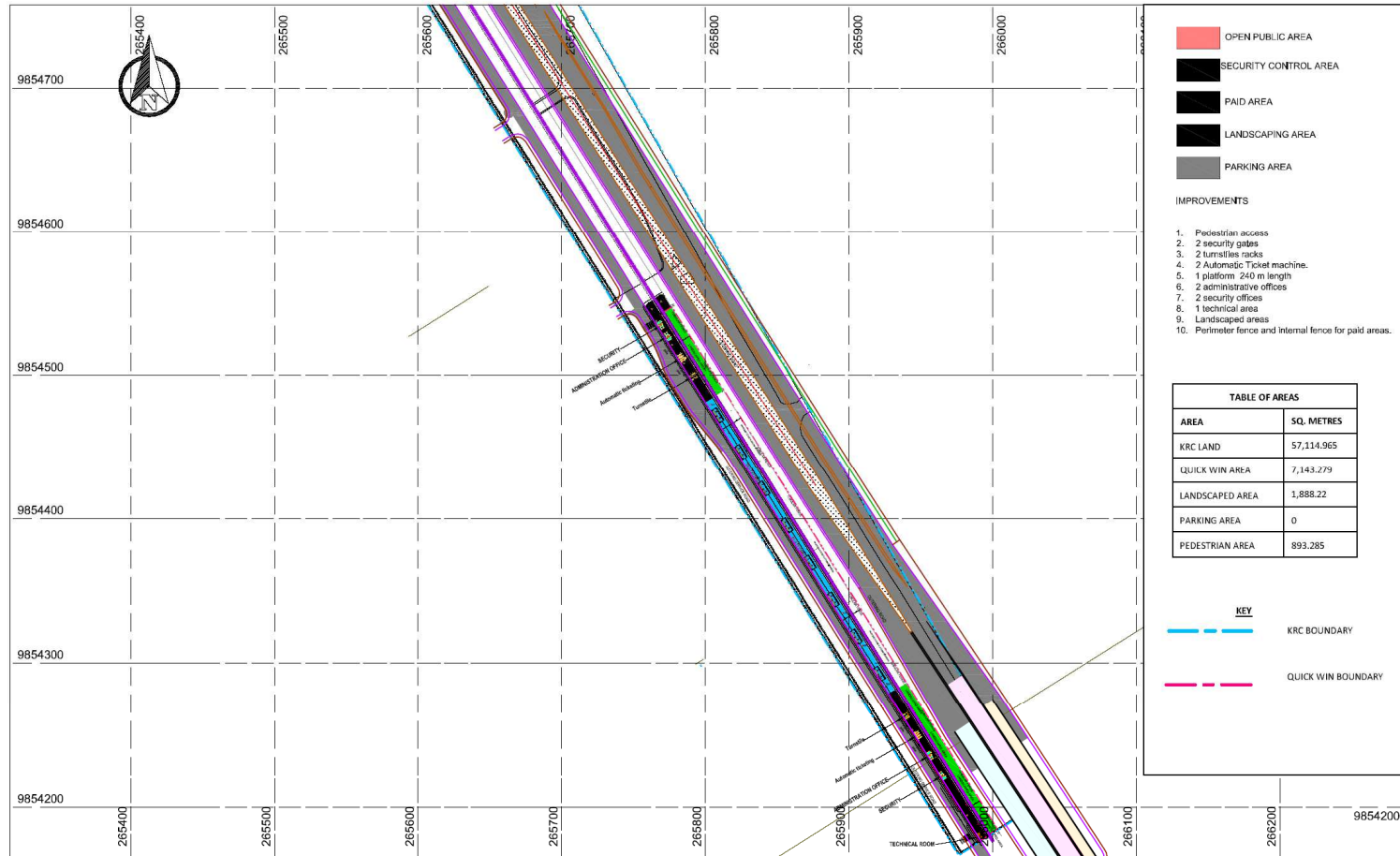
13	PETER KIMANI	PIPELINE	SURVEY	0712222000	222222	
14	WILLIAM KIMANI	PIPELINE	P/O	0712222000	222222	
15	PETER AND ALBERT KIMANI	PIPELINE	CARWASH	0702222000	222222	
16	AFRICA KIMANI	"	BUSINESS	0712222000	222222	
17	DAVID OLUOK	PIPELINE	HOTEL	0712222000	222222	
18	MARSHAL WANGUI KIMANI	PIPELINE	ROAD	0712222000	222222	
19	PETER KIMANI	PIPELINE	CARWASH	0712222000	222222	
20	KEVIN KIMANI	PIPELINE	CARWASH	0712222000	222222	
21	DAVID KIMANI KIMANI	PIPELINE	HOTEL	0712222000	222222	
22	MARY KIMANI	PIPELINE	BUSINESS	0712222000	222222	
23	MARSHAL WANGUI KIMANI	PIPELINE	BUSINESS	0712222000	222222	
24	LAWRENCE M. MBITHI	PIPELINE	BUSINESS	0712222000	222222	
25	MARSHAL WANGUI KIMANI	PIPELINE	BUSINESS	0712222000	222222	
26	MARSHAL WANGUI KIMANI	PIPELINE	CARWASH	0712222000	222222	
27	KIMANI BEATRICE WANGUI	PIPELINE	CARWASH	0712222000	222222	
28	MARSHAL WANGUI KIMANI	PIPELINE	CARWASH	0712222000	222222	
29	LINET KIMANI	PIPELINE	CARWASH	0712222000	222222	

