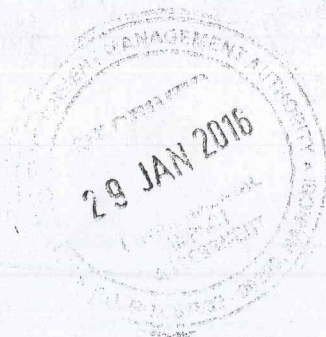


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1,050MW Coal Power Project Terms of Reference for Environment and Social Impact Assessment Study



Prepared for:

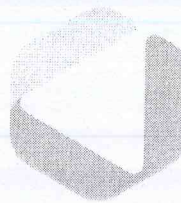
National Environment Management Authority

Approved
[Signature]
29/1/2016

Report No. KT/4085/TOR/RO
27 January 2016



Kurrent
TECHNOLOGIES
COMPLETE ENERGY SOLUTIONS



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1,050MW Coal Power Project Terms of Reference for Environment and Social Impact Assessment Study

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27 January 2016

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Approved by:

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NEMA Lead Expert – Registration: 0119

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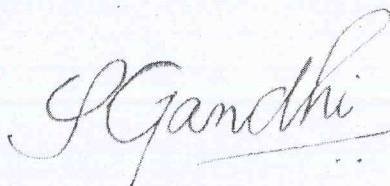
Declarations

Lead Expert

I, **Mr. Sanjay Gandhi** on behalf of **Kurrent Technologies Ltd.**, certify that the information provided herein is to the best of my knowledge true and correct.

Position: **Chief Operating Officer**

Signed:



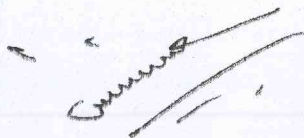
Date: 27 January 2016

Proponent

I, **Mr. Cyrus Kirima** on behalf of **Amu Power Company Limited**, certify that the information provided herein is to the best of my knowledge true and correct.

Position: **Chief Operating Officer**

Signed:



Date: 27 January 2016

Approval of the Terms of Reference by NEMA

I, _____ hereby certify that the information provided in this ESIA Study ToR will be sufficient for the determination of the Environmental and Social Impact Assessment (ESIA) of the proposed **1,050 MW Coal Power Project in Lamu County**.

Name

Position:

Signed:

Date:

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1 Introduction

Amu Power Company Ltd. (APCL) proposes to develop a 1,050MW coal fired power plant in the Kwasasi area of Hindi/Magogoni sub-county, Lamu County, Kenya. The plant will utilize Super-critical technology in the production of 1,050 MW of electricity. Produced power will be evacuated through a 400 kV KETRACO built transmission line terminating at Nairobi.

APCL (The Proponent) is a project development company made up of two sponsors namely Gulf Energy Limited (lead sponsor) and Centum Investment Company Ltd. (co-sponsor). Gulf Energy Limited is a leading oil marketing company in Kenya and also owns an 80MW medium speed diesel (MSD) power plant in Athi River, Kenya. Centum Investment Company Ltd. is a Nairobi Securities Exchange listed company whose investments span real estate, shopping malls, among other numerous investments.

The Proponent has appointed Kurrent Technologies Ltd (KTL) to undertake the Environmental and Social Impact Assessment (ESIA) and Environment Management Plan (EMP) for necessary environmental authorizations. KTL will prepare and submit an ESIA report to explain the environmental and social effects of the proposed project activities. The ESIA report will be prepared in accordance with the Environment Management and Coordination Act, 1999, AfDB and IFC Performance Standards on environment and social sustainability. The Proponent has also awarded the Engineering, Procurement and Construction (EPC) contract to design, build and operate the Lamu coal fired power plant to the Power Construction Corporation of China (POWERCHINA).

APCL submitted the Project Report for the proposed project to NEMA. Following NEMA's review of the submitted Project Report, the Authority gave a directive to undertake a full ESIA through the letter NEMA/PR/5/2/14779 dated 26th October 2015. Pursuant to the above, this Terms of Reference (ToRs) for the ESIA Study have been prepared for approval by NEMA. The aim is to identify, reduce or avoid negative impacts and promote positive impacts to the local communities and environment associated with the Project.

2 Project Overview

Given in this section is a description of the proposed coal fired power plant.

2.1 Project background

Electricity demand in Kenya is expected to increase especially with expanded economic activities in the counties. Such activities include mining, iron and steel smelting, irrigation of large tracts of land, etc. In order to provide affordable electricity for these and other activities, the Government of Kenya proposes to increase the generation capacity from 1664MW (in October 2013) to 6700MW (by October 2017). Through this plan, the Kenya Government intends to reduce the generation capacity cost from US cents 11.30 to US cents 7.41; indicative end-user tariffs are projected to reduce from US cents 14.14 to 9 for commercial/industrial customers and from US cents 19.78 to 10.45 for domestic customers.

This capacity of an additional 5000MW of power generation capacity will be developed by an energy mix comprising geothermal, coal, wind, solar, hydro sources. It is expected that this capacity will be generated by Independent Power Producers (IPPs) under the Public Private Partnership (PPP) framework.

In an effort to meet the growing National Power demand, the Government of Kenya (GOK) commissioned Amu Power Company Limited as the winning private sector bidder to build, own and operate the proposed coal fired power plant power plant for a stipulated 25 year-period. The proposed power plant will generate a gross electrical output of 1,050MW. The power plant is envisioned to utilize 68.5MW for its own use and will export a total of 981.5MW to the national grid via a 400kV overhead transmission line to be constructed by KETRACO.

