



Environmental and Social Impact Assessment Project Report

Eldosol Energy

**Proposed 40 Megawatts Solar Photovoltaic Power Plant
and associated Transmission Line (interconnector) in
Kipchamo Village, Saroiyoi Sub Location, Kipchamo
Location, Kesses Constituency, Uasin Gishu County**

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EXECUTIVE SUMMARY

Project: Environmental and Social Impact Assessment (ESIA) for the proposed 40 MW Solar Photovoltaic (PV) Power Plant and the associated Transmission Line, to connect to the national grid system.

Proponent: Eldosol Energy Limited (Eldosol Energy)

Location: Kipchamo Village, Saroiyoi Sub Location, Kipchamo Location, Kesses Division, Kesses Constituency, Uasin Gishu County, Kenya

Project Description:

The proposed development includes the installation and operation of solar panels (PV arrays) with a proposed output of 40 megawatts (MW) at the Point of Utility Connection (PUC), as well as a transmission line, to be connected to the national grid system via the existing 220kV Kenya Electricity Transmission Company Limited (KETRACO) Turkwel- Lessos transmission line traversing private land approximately 1 kilometre east of the Site. The Project will consist of the following key components:

- Mounting structures and foundation- solar array support fixed system or trackers, screw-foot, rammed poles or concrete foundation, depending on soil conditions
- 140, 800 PV modules;
- Medium Voltage (MV) step-up transformer (400V – 22kV) located either outdoors or in a sheltered housing structure;
- Inverter; and
- Access roads including a perimeter road within the site boundaries as required.

The total developable area for the solar project would cover up to 301 acres (121.81 Ha) with the panels covering approximately 129 acres (52.5 ha or 43%) of this area. It is anticipated that the PV array will comprise of approximately 140, 800 modules for a maximum peak power of approximate 42,224 kilowatts peak (kWp) in order to provide the 40 MW capacity at the PUC.

ESIA Process or Methodology

The ESIA was undertaken in fulfilment of the Environmental Management Coordination Act of 1999 (EMCA) Schedule II that identifies projects that require an Environmental Impact Assessment (EIA) to be conducted prior to the commissioning/operation in order to identify the potential adverse impacts of a project and thereby devise appropriate mitigation measures. The ESIA was also aligned to the International Finance Corporation's (IFC) Performance Standards on Social and Environmental Sustainability (2012) as

well as applicable provisions of IFC's General Environmental Health and Safety Guidelines.

Various data collection methods were used as follows:

Document Review

A literature review was undertaken based on the findings of the scoping process, which involved reviewing legislation, policies, development plans and past studies carried out in the area for the purpose of informing the ESIA regarding baseline conditions and establishing the legal, institutional and environmental setting of the proposed project.

The desk study also included the development of fieldwork tools, fieldwork schedules as well as the Public Consultation and Disclosure Plan (PCDP).

Site Visits

ERM carried out an initial site reconnaissance visit on 30th April 2015. ERM was accompanied by Eldosol Energy as well as 3E and Power Engineers so that any environmental, social or technical constraints could be discussed. The purpose of the initial site visit was to familiarise the Project Team with the affected project area and to collect primary environmental and social baseline data.

A scoping visit was thereafter undertaken between the 9th to 12th of June 2015, during which time a site walkover was undertaken that included the consideration of the proposed wayleave and meetings with stakeholders with key stakeholders at the County and Community level were undertaken to announce the Project, identify data sources and commence the process of determining potential impacts.

Detailed site investigations were then undertaken between 30th June and 2nd July, 2015, during which further stakeholder engagement was undertaken and primary environmental and social data was collected through focus group discussions, key informant interviews and further site walk overs.

During the site visits, photography was also used to record the salient features and baseline conditions in the project site and its surroundings. The photos were used to define existing features in the project area and identify soils and floral species. Photography was combined with transect walks and used to identify possible impacts of the proposed project. All the relevant images were stored and are attached to this Report.

Impact Assessment Methodology

The purpose of impact assessment and mitigation is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe measures that will be taken to avoid or minimise any potential adverse effects and to enhance potential benefits.

Study Objectives

The objectives of the ESIA are to:

- Identify all potential significant adverse environmental and social impacts of the project and recommend measures for mitigation;
- 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 avoid or reduce the anticipated negative impacts and enhance the positive impacts; and
- Prepare an ESIA Report compliant to EMCA and the Environmental (Impact Assessment and Audit) Regulations (2003), detailing findings and recommendations.

Stakeholder Engagement

Stakeholder Engagement ensures that the views and concerns of stakeholders and the community are incorporated as early as possible into the project development, i.e., at the planning, implementation and operations phase, to minimise any potential unexpected opposition to the proposed development, and potential adverse effects to the environment. Incorporating the views of the stakeholders into the design process is also very beneficial for adopting the best workable models and systems.

The main objective of the Stakeholder Engagement was to inform stakeholders and the public about the proposed project and its likely effects, and in turn incorporate their inputs, views and concerns into project planning.

The open and inclusive consultation process was conducted between 9th to 12th of June as well as between 30th June and 2nd July, 2015.

During the Stakeholder Engagement process, over 400 individuals were consulted within the Study and Project Area, and their comments and concerns were recorded and incorporated into the ESIA Report. Their continued involvement in the Project and ESIA was always encouraged. The meetings and interviews took place in the stakeholder's choice of language (English, Kiswahili or Nandi and translated where necessary).

A total of five meetings were conducted during the Scoping and ESIA engagement phases. The key questions and concerns raised by stakeholders during both phases of engagement are outlined in *Table 0.1* below.

Table 0.1 **Outcomes of Scoping and ESIA Engagement**

Theme	Issue
Employment	Employment for local communities
	Recruitment process
	Skills transfer for local communities

Environment	Changes to water drainage channels
	Impacts to birds in the area
	Waste storage and disposal
Resettlement	Confirmation on whether resettlement will be required
Transmission Line	Health impacts of the proposed transmission line
	Loss of livelihoods due to transmission line
	How compensation and lease payments for the wayleave for the transmission line would be managed
Health	Perceived radiation impacts from the PV panels
	Electrocution impacts from overhead transmission line
Community Development	Request for investment in infrastructure (roads and water) in the local area
	Request for investment in educational facilities in the local area
	Request for investment in health facilities in the local area
	Investment in local livelihood activities including milk production, storage and sale
	Support for vulnerable groups in particular orphans
Cultural Heritage	Impacts to initiation site (identified to not be located on the Project site)
Visual and Physical	Visual impacts of the PV panels when in operation
	Perceived interference with planes landing at the Eldoret International Airport

Potential Impacts and Mitigation Measures

The bio-physical and socio-economic impacts during the construction phase that have been identified and assessed in the ESIA include the following:

Summary of Pre-mitigation Significance during Construction Phase for the Layout of the PV Plant

Section	Impact	Pre-mitigation Significance	Residual Impact Significance (Based on mitigation)
9.2.1	Loss of Topsoil, compaction and erosion	MODERATE NEGATIVE	MINOR NEGATIVE
9.2.1	Impact on Hydrology and Hydrogeology	MINOR NEGATIVE	MINOR NEGATIVE
9.2.2	Habitat Loss	MINOR NEGATIVE	NEGLIGIBLE
9.2.2	Impacts on Avifauna	MODERATE NEGATIVE	MODERATE - MINOR NEGATIVE
9.2.3	Local Air Quality	MINOR NEGATIVE	NEGLIGIBLE
9.2.4	Waste and Effluent	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.1	Loss of Livelihoods	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.2	Direct Employment and Training	MINOR - MODERATE NEGATIVE	MODERATE POSITIVE
9.3.2	Procurement and Indirect Employment	MINOR POSITIVE	MODERATE POSITIVE
9.3.2	Induced Economic Benefits	MINOR POSITIVE	MODERATE POSITIVE
9.3.2	Increased Revenue Generation	MINOR POSITIVE	MODERATE POSITIVE
9.3.3	Increased Social Disturbance	MINOR NEGATIVE	NEGLIGIBLE
9.3.4	Impact on Disease Transmission	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.5	Traffic Impacts	MODERATE - MINOR NEGATIVE	MINOR NEGATIVE
9.3.6	Workers Management and Rights	MINOR NEGATIVE	NEGLIGIBLE
9.3.5	Health and Safety	MINOR NEGATIVE	MINOR NEGATIVE
9.3.7	Visual Impacts	MINOR NEGATIVE	NEGLIGIBLE

The major mitigation/enhancement measures to address the more significant impacts for the construction phase include the following (for a comprehensive list of mitigation measures please refer to the ESIA report and Environmental and Social Management and Monitoring Plan, ESMMP):

- Protect disturbed surfaces against erosion with terraces or a water feature (e.g., a swale), and disturbed areas will be rehabilitated as soon as possible to prevent erosion.
- Fuel, oil and used oil storage areas will be contained in bunds of 110 percent capacity of the stored material.
- Site clearing activities will be kept to the minimum required (PV arrays and road footprint).
- In order to reduce collisions of vehicles with fauna, a 30 km/hr speed limit will apply to all roads and vehicles using the site. Animals will have right of way.
- The collection, hunting or harvesting of any avi-fauna at the site will be strictly forbidden throughout all phases of the project. Eldosol Energy will develop and implement a disciplinary procedure for staff caught conducting such activities.
- Eldosol Energy will develop and implement a grievance procedure that is easily accessible to the local communities, through which complaints related to contractor or employee behaviour can be lodged and responded to.
- Eldosol Energy and its appointed Contractor will develop an induction programme, including a Code of Conduct, for all workers (including contractors and their workers). A copy of the Code of Conduct will be presented to all workers and signed by each person.
- The construction area should be limited to a small an area as practicable and natural strips of vegetation will be allowed to persist between the rows of arrays.
- Any electrocution and collision events that occur should be recorded, including the species affected and the date. This can be done, for example, by Site Security during their regular patrol

All negative impacts associated with the Project have been mitigated to a level which is deemed appropriate for the construction phase to proceed.

Summary of Pre-mitigation Significance during Operational Phase for the Layout of the PV Plant

Section	Impact	Pre-mitigation Significance	Residual Impact Significance (Based on mitigation)
9.2.1	Loss of Topsoil, compaction and erosion	MINOR NEGATIVE	NEGLIGIBLE
9.2.1	Impact on Hydrology and Hydrogeology	MODERATE - MINOR NEGATIVE	MINOR NEGATIVE
9.2.2	Habitat Loss	MINOR NEGATIVE	MINOR POSITIVE
9.2.2	Impacts on Avifauna: Disturbance	MINOR NEGATIVE	NEGLIGIBLE
9.2.2	Impacts on Avifauna: Avifaunal Mortality	MINOR NEGATIVE	NEGLIGIBLE
9.2.4	Waste and Effluent	MINOR NEGATIVE	MINOR NEGATIVE
9.3.1	Loss of Livelihoods	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.2	Direct Employment and Training	MINOR POSITIVE	MINOR POSITIVE
9.3.2	Procurement and Indirect Employment	MINOR POSITIVE	MINOR POSITIVE
9.3.2	Induced Economic Benefits	MINOR POSITIVE	MINOR POSITIVE
9.3.2	Increased Revenue Generation	MINOR POSITIVE	MINOR POSITIVE
9.3.3	Increased Social Disturbance	NEGLIGIBLE	NEGLIGIBLE
9.3.4	Impact on Disease Transmission	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.5	Traffic Impacts	NEGLIGIBLE	NEGLIGIBLE
9.3.6	Workers Management and Rights	MINOR NEGATIVE	NEGLIGIBLE
9.3.5	Health and Safety	NEGLIGIBLE	NEGLIGIBLE
9.3.7	Visual Impacts	MODERATE NEGATIVE	MINOR - MODERATE NEGATIVE

The major mitigation/enhancement measures to address the more significant impacts for the operational phase include the following (for a comprehensive list of mitigation measures please refer to the ESIA Report and ESMMP):

- Document erosion problems and the control measures implemented.
- Any electrocution and collision events that occur will be recorded, including the species affected and the date.
- The footprint of the operations and maintenance facilities, as well as parking and vehicular circulation, should be clearly defined, and not be allowed to spill over into other areas of the site.
- Laydown or infrastructure assembly areas not required during the operational phase of the PV power facility will be re-vegetated with indigenous vegetation to prevent erosion immediately after these areas are no longer required for construction.

All negative impacts associated with the Project have been mitigated to a level which is deemed appropriate for the operational phase of the PV power facility to be sustainable.

Recommendations

ERM is confident that every effort will be made by Eldosol Energy to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the Project. The implementation of the mitigation measures detailed in *Chapters 9* and listed in the ESMMP will provide a basis for ensuring that the potential positive and negative impacts associated with the establishment of the development are enhanced and mitigated to a level which is deemed adequate for the development to proceed.