27	JAMES WAIJARI KIRIYI	MAMA	07153820	2231003	PIP	
28	Miriam Joseph Klerobuu	MAMA	071211187	1671860	PIP	
29	SAMUEL MUTIHA	CARWASH	070470450	2824942	PIP	
30	SILAS KOKA	KARUTING	0724816310	21219140	PIP	
31	PAUL KAMAY	CARWASH	0714322459	2892845	PIP	
32	JAMES MACHARIA	FURNACE	0728994520	23954792	PIP	
33	JAMES THOMAS NGIGE	CLOTHING	0716296448	23006535	PIP	
34	SAMUEL MUNSONI	GARDEN	0724736447	9980244	PIP	
35	JOHN OJARA	GARDEN		237036728	PIP	
36	JOSIAS MBURU WAINAINA	FURNACE	0719414393	28361888	PIP	
37	AMOS Ndungu	Mechanic	075602172	29197665	PIP	
38	Daniel Mburu	GARDEN	0717372156		PIP	
39	ERIC WAMBUI NTAHA	WELDING	0718164821	22541208	PIP	
40	MARION WAMBUI	MUSIC	0705226120		PIP	
41	Daniel Kioe	Garden	0720379159	0924380	PIP	
42	MURANI VIA	TOILET	0714236406	26582958	PIP	
43	VINCENT OMINDE	SHOP	0731521497	2340452	PIP	
44	ALEX MIRINDI	BLK	0726923902		PIP	
45	WILSON NTAHA	MUSIC	0796217531	2623163	PIP	