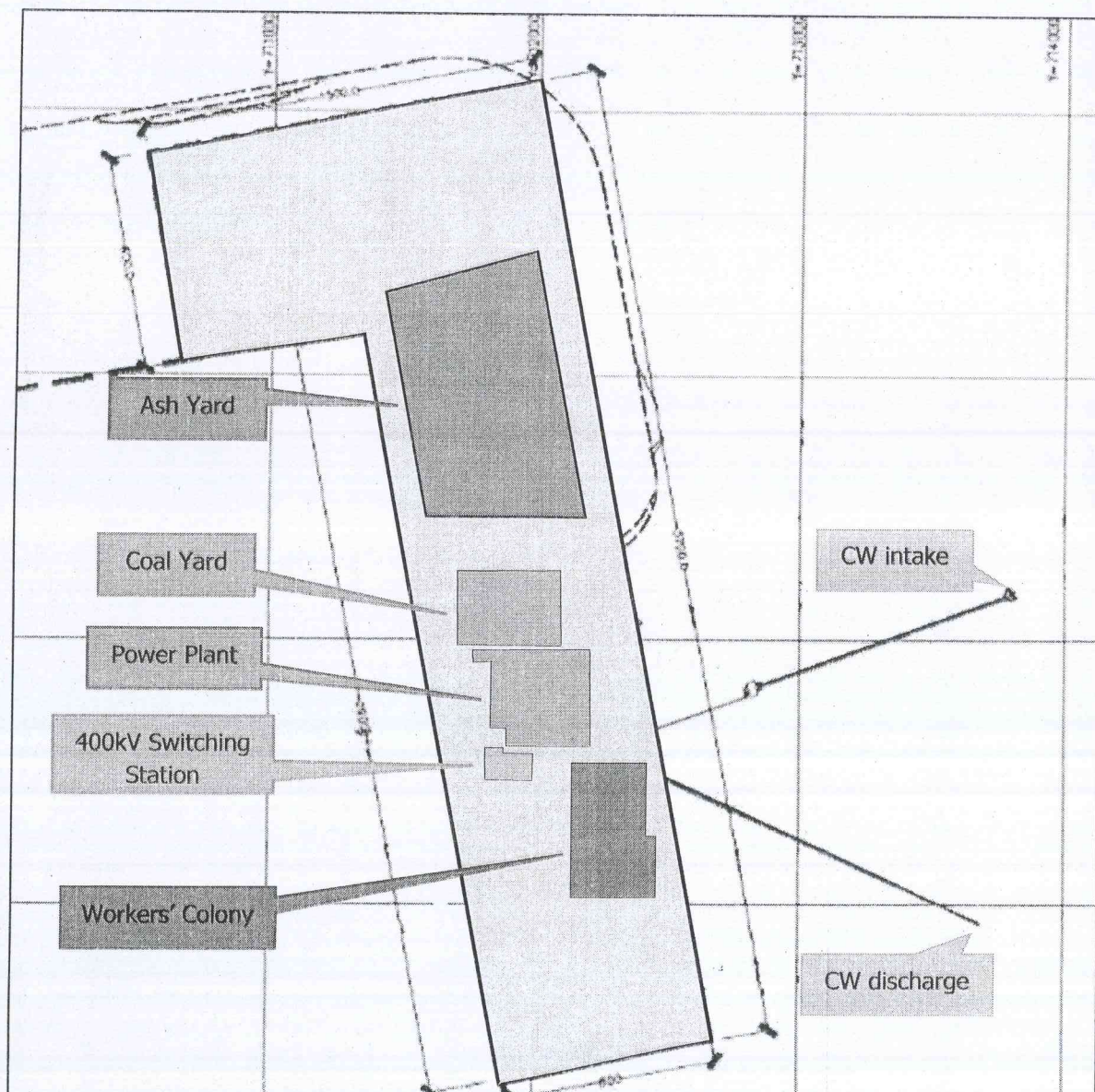
2.2 Project features

The project comprises the design, construction, commissioning, operation and decommissioning of a coal-fired power station and its associated infrastructure (also referred to as the balance of plant). The power station will comprise three boiler/turbine sets with a nominal electricity generation capacity of approximately 1,050MW (350 MW per unit). Apart from the power station buildings themselves, the ancillary infrastructure may include the following:

- Coal and sorbent stockyards;
- A black start facility;
- A coal-delivery conveyor belt;
- Ash, sorbent and gypsum conveyors;
- A High Voltage (HV) yard within the power station precinct;
- Water and wastewater treatment facilities;
- Ash and spent sorbent disposal systems and dump site;
- Gypsum storage facility;

- Access roads (temporary and permanent, and external and internal roads);
- Maintenance, medical, administration, services, control buildings;
- Water supply pipeline for construction phase;
- Borrow pits (on site and off site). These are yet to be identified by the Proponent;
- Communication mast/telecommunication facilities;
- General and hazardous storage and handling facilities (temporary and permanent);
- Batching plant (including concrete and asphalt);
- Construction worker accommodation and construction site offices; and
- A permanent colony for 250 – 300 operational phase workers.

Figure 2-1 : Preliminary layout of coal fired power plant



2.3 Project location

The location of the proposed coal power plant was determined by the Government of Kenya (through the Ministry of Energy and Petroleum) who are responsible for providing the land for constructing the power plant. Three alternative sites located within the Manda Bay area that can be used as the power plant site were identified. The important thing to note about coal power plants is that they need to be situated close to viable transport routes for supply of coal in bulk and secondly, require significant amounts of water for various purposes.

Option 3 (see Figure 2-2) is a location that is 394.9 Ha (975.4 acres) and is in the shape of an inverted "L". This site has been identified as the most ideal out of the three as it allows for future expansion of the power plant. The frontage of the site is about 3.7km long facing the Manda Bay and the depth is about 800m.

Of the three alternatives, the Government of Kenya through the Lamu Port South Sudan Ethiopia Transport Corridor Development Authority (Lapsset Corridor Development Authority or LCDA) has allocated 394.9 Ha of land to Amu Power for the construction of the 1,050MW coal power plant.

Figure 2-2: Image showing location of the proposed Coal Fired Power Plant



3 The ESIA Study

3.1 Overall objective

The proposed ESIA Study will independently assess the effects of the proposed project activities on the environmental and social settings locally, regionally and nationally. It will identify potential positive and adverse impacts of the proposed project activities, i.e. how they affect people, property and the environment. The ESIA will also identify appropriate measures to mitigate negative impacts, while maximizing the benefits of the positive ones, and will seek to reduce risks at all stages of the project, including planning, design, construction, operation, monitoring and evaluation as well as decommissioning. The proposed project will be undertaken in accordance with the legislative requirements in Kenya as well as international best practices.

This ESIA will be developed on the basis of available information and data out of which a study report will be prepared for submission to the NEMA for consideration. An appraisal of the current baseline status of the project area and the anticipated impacts, mitigation measures as well as development of an environmental and social management plan will be the main focus of the assignment.

The ESIA, in line with this ToR, will be based upon environmental, social and other baseline data, specific site characteristics and project technical specifications and mitigation measures as applicable to nature and magnitude of the proposed power plant. This ToR and subsequently the ESIA will be undertaken in line applicable Kenyan law on Health, Safety and Environmental management, African Development Bank (AfDB) Operational safeguards and International Finance Corporation (IFC) Environmental and Social (E&S) Performance Standards (PSS).

In addition to physical environmental assessment, the communities within the project area will be involved through interviews and consultation fora, which provide them with an opportunity to give their views and opinions as potentially affected persons. In this regard, members of the public and other stakeholders will be engaged for interviews and consultations.

The ultimate goal will be to identify the anticipated impacts resulting from the proposed project activities determined on the basis of the preliminary power plant design information provided by APCL and existing baseline conditions, and information obtained from the documents reviewed and a validation exercise during the scheduled field visits. As part of the ESIA, potential impacts that will be assessed include: effects of the proposed project on thermal effluent; air quality; noise quality; climate change and Green House Gas (GHG) emissions; surface and groundwater quality; terrestrial and marine ecology; socio-economic impacts; land use features; public safety; and, cultural heritage activities.

The ESIA will have the following key outputs:

- Detailed impact identification and assessment (including key specialists assessments);
- Development of detailed mitigation measures; and
- Development of the ESIA Study including an Environmental and Social Management Plan (ESMP), Stakeholder Engagement Plan (SEP) and Grievance Mechanism (GM).

3.2 Scope of the ESIA Study

The ESIA Study will include an assessment of the environmental and social impacts associated with the project infrastructure necessary for the development, operation, and future closure and decommissioning of the proposed power plant. In addition to the direct impacts of the proposed Project, the ESIA Study will assess cumulative impacts through the combination of project impacts and background concentrations and impacts from other economic activities within Lamu and the region. The ESIA Study will ensure that all potentially significant environmental and social impacts are taken into consideration that the public and particularly the directly affected communities have been properly consulted and mitigation measures and monitoring identified and agreed upon. The scope of the ESIA Study will encompass all activities that will be undertaken throughout the lifespan of the power plant which include:

- Site clearing, site preparation and mobilization;
- Establishment of contractor yard, laydown areas and access roads;
- Construction utilities;
- Security facilities;
- Construction of foundations and below grade utilities;
- Building and equipment installation;
- Start-up, commissioning and testing;
- Site cleanup and project closeout;
- Water supply system construction;
- Waste management; and
- Stakeholder engagement.