In summary, based on the findings of this assessment, ERM finds no reason why the 40 MW PV Power facility proposed for the Site should not be authorised, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the ESMMP.

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1.1

OVERVIEW

Eldosol Energy Limited (hereafter referred to as Eldosol Energy), have appointed Environmental Resources Management (ERM) to act as independent environmental and social consultants to undertake the Environmental and Social Impact Assessment (ESIA) for the construction and operation for the proposed 40 megawatts (MW) Solar Photovoltaic (PV) Power Plant and associated Transmission Line (interconnector) “The Project”.

The Site of the proposed PV power facility and transmission line is in Kipchamo Village, Saroiyoi Sub Location, Kipchamo Location, Kesses Constituency, Uasin Gishu County. The Site is 301 acres (approximately 121 hectares) consisting solely of private land, specifically plot number LR 6170 (A) (see *Annex A* for the Land Contract) which has been sold to Eldosol Energy for the purpose of this Project.

The Site is located 13.5 kilometres to the South East of Eldoret Town and is accessible via the Plateau Road. The proposed Project includes the installation and operation of solar panels (PV arrays) with a proposed output of 40 MW at the Point of Utility Connection (PUC), as well as a transmission line, connected to the national grid via the existing 220kV Kenya Electricity Transmission Company Limited (KETRACO) Turkwel- Lessos transmission line traversing private land approximately 1 kilometre east of the Site. A locality map providing further detail of the Project Site is provided in *Annex B1*.

The Project will include the following components:

- Mounting structures and foundation- solar array support fixed or tracker system, screw-foot, rammed poles or concrete foundation, depending on soil conditions
- 140, 800 PV modules;
- Medium Voltage (MV) step-up transformer (400V – 22kV) located either outdoors or in a sheltered housing structure;
- Inverter; and
- Access roads including a perimeter road within the site boundaries as required.

This ESIA Project Report has been compiled as part of the Kenyan EIA Process in accordance with regulatory requirements stipulated in the Environmental Management and Coordination Act of 1999 (EMCA) and the Environmental (Impact Assessment and Audit) regulations of 2003. The ESIA has also been undertaken in line with the requirements of the International Finance Corporation’s (IFC) Performance Standards on Social and Environmental Sustainability (2012).

1.2

PURPOSE OF THE REPORT

The information contained in this Report, along with comments and inputs received from stakeholders and commenting authorities will assist the competent authority, the National Environment Management Authority (NEMA), in deciding whether or not to grant environmental authorisation for the proposed Project, and to inform the conditions associated with such authorisation.

The environmental and social impact assessment process involves the identification, prediction and evaluation of actual and potential environmental and social impacts of a Project and outlines the proposed mitigation measures for negative impacts and enhancement measures for positive impacts which the Project will implement.

The objectives of this document are to:

- Communicate the results of the ESIA process for the proposed Project and alternatives considered;
- Ensure that the impacts identified during the ESIA process are assessed;
- Present the mitigation and enhancement measures which will be implemented by the Project to manage impacts identified;
- Provide a record of comments and responses received from Interested and Affected Parties (I&APs) during the ESIA process; and
- Facilitate an informed decision-making process by the relevant authorities.

1.3

PROJECT OBJECTIVES

The main objective of the proposed Project is to establish a Solar PV Power Plant with the capacity to generate 40 MW of electricity at the PUC and associated Transmission Line, to connect to the national grid.

Kenya's electricity generating capacity as of June 2011 was 1,593 MW, but this is expected to grow to 15,000 MW by 2030 (KERE, 2012). The Ministry of Energy and Petroleum (2014) stated that energy has been singled out as one of the key enablers of Vision 2030, as expensive energy hinders the competitiveness of Kenya by increasing the cost of doing business. The development of renewable energy, including solar, is therefore extremely important in order to meet the Country's growing demand for electricity. The Ministry of Energy and Petroleum (2014) states that renewable energy can supply not only Kenya's current needs but that of future generations in a sustainable way if effectively harnessed as it has the potential to:

- enhance energy security and reliability;
- mitigate climate change;
- generate income and create employment; and

- enable the country to make substantial foreign exchange savings by reducing dependence on imported fuels and its attendant price volatility.

The Project will generate electricity and reduce Kenya's dependence on non-renewable fossil fuels, thereby contributing to increased energy security and sustainability as well as facilitating Kenya's Vision 2030 development goals.

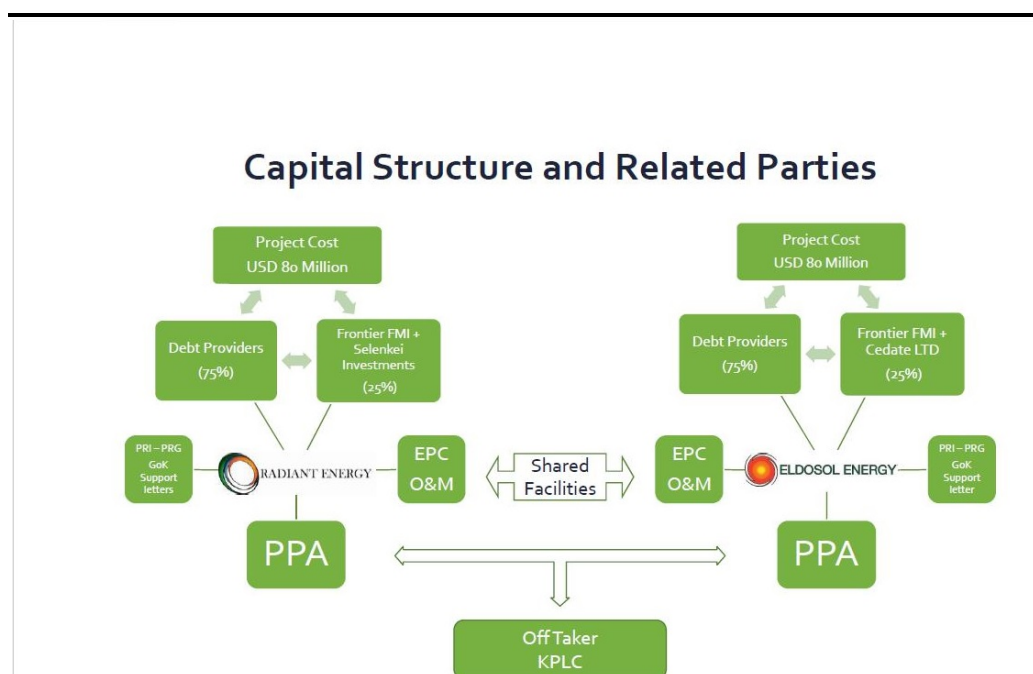
1.4 PROJECT PROPONENT

Eldosol Energy is a solar PV Independent Power Producer (IPP) which registered in Mauritius in April 2015 as the Project Company for the Eldosol Energy Power Plant. It is a Global Business Company (GBC 1) with a Global Business License. The Project sponsors and shareholders are:

- Frontier Investment Management;
- Selenkei Investment Limited;
- Cedate Limited;
- Interpro International LLC; and
- Paramount Bank.

The structure of the sponsors and shareholders is shown in *Figure 1.1* below:

Figure 1.1 Capital Structure and Related Parties



Source: Eldosol Energy, 2015

1.5 PROJECT CONSULTANTS

1.5.1 ERM East Africa Limited

ERM East Africa Ltd. was appointed by Eldosol Energy to undertake the ESIA for the proposed Project. ERM (and specialists appointed by ERM during the course of this ESIA) have no financial ties to, nor are they a subsidiary, legally or financially, of Eldosol Energy.

ERM is a global environmental consulting organisation with over 150 offices in 40 countries. ERM, has operated throughout Africa for over thirty-five years and our Sub-Saharan Africa Business Division with over 200 employees is currently based in South Africa (Cape Town, Durban, Johannesburg and Pretoria), Mozambique (Maputo) and Kenya (Nairobi).

ERM East Africa Ltd. is registered with NEMA as a Firm of ESIA/ Audit Experts, Reg. No 7264. Ref *Annex C* for ERM East Africa's Registration Certificate and 2015 Practicing Licence from NEMA.

The ESIA team is presented in *Table 1.1*.

Table 1.1 **ERM Project Team**

Position	Name	Qualifications
Partner in Charge	Michael (Mike) Everett	M.Sc. Hydrology, B.Sc. (Hons) Hydrology and Soil Science, NEMA Kenya Lead EIA/ Audit Expert (Reg. No 7263)
Project Manager	Wanjiku Githinji	MSc Environmental Assessment, Auditing and Management Systems, B.Sc. (Hons) Environmental Studies, NEMA Kenya Lead EIA/ Audit Expert (Reg. no 1244)
Social and Community Health Consultant	Callie Phillips	MSc Epidemiology, London School of Hygiene and Tropical Medicine, England 2005; B. Med. Sc Medical Science University of Birmingham, England 2001.
Social and Stakeholder Engagement Consultant	Nomsa Fulbrook- Kagwe	MSc Environmental Technology, Imperial College, London, 2010; BSc (Biological Sciences), University of Warwick, United Kingdom, 2009
Environmental Consultant	Michael Waweru	Master's in Environmental Planning and Management (ongoing), BSc Environmental Studies, NEBOSH International General Certificate in Occupational Health and Safety, NEMA Kenya Associate EIA/ Audit Expert (Reg. no 2760)

1.5.2 **3E**

Eldosol Energy have appointed *3E n.v./s.a* (3E), an international consultancy that specialises in delivering advisory services and software solutions for sustainable energy project development and operation worldwide.

3E is carrying out the Feasibility Study, providing technical support during the Power Purchase Agreement (PPA) negotiations as well as the Engineering, Procurement and Construction (EPC) contractor tender.

3E is also responsible for preparation of the following activities:

- a single line diagram for the power plant;
- the power plant proposal;
- the layout estimation (PV) site; and
- a general arrangement drawing.

1.5.3 **Power Engineers**

Power Engineers is a global consulting engineering firm specialising in the delivery of integrated solutions in a wide range of industries including power generation and delivery. Power Engineers have been appointed by Eldosol

Energy to undertake the Interconnection Studies which will include preparation of the following:

- sub-station design and technical report;
- single line diagram for the interconnection;
- protection diagram;
- Bill of Quantities (BOQ); and
- the combined plot plan.

Power Engineers will also provide project management and administration support to Eldosol Energy.

1.6 REPORT STRUCTURE

The structure of this ESIA Report is outlined in *Table 1.2*.

Table 1.2 *Report Structure*

Section	Contents
Chapter 1 Introduction	Contains a brief description of the proposed activities, Project proponent, Project consultants and an outline of the report structure.
Chapter 2 Legal and Institutional Framework	Outlines the legislative, policy and administrative requirements applicable to the proposed Project.
Chapter 3 Approach and Methodology	Outlines the approach to the ESIA and summarises the process undertaken by the Project to date.
Chapter 4 Project Description	Includes a detailed description of the proposed Project activities.
Chapter 5 Project Alternatives	Describes the alternatives that have been considered and the reasons for the selection of the preferred alternative
Chapter 6 Biophysical Baseline	Describes the receiving biophysical baseline environment.
Chapter 7 Socio-economic Baseline	Describes the receiving socio-economic baseline environment.
Chapter 8 Stakeholder Engagement	Describes the approach to and outcomes of the stakeholder engagement and public participation process.
Chapter 9 Impacts and Mitigation Measures	Describes and assesses the potential environmental and social impacts of the proposed Project. Mitigation measures are also presented.
Chapter 10 Environmental and Social Management and Monitoring Plan (ESMMP)	Specifies the mitigation and management measures to be undertaken and shows how the Project will mobilise organisational capacity and resources to implement these measures.
Chapter 11 Conclusions and Recommendations	Summarises the key findings of the EIA and provides recommendations for the mitigation of potential impacts and the management of the proposed Project.
Chapter 12 References	Contains a list of references used in compiling the report.

In addition the Report includes the following annexures:

Annex A: Land Contract

Annex B: Maps

Annex C: ERM NEMA Registration and 2015 Practicing Licence

Annex D: Stakeholder Engagement Plan and Public Participation Documents

Annex E: Correspondence with NEMA

Annex F: Land Acquisition Report

2.1 GENERAL OVERVIEW

This *Chapter* outlines the existing national and international environmental and social legislation, policies and institutions applicable to energy generation that guide the development of the Project.

As Kenya is a signatory to various international conventions and laws national projects need to align with these requirements, relevant international conventions are therefore presented.

Finally, a summary of the International Finance Corporation's (IFC) Performance Standards on Social and Environmental Standards (2012) relevant to this Project are presented.

2.2 KENYA POLICY PROVISIONS

2.2.1 Kenya Energy Policy, 2014

The Energy Policy sets out the national policies and strategies for the energy sector that are aligned to the Constitution of Kenya and Kenya's Vision 2030 (*Section 2.2.3*).