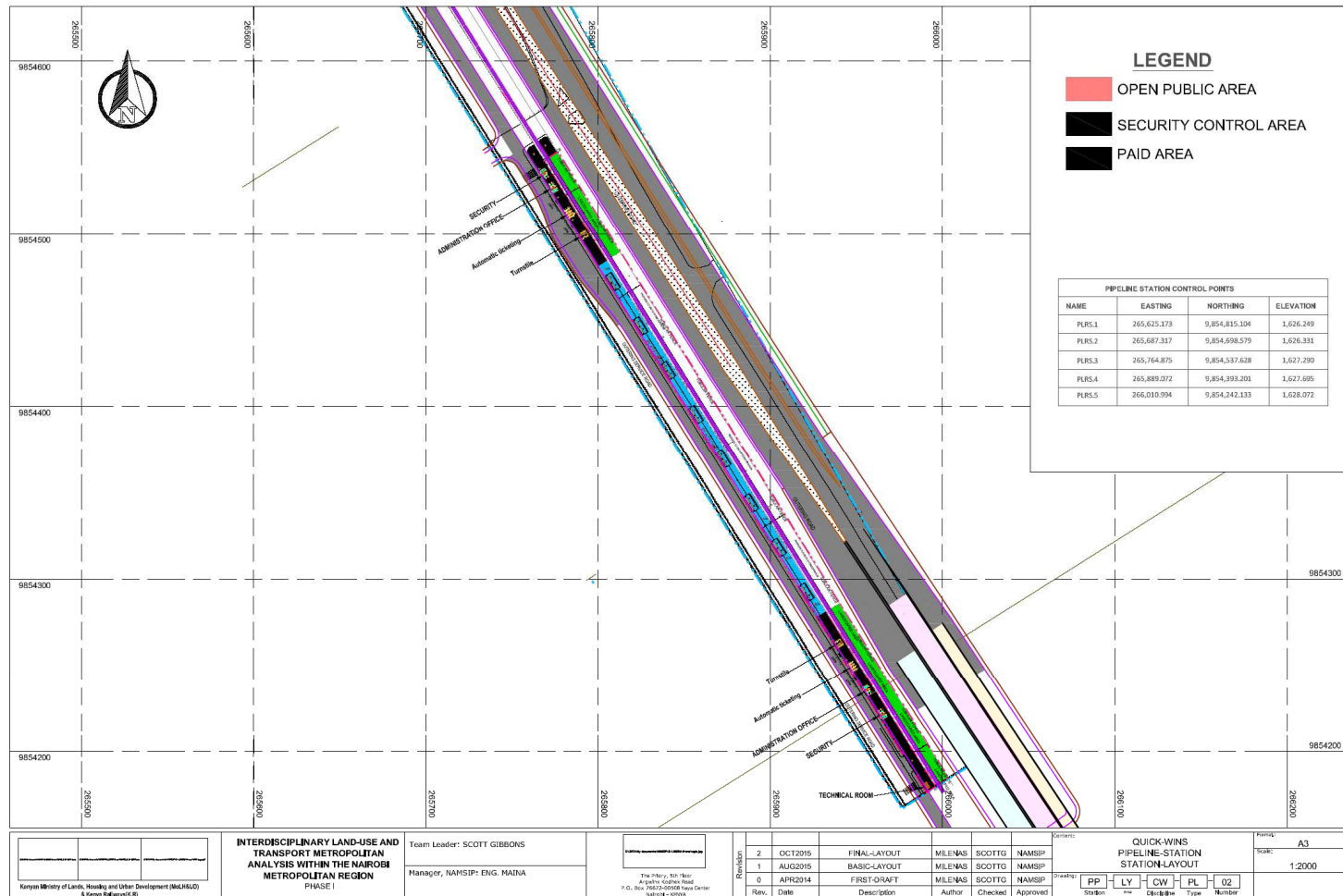
43	KITHENO BOTICH BBOF	072541467	PIPELINE	25957749	KAICHU	
44	TERESIA MUMBI NZALU	072591032	PIPELINE	12661372	MKS	
45	ALEX KATANA	0764122200	PIPELINE	180293598	MKS	
46	DEDAN WATHAK WAMBUI	0791418678	PIPELINE	2431858	MURANGA	
47	IBRAHIM CHEGE MWANGI	0721215910	II	23021550	II	
48	GABRIEL OCHIENG KONYANGO	0722944872	II	29379229	KISUMU	
49	JOSEPH KAMAU MWANGI	070820487	II	23858883	NAKURU	
50	JULUS YAYA MUTUKU	072894050	II	28324426	YATTA	
51	KENNEDY KITENGE	070836457	II	30404128	MVS	
52	MICHAEL KIOKO	0712636699	II	24985410	MKS	
	FELICITY KINYA	0723326592	II	2289984	II	
	HENRY MOYI	0724629240	II	21257236	KARASSET	
	PHOENI AMONGI	0796080366	II	07846640	KIAMBU	
	PHOENI ALONG ENOIEK		II			
	STANLEY NG'HOE KARUKI	0715235306	II	28584885	MELIMA	