3.3 ESIA Study approach

The general study approach will be to establish the relationships between the project, the natural ecosystems and the social setting. The study will identify environmental, social and economic areas of concern and related linkages so that any required mitigation can be integrated into the implementation of the project from the planning to eventually longer term use in future phases of the project.

The ESIA approach will focus on: Identification of potential impacts; identification and impact modeling for potential emissions in line with international accepted standards to be used in estimating the magnitude of environmental effects; development of mitigation measures to be considered in the design of the project and environmental and social monitoring; stakeholder engagement and communication to inform the stakeholders through public consultations about the scope and preparation of the ESIA, the results of the scoping study, including identification of the main stakeholders and their concerns.

Among the broad focal areas to be addressed, the ESIA Study will include due consideration of the following topics:

- Natural Resources;
- Physical Environment;
- Biodiversity and Conservation aspects;

- Socio-economic issues;
- Cultural and archaeological issues;
- Safety and Health aspects; and
- Administrative and Institutional arrangements.

The ESIA Study will adopt an integrated approach in which data and information evaluation, field investigations, specialists' studies, consultations, interviews and discussions with stakeholders and affected parties will be undertaken concurrently.

Identification of the anticipated impacts will be determined on the basis of the established baseline conditions and information obtained from the documents reviewed and supported by fieldwork and observations. The project will be assessed in its capacity to potentially affect the physical environment and social patterns. Given in the next sub-section, is a summarized general approach to the process.

3.4 ESIA Specialist studies

The proposed 1,050 MW coal fired power plant is the first of its nature and magnitude in Kenya as well as in the region. For this reason, there is minimal existing local context data on parameters related to the proposed project. For these reasons, the commissioned ESIA team considered it necessary to undertake various specialist studies. The range of specialist studies has been informed by the issues identified in the project scoping phase and Environment Project Report (EPR) Study. The results from the specialist studies will be utilized to identify describe and assess the potential impacts of the proposed project. The specialist studies are outlined below.

3.4.1 Thermal Plume Modeling

The proposed coal fired power plant will utilize a once-through seawater cooling system for the condensers associated with the power plant. The thermal effluent will be returned into the Manda Bay where the sweater for cooling will be abstracted from. The temperature differential between the ambient seawater and at the discharge outlet will be about 9°C. The World Bank Group General Environment Health and Safety (EHS) Guidelines state that the thermal discharge water temperature should not exceed ambient water quality standards by 3°C at the edge of a scientifically established mixing zone. Additionally, the Kenyan Environment Management and Coordination (Water Quality) Regulations, 2006 state that effluent discharged into the environment should not exceed 3°C but fails to explain where this is measured at.

Subsequently, a thermal effluent modeling study will be undertaken to establish the near-field and far-field mixing behavior of the thermal effluent to be discharged from the seawater cooling system. It is intended that the modeling will be undertaken using the US Environmental Protection Agency (EPA) endorsed CORMIX modeling for the near-field screening of the circulating water discharge location. Additionally, it is intended to use PLUME 3D modeling software for the far-field modeling of the thermal plume arising from the seawater cooling system. The objective of the thermal plume modeling study is to identify possible locations for the circulating water outlet location in Manda Bay which will meet the World Bank Group criteria on temperature differential in a scientifically established mixing zone.

3.4.2 Atmospheric Dispersion Modeling

During the operational phase, the proposed coal fired power plant will generate air emissions from the burning of coal from each of the three boilers. The proposed project will also generate air emissions from diesel operated plant and equipment during the construction phase of the project.

During the construction phase, it is envisaged that the most significant components of such emissions from an environmental perspective, will be combustion (exhaust) gases and particulate matter (dust) associated with site clearance and the operation of construction plant and equipment. During the operational phase, the key emission sources are expected to consist of emissions from the burning of coal in the boilers, materials handling and storage (including coal storage and ash yard), and traffic-related dust.

In order to quantify the ambient air quality impacts associated with the project, an Atmospheric Air Dispersion Modeling study will be undertaken. The Atmospheric Dispersion Modeling study will consider all possible pollutant emissions associated with the power plant including: boiler emissions and fugitive dust from coal handling and ash disposal activities. The specialists will undertake Air Dispersion modeling utilizing internationally recognized regulatory dispersion models on the atmospheric emissions associated with the Project such as the US EPA endorsed AERMOD and CALPUFF models. The assessment will aim to: identify the fallout areas and ground level concentrations of priority pollutants, undertake a review of relevant Kenyan and international ambient air quality legislation and provide a summary of the minimum standards that will need to be achieved in ambient air; and to quantify and assess the potential construction and operational impacts of the Lamu Power Station with regards to ambient air quality.

Based on the results of the air quality study, mitigation measures and a monitoring plan will be recommended for the construction and operational phases of the project respectively.

3.4.3 Noise Quality Study

The Noise Quality Study will be undertaken in order to identify, categorize and analyze noise associated with the proposed Project and the resulting impacts to the project environment. All sensitive receptor points, with regards to the proposed project will be identified and mapped. The study will evaluate the potential impact of the project activities on the local noise climate from construction noise associated with the Project, normal power plant operating conditions and, emergency operating conditions associated with the Project.

During the construction phase of the project, noise emissions will be estimated using British Standards Institute (BSi), 2008, 'BS5228 – Noise and Vibration Control on Construction and Open Sites'. This standard provides a noise calculation method, practical information on noise reduction measures, and promotes 'Best Practice Means' approach to control noise emissions during construction.

For the operational phase of the project, the specialist study will undertake noise and potential impacts modeling using the internationally recognized SoundPLAN Version 7.3 and compare the results against International Finance Corporation (IFC) General Environmental Health and Safety (EHS) Guidelines.

Based on the results of the noise quality study, the ESIA will recommend mitigation measures and a monitoring plan for the construction and operational phases of the project.

3.4.4 Climate Risk Assessment and GHG assessment

A Climate Risk Assessment (CRA) and Greenhouse Gas emission (GHG) assessment will be undertaken for the proposed coal fired power plant project. The objectives of undertaking the study are:

- Undertake a high level assessment of the physical risks facing the development, such as high temperatures, floods, strong winds, monsoons etc., and identify adaptation measures that could reduce the risk or take advantage of opportunities; and
- Estimate the operational carbon footprint of the proposed 1,050MW Coal Fired Power Plant, Lamu County, identify high level opportunities for minimising the carbon footprint, and understand exposure to applicable regulation.

The objectives of the CRA are to:

- Identify the principle climate-related risks to the Lamu Coal Fired Power Plant across the timescale of the project;
- Prioritize the principal climate related risks; and
- Identify potential mitigation measures that could reduce risk or take advantage of opportunities (i.e. climate change adaptation).

The Greenhouse Gas (GHG) emission assessment will be undertaken to determine the gas emissions caused directly and indirectly by the project in the operational phase. The Amu Power Company carbon footprint will be estimated in accordance with the *GHG Protocol: Corporate Accounting & Reporting Standard* developed by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI).

3.4.5 Ecological Impact Assessment Study

Lamu County is endowed with rich biodiversity including possible presence of species listed in the International Union for Conservation on Nature (IUCN) red list. The ESIA Study will assess the baseline marine and terrestrial ecological environment within the proposed project site and its environs as well as identify, analyze and develop appropriate mitigation measures to potential impacts associated with the proposed project. Towards this end, an Ecological Impact Assessment will also be undertaken.