The Energy Policy envisages promoting an energy mix that includes solar energy at both the household/institutional levels as well as large-scale solar energy generation. The Government of Kenya has initiated and been promoting programmes for the provision of electricity to institutions far from the grid through solar PV systems. The Government has also embarked on a programme to provide solar/diesel and solar/wind hybrid generation capacity to off-grid stations.

The Policy strategizes the need to:

- promote the widespread use of solar energy while enforcing existing regulations and standards;
- provide incentives to promote the local production and use of efficient solar systems;
- provide a framework for connecting electricity generated from solar energy to the national and isolated grids, through direct sale or net metering;
- promote the use of hybrid power generation systems involving solar and other energy sources; and
- facilitate the generation of electricity from solar energy by, among other things, funding, provision of land, fast-tracking issuance of permits and

licences, as well as acquisition of data and information so as to realise at least 100 MW from solar by 2017, 200 MW by 2022 and 500 MW by 2030.

The Kenya Electricity Supply Industry (ESI) is one of the sub-sectors in the energy sector which the Ministry of Energy and Petroleum oversees on behalf of the Government of Kenya (GoK). Under the Energy Act of 2006, the Ministry is responsible for formulation and articulation of policies to provide an enabling environment for operators and other stakeholders in the energy sector. Key stakeholders in the ESI are presented in *Box 2.1*.

Box 2.1

Key ESI Stakeholders

The key stakeholders in ESI are:

- **Kenya Power Company:** responsible for transmission, distribution and retail supply of electrical energy to end users. Kenya Power purchases power in bulk from the Kenya Electricity Generating Company Limited (KenGen) and the Independent Power Projects (IPPs) through bilateral contracts or Power Purchase Agreements (PPAs) approved by the Energy Regulatory Commission (ERC).
- **The Energy Regulatory Commission:** established as part of the Energy Act of 2006. The ERC's mandate extends beyond electricity and includes natural gas (including petroleum), renewables and all other forms of energy. The generation, transmission, distribution, supply, import and export of electricity can only be carried out by parties in possession of a licence or a permit issued by the ERC. In the event that the capacity involved is more than 1 MW but does not exceed 3 MW, a permit is required as opposed to a licence. Eldosol Energy therefore requires a licence from the ERC to generate electricity as stipulated in the Energy Act, 2006.
- **Ministry of Energy and Petroleum:** aims to facilitate provision of clean, sustainable, affordable, reliable, and secure energy services for national development while protecting the environment.
- **The Rural Electrification Authority (REA):** was established under Section 66 of the Energy Act, 2006 (No 12 of 2006) as a corporate body. The Authority was created in order to accelerate the pace of rural electrification in the country, a function which was previously undertaken by the Ministry of Energy. REA is mandated to, inter alia, develop and update the rural electrification master plan, implement the rural electrification programme and promote the use of renewable energy sources including small hydros, wind, solar, biomass, geothermal, hybrid systems and oil fired components taking into account specific needs of certain areas including the potential for using electricity for irrigation and in support of off-farm income generating activities.
- **The Geothermal Development Company (GDC):** is a 100% state-owned company, formed by the Government of Kenya as a Special Purpose Vehicle to fast track the development of geothermal resources in the country. The creation of GDC was based on the government's policy on energy - Sessional paper No. 4 of 2004, and the energy Act No. 12 of 2006.
- **The Kenya Electricity Transmission Company (KETRACO):** was incorporated on 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional paper No. 4 of 2004 on Energy. KETRACO's mandate is to design, construct, operate and maintain new high voltage electricity transmission infrastructure that will form the backbone of the National Transmission Grid, in line with Kenya Vision 2030.

The overall goal of this Sessional Paper is to ensure that environmental concerns are integrated into the national planning and management processes and provide guidelines for environmentally sustainable development. The objectives of the Paper are to conserve and manage the natural resources of Kenya including air, land, flora, and fauna and promote environmental conservation with regard to soil fertility and conservation, biodiversity, to foster afforestation activities, and to protect water catchment areas. More importantly the Policy emphasizes the enhancement of public awareness and appreciation of the essential linkages between development and environment, involving NGOs, private sector, and local communities in the management of natural resources and their living environment and ensures that an environmental impact assessment report is undertaken for all public and private projects and programmes.

The proposed 40MW Solar Power Project must ensure that it promotes this integrated approach to environmental management and development, without compromising the livelihoods of the local community.

Vision 2030

Kenya Vision 2030 is the country's development blueprint covering the period 2008-2030. It aims to transform Kenya into a newly industrialised, *'middle income country providing a high quality life to all its citizens by the year 2030'*.

Vision 2030 is based on 3 key pillars namely: Economic, Social, and Political. These pillars are anchored on the following foundations:

- macroeconomic stability;
- continuity in governance reforms;
- enhanced equity and wealth creation opportunities for the poor; infrastructure;
- energy;
- science, technology and innovation (STI);
- land reform;
- human resources development;
- security; and
- public sector reforms.

This policy recognises that infrastructure, and in particular a reliable power supply, is vital in sparking economic growth. The challenges facing the power sector in Kenya include weak transmission and distribution infrastructure, high cost of power, low per capita power consumption, and low electricity access countrywide.

Eldosol Energy aims to increase the supply of national grid connected energy to meet the growing needs and targets as envisioned under this policy. This

Project, through the provision of 40MW to the national grid, is in direct support of Vision 2030.

2.2.4 *National Policy on Water Resources Management and Development, 1999*

The National Policy on Water Resources Management and Development promotes the systematic development of water facilities in all sectors while recognising wastewater as a by-product of this process. The Policy therefore calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. This implies that industrial and business development activities should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from.

The Policy will be applicable to the Project during construction and operational phases. During construction, water will be required for concrete works and during the operation period water supply is will be necessary for cleaning the PV modules. Appropriate water treatment and waste handling must be incorporated into the project design to be in alignment with this policy.

2.3 *NATIONAL LEGAL FRAMEWORK*

2.3.1 *Administrative Framework*

In 2001, the Government established the administrative structures to implement the Environmental Management and Co-ordination Act of 1999 (EMCA). The main administrative structures are described in the following sections.

The National Environmental Council

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

Eldosol Energy should ensure that the project abides by the set goals and objectives of the Council.

The National Environment Management Authority (NEMA)

The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment.

Eldosol Energy has undertaken an ESIA for the Project for review by NEMA in compliance to the EMCA.

Standard and Enforcement Review Committee (SERC)

EMCA provides for the establishment and enforcement of environmental quality standards by a technical committee of NEMA known as the Standards and Enforcement Review Committee (SERC).

Public Complaints Committee

EMCA has also established a Public Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The Committee has the mandate to investigate complaints relating to environmental damage and degradation. The members of the Public Complaints Committee include representatives from the Law Society of Kenya, NGOs and the business community.

Eldosol Energy should address all issues arising from the project in accordance with the above requirements, including a clear approach to stakeholder engagement and feedback.

Water Resource Management Authority (WRMA)

WRMA is responsible for regulation of water resources such as water allocation, source protection and conservation, water quality management and pollution control and international waters. Its roles and responsibilities are as follows:

- Planning, management, protection and conservation of water resources;
- Planning, allocation, apportionment, assessment and monitoring of water resources;
- Issuance of water permits;
- Water rights and enforcement of permit conditions;
- Regulation of conservation and abstraction structures;
- Catchment and water quality management;
- Regulation and control of water use;
- Coordination of the Integrated Water Resource Management (IWRM) Plan.

Eldosol Energy will be required to apply for a water abstraction permit should they decide to either sink a borehole or abstract water from any nearby surface water resources such as the Kipsinende River, 3 km north of the Site.

2.4

RELEVANT STATUTES

The current legal provisions for natural resource management in Kenya are contained in over seventy sector-specific statutes. In 1999, the Government of Kenya enacted the Environmental Management and Co-ordination Act which is an umbrella legal framework and institutional framework under which the

environment is managed. The Act prevails over all other sectoral laws relating to the environment in cases of conflict or contradictions. It also grants the public a *locus standi* in matters of the environment.

2.4.1 *The Constitution of Kenya*

In the Constitution of Kenya, 2010 Part II (Environment and Natural Resources), (I) the State clearly undertakes to carry out the following:

- Ensure sustainable exploitation, utilization, 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 per cent 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 of 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.

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

The Project should observe the above stated conditions in as far as environmental protection is concerned.

2.4.2 *The Energy Act, 2006*

The Energy Act of 2006 deals with all matters relating to all forms of energy including the generation, transmission, distribution, supply and use of electrical energy as well as the legal basis for establishing the systems associated with these purposes. The Act also established the Energy Regulatory Commission (ERC). One of the duties of the ERC is to ensure compliance with Environmental, Health and Safety Standards in the Energy Sector, as empowered by Section 98 of the Energy Act, 2006.

In respect of the above, the following environmental issues will be considered before approval to establish the solar PV plant is granted:

- The need to protect and manage the environment, and conserve natural resources;

- The ability to operate in a manner designated to protect the health and safety of the project employees, the local and other potentially affected communities; and
- Licensing and authorisation to generate and transmit electrical power must be supported by an Environmental and Social Impact Assessment (ESIA) Report approved by NEMA.

2.4.3 *The Energy (Solar Photovoltaic System) Regulations, 2012*

In accordance to Section 2 (1) of this regulation it states: *“These regulations shall apply to a solar PV system manufacturer, importer, vendor, technician, contractor, system owner, a solar PV system installation and consumer devices”*.

This regulation gives the licensing criteria of Solar PV system technicians, stating that the person designing the Solar PV system should be licensed by the Energy Regulatory Commission (ERC). The regulation under *Section 4 (2) and (3) a, b, c* gives the criteria (qualifications and experience) of a technician to be licenced by the Commission (ERC) as set out in the First Schedule of the regulation.

The technicians directly employed by Eldosol Energy or its Contractors will be required to be licensed under this Regulation.

The regulation further gives the criteria for Licensing a solar PV system manufacturer, importer, vendor or contractor. Section 6 of the regulation states that:

- “(1) A person shall not import, distribute, promote, sell or install any solar PV system unless he is licensed by the Commission as a vendor.
- (2) Where under this regulation a person who is not a technician applies to be licensed by the Commission as a vendor or contractor that person shall be required to have in his employment, a licensed Solar PV system technician.
- (3) The Commission may on application being made to it, grant to the applicant any one of the following classes of licences –
 - a) Class C1 licence, which shall entitle the holder to carry out design and installation work for solar PV systems, in which case the contractor shall be requested to be or have in his employment a class T3 technician;
 - b) Class V1 licence, which shall entitle the holder to design, distribute, promote, sell or install solar PV systems, in which case the licensee shall be required to be, or to have in his employment a class T2 technician
 - c) Class V2 licence, which shall entitle the holder to manufacture or import solar PV systems or components, in which case the licensee shall be required to be or to have in his employment a class T2 technician.”

The regulation under Section (4) gives the period of validity of the License given to be one year from the date of issue. Under Section 8(4) the regulation gives responsibility of the design and specifications of complete solar PV system to the vendor or contractor. Under Section 8(5) states that the vendor or contractor shall submit the solar PV system design tools to the ERC for approval. It further gives the responsibility to ensure maintenance and carry out repairs required to keep the installation in good and efficient condition to the owner of the solar PV system.

In this case Eldosol Energy will be required to ensure that their Operation and Maintenance (O&M) plans are compliant with this regulation.

The regulation clearly gives reference to appropriate regulation (discussed in this Chapter) in relation to the management and disposal of waste and safety concerns during construction and operation of the 40MW solar PV Power Plant. Section 10 (Use and disposal of solar PV systems and components) states:

- “10. (1) All manufacture, sale, installation, use and disposal of solar PV systems and components shall be in accordance with the provisions of the Environmental Management Coordination Act, No 8 of 1999 and the Occupational Safety and Health Act, No 15 of 2007.
- (2) A manufacturer or vendor of a solar PV system and components shall affix thereon appropriate safety and health warning labels.
- (3) A technician or contractor shall affix appropriate safety and health warning labels on completed solar PV system installations.”

The EPC Contractor will be required to comply with regulations set as stated in Section 10 of this regulation as referenced to other environmental, occupational health and safety regulations as discussed in this Report.

2.4.4

The Environmental Management and Coordination Act, 1999

The Environment Management and Coordination Act (EMCA), 1999 is implemented by the guiding principle that every person has a right to a clean and healthy environment and can seek redress through the high court if this right has been, is likely to be or is being contravened.

Section 58 of the Act makes it a mandatory requirement for an EIA to be carried out by proponents intending to implement projects specified in the second schedule of the Act. Such projects have a potential of causing significant impacts on the environment. Similarly, section 68 of the same Act requires operators of existing projects or undertakings to carry out environmental audits in order to determine the level of conformance with statements made during the EIA.