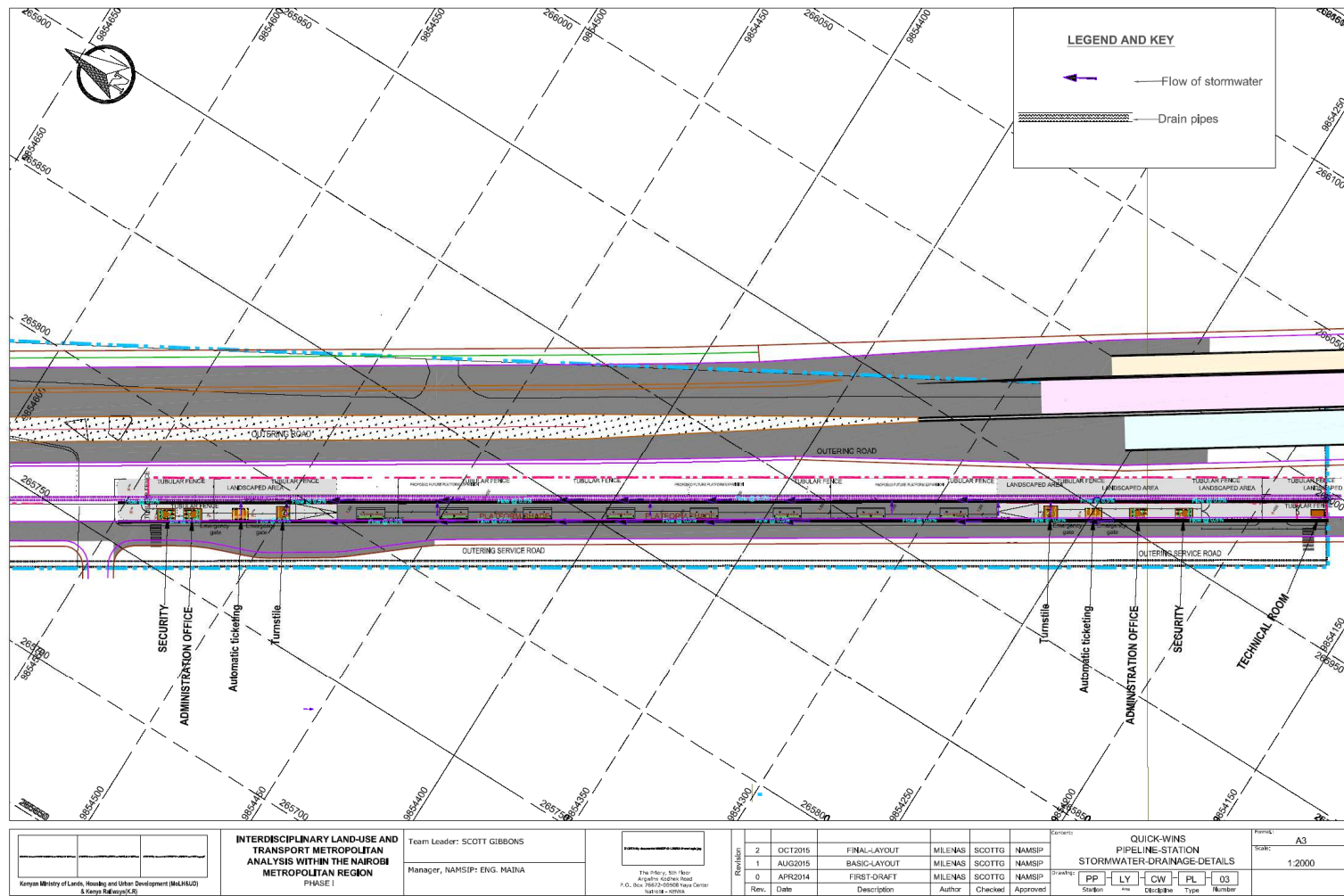
**Annex 4: Technical Designs & Approvals**