The study will include: a desktop review of available secondary information; identification and investigation of biodiversity habitats; Determination of the current key biodiversity population with specific emphasis on threatened biodiversity, key indicator receptor species and species prone to the development of the coal power plant so that there is a baseline against which impacts can be identified and measured; documentation on faunal species listed in the Red Data Book(s) as Critically Endangered, Endangered, Vulnerable, or Near-Threatened occur at the site; identification of sites of importance, such as roosting and nesting sites and key micro-habitats within the proposed project site; assessing presence of wildlife migratory routes and stopovers; and finally perform an impact analysis and description of mitigation and management measures as necessary.

3.4.6 Geology and Soils Study

The Geology and soils study will outline the baseline soil and geological environment, the sensitivity of this baseline environment in relation to the proposed project and the potential impacts that may emanate due to it. Appropriate measures are recommended in order to ensure that the potential adverse impacts of the proposed project on geology and soil environment are mitigated throughout the project cycle.

Specifically, the study will; identify the types of soils and geological environment that exists in the project area; assess the sensitivity of the soils and geological environment with respect to the proposed coal power development; identify existence of geological features which could affect the project location; identify any potential impacts on the soils and geological environment associated with the proposed development; and to propose appropriate mitigation measures As necessary.

3.4.7 Hydrology study

The hydrology study will assess the sensitivity of the baseline hydrological environment and identify the potential impacts of the proposed project as well as propose mitigation and management measures. The study will include desk top analysis of available hydrological information for the proposed project site as well as site surveys and topographical analysis.

3.4.8 Hydrogeology study

This specialist study will outline the baseline hydrogeological environment, the sensitivity of the proposed project site environment in relation to the proposed project and the potential impacts that may emanate due to the development of the coal power project. It will also highlight mitigation measures to ensure that the potential adverse impacts of the proposed project on the environment are mitigated.

The study will aim to: identify the types of hydrogeological environment that exists in the project area; assess the sensitivity of the hydrogeological environment in the subject area with respect to the proposed coal fired power development; identify existence of hydrogeological features which could affect the proposed project location; identify any potential impacts on the hydrogeological environment associated with the proposed development; identify any constraints posed by the existing hydrogeological environment to the proposed development; and to propose appropriate mitigation measures in order to ensure that the potential impact of the proposed coal power development is slight and neutral.

3.4.9 Visual Impact Assessment Study

In general, Lamu County is an important tourism location with notable scenic and cultural significance. Given the relatively preserved nature of landscape, and taking into consideration the magnitude of the construction with emphasis on the proposed 210 meter high chimney, it is considered imperative to undertake a Visual Impact Assessment study.

The study will assess the potential visual impacts of the proposed coal fired power plant on the existing landscape and values of the area. Specifically, the study will involve: site inspection to identify the view-shed for the planned activities and potentially sensitive viewing locations within the vicinity; characterization of the existing visual landscape in terms of topography, existing land use and vegetation; assessment of the potential visual impacts of the planned activities on sensitive receptors; and development of mitigation and management measures as necessary.

3.4.10 Cultural Heritage Impact Assessment study

Lamu Old Town which is the administrative capital of Lamu County is recorded as the oldest and best preserved example of Swahili settlement in East Africa. In 2001, Lamu Town was named a UNESCO World Heritage Site because it has retained its traditional functions and culture to this day, and is also a focal point for Swahili language, culture and arts.

Given the high cultural heritage value of Lamu, a Cultural Heritage Impact Assessment study (CHIA) will be undertaken to establish potential archaeological and cultural heritage impacts within the development area and the resulting cumulative effects to the Lamu World Heritage Site, and to review the probability and extent of the perceived impacts with a view to suggesting mitigation measures.

The CHIA specialist will employ the following methodology for the study: desktop study to review secondary literature such as databases and maps, scientific publications and unpublished reports relating to paleontological, archaeological and cultural heritage work undertaken on the Island; a physical site survey to record heritage that has not previously been recorded, to establish its integrity and state of conservation. Interviews were also conducted with various communities to collect data on tangible and intangible heritage.

3.4.11 Waste management

The proposed coal fired power plant will generate a variety of wastes during the construction and operational phase of the project. The ESIA Study will evaluate the potential impacts arising from the various wastes especially the Coal Combustion Products (CCPs) such as bottom ash, fly ash and gypsum. Additionally, the ESIA Study will try to estimate the quantities of wastes that will be generated by the project during the construction and operational phases.

Lamu County lacks waste management infrastructure. Therefore the ESIA Study will endeavor to recommend waste prevention measures as the first priority to reduce the amount of wastes to be generated. Additionally, the ESIA Study will recommend the development of an integrated waste management plan for various types of wastes that could potentially be generated during the construction and operational phases of the project respectively.

3.4.12 Social Impact Assessment study

A comprehensive Social Impact Assessment study will be undertaken. This will focus in providing a detailed description of the baseline socio-economic environment of the proposed project site and its environs, identifying valued socio-economic aspects that may be affected by the proposed project as well as identifying, describing and analyzing potential adverse or beneficial impacts associated with the proposed project along with the appropriate mitigation measures.

The social impact assessment will also involve stakeholder identification and analysis, stakeholder engagement process, public consultation and disclosure of project related information. A Stakeholder engagement Plan (SEP) and Project Grievance Mechanism (GM) will also be developed to address all the phases of the project.

3.4.13 Resettlement Action Plan

The land acquisition and associated re-settlement arrangements are the onus of the Government of Kenya (GOK), which has commissioned APCL to build, own, and operate the power plant for a period of 25 years. APCL expects to lease the required project site land from the Government of Kenya through the Lamu Port South Sudan Ethiopia Transport Corridor Development Authority (Lapsset Corridor Development Authority or LCDA). The resettlement and compensation of Project Affected Persons (PAPs) is under the Government's mandate. The Government of Kenya, through the Ministry of Energy and the Lamu Port South Sudan Ethiopia Transport Corridor Development Authority (Lapsset Corridor Development Authority or LCDA) will prepare and endorsed a Resettlement Action Plan (RAP) for the proposed project site.

The RAP should accurately identify the lands required for the project. Additionally, the numbers, locations, and socio-economic conditions of the affected people should be fully documented to meet acceptable international standards for resettlement and/or compensation. Such standards include AfDB's Operational safeguard 2 (OS2) on Involuntary Resettlement, Land Acquisition, Population Displacement and Compensation and the AfDB Involuntary Resettlement Policy (2003), requirements of World Bank Policy OP 4.12, IFC performance Standard 5 and applicable Kenyan law in compliance with the Kenya Constitution 2010 and the National Land Act (2012), specifically Chapter 280 part VIII, which covers matters on compulsory acquisition of interests in land.

3.4.14 Occupational safety and health

The proposed project will be a large construction site with over 3,500 workers during the peak construction phase of the project. The ESIA Study will endeavor to characterize the potential Safety and Health (S&H) aspects and impacts that could arise during the construction and operational phases of the project.

Based on the potential S&H impacts, the ESIA Study will recommend appropriate mitigation measures for prevention of S&H aspects and impacts associated with the construction and operation of the proposed power plant. Among mitigation measures, the EPC Contractor will be required to develop and implement a documented S&H management system in alignment with the requirements of ISO 31000 – Risk Management and OHSAS 18001 specification.

3.5 ESIA activities

3.5.1 Task 1: Document review

The first task with respect to the Environmental and Social (E&S) assessment will be to review secondary literature about the project area and Lamu County in general. KTL will review relevant documents to obtain general information for the proposed coal power plant. This documentary review will provide further understanding of the national and local micro-environmental conditions; demographic trends; land use practices; and the policy and legal framework within which the project will be executed.