This Project falls within Schedule 2 of EMCA (under Energy Generating Power Plants). Eldosol Energy has therefore commissioned the EIA in compliance with the Act and they shall be required to commit to implementing the Environmental and Social Management and Monitoring Plan (ESMMP) laid out in this Report and any other conditions laid out by NEMA, prior to being issued a licence.

2.4.5 *The Environmental (Impact Assessment and Audit) Regulations, 2003*

The Environmental Impact Assessment and Audit Regulations state in Regulation 3 that “*the Regulations should apply to all policies, plans, programmes, projects and activities specified in Part IV, Part V and the Second Schedule of the Act*”. Part III of the Regulations indicates the procedures to be taken during preparation, submission and approval of the ESIA Report, i.e., this Report.

This ESIA Report has been undertaken to comply with the requirements of the Environmental Regulations. Eldosol Energy shall be required to commit to implementing the ESMMP laid out in this report and any other conditions stipulated by NEMA.

2.4.6 *The Environmental Management and Coordination (Water Quality) Regulations, 2006*

The Regulations provides for sustainable management of water resources including prevention of water pollution and protection of 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.

The proposed Solar PV power plant will generate some waste water in the form of storm water runoff, water used in panel cleaning, and waste water from staff quarters. All waste water discharged must comply with the standards specified in this regulation.

2.4.7 *The Environmental Management and Coordination (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; and
- 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:

Improvement of production process through:

- conserving raw materials and energy;
- eliminating the use of toxic raw materials and wastes;
- reducing toxic emissions and wastes.

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; and
- incorporating environmental concerns in the design and disposal of a product.

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

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.

The Project, during the operational and construction phases will generate wastes which will need to be disposed of as per the guidelines in the regulations.

2.4.8

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

These regulations were published as legal Notice No. 61 being a subsidiary legislation to the Environmental Management and Co-ordination Act, 1999. The regulations provide information on the following:

- prohibition of excessive noise and vibration;
- provisions relating to noise from certain sources;
- provisions relating to licensing procedures for certain activities with a potential of emitting excessive noise and/or vibrations; and

- noise and excessive vibrations mapping.

According to regulation 3 (1), no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. Regulation 4 prohibits any person to (a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the environment; or (b) cause to be made excessive vibrations which exceed 0.5 centimetres per second beyond any source property boundary or 30 metres from any moving source.

Regulation 5 further makes it an offence for any person to make, continue or cause to be made or continued any noise in excess of the noise levels set in the First Schedule to these Regulations, unless such noise is reasonably necessary to the preservation of life, health, safety or property.

Regulation 12 (1) makes it an offence for any person to operate a motor vehicle which- (a) produces any loud and unusual sound; and (b) exceeds 84 dB(A) when accelerating. According to sub-regulation 2 of this regulation, No person shall at any time sound the horn or other warning device of a vehicle except when necessary to prevent an accident or an incident. Regulation 13 (1) provides that except for the purposes specified in sub-Regulation (2) there under, no person shall operate construction equipment (including but not limited to any pile driver, steam shovel, pneumatic hammer, derrick or steam or electric hoist) or perform any outside construction or repair work so as to emit noise in excess of the permissible levels as set out in the Second Schedule to these Regulations

Regulation 19 (1) prohibits any person to carry out activities relating to fireworks, demolitions, firing ranges or specific heavy industry without a valid permit issued by the Authority. According to sub-regulation 4, such permit shall be valid for a period not exceeding three months.

The EPC Contractor will be required to ensure compliance with the above regulations in order to promote a healthy and safe working environment throughout the construction phase. This shall include regular inspection and maintenance of equipment to reduce noise and vibration, prohibition of unnecessary noise emitted from construction equipment and project heavy and light vehicles, adherence to noise those noise levels stipulated for day and night etc.

2.4.9

The Forestry Services Act, 2005

The Act led to the establishment of Kenya Forest Service which is charged with management of forests in consultation with the forest owners. The body enforces the conditions and regulations pertaining to logging, charcoal making and other forest utilisation activities. To ensure community participation in forest management, the service collaborates with other organisations and communities in the management and conservation of

forests and for the utilisation of the biodiversity. Section 43 (1) provides that if mining, quarrying or any other activity carried out in the forest, where the activity concerned is likely to result in forest cover depletion, the person responsible shall undertake compulsory re-vegetation immediately upon the completion of the activity.

The Site is bounded by *Eucalyptus globulus* (Blue Gum). Eldosol Energy will therefore ensure that the provisions of this Act are observed.

2.4.10 *The Land Act, 2012*

This Act of Parliament intended to give effect to Article 68 of the Constitution, to revise, consolidate and rationalise land laws, to provide for the sustainable administration and management of land and land based resources, and for connected purposes.

Principles and Values to Guide Land Management and Administration

Parts 1 and 2 of section 4 of the Act outline the main guiding principles in land management and administration, binding to all land actors including state officers. These principles are to be applied when enacting, applying or interpreting any provisions of this Act; and when making or implementing public policy decisions. In discharging their functions and exercising of their powers under this Act, the Commission and any State officer or Public officer shall be guided by the following values and principles:

- equitable access to land;
- security of land rights;
- sustainable and productive management of land resources;
- transparent and cost effective administration of land;
- conservation and protection of ecologically sensitive areas;
- elimination of gender discrimination in law, customs and practices related to land and property in land;
- encouragement of communities to settle land disputes through recognised local community initiatives;
- participation, accountability and democratic decision making within communities, the public and the Government;
- technical and financial sustainability;
- affording equal opportunities to members of all ethnic groups;
- non-discrimination and protection of the marginalized;
- democracy, inclusiveness and participation of the people; and
- alternative dispute resolution mechanisms in land dispute handling and management.

Article 5 of the Land Act, lists forms of land tenure: Freehold; Leasehold; such forms of partial interest as may be defined under this Act and other law, including but not limited to easements and customary land rights, where consistent with the Constitution. This article also provides for equal recognition and enforcement of land rights arising under all tenure systems

and non-discrimination in ownership of, and access to land under all tenure systems.

Article 56 of the land act on the power to lease land states the owner of private land may – (a) Lease that land or part of it to any person for a definite period or for the life of the lessor or of the lessee or for a period which though indefinite, may be terminated by the lessor or the lessee; and
(b) Subject the lease to any conditions that may be required by this Act or any other law or that the lessor may impose

The Project Proponent has purchased 300 acres of land to be covered by the Project and holds a legal title to the Site.

2.4.11 *The National Land Commissions Act, 2012*

This is an Act of Parliament to make further provision as to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the commission, to give effect to the objects and principles of devolved government in land management and administration, and for connected purposes.

The mandate of the Commission, as provided for in the Act, Pursuant to Article 67(2) of the Constitution, shall be:

- to manage public land on behalf of the national and county governments;
- to recommend a national land policy to the national government;
- to advise the national government on a comprehensive programme for the registration of Title in land throughout Kenya;
- to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- to initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- to encourage the application of traditional dispute resolution mechanisms in land conflicts;
- to assess tax on land and premiums on immovable property in any area designated by law;
- to monitor and have oversight responsibilities over land use planning throughout the country;
- on behalf of, and with the consent of the national and county governments, alienate public land;
- to monitor the registration of all rights and interests in land;
- to ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations;
- develop and maintain an effective land information management system at national and county levels;
- manage and administer all unregistered trust land and unregistered community land on behalf of the county government; and

- develop and encourage alternative dispute resolution mechanisms in land dispute handling and management.

The Project Proponent has purchased 300 acres of land to be covered by the Project and holds a legal title to the Site.

2.4.12 *The Land and Environment Court Act, 2011*

This is an Act of Parliament to give effect to Article 162 (2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act.

Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2) (b) of the Constitution, the Court shall have power to hear and determine disputes relating to environment and land, including disputes:

- relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources;
- relating to compulsory acquisition of land;
- relating to land administration and management;
- relating to public, private and community land and contracts, chooses in action or other instruments granting any enforceable interests in land; and
- any other dispute relating to environment and land.

Section 24 (2) also states that the Chief Justice shall make rules to regulate the practice and procedure, in tribunals and subordinate courts, for matters relating to land and environment.

However, the physical offices of this Court are yet to be established. As such, section 30 (1) states that all proceedings relating to the environment or to the use and occupation and title to land pending before any Court or local tribunal of competent jurisdiction shall continue to be heard and determined by the same court until the Environment and Land Court established under this Act comes into operation or as may be directed by the Chief Justice or the Chief Registrar.

In the event that any disputes relating to environmental protection, such as any land use planning, title, tenure and boundaries issues in Kipchamo Location are not solved at the project level, these can be forwarded to the Land and Environment Court.

This is an Act of Parliament intended to revise, consolidate and rationalise the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes.

Land Registry

Section 7(1) of the Act provides for establishment of a land registry in each registration unit which shall keep registers of the following regarding land:

- a land register, in the form to be determined by the Commission;
- the cadastral map;
- parcel files containing the instruments and documents that support subsisting entries in the land register.
- any plans which shall, after a date appointed by the Commission, be geo-referenced;
- the presentation book, in which shall be kept a record of all applications numbered consecutively in the order in which they are presented to the registry;
- an index, in alphabetical order, of the names of the proprietors; and
- a register and a file of powers of attorney.

Maintenance of Documents, including Land Title Deeds

Further, section 9 (1) provides that the Registrar shall maintain the register and any document required to be kept under this Act in a secure, accessible and reliable format. These documents include:

- publications, or any matter written, expressed, or inscribed on any substance by means of letters, figures or marks, or by more than one of those means, that may be used for the purpose of recording that matter;
- electronic files; and
- an integrated land resource register.

The register, as provided for in part 2 of section 9, shall contain the following particulars;

- name, personal identification number, national identity card number, and address of the proprietor;
- in the case of a corporate body, name, postal and physical address, certified copy of certificate of incorporation, personal identification numbers and passport size photographs of persons authorised and where necessary attesting the affixing of the common seal;
- names and addresses of the previous proprietors;
- Size, location, user and reference number of the parcel; and
- any other particulars as the Registrar may, from time to time, determine.

The Project Proponent has purchased 300 acres of land to be covered by the Project and holds a legal title to the Site.

2.4.14 *The Water Act, 2002*

The Water Act No. 8 of 2002 provides for the management, conservation, use and control of water resources and for acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services. Section 18 of this Act provides for national monitoring and information systems on water resources. Following on this, sub-Section 3 mandates the Water Resources Management Authority (WRMA) to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a site operator and the information thereof furnished to the authority.

Section 73 of the Act provides that a person who is licensed to supply water has a responsibility of safeguarding the water sources against degradation. According to section 75 (1) such a person is required to construct and maintain drains, sewers and other works for intercepting, treating or disposing of any foul water arising or flowing upon land for preventing pollution of water sources within his/her jurisdiction.

Section 94 of the Act also makes it an offence to throw or convey or cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive or unwholesome matter or thing into or near to water resource in such a manner as to cause, or be likely to cause, pollution of the water resource.

The Project will require water for use at various stages. If Eldosol Energy plans to abstract water from underground sources such as a borehole or abstract from the Kipsinende River, they will have to apply for an abstraction permit from the Water Resources Management Authority (WRMA).

2.4.15 *The Water Quality Regulation, 2006*

The Water Quality Regulations (2006) are contained in the Kenya Gazette Supplement No 68, Legal Notice No 120. Of immediate relevance to the proposed facility for the purposes of this Scoping Report is Part II, Sections 4 - 5, as well as Part V Section 24.

Part II Section 4 states that “Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution”

Part V Section 24 states that “No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump or discharge any such matter into water meant for fisheries, wildlife, recreational purposes of any other uses”.

The risk of leaks and spills has been addressed in the anticipated impacts and mitigation measures chapter of this ESIA Report. Eldosol Energy will therefore observe the guidelines as set out in the ESMMP as laid out in this Report.

2.4.16 *Water Resources Management Rules (2007)*

In addition to the Water Act 2002, the main document outlining the regulations is the Water Resource Management Rules 2007. The rules set out the procedures for obtaining water use permits and the conditions placed on permit holders.

Water supply for the proposed project is not extensive, although permissions will be obtained and conditions met, before water is used. Eldosol Energy shall follow the mitigation measures listed in the ESMMP in order to limit the pressure on the local community and their water sources.

2.4.17 *The Public Health Act (Cap 242)*

This is an Act of Parliament to make provision for securing and maintaining health. Section 115 of this act prohibits causing nuisance or other condition liable to be injurious or dangerous to health. Section 118 provides a list of nuisances which includes any noxious matter, or waste water, flowing or discharged from any premises, wherever situated, into any public street, or into the gutter or side channel of any watercourse, irrigation channel or bed thereof not approved for the reception of such discharge.