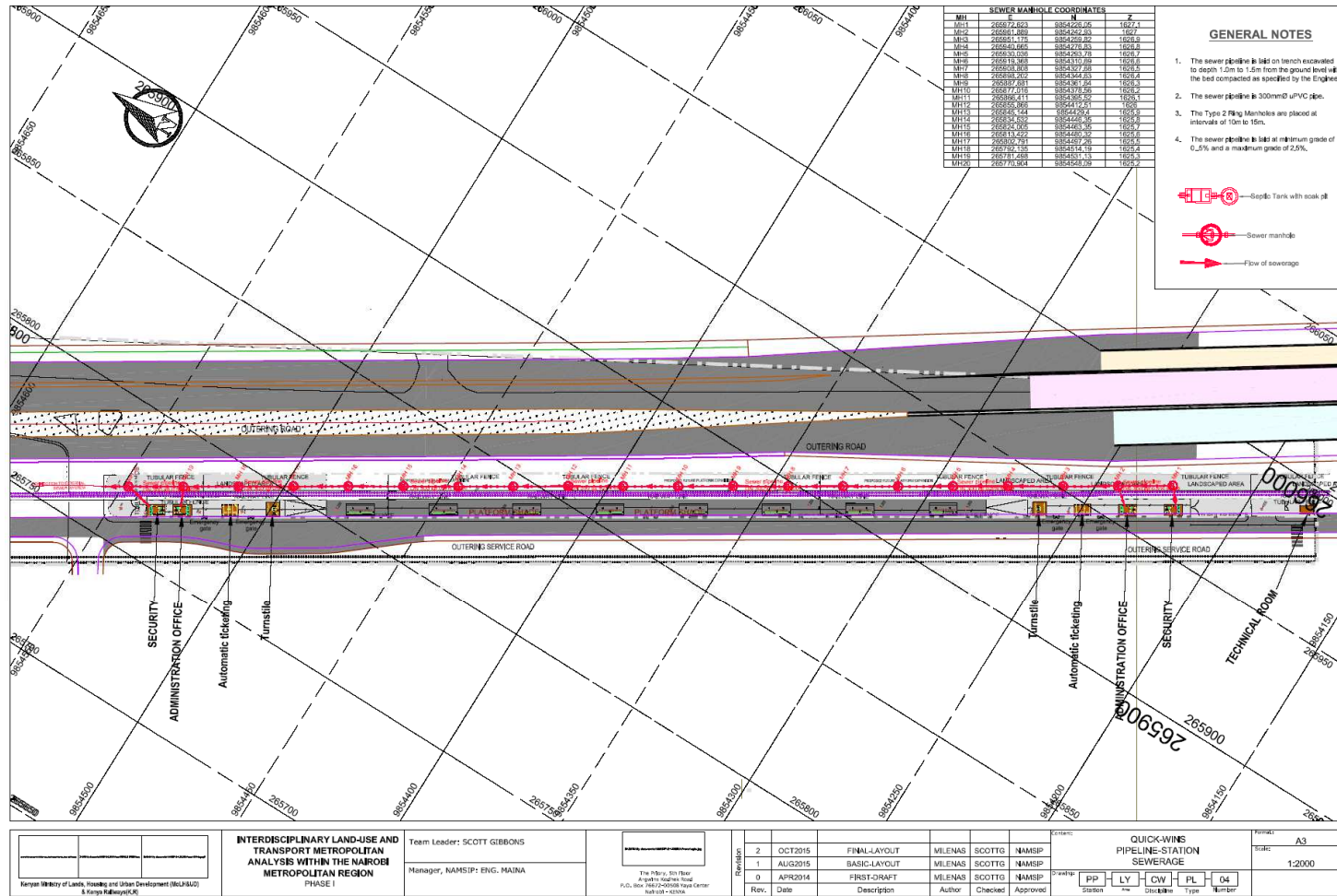


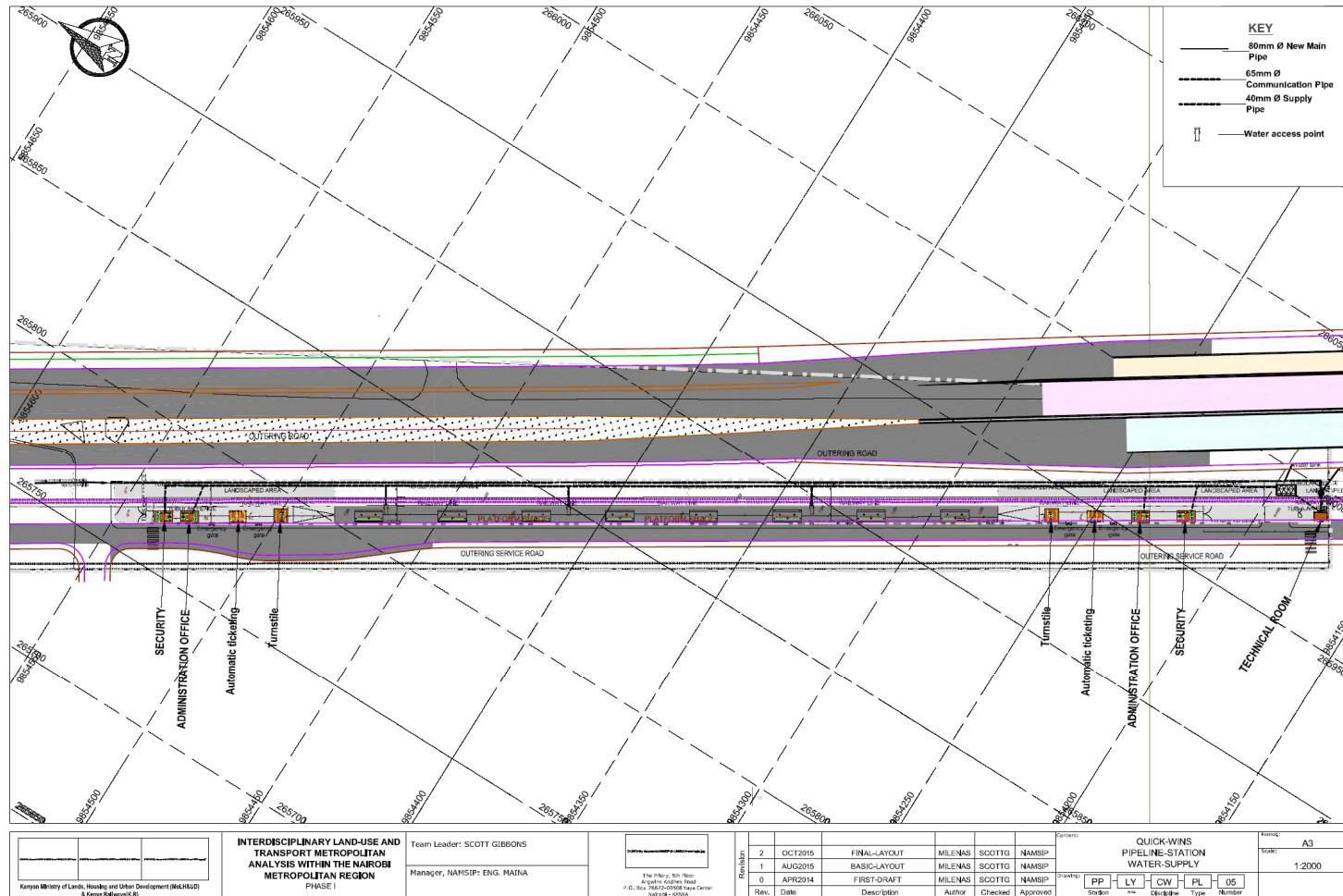
<p>Kenyan Ministry of Lands, Housing and Urban Development (MAMHUD) &amp; Kenya Railways (CR)</p>	<p><b>INTERDISCIPLINARY LAND-USE AND TRANSPORT METROPOLITAN ANALYSIS WITHIN THE NAIROBI METROPOLITAN REGION</b> PHASE I</p>	<p>Team Leader: SCOTT GIBBONS</p>	<p>The Kenya Railways Corporation P.O. Box 2622-00100, Ngara Road, Nairobi - KENYA</p>	<p>2 OCT2015 FINAL-LAYOUT MILENAS SCOTTG NAMSIP</p>	<p>QUICK-WINS PIPELINE-STATION LOCATION-MAP</p>	<p>FORMAL A3</p>
		<p>1 AUG2015 BASIC-LAYOUT MILENAS SCOTTG NAMSIP</p>		<p>SCALE: 1:5000</p>		
		<p>0 APR2014 FIRST-DRAFT MILENAS SCOTTG NAMSIP</p>		<p>PP LY CW PL 01</p>		
<p>Rev. Date Description Author Checked Approved</p>						