This will include deskwork in order to provide a detailed description of the project location with respect to spatial coverage, implementation layout, magnitude of operations, implementation schedules as well as human resources required.

3.5.2 Task 2: Review of applicable legislative framework

KTL will review the applicable environmental legislative and regulatory framework which the proposed project will be required to comply with during its lifetime.

In addition to the corporate environmental and social policies developed throughout the lifetime of the project, KTL will also outline the compliance of APCL to the following:

- Environmental and social legislation in Kenya (existing and emerging);
- African Development Bank policies on coal power plants and environmental and social safeguards;
- Environmental and Social Performance Standards of the World Bank Group and specifically the International Finance Corporation (IFC); and
- International conventions and treaties associated with the proposed coal power plant project.

3.5.3 Task 3: Preparation of EPR Study

The ESIA team will conduct a site survey within the project site and its environs in order to understand the existing environmental and social setting. Based on the site visit, secondary literature review including the applicable regulatory framework, the ESIA team will scope the environmental and social issues that need to be studied in the detailed environmental and social assessment phase.

The ESIA team will further determine the scope of baseline studies that need to be carried out in the project area and its environs to be able to predict the potential environmental and social impacts associated with the proposed coal fired power plant.

The output of this task will be the generation of an Environment Project Report (EPR) Study which will be submitted to NEMA for consideration.

3.5.4 Task 4: Characterization of Baseline Information

As part of the baseline data collection and studies, KTL will assemble, evaluate and present data on relevant environmental characteristics around the Amu Power. The specific task on each aspects is discussed below.

3.5.4.1 Air Quality

A specialist air quality study will be undertaken for the proposed coal fired power plant. A baseline ambient air quality survey will be undertaken in the project area and its surroundings. Samples of air will be collected and analyzed for priority pollutants such as Nitrous Oxides, Sulfur Oxides and Particulate Matter. Passive diffusion tubes for Sulfur Oxide and Nitrous Oxide will be mounted at several locations over a radius of about 20 km from the center of the project site and left there for at least 30 days. The locations where the tubes will be mounted will include sensitive receptors that can be identified using satellite imagery such as schools, hospitals, homes, places of worship, etc.

3.5.4.2 Noise Quality

A specialist noise quality study will be undertaken for the proposed coal fired power plant. A baseline noise level survey will be undertaken within the project area and over a radius of 5km from the project site. The baseline noise survey locations will be determined based on satellite imagery showing sensitive receptors such as homes, schools, places of worship, medical centers, etc. At some locations within the project site, 24-hour baseline noise measurements will be undertaken and used in the noise modeling study.

3.5.4.3 Soils, Geology, Hydrology and Hydrogeology

KTL will engage a registered geologist to undertake a baseline survey of the soils and geology of the project area. Among other things, the geologist will:

- Survey the general topography, soil types and exposed geology and drainage pattern of the project area;
- Observe significant features such as shallow water wells, groundwater wells, faults, etc;
- Identify the existing terrain and soil resources of the project area ;
- Dig up trial pits of 1.5m by 1.5m by 1.5m to establish soil horizon within the project area;
- Undertake Vertical Electrical Soundings (VES) over the project area for investigation of a geological medium;
- Provide a topographic map of the Study Areas and describe topographic patterns;
- Characterize the distribution and properties of bedrock; and
- Characterize soil properties of the representative soils types in the proposed Project Area with respect to baseline soil properties required to assess potential environmental impacts.

On hydrology and hydrogeology, KTL will describe pre-development water quality and sediment quality conditions of surface water bodies that will be influenced by the proposed project or have the potential of being influenced by some or all aspects of the proposed Project. The specialist will consider water bodies that may be within the power plant site and its close proximity that receive effluent discharges and selected water bodies which may be affected by atmospheric contaminant loading such as the Manda Bay.

For these water bodies the specialist will summarize baseline data for water, sediments and aquatic biota considering:

- Relevant water quality parameters including, but not limited to, temperature, pH, dissolved oxygen, major ions, metals (including selenium and mercury), trace organic compounds, suspended solids and nutrients;
- Relevant sediment quality parameters;
- Determine if and describe how, the existing water quality and sediment quality may be affected by various aspects of the proposed Project.

3.5.4.4 Terrestrial and Marine Ecological baseline

A specialist Ecological Impact Assessment (EcIA) Study will be undertaken for the proposed coal fired power plant. In general, the terrestrial and marine ecology assessment will be undertaken in accordance with the "Guidelines for Ecological Impact Assessment in the United Kingdom 2006", taking cognizance of "International Finance Corporation's Guidance Note 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources". Specifically, the Ecological Impact Assessment (EcIA) will include (i) a secondary literature review of available biodiversity information from the National Museum of Kenya libraries, other available documents on biodiversity available for Lamu County, available project design information and sub-specialists individual knowledge about the project area, (ii) field visit to collect and quantify where practical various terrestrial and marine biodiversity taxa found within the project site and its surroundings, and (iii) analysis of samples collected from the field visit.

3.5.4.5 Cultural heritage

A specialist Cultural Heritage Impact Assessment (CHIA) Study will be undertaken for the proposed coal fired power plant. Lamu stone town which is an area of about 16 hectares on Lamu Island was inscribed into the World Heritage Site in 2001 for its tangible and intangible heritage. This makes cultural heritage an important aspect for the ESIA Study. The proposed project site is located about 26km due north by road from Mokowe while Lamu town is located about 7km south-east of Mokowe.

As part of the ESIA Study, cultural heritage is an issue that was scoped and found to be important given that the project is in Lamu County which has a rich cultural heritage. Subsequently, cultural heritage specialists will be engaged to undertake a reconnaissance of the project area and its environs in order to establish if there are any areas of archaeological and cultural heritage importance. It is a known fact that limited secondary information on archaeology and cultural heritage exists about the area where the coal fired power plant is to be located and consequently, any new information gathered will be part of the repository of information held by the National Museums of Kenya.

It is understood that the UNESCO commissioned a CHIA Study associated with the construction of the first three berths of the LAPSET project. This study will be important in understanding the potential cultural heritage issues that could emanate from the coal fired power plant.

Subsequently, the cultural heritage specialists will work with the local communities living in and around the project site to identify potential sites of cultural heritage importance. The cultural heritage specialists will map any sites of cultural heritage importance including identification of any shrines, graves, etc. within the project site that could be of significant importance.

3.5.4.6 Socio-economic baseline

KTL will characterize the socio-economic baseline conditions found within the project area and its environs by characterizing the demographics, population by age group, health facilities, schools, public health and sanitation, etc.

A stakeholder identification and analysis will be conducted to identify the power and influence of various types of stakeholders on the outcome of the project.

Socio-economic baseline information will be gathered through a combination of (i) secondary literature review of publicly available information, (ii) National and County Government databases on social information about the project area, (iii) stakeholder consultation meetings including Key Informant Interviews, Focus Group Discussions, One-on-One meetings and Public Meetings held in and around the project site, (iv) identification of vulnerable groups, etc.

3.5.5 Task 5: Analysis of alternatives

The ESIA will describe alternatives evaluated in the course of developing the proposed project. The concept of alternatives will extend to siting, design and technology selection. Comparison of alternatives in terms of potential environmental impacts, their suitability under local conditions and instructional, training, and monitoring requirements will also be qualitatively undertaken.

The ESIA will include the "No-go" alternative in order to demonstrate the environmental and social conditions without the proposed project.