The ESMMP within this Report advises Eldosol Energy on public health aspects, potential impacts, mitigation implementation and monitoring.

2.4.18 *The Public Health (Drainage and Latrines) Rules, Cap 130, 1958*

Rule 85 provides that every owner or occupier of every workshop, workplace or other premises where persons are employed shall provide proper and sufficient latrines for use by employees.

Rule 87 requires every contractor, builder or other person employing workmen for the demolition, construction, reconstruction or alteration of any building or other work in any way connected with building to provide in an approved position sufficient and convenient temporary latrines for use by such workmen. Rule 91 provides that no person shall construct a latrine in connection with a building other than a water closet or a urinal, where any part of the site of such building is within 200 feet of a sewer belonging to the local authority which is at a suitable level, and where there is sufficient water supply.

This Act is applicable to the project since the EPC Contractor will be required to construct toilets for use by workers and visitors to the site during the

construction phase of the proposed project. Sufficient latrines will also be required during the operational phase for the staff quarters within the site.

2.4.19 *The Physical Planning Act, 1996*

This is the main Act that governs land planning and all proposed developments must be approved by the respective local authority and certificate of compliance issued accordingly.

This Act 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 in order to remove uncertainty regarding the responsibility for regional planning. A key provision of the Act is the requirement for Environmental Impact Assessment (EIA).

The design layout plan within this Report shows the proposed layout for the PV plant and transmission line. Eldosol Energy shall secure all mandatory approvals and permits as required by the law.

2.4.20 *The Occupational Safety and Health Act, 2007*

This 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.

It applies to all workplaces where any person is at work, whether temporarily or permanently.

The purpose of this Act is to:

- secure the safety, health and welfare of persons at work;
- protect persons other than persons at work against safety and health arising out of, or in connection with the activities of persons at work.

The scope of OSHA 2007 has been expanded to cover all workplaces including offices, schools, academic institutions, factories and plantations. It establishes codes of practices to be approved and issued by the Directorate of Occupational Safety and Health Services (DOSHS) for practical guidance of the various provisions of the Act.

The EPC Contractor and Proponent will be required to comply with all the provisions of the Act throughout the Project life cycle.

2.4.21 *The Employment Act No 11 of 2007*

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and

democratisation of trade unions and employers organisations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes. This Act is important since it provides for employer – employee relationship that is important for the activities that would promote management of the environment within the energy sector.

With the EPC contractor and Eldosol Energy being primary employers during the construction and operational phases of the Project, respectively, they are bound by this law to abide to its stipulations on employee management and relations.

2.5 *RELEVANT PERMITS*

Table 2.1 provides a summary of all permits and licences required by NEMA which could be applicable to Eldosol Energy.

Table 2.1 **Relevant Permits Required by Eldosol Energy**

	Sector	Legislation	Authority	Permit/Licence	Comments
Construction Phase	Environment	EMCA	NEMA	EIA Licence	The EIA licence will give the decision criteria for NEMA
		EMCA	Uasin Gishu County Director Environment	EIA licence for a borehole	Before sinking a borehole,
		Environmental Management and Coordination (Waste Management) Regulations, 2006	NEMA	Ensure that the contracted waste handlers (transport and disposal) are licensed by NEMA	When disposing waste
	Water Resources	Water Act, 2002	WRMA	Water Abstraction Permit	Before sinking a borehole of abstracting from a River
	Land	Land Act 2012, National Land Commissions Act, 2012	National Land Commission	Title Deeds	Applicable to the Project Site
		Physical Planning Act, 1996	Planning Department (Ministry of Lands)	Change of Land Use	Change of land use approval is given at the County level
		Physical Planning Act, 1996	Planning Department (Ministry of Lands)	Development Approval	Relates to building and urban planning
		Civil Aviation Act, 2013	Kenya Civil Aviation Authority (KCAA)	Civil Aviation Clearance	A letter from KCAA clearing the facilities from Eldoret International Airport
					Aerodrome
Operation Phase	Occupational Health and Safety	Occupational Health and Safety, 2007	Directorate of Occupational Health and Safety (DOSHS)	Registration of workplace	Prior to construction and during operation
	Environment	EMCA	NEMA	Initial Environmental Audit Acknowledgement Letter and Self-Audit Acknowledgement thereafter	Annual, throughout the operations phase
		Environmental Management and Coordination (Waste Management) Regulations, 2006	NEMA	Ensure that the contracted waste handlers (transport and disposal) are licensed by NEMA	When disposing waste
		Energy Act, 2006; Energy (Electricity Licensing) Regulations, 2010	Energy Regulatory Commission (ERC)	Electricity Generation Licence	Compliance with Energy Act and Feed in Tarrif (FIT) Policy
		Energy Act, 2006	ERC	Approval of the Power Purchase Agreement (PPA)	Before Secure energy off-take at a certain energy price

2.6 *INTERNATIONAL CONVENTIONS AND TREATIES*

Kenya is also a signatory to various multilateral agreements and international conventions. The following list is a presentation of some which are relevant to the project and ESIA:

2.6.1 *United National Convention of Biological Diversity (CBD)*

The three goals of the CBD are to promote the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. Kenya, as a signatory of this convention, is supposed to work towards achieving these goals.

2.6.2 *United Nations Framework for Convention on Climate Change (UNFCCC)*

The convention addresses the principles of common but differentiated responsibility and precautionary action. Its main objective is to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with climate systems and within a specific timeframe which will allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. Kenya signed the Kyoto protocol to the UNFCCC in 1997 which provided limitations and reduction commitments for developed countries and those in transition.

2.7 *INTERNATIONAL FINANCE CORPORATION (IFC) PERFORMANCE STANDARDS*

2.7.1 *Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts*

This PS relates to integrating and managing environmental and social performance throughout the life of a project in line with national regulations and international standards.

The objective of the PS1 is to identify and evaluate environmental and social risks and impacts of the project, adopting a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment, promote improved environmental and social performance of clients through the effective use of management systems and to ensure that grievances from affected communities and external communications from other stakeholders.

The standard requires the development of an Environmental and Social Management System (ESMS) that entails a structured approach to managing environmental and social risks and impacts.

In general, the PS1 calls for Identification of Risks and Impacts of the project, establishing, maintaining, and strengthening as necessary an organisational structure that defines roles, responsibilities, and authority to implement the ESMS, establishing and maintaining an emergency readiness and response system to respond to accidental and emergency situations associated with the project, establishing procedures to monitor and measure the effectiveness of the management programme, as well as compliance with any related legal and/or contractual obligations and regulatory requirements, engaging stakeholders at all levels and addressing stakeholder grievances.

The ESIA has included all the issues and items specified in PS 1, Guidance Note 1.

2.7.2 Performance Standard 2: Labour and Working Conditions

This standard aims to ensure that the client establishes, maintains and improves a worker-management relationship that promotes the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws and international standards (as defined by the International Labour Organisation (ILO)). PS2 addresses child labour and forced labour, and promotes safe and healthy working conditions, and protecting and promoting the health of workers by recognising the role of employees.

This PS applies to workers directly engaged by the client (direct workers), workers engaged through third parties to perform work related to core business processes of the project for a substantial duration (contracted workers), as well as workers engaged by the client's primary suppliers (supply chain).

The PS calls for the adoption of a human resources policy and procedure by Eldosol Energy appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this Performance Standard and Kenyan laws. Eldosol Energy should also provide workers with documented information that is clear and understandable, regarding their rights under Kenyan labour and employment laws and any applicable collective agreements, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur.

2.7.3 Performance Standard 3: Resource Efficiency and Pollution Prevention

This PS aims to abate pollution to air, water, and land that may threaten people and the environment at the local, regional, and global levels. This Performance Standard promotes the ability of private sector companies to adopt such technologies and practices where feasible.

By using photovoltaic technology, the project will, as a minimum prevent global warming through displacement of GHGs if other fossil fuel sources of energy would have been used.

2.7.4

Performance Standard 4: Community Health, Safety and Security

The role of this PS is to anticipate and avoid adverse impacts on the health and safety of the affected communities throughout the life of the Project as a result of routine and non-routine events. The PS also requires an assessment of how use of security by the Project to safeguard personnel and property could impact on community security taking into account considerations of human rights.

This ESIA evaluates the risks to, and impacts on, the health, safety and security of the affected communities during the project lifecycle and proposes mitigation measures consistent with good international industry practice (GIIP).

2.7.5

Performance Standard 5: Land Acquisition and Involuntary Resettlement

PS5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. The PS aims to anticipate and avoid physical and economic resettlement or, where avoidance is not possible, to minimise adverse social and economic impacts. IFC PS 5 requires that feasible alternative project designs are considered that minimise resettlement. In cases where resettlement is unavoidable, the responsible party is required to improve, or restore, the livelihoods and standards of living of displaced persons, provide consistent compensation in a transparent manner and to organise appropriate disclosure of information, consultation, and the informed participation of those affected throughout the resettlement process.

Eldosol Energy has purchased 301 acres of land to be covered by the Project and holds a legal title to the Site. However, economic displacement is anticipated in relation to the wayleave for the transmission line to connect the Project to the National Grid. Impacts associated with the wayleave are considered in this ESIA.

2.7.6

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

This PS aims to protect and conserve biodiversity based on the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within a species, between species, and ecosystems.”

This PS divides habitat into three categories, modified, natural, and critical. Critical habitats are a subset of modified or natural habitats. Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially altered them. These may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands.

Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological function and species composition.

Critical habitats are areas with high biodiversity values, including habitats of significant importance to critically endangered and/or endangered species, habitats of significant importance to endemic and/or restricted-range species, habitats supporting globally significant concentrations of migratory species and/or congregatory species, highly threatened and/or unique ecosystems, and/or areas associated with key evolutionary processes.

There are no critical habitats identified in the direct project area, as most of the habitat has been modified by large scale wheat and maize farming.

2.7.7 *Performance Standard 7: Indigenous Peoples*

This PS deals with safeguarding Indigenous Peoples. The PS defines indigenous peoples as social groups with identities that are distinct from mainstream groups in national societies, and are often among the most marginalised and vulnerable segments of the population.

This PS will not be triggered as no indigenous people reside in or around the Project area.

2.7.8 *Performance Standard 8: Cultural Heritage*

Cultural heritage, according to this PS, refers to tangible forms of cultural heritage, such as tangible movable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

None of these features have been identified in the project area and due to the modified nature of the environment it is unlikely that they exist, therefore in principle this PS will not be triggered.

2.8 TRANSMISSION LINES AND ELECTRIC AND MAGNETIC FIELDS (EMF)

2.8.1 IFC Environmental, Health and Safety (EHS) Guidelines for Electric Power Transmission and Distribution

The IFC EHS Guidelines for Electric Power Transmission and Distribution (2007) state that:

- Although there is public and scientific concern over the potential health effects associated with exposure to EMF (not only high voltage power lines and substations, but also from everyday household uses of electricity), there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern, and
- Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g. schools or offices), should be avoided.

2.8.2 World Health Organisation's International EMF Project

The World Health Organisation (WHO), 2015, has also been carrying out a long term study on the health impacts of long term exposure to low levels of EMF, such as those from transmission lines. WHO's International EMF Project was launched to provide scientifically sound and objective answers to public concerns about possible hazards of low level electromagnetic fields and they have concluded that despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health.

2.8.3 Wayleave Requirements for Transmission Lines

The Kenya Electricity Transmission Company Limited (KETRACO), 2015, explains that the wayleave for a transmission corridor includes the land set aside for the transmission line and associated facilities as well as land set aside for a safety margin between the line and nearby structures and vegetation. KETRACO further state that the right-of-way width needed for transmission lines ranges from 30 metres to 60 metres, as indicated in *Table 2.2* below:

Table 2.2 *Wayleave Requirements in Kenya*

Transmission Line	Wayleave
132 kV	30 metres (15 meters from the centre line on both sides)
220 kV	40 metres (20 metres from the centre line on both sides)
400 kV	60 metres (30 metres from the centre line on both sides)

In comparison, the Southern African Power Pool (SAPP) Guidelines for Transmission Infrastructure (2010) for the SAPP Region are provided in *Table 2.3* below and they are similar to those for KETRACO.

Table 2.3 SAPP Guidelines for Transmission Infrastructure

Transmission Line	Wayleave
275 kV	47 metres
132 kV	31 metres
33 kV	22 metres

3.1 ESIA OBJECTIVES

The objectives of the ESIA are to:

- Identify all potentially significant adverse environmental and social impacts of the project and recommend measures for mitigation.
- Gather baseline data to inform the assessment of impacts and to monitor changes to the environment as a result of the Project as well as evaluate the success of the mitigation measures implemented.
- Recommend measures to be used to avoid or reduce the anticipated negative impacts and enhance the positive impacts.
- Prepare an ESIA Report compliant to EMCA and the Environmental (Impact Assessment and Audit) Regulations (2003), detailing findings and recommendations for review by NEMA.