Drainage and sewerage design





### **Annex 5: Sample Chance Finds Procedures**

Developments that involve excavation, movement, or disturbance of soils have the potential to impact archaeological materials, if present. Activities such as railway construction, land clearing, and excavation are all examples of activities that may adversely affect archaeological deposits if encountered.

If the Contractor discovers archeological sites, historical sites, remains and objects during excavation or construction, the Contractor shall:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Ministry of State for National Heritage and Culture take over;
- Notify the supervisor, Project Environmental Officer and Project Engineer who in turn will notify the responsible local authorities and the Ministry of State for National Heritage and Culture immediately (within 24 hours or less);

Responsible local authorities and the Ministry of State for National Heritage and Culture would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the National Museums of Kenya. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.

Decisions on how to handle the find shall be taken by the responsible authorities and the Ministry of State for National Heritage and Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage.

Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.

Construction work may resume only after permission is given from the responsible local authorities or the Ministry of State for National Heritage and Culture concerning safeguard of the heritage.

**Annex 6: Grievance Redress Process**

Process	Description	Time frame	Other information
Identification of grievance	Face to face; phone; letter, e-mail; recorded during public/community interaction; others	1 Day	Email address; hotline number
Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book)	4-7 Days	Significance criteria: Level 1 –one off event; Level 2 – complaint is widespread or repeated; Level 3- any complaint (one off or repeated) that indicates breach of law or policy or the ESIA provisions
Grievance is acknowledged	Acknowledgement of grievance through appropriate medium	7-14 Days	
Development of response	Grievance assigned to appropriate party for resolution  Response development with input from management/ relevant stakeholders	4-7 Days  7-14 Days	
Response signed off	Redress action approved at appropriate levels	4-7 Days	Project staff at project proponent to sign off
Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant	10-14 Days	
Complaints Response	Redress action recorded in grievance log book  Confirm with complainant that grievance can be closed or determine what follow up is necessary	4-7 Days	
Close grievance	Record final sign off of grievance  If grievance cannot be closed, return to step 2 or refer to sector minister or recommend third-party arbitration or resort to court of law.	4-7 Days	Final sign off on by project proponent