3.5.6 Task 6: Stakeholders consultation

Stakeholder consultation meetings will be organized throughout the ESIA process in and around the project area to capture the views of the parties affected. The stakeholder consultations and public participation will be planned to obtain the opinions and views of stakeholders and communities living in the vicinity of the Power Plant, and including any perceived associated impacts by the local communities.

In order to establish and maintain a constructive relationship with a variety of external stakeholders from the onset to the decommissioning of the project, KTL will continue with public consultation (started during scoping phase) and disclosure for the proposed project. Stakeholders' engagement during ESIA will include:

- Stakeholder analysis and planning;
- Disclosure and dissemination of information;
- Public consultation and participation;
- Identification of and consultation with vulnerable stakeholder groups;
- Grievance mechanism and ongoing reporting to Affected Communities; and Development of stakeholder engagement plan for the project.

3.5.7 Task 7: Field assessment

Physical validation of the project area will be carried out with specific focus on land-use patterns; biodiversity; natural resources; rainfall patterns, depth and intensity, wind and other climatic variations; hydrology; and drainage patterns; and potential impacts.

The field validation exercise will also include an evaluation of the current environmental status with respect to physical, biological and socio-cultural perspectives. It will be a systematic field inspection backed up with available documentation and direct interviews.

3.5.8 Task 8: Environmental and Social Impacts Analysis

Anticipated impacts that may emanate from the construction and operation of the proposed coal fired power plant will be analyzed against secondary literature review, the baseline conditions established during the information review and field validation exercise and each specialist's technical knowledge. Effects of the project on the environment and social wellbeing will be evaluated against issues such as environmental pollution, health and safety, cultural integration and overview of benefits to the local residents, the Lamu County and the country.

3.5.8.1 Thermal plume modeling

The proposed coal fired power plant will utilize once through cooling seawater to cool and condense the steam for return to the boiler. The heated and sometimes briny cooling water will be discharged into Manda Bay, and will not immediately disperse in the cooler receiving waters. The resulting plume will be subject to water quality standards promulgated under the Environment Management and Coordination (Water Quality) Regulations, 2006 and regulated through an Effluent Discharge License (EDL) issued by NEMA. An area extending from the end of the discharge pipe where the discharge can legally cause water quality standards to be exceeded is called the mixing zone.

Subsequently, thermal plume modeling will be carried out using the US EPA endorsed methods commonly known as CORMIX and PLUME 3D. Thermal plume modeling can be used to determine how the discharge will dissipate in the receiving water under varying ambient conditions and different outlet configurations.

The thermal plume modeling will aid in plant design specifically the siting of the circulating water discharge outlet and design of the diffuser system, and provide solid evidence to regulators in support of discharge limits. KTL specialists will model discharge plumes using the CORMIX (Cornell Mixing Zone Expert System) hydrodynamic mixing zone computer simulation. Developed for the U.S. Environmental Protection Agency, CORMIX emphasizes predicting the geometry and dilution characteristics of pollutant plumes to assess regulatory compliance. Information required for CORMIX will include bathymetry, flow or tidal regimens; water quality of the receiving water in the vicinity of the discharge, geometry of the discharge structure and the quantity and quality of the discharge.

3.5.8.2 Impacts on Air Quality

The results of the ambient air quality survey will be fed into an air dispersion model that will be used to calculate the ground level concentration of priority pollutants generated during the construction and operational phase activities. KTL will engage an air quality specialist to conduct air dispersion modelling (ADM) using United States Environmental Protection Agency (US EPA) endorsed models including AERMOD and CALPUFF. The air dispersion modeling will identify fall out areas and ground level concentrations of priority pollutants such as sulfur oxides, nitrous oxides and particulate matter.

The results of the air dispersion modeling study will be compared to Kenyan and International air quality limits and used to recommend mitigation measures and a monitoring plan for ambient air quality during the construction and operational phases of the project respectively.

3.5.8.3 Noise Impacts

The results of the baseline noise level survey will be fed into a numerical model for predicting the operational phase noise levels to be generated by the proposed coal fired power plant. KTL will engage a noise specialist company to undertake the acoustic modeling using the internationally accepted SoundPLAN Version 7.3 software. For construction phase noise prediction, KTL's noise specialist will use BS 5228 - Noise and Vibration Control on Construction and Open Sites.

The results of the modeled construction and operational phase noise levels will be compared to the occupational and environmental noise limits set under Kenyan legislation and international guidelines. Mitigation measures and a monitoring plan for noise will be generated if the predicted noise levels in the construction and operational phases exceed those set either under Kenyan legislation or international guidelines.

3.5.8.4 Climate change and Greenhouse Gas assessment

Given that the proposed development is a coal fired power plant, it is important to evaluate the impacts of climate change on it and undertake a Scope 1 Greenhouse Gas (GHG) emissions assessment of the project during the operational phase.

Subsequently, KTL will engage a specialist to undertake this work and produce a report which will be discussed in the ESIA Study for the project.

3.5.8.5 Terrestrial and Marine Ecological impacts

The assessment of terrestrial and marine ecological impacts for the proposed project will be done using the International Finance Corporation's guidance note 6 on Biodiversity Conservation and Sustainable Management of living Natural Resources. Specifically, paragraph 7 requires that the risks and impacts identification process consider direct and indirect project-related impacts on biodiversity and ecosystem services, and identify any significant residual impacts. The process is expected to consider relevant threats to biodiversity and ecosystem services focusing on habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading and pollution. Additionally, the process is expected to take into account the differing values attached to biodiversity and ecosystem services by Affected Communities and other stakeholders.

The mitigation measures will seek avoidance of impacts on biodiversity and ecosystem services. Measures to minimize impacts and restore biodiversity and ecosystem services will be recommended where avoidance of impacts is not possible. The client is expected to take cognizance of the fact that predicting impacts on biodiversity and ecosystem services is a complex process. Therefore, the client should adopt a practice of adaptive management in which the implementation of mitigation and management measures are responsive to changing conditions and the results of monitoring throughout the project's lifecycle.

3.5.8.6 Soils, Geology, Hydrology and Hydrogeology Impacts

Based on the project design features and the baseline studies for soils, geology, hydrology and hydrogeology, the specialists will predict the potential construction and operational phase impacts associated with the proposed project. Specific activities to be undertaken by the specialists include:

- Predict water quality changes that could occur as a result of the construction and operation of the proposed coal fired power plant;
- Predict impacts of sediment quality in the Study Area(s) that may be expected due to the construction and operation of the proposed Project:

- Discuss the environmental significance of changes predicted in water and sediments;
- Determine the impact of any water intake for the proposed Project on water quality in Indian Ocean;
- Discuss the existing groundwater quality on a regional and site-specific context; and
- Discuss the potential contaminant sources and contaminant migration pathways in groundwater. Describe the methods that will be used to predict the effect on groundwater quality.

Subsequently, the specialists will discuss any proposed mitigation plans and identify any anticipated residual effects on water and sediment quality in the Study Area.

3.5.8.7 Waste management

The proposed coal fired power plant will generate a variety of non-hazardous and hazardous wastes during the lifetime of the project. During the construction phase, the project will generate inert wastes such as sewage, paper and other trash, wood offcuts, etc. During the operational phase, the power plant will burn coal to produce steam that will drive a steam turbine in order to produce power. Associated with burning, there will be three by-products or wastes that will be generated namely, bottom ash, fly ash and gypsum.

As the above wastes must be managed as a minimum in accordance with the Environment Management and Coordination (Waste Management) Regulations 2006, the ESIA Study will analyze the potential impacts of waste generation in the construction and operational phases respectively and recommend mitigation measures for management of various types of wastes.