3.2 METHODOLOGY**3.2.1 Screening**

The proposed Project was screened to determine the need to undertake an ESIA based on:

- Project characteristics;
- the Second Schedule of EMCA, which lists the mandatory projects that must undergo an EIA;
- International Finance Corporation's (IFC) Performance Standards on Social and Environmental Sustainability (2012); and
- Applicable provisions of IFC's General Environmental Health and Safety Guidelines.

Based on the above criteria, it was concluded that an ESIA would be necessary for the proposed PV plant due to the following aspects:

- The Second Schedule of EMCA lists electrical infrastructure as projects that must undergo and EIA; and
- The nature and extent of the potential impacts of the Project.

3.2.2 Scoping

As a first step of the ESIA process a scoping study was undertaken. The objectives of the Scoping Study were to identify the potentially significant

environmental and social issues relating to the Project that will need to be addressed as part of the ESIA.

As part of the scoping study the following activities were undertaken:

- identification of sources of data on baseline conditions;
- determination of the likely area of influence to be considered in the ESIA;
- consideration of alternatives related to the Project;
- identification and consultation with stakeholders who would be interested and/or affected by the Project;
- identification of cross-sectoral issues and impacts, prioritising them on a shortlist which would need to be considered as part of the ESIA;
- defining the environmental and legislative setting of the proposed project.

3.2.3 Baseline Data Collection

In order to understand the existing baseline environmental and social conditions in the area, a variety of data collection methods were undertaken.

Document Review

A literature review was undertaken based on the findings of the scoping process, which involved reviewing legislation, policies, County development plans and previous studies carried out in the area to determine the baseline conditions and establish the legal, institutional and biophysical and socio-economic environmental setting of the proposed project.

The desk based study also included the development of fieldwork tools, fieldwork schedules as well as the approach to stakeholder engagement as outlined in the Stakeholder Engagement Plan.

Site Visits

ERM carried out an initial site reconnaissance visits on 30th April, 2015 to identify key environmental and social sensitivities within the proposed site so as to avoid siting facilities within these areas. During this visit ERM was accompanied by the Eldosol as well as 3E and Power Engineers so that any environmental, social or technical constraints could be discussed.

A scoping visit was undertaken between the 9th to 12th of June, during which time a site walkover was undertaken including consideration of the proposed wayleave and meetings with stakeholders with key stakeholders at the County and Community level were undertaken to announce the Project, identify data sources and commence the process of determining potential impacts.

Detailed site investigations were then undertaken between 30th June and 2nd July, 2015, during which further stakeholder engagement was undertaken and

primary environmental and social data was collected through focus group discussions, key informant interviews and further site walk overs.

During the site visits, photography and GPS were used to record the salient features and baseline conditions in the Project site and its surroundings. The photos were used to define existing features in the project area and identify soils and floral species. Photography was combined with transect walks and used to identify possible impacts of the proposed project. All the relevant images were stored and are attached to this Report.

3.2.4 *Impact Assessment Methodology*

Impact Assessment Process

The purpose of impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe mitigation measures that will be taken to avoid or minimise any potential adverse effects and to enhance potential benefits.

The impacts of the proposed project were identified based on the findings of public consultation, the existing baseline conditions and professional knowledge. Impacts were first distinguished as either positive or negative. The cross-sectoral issues and aspects were: health; safety; biodiversity; air quality; pollution; social aspects; water resources; climate; infrastructure, and utilities.

Definition of Key Terminology

- **Project** - The features and activities that are a necessary part of the Project Proponent's development, including all associated facilities (such as the transmission line) without which the Project cannot proceed. The Project is also the collection of features and activities for which authorisation is being sought.
- **Project Site** - The (future) primary operational area for the Project activities.
- **Project Footprint** - The area that may reasonably be expected to be directly affected by Project activities, across all phases. The Project Footprint includes land used on a temporary basis such as construction lay down areas or construction haul roads, as well as disturbed areas in transport corridors, both public and private.
- **Area of Influence:** The area where impacts could reasonably be expected

Impact Types and Definitions

An impact is any change to a resource or receptor brought about by the presence of a Project component or by the execution of a Project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the Project could affect the bio-physical and socio-economic environment.

Impacts are described according to their nature or type, as summarised in *Table 3.1*.

Table 3.1 *Impact Nature and Type*

Nature or Type	Definition
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change
Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct impact	Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors (e.g. between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).
Indirect impact	Impacts that result from other activities that are encouraged to happen as a consequence of the Project (e.g. in-migration for employment placing a demand on resources).
Cumulative impact	Impacts that act together with other impacts (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the Project.

Assessing Significance

Impacts are described in terms of 'significance'. Significance is a function of the **magnitude** of the impact and the **likelihood** of the impact occurring. Impact magnitude (sometimes termed severity) is a function of the **extent, duration and intensity** of the impact. The criteria used to determine significance are summarised in *Table 3.2*. Once an assessment is made of the magnitude and likelihood, the impact significance is rated through a matrix process as shown in *Table 3.3* and *Table 3.4*.

Significance of an impact is qualified through a statement of the **degree of confidence**. Confidence in the prediction is a function of uncertainties, for example, where information is insufficient to assess the impact. Degree of confidence is expressed as low, medium or high.

Table 3.2 *Significance Criteria*

<i>Impact Magnitude</i>	
Extent	On-site – impacts that are limited to the boundaries of the development site. Local – impacts that affect an area in a radius of 20km around the development site. Regional – impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by

	administrative boundaries, habitat type/ecosystem. National – impacts that affect nationally important environmental resources or affect an area that is nationally important/ or have macro-economic consequences.
Duration	Temporary – impacts are predicted to be of short duration and intermittent/occasional. Short-term – impacts that are predicted to last only for the duration of the construction period. Long-term – impacts that will continue for the life of the Project, but ceases when the project stops operating. Permanent – impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the project lifetime.
Intensity	BIOPHYSICAL ENVIRONMENT: <i>Intensity can be considered in terms of the sensitivity of the biodiversity receptor (i.e. habitats, species or communities).</i> Negligible – the impact on the environment is not detectable. Low – the impact affects the environment in such a way that natural functions and processes are not affected. Medium – where the affected environment is altered but natural functions and processes continue, albeit in a modified way. High – where natural functions or processes are altered to the extent that they will temporarily or permanently cease. <i>Where appropriate, national and/or international standards are to be used as a measure of the impact. Specialist studies should attempt to quantify the magnitude of impacts and outline the rationale used.</i> SOCIO-ECONOMIC ENVIRONMENT: <i>Intensity (Vulnerability) can be considered in terms of the ability of people/communities affected by the Project to adapt to changes brought about by the Project.</i> Negligible – there is no perceptible change to people's livelihood. Low – people/communities are able to adapt with relative ease and maintain pre-impact livelihoods. Medium – people/communities are able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support. High – affected people/communities will not be able to adapt to changes or continue to maintain-pre impact livelihoods.
Likelihood - the likelihood that an impact will occur	
Unlikely	The impact is unlikely to occur.
Likely	The impact is likely to occur under most conditions.
Definite	The impact will occur.

Once a rating is determined for magnitude and likelihood, the following matrix can be used to determine the impact significance.

Table 3.3 *Significance Rating Matrix*

SIGNIFICANCE				
MAGNITUDE		LIKELIHOOD		
		Unlikely	Likely	Definite
	Negligible	Negligible	Negligible	Minor
	Low	Negligible	Minor	Minor
	Medium	Minor	Moderate	Moderate
	High	Moderate	Major	Major

Table 3.4 *Significance Colour Scale*

Negative ratings	Positive ratings
Negligible	Negligible
Minor	Minor
Moderate	Moderate
Major	Major

It is important to note that the positive impacts are not rated, merely stated.

Table 3.5 **Significance Definitions**

Significance definitions	
Negligible significance	An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations.
Minor significance	An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate significance	An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that 'moderate' impacts have to be reduced to 'minor' impacts, but that moderate impacts are being managed effectively and efficiently.
Major significance	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the EIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project.

Once the significance of the impact has been determined, it is important to qualify the degree of confidence in the assessment. Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact. Degree of confidence can be expressed as low, medium or high.

Mitigation Measures and Residual Impacts

For activities with significant impacts, the ESIA process is required to identify, in collaboration with the developer, suitable and practical mitigation measures that can be implemented. Mitigation that can be incorporated into the project design, in order to avoid or reduce the negative impacts or enhance the positive impacts, have been defined and require final agreement with the client as these are likely to form the basis for any conditions of approval by NEMA. The implementation of the mitigation is ensured through compliance with the Environmental and Social Management and Monitoring Plan (ESMMP).

After first assigning significance in the absence of mitigation, each impact is re-evaluated assuming the appropriate mitigation measure(s) is/are effectively applied, and this results in a significance rating for the residual impact.

As a result of the ESIA process a comprehensive EIA Project Report (this document) was developed for submission to NEMA for review.

ESIA is a process that aims to identify and anticipate possible impacts based on past and present baseline information and details of the proposed Project. As the ESIA deals with the future there is, inevitably, always some uncertainty about what will actually happen in reality. Impact predictions have been made based on field surveys and with the best data, methods and scientific knowledge available at this time. However, some uncertainties could not be entirely resolved. Where significant uncertainty remains in the impact assessment, this is acknowledged and the level of uncertainty is provided.

In line with best practice, this ESIA Report has adopted a precautionary approach to the identification and assessment of impacts. Where it has not been possible to make direct predictions of the likely level of impact, limits on the maximum likely impact have been reported and the design and implementation of the project (including the use of appropriate mitigation measures) will ensure that these are not exceeded. Where the magnitude of impacts cannot be predicted with certainty, the team has used professional experience and available scientific research from solar facilities worldwide to judge whether a significant impact is likely to occur or not. Throughout the assessment, this conservative approach has been adopted to the allocation of significance.

In any ESIA process it is inevitable gaps remain. This section summarises the gaps and uncertainties which were considered when undertaking the ESIA.

Gaps in Project Description

- At this stage it is unknown, although unlikely, whether a borrow pit for rock or soil material will be required for the construction of Project infrastructure.

Gaps in Understanding of Impacts

- Traffic volumes during construction of this Project need to be confirmed, at this stage ERM has only provided estimates based on similar studies carried out in Kenya and the anticipated number of panels and other required equipment.

Lack of Recently Available Secondary Data

- Much of the secondary socio-economic data (such as demographics, water access etc.) is taken from the Kenya National Bureau of Statistics (KNBS) census dated 2009, as per the Uasin Gishu County Integrated Development Plan (2013-2018). While ERM made every effort to collect more recent data from the County Offices, it was not possible to fill all the gaps with more recent secondary data. ERM, however, also carried out primary data collection through Focus Group Discussions (FGD) and Key Information Interviews (KII) to collect additional socio-economic data.

This *Chapter* provides an overview of the proposed PV Power Facility. Project activities and requirements for the construction, operation and decommissioning of the facility are discussed in this section.

4.1 PROJECT LOCATION AND EXISTING LAND USE

The Project is located in Kipchamo Location, Kesses Division, Uasin Gishu County at the following GPS coordinates (*Table 4.1* below) and a map of the project locality is provided in *Annex B1*:

Table 4.1 GPS Coordinates of the Proposed Project Site Boundaries

Northings	Eastings
0°25'3.47"N	35°21'5.20"E
0°24'58.71"N	35°22'0.19"E
0°24'41.02"N	35°20'59.47"E
0°24'36.19"N	35°21'54.49"E

The Project will be developed on approximately 300 acres of land owned by the Project Development Company Sponsors and Shareholders (a copy of the Land Contract is provided in *Annex B*). The Site is currently used for large-scale planting of maize and wheat as well as charcoal production and livestock rearing and grazing.

4.2 PV PLANTS AND POWER GENERATION

Solar energy systems produce energy by converting solar irradiation into electricity or heat. For the proposed PV power facility, Eldosol will utilise photovoltaic (PV) technology to generate electricity. PV technology consists of the following components:

- **PV cell;** a basic photovoltaic device, which generates electricity when exposed to solar radiation. The absorbed solar energy excites electrons inside the cells and produces electrical energy. The PV cells are commonly constructed from polycrystalline silicon. All photovoltaic cells produce direct current (DC).
- **PV module or panel;** the smallest complete assembly of interconnected photovoltaic cells. In the case of crystalline silicon cells, following testing and sorting to match the current and voltage, the cells are interconnected and encapsulated between a transparent front (usually glass) and a backing material. The module is then typically mounted in an aluminium frame.

- **PV array;** a mechanically integrated assembly of modules and panels together with support structures, to form a direct current power producing unit. The proposed PV power facility will consist of antireflective modules arranged in numerous arrays. The feeding of electricity into the grid requires the transformation of DC from the PV array into alternating current (AC) by means of an inverter.

4.3

PROJECT COMPONENTS

It is anticipated that once operational, the proposed Project will generate up to 40MW of electricity at the PUC Connection, which will be fed into the national power grid. The anticipated annual electricity generation is 74,968,000 MWh.

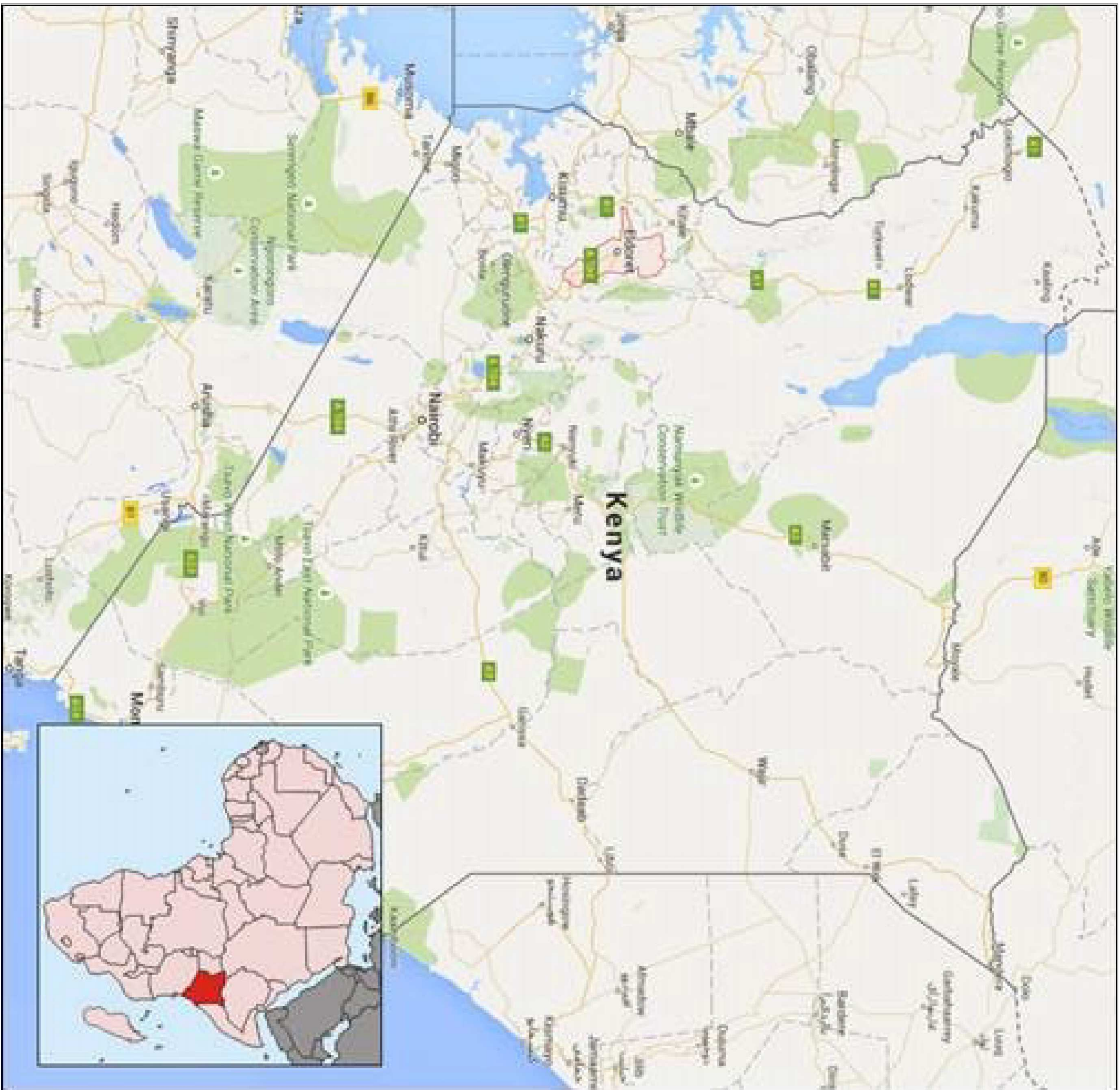
The Project will include the following components:

- Mounting structures and foundation- solar array support fixed system, screw-foot, rammed poles or concrete foundation, depending on soil conditions,
- 140, 800 PV modules;
- MV step-up transformer (400V – 22kV) located either outdoors or in a sheltered housing structure;
- Inverter; and
- Access roads including a perimeter road within the site boundaries as required.

Figure 4.1 (below) shows a preliminary site layout of the Eldosol Energy Solar facility

Figure 4.1 Eldosol Energy Project Site Layout

GEOLOCATION



NTS

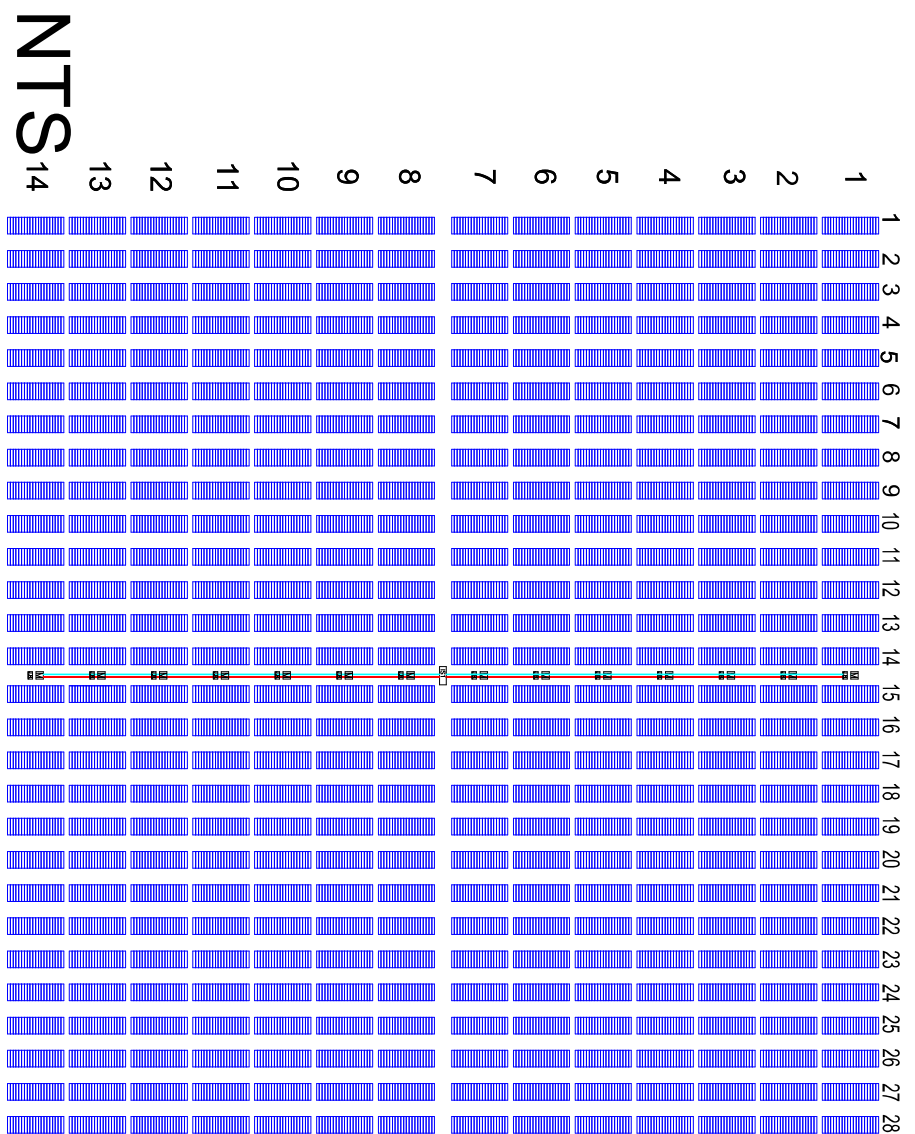


TECHNICAL DESCRIPTION

- Standard Inverter station 2.0 MVA @ Power Factor= 1 / I.S.
- MW = 22 kV
- 20 Blocks
- 47,040 MWp
- 40 MW AC
- 14x28 = 392 structures / I.S.
- 7840 modules / I.S.
- 3920 modules / inverter
- 20 modules / string
- PV Module 300W-72 cells polycrystalline
- 196 strings / inverter
- Grid connection = 220 kV

Total area = 68.9 Ha
Fence perimeter = 3584m
Total area PV panels = 6085 Ha

DETAILED VIEW 1 block=2.352MWp



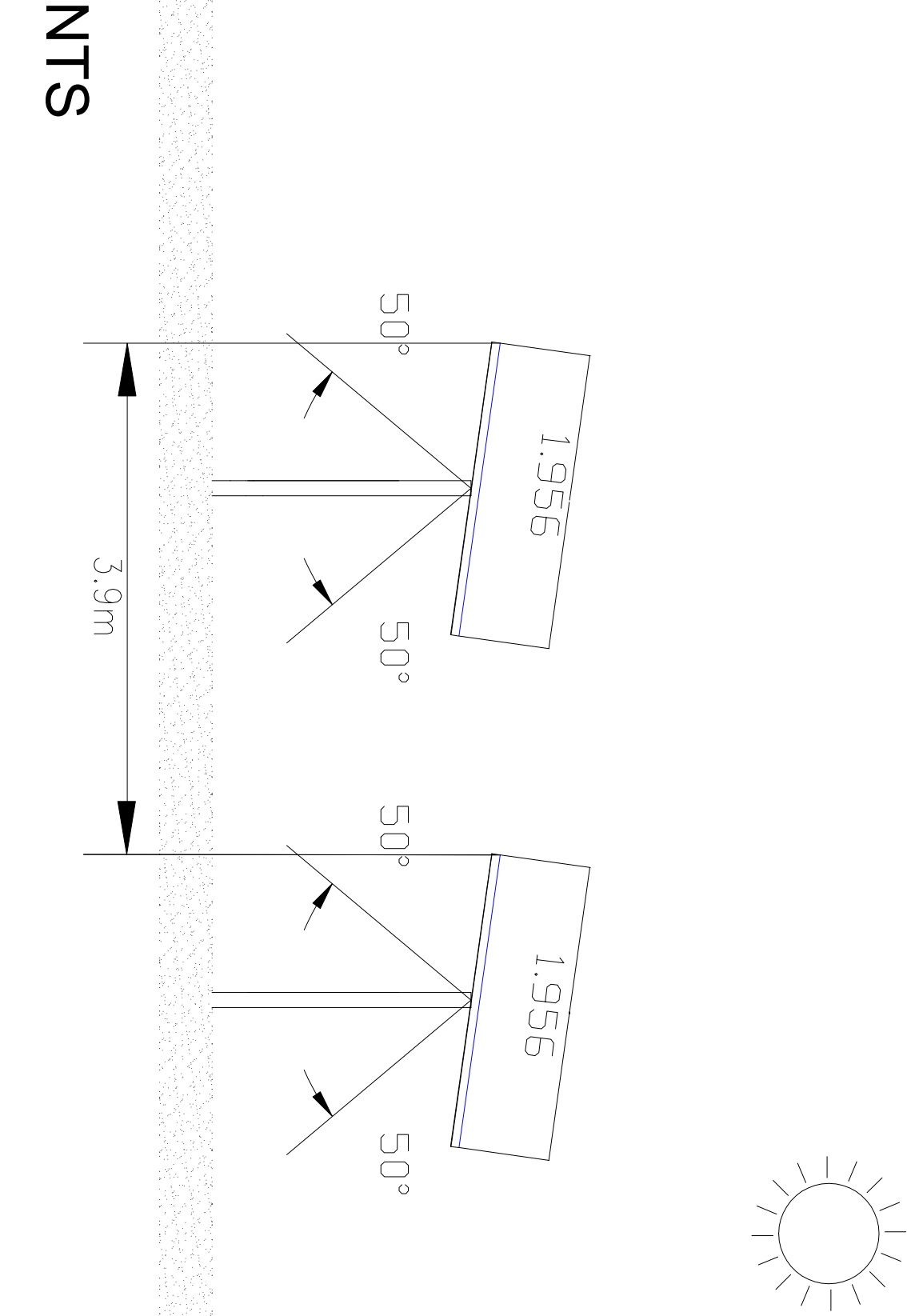
SIMBOLOGY

	Fence
	Perimeter road (3m)
	Access road (4m)
	22kV/220 kV Substation
	Temporary site facilities
	Inverter Station
	Motor
	Junction Box
	Site Offices
	W.C.
	Gate House and control building
	D.S. (delivery substation)
	Warehouse
	Equipment Storage
	Weather Station
	Plant Access
	Access Gates
	5G6mm² Copper
	Cables 2x1x240mm² Copper
	3x1x 95-240mm² Aluminium
	Surveillance Camera
	Connection to Grid

TECHNICAL DESCRIPTION

- Standard Inverter station 2.0 MVA @ Power Factor= 1 / I.S.
- MW = 22 kV
- 20 Blocks
- 47,040 MWp
- 40 MW AC
- 14x28 = 392 structures / I.S.
- 7840 modules / I.S.
- 3920 modules / inverter
- 20 modules / string
- PV Module 300W-72 cells polycrystalline
- 196 strings / inverter
- Grid connection = 220 kV

SITE DATA



NTS

4.3.1

PV Arrays and Mountings

The total developable and fenced area for the solar project will cover 300 acres (approximately 121 ha) with the panels covering 129 acres (52.5 ha or 43%) of this area. The panels will be arranged in either 4 rows of solar modules in 10 columns (4 x 10 structures) or 2 rows of solar modules in 20 columns (2 x 20 structure). The collective term for a series of PV panels in rows is a PV array.