3.5.8.8 Visual Impacts

KTL will engage a Landscape and Visual Impact Assessment (LVIA) Specialist to assess the potential visual impacts of the proposed coal fired power plant on the existing landscape and values of the area. The following activities will be undertaken by the LVIA Specialist:

- Site inspection to identify the view-shed for the planned activities and potentially sensitive viewing locations within the vicinity;
- Characterization of the existing visual landscape in terms of topography, existing land use and vegetation;
- Assessment of the potential visual impacts of the planned activities on sensitive receptors; and
- Development of mitigation and management measures.

3.5.8.9 Cultural Heritage impacts

Subsequent to the baseline information gathered on archaeology and cultural heritage, the specialists will:

- Consider the results of previous CHIA studies that have been conducted in the Study Area(s) including archaeological resources, paleontological resources and historic period sites and any other historical resources;
- Provide an outline of the historical resources management program and schedule of field investigations that may be required to further assess and mitigate the potential effects of the proposed Project on cultural heritage.

- Provide a summary of KTL consultation with local community to determine the extent of traditional use of the local Study Areas from both an historic and ongoing use perspective;
- Document stakeholder concerns with respect to the development of the proposed Project based on the historical significance of the Study Area(s) and its current use by traditional users and
- Recommend development of a "Chance Finds Procedure" for the proposed coal fired power plant.

3.5.8.10 Social impacts

Identification of the anticipated impacts will be determined on the basis of the established baseline conditions and information obtained from the documents reviewed, supported by fieldwork and observations

The potential social impacts, both positive and negative, of the various activities and phases of the Project will be assessed and quantified as far as possible using a risk ranking criteria before any mitigation measures are applied and after applying appropriate mitigation measures. The significance of the impacts identified will be evaluated according to the following significance factors:

- Certainty of impacts: likelihood of occurrence, level of certainty of its occurrence
- Extension of the impacts: geographical range of the impacts
- Duration and frequency of impacts: temporary occurrence of the impacts, (short Lasting or permanent?)
- Period of Manifestation: the impacts could be noticed immediately or over time by the community

Public concern will also be considered when assessing the significance of the impacts. An impact matrix will be developed to identify the social impact of the Project and what mitigation measures may need to be implemented to reduce the impact. Mitigation measures will be determined based on the likelihood and the severity of the impact. Enhancement measures for identified positive impacts will also be developed.

3.5.8.11 Land acquisition and involuntary resettlement

According to the Request for Proposal floated in 2013 for the proposed coal fired power plant, the successful bidder is to be provided land to build the power plant on a Design, Build Own and Operate basis. The Ministry of Energy and Petroleum (MoEP) is to provide land to the project developer free of encumbrances.

Land acquisition and involuntary resettlement requires the engagement of a Resettlement Action Plan (RAP) specialist. The MoEP engaged a RAP Specialist in late 2015 to complete a RAP Study in alignment with a formal Terms of Reference (ToR). The ToR was based on the requirements of the African Development Bank (AfDB) Operational Safeguard 2 titled Involuntary Resettlement and the International Finance Corporation (IFC) Performance Standard 5 (PS5).

Once the RAP is complete, KTL will incorporate the findings of that study into the main ESIA Study. Alternatively, if the RAP Study will not be ready by the time of submission of the ESIA Study, the RAP recommendations will be proposed as a Variation to the EIA License.

3.5.8.12 Health and safety

KTL will describe those aspects of the proposed Project that may have implications on Occupational Safety and Health (OSH) associated with the construction and operational phases of the project. Some of the OSH aspects and impacts that KTL will consider including in the ESIA Study are:

- Discuss the methods used to assess the potential OSH risks and impacts of the proposed Project on human health and safety;
- Assess the potential health implications of the compounds that will be released to workers from the proposed operation of the power plant in relation to exposure limits established to prevent acute or chronic adverse effects on human health;
- Assess cumulative health effects that are likely to result from the proposed Project in combination with other existing, approved and planned projects or reasonably foreseeable activities in the area;
- Provide a summary of an emergency response plan and discuss mitigation plans that will be implemented to ensure workforce and public safety during preconstruction, construction, operation and reclamation of the proposed Project. Include prevention and safety measures for wildfire occurrences, accidental release or spill of chemicals to the environment and failures of structures retaining water or fluid waste;
- Describe how local residents will be contacted during an emergency and what type of information will be communicated to them;
- Identify and discuss potential health and safety impacts due to higher regional traffic volumes and the increased risk of accidental leaks and spills; and
- Discuss health and safety concerns raised by stakeholders during consultation on the proposed Project.

3.5.8.13 Cumulative Impact Assessment

KTL will identify and assess the cumulative environmental and social effects associated with the proposed coal fired power plant and include the following:

- Consideration of the environmental effects from other existing and proposed projects, activities and land uses or reasonably foreseeable projects, activities and land uses in the region;
- Demonstration that any information or data used from previous and other development projects is appropriate for use in this ESIA report. Supplement the information where required and consider all relevant components of the environment;
- Explanation of the approach and methods used to identify and assess cumulative effects including cooperative opportunities and initiatives undertaken to further the collective understanding of cumulative effects. Provide a record of all assumptions, confidence in data and analysis to support conclusions; and
- Describe deficiencies or limitations in the existing database on environmental components and propose measures to deal with resultant uncertainties

3.5.9 Task 9: ESIA Study report compilation

The ESIA Study Report will be concise and limited to significant environmental and social issues. The main text will focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. The contents of the ESIA Study Report will be as follows:

| Section in ESIA Study | Section Heading and brief description |
|-----------------------|---|
| Section 1 | Executive Summary |
| | <p>A non-technical summary of the ESIA Study</p> <p>This section will provide a summary of the project objectives, project components, a summary of the anticipated environmental and social benefits of the proposed project; a summary of the overall findings of the ESIA including potentially significant adverse environmental and social impacts, and a summary of recommended relevant mitigation/corrective action plans</p> |
| Section 2 | Overview of the Regulatory and Legal context for power generation projects in Kenya |
| | Introduces the EPR Study and the legal context |
| Section 3 | Need for the project |
| | Describes the various elements of and the motivation for development of the proposed coal fired power plant |
| Section 4 | Description of the Project |
| | A concise description of the proposed coal fired power plant components |
| Section 5 | Environmental and Social Baseline |
| | Provides an overview of the affected biophysical and socio-economic environment in the project area |
| Section 6 | Analysis of Alternatives |
| | Discusses the various alternatives for achieving the project outcomes including site, technology, energy type, etc. |
| Section 7 | Methodology for impact identification and assessment |
| | Provides an overview of the methodology used for assessing the potential environmental and social impacts associated with the project |
| Section 8 | Assessment of Environmental and Social impacts |
| | Describes the potential environmental and social impacts identified through various processes |
| Section 9 | Stakeholder Engagement Plan (SEP) |
| | Describes the public participation process followed and the issues and concerns that have been raised by stakeholders. It also presents an outline of the Stakeholder Engagement Plan (SEP), Grievance Mechanism (GM) and framework for the Resettlement Action Plan (RAP) |
| Section 10 | Cumulative Impact Assessment |
| | Describes the cumulative impacts associated with the proposed coal fired power plant and the associated transmission line |
| Section 11 | Environmental and social management plan |

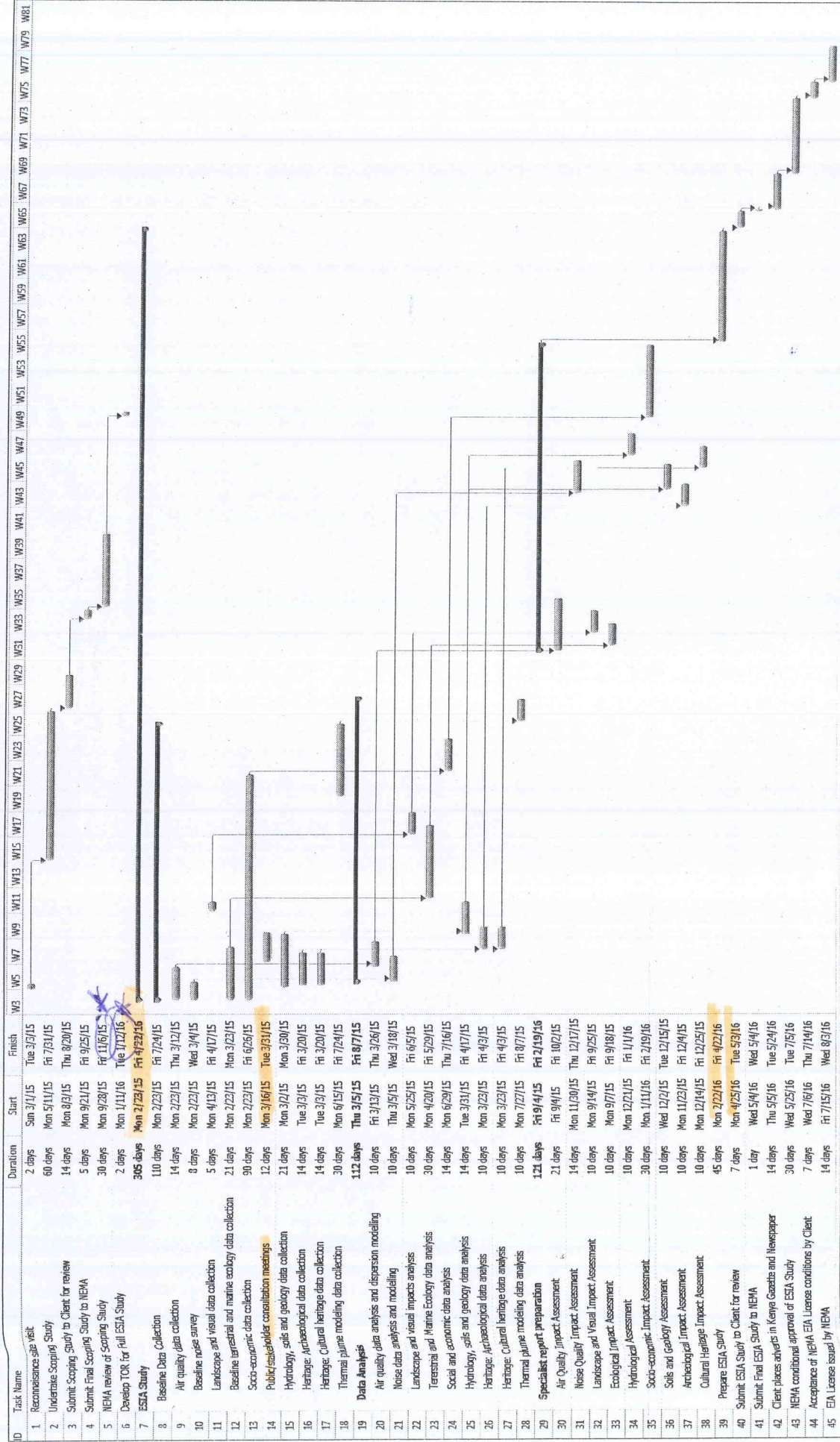
| Section in ESIA Study | Section Heading and brief description |
|-----------------------|--|
| | Stipulates environmental management guidelines that should be implemented in the planning, design, pre-construction, construction and operational stages of the coal fired power plant |
| Section 12 | Conclusions and Recommendations |
| | Concludes and summarizes the findings and recommendations of the ESIA Study |
| Section 13 | Appendices to the ESIA |
| | The Appendices contain all Specialist Studies undertaken as aprt of the ESIA Study for the proposed coal fired power plant |
| Section 14 | References |
| | Provides references used to compile the report |

3.6 ESIA Study Schedule

Following approval of the EPR and TOR by NEMA, the schedule of the ESIA Study is expected to be as follows:


- Stakeholder engagement and consultation
- Baseline surveys, information gathering and analysis;
- Presentation of Draft EIA report and EMP;
- Presentation of the findings at stakeholder meetings;
- Presentation of Final ESIA report.

Figure 3-1 : Proposed Timeline for undertaking ESIA Study of the 1050MW Coal Fired Power Plant, Lamu



4 KTL NEMA Certificates

FORM 7 (2/15/20)



nema
NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY


NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE


License No : NEMA/EIA/EIPL/1222
Application Reference No: NEMA/CIA/EI/22/19

M/S Kurrent Technologies Ltd
(individual or firm) of address
P.O. Box 16989 - 00620 Nairobi

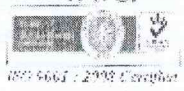
is licensed to practice in the
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **0191**
in accordance with the provision of the Environmental Management and Coordination Act, 1999.

Issued Date: 1/27/2015 Expiry Date: 12/31/2015

Signature..... 

(Seal)
 Director General
The National Environment Management
Authority

P. T. O.



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5 CVs of specialists

The proposed ESIA team will include the specialists whose names are provided in Table 5-1.

Table 5-1 : Proposed ESIA team for 1,050MW Coal Fired Power Plant, Lamu County

| Position | Name |
|--|---|
| ESIA Team leader | Mr. Sanjay Gandhi - NEMA Lead Expert |
| Noise Quality Study | Ward Karlson Consulting |
| Ecological Impact Assessment Study | Geoffrey Mwangi, Dr. George Ndiritu, Dr. Peter Njoroge, Mr. Vincent Muchai, Mr. Laban Njoroge, Mr. Kennedy Wambua |
| Marine thermal discharge study | Ward Karlson Consulting |
| Geology and Soils Study | Mr. Bernard Muhangu – Reg. Geologist |
| Air Quality Study | Ward Karlson Consulting |
| Hydrology study | Mr. Bernard Muhangu – Reg. Geologist |
| Hydrogeology study | Mr. Bernard Muhangu – Reg. Geologist |
| Social Impact Assessment study | Ms. Belinda Muya and Mr. Gideon Owaga |
| Stakeholder Engagement Plan | Ms. Belinda Muya and Mr. Gideon Owaga |
| Grievance Mechanism | Ms. Belinda Muya and Mr. Gideon Owaga |
| Cultural Heritage Impact Assessment Study | Dr. Freda Nkirote and Ms. Angela Kabiru |
| Visual Impact Assessment Study | Aurecon South Africa |
| Baseline air, water, soil and sediment sampling and analysis reports and certificates | SGS Kenya Limited |

Given in the following pages are the CVs of the specialists that will be involved in the ESIA Study of the proposed project as detailed above.

FORM 7

01/02/15



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

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

License No: NEMA/EIA/EPPI/1230

Application Reference No: NEMA/EIA/E/2282

M/S Sanjay Gandhi
(individual or firm) of address

P.O. Box 45630 - 00100 Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **0119**

in accordance with the provision of the Environmental Management and Coordination Act, 1999.

Issued Date: 1/27/2015

Expiry Date: 12/31/2015

Signature.....

(Seal)
Director General
The National Environment Management
Authority