It is anticipated that the PV array will comprise of approximately 140, 800 modules for an approximate maximum peak power of 42 240 kilowatts peak (kWp) in order to provide the 40 MW capacity at the PIC.

The PV panels are approximately 1.956 cm in length, 992cm in width and 40 cm in height. Generally each panel weighs approximately 27 kg.

Eldosol Energy proposes to use a tracking mounting system. In a single tracking system, PV panels are fixed to mountings which track the sun's movement while a 'single axis tracker' will track the sun from east to west. These tracking systems utilise moving parts and complex technology including solar irradiation sensors to optimise the exposure of PV panels to sunlight (*Figure 4.2*).

Figure 4.2 *Typical Single Tracker PV Array*



Source: Eldosol Energy, 2015

4.3.2

Plant Substation

The substation will connect both the Eldosol PV solar farm and the neighbouring Radiant PV solar farm to the national grid via a 220 kV

transmission line. Depending on which option is favourable, the transmission line will either connect to:

- Two line bays provided at the Kesses switching station, or
- A loop-in/loop-out of the existing Lessos-Turkwell 220 kV line (as discussed in *Section 4.3.3* below)

Therefore, each PV solar farm (Radiant and Eldosol) will be operated independently from each other, but will share a common substation. The general design requirements of the substation are as follows:

- Independent operation of the two (2) PV solar farms,
- Power collection from the PV solar farm at 22kV, and
- The substation to supply auxiliary power to the PV solar farm facilities at 400V AC with a backup power in the form of a DC system and diesel generator backup.

The Radiant/Eldosol substation will consist of:

- A 220kV section, including isolators, circuit breakers current transformers (CTs), voltage transformers (VTs) and surge arrestors,
- A 22kV collector section, consisting of collector metal clad switchboard, compensation, Neutral Earthing Compensator and harmonic filters;
- A protection and metering system;
- Low Voltage systems that consist of the auxiliary transformers of the Neutral Earthing Compensators, standby diesel generator and 400V ac distribution boards; and
- A redundant 110v dc system with battery backup.

4.3.3

Transmission Line

Interconnection

The existing utility network available for power evacuation in the area consists of the 220kV line between Lessos and Turkwell and the following options are proposed for the 220 kV interconnection:

- Option A: 220kV Interconnection: Kesses Substation: Where the Radiant/Eldosol PV solar plants are connected to the national grid via the Kesses substation and in this option, two line bays will be made available at Kesses substation for the PV solar plants, or
- Option B: 220kV Interconnection: Lessos – Turkwell Loop-In Loop-Out, where the Radiant/Eldosol PV solar plants are connected to the National Grid by means of a loop-in loop-out of the Lessos–Turkwell 220kV line through a new 220kV switchyard.

4.3.4

Point of Utility Coupling (POC)

The designated point of utility coupling is the High Voltage (220kV) side of each step-up transformer and metering will therefore take place at these points. The substation will be designed to ensure that it is possible to meter

each PV solar farm independently. Each PV solar farm will have its own main and check meter.

4.3.5 *Lighting and Protection System*

The high voltage equipment will be protected by a lightning protection system as follows:

- Intercept lightning before it hits the structure,
- Provide a low resistance path to ground for the high currents associated with lightning discharges
- Prevent damage to structures and hazards to people, and
- Have the installation inspected.

4.3.6 *Earthing System*

The earthing system will consist of bare copper conductors and ground rods to provide a metallic ground connection for all electrical apparatus installed in the high voltage station in order to bond steel, exposed metal structures and other non-current carrying metal to a common ground potential.

4.3.7 *Fences*

Fences will be earthed in the areas of high personnel traffic, near transmission or distribution lines, and where the fence crosses the earth-grid.

4.3.8 *Power Transformers*

A step-up transformer is to serve the Power Plant. The transformer will be equipped with on-load tap changers in order to regulate the voltage on the 22kV medium busbar and will be capable of evacuating the total combined 80MW generated by the Eldosol PV solar plant and the neighbouring Radiant PV solar plant.

The step-up transformer will be of Oil Natural Air Forced (ONAF), with the forced cooling only switched on when the full 80MW of the combined output power of the two) PV solar farms must be evacuated.

4.3.9 *Auxiliary Services Infrastructure*

Uninterruptable Power Supply (UPS)

The substation Uninterruptable Power Supply (UPS) will be a 110V dc system with battery backup. The UPS system will power all metering and protection devices, as well as the emergency lighting. The UPS system will be rated to supply power for two hours when no other main power is available.

Emergency Lighting System

The substation will be equipped with emergency lighting in the control room, switchgear and equipment rooms only. The emergency light will be powered from the 110V dc UPS and will be designed to supply emergency power for one hour.

Underground Trenches

Power cables in the substation outside of buildings and closures will be directly buried in trenches 500 mm or deeper. The trenches will be prepared with engineered backfill to ensure proper thermal conductivity. Within buildings and enclosures, the power cables will be routed in trenches.

4.3.10 Access and Perimeter Roads

The Site is accessible via the Plateau Road (E282A) which borders the North end of the plot. The Road will be restored to its existing condition after construction is complete and the Proponent will look after the condition of the road during the construction phase. A three meters wide perimeter road will be constructed for maintenance purposes.

Figure 4.3 *Access to site via Plateau Road*



Source: ERM Site Visit, 2015

4.3.11 Construction Material Sources

The need for cut and fill areas and or borrow pits at the PV sites, along roads and at substation/transformer sites will only be known after the final design has been completed. The PV panels and mounting, however, will be obtained from outside of Kenya.

The PV, electrical and structural equipment will be delivered to site via road in small trucks. Once the PV components have arrived on site, technicians will supervise the assembly of the panels and test the facility.

4.4 PROJECT STAGES AND ACTIVITIES

4.4.1 Feasibility Studies and Construction

Table 4.2 below shows the proposed timeframe of the Project from pre-feasibility to construction.

Table 4.2 Proposed Timeframe of the Project

Timeframe	Activities
Q2 2014 – Q4 2014	• Conduct Pre-Feasibility Study (PFS) • Complete Shareholders agreement • Conduct preliminary Solar Study • Secure development financing
Q1 2015 – Q4 2015	• Procurement of permits & licenses • Conduct full Feasibility Study & technical design of the power plants • Conduct ESIA • Complete PPA negotiation • Complete Transmission Agreement negotiation • Complete EPC & O&M negotiation • Secure senior debt financing
Q1 2017 – Q4 2017	• Construction of the 40MW Eldosol Energy Power Plant
Q2 2017	• Test run of the Eldosol Energy Project • Commissioning of the Eldosol Energy power plant
Q2 2017	• Commercial operation of the Eldosol Energy Power Plant

Source: Eldosol Energy, 2015

4.4.2 Operations

Once the facility is complete and operational, it is expected that it will have a lifespan of at least 25 years. Measuring the performance of the PV power plant will be done remotely, through the use of telemetric monitoring. Day to day facility operations will involve both regular on site preventive and corrective maintenance tasks in order to keep the PV power plant in optimal working order throughout the operational period. Maintenance will consist mostly of panel replacement and other mechanical and electrical infrastructure repairs. Intermittent cleaning of the panels will be carried out as necessary which is anticipated to be once or twice a year. Faulty components will be replaced as soon as problems are identified.

4.4.3

Decommissioning

The PV power facility will be decommissioned at the end of its useful life. Alternatively the facility will be upgraded. Should the plant be decommissioned, the site will be rehabilitated to its original state by applying the following actions:

- PV panels will be removed from the fixed aluminium frames;
- fixed aluminium frame structures will be removed;
- PV panels will be transported to special recycling facilities (alternatively used at other operational sites);
- electrical equipment (transformers) will either be re-used on other developments/projects or sold;
- underground cable runs (where applicable) will be removed;
- buildings, such as the guardhouse can be taken over by the landowner for operational purposes, alternately all the reusable material can be removed, the structures demolished and the rubble transported to a municipal waste site; and
- disturbed land areas will be rehabilitated, and replanted with indigenous vegetation if required.

4.5

WATER REQUIREMENTS

During the construction phase the primary water use requirement will be for dust control. However, water may also be required to moisture condition the soils for proper compaction at roads and foundations. Water will also be required for the concrete foundations. Temporary ablution facilities will also be required during construction (i.e. portable toilets). Water requirements for the construction phase of the PV power facility will be supplied by either a borehole, a well or abstracted from the Kipsinende River.

During the operational phase PV panel cleaning will be carried out, using water and a mild, biodegradable and non-abrasive detergent. A 40 MW facility will require approximately 200,000 litres of water (1.5 litres per m²) for each cleaning, which will only be required in the event of a year with low rains. Considering the annual rainfall in the area, this will only be required on rare occasions. The PV panels will be cleaned manually with a window washer type device (covered with a specialized cloth material), soft brush, window squeegee or soft cloth.

During the operational phase, the Proponent can either tanker in the required water and / or sink a borehole.

4.6

WASTE MANAGEMENT

All project generated wastes will need to be managed and disposed of in a manner to prevent potential impacts on the environment and risks to human

health. A Waste Management Plan (WMP) for the proposed project will be developed. This will follow the principles of waste minimisation at source, segregation for reuse, recycling, treatment or disposal.

All wastes produced from the project activities on site will be temporarily stored in a designated waste storage area, for removal from site. More detailed information on the specific wastes to be generated is contained in *Chapter 9* of this Report.

4.7 **EMPLOYMENT AND PROCUREMENT**

Direct job creation from the Project would include an approximate maximum of 250 jobs during the construction period. It is estimated that 210 junior staff and labourers would be required, which should be sourced locally and provided with the necessary training. Around 40 high level staff, such as foremen, artisans, engineers, technicians, quantity surveyors and senior management would also be required, these are likely to come from outside of the local community.

Furthermore, the project would generate around 35 jobs during the operational phase, which are expected to last the full operational life of the plant. These jobs will require both skilled and unskilled staff

Decommissioning is expected to take 3-6 months.

4.8 **COST ESTIMATES**

The estimated total cost of the project is 45,811,382.00 USD (*US Dollars Forty Five Million, Eight Hundred and Eleven Thousand, Three Hundred and Eighty Two*) and a summary breakdown of the costs is presented in *Table 4.3* below:

Table 4.3 *Project Budget*

Item	Cost (USD)
Construction site installation, on-site facilities	228,816.00
Earthwork, track, etc.	691,426.00
PV modules	28,425,600.00
Inverter and transformation Station	5,376,000.00
Mobilised spare parts	14,515.00
Structure/trackers	10,528,000.00
Fences, portal	341,897.00
Cameras	205,128.00
Total	45,811,382.00

This *Chapter* outlines the alternatives considered for the proposed PV power facility.

5.1

SITE LOCATION ALTERNATIVES

As part of the Site selection process a number of potential sites were investigated in Kenya through a desk-top analysis and a variety of studies. Initially the Project was to be developed in Makindu, Makueni County, however, Kenya Power advised the Proponent to focus on the Western Region of Kenya as it has the potential to support a solar PV project, as well as increase the number of power plants in the region. The Kipchamo Site was thereafter identified based on a number of criteria, including:

- **Solar resource:** Analysis of available data from existing weather stations and satellite data suggests that the Site has excellent solar resource to make a solar energy facility viable. The Site is located in one of the most irradiated areas of the country.
- **Site extent:** Sufficient land was bought to enable maximum power supply allowed by the Ministry of Energy policy, therefore maximising potential social benefits for the area.
- **Grid access:** Access to the grid and adequate transmission lines were key considerations for Site location. The Site is located less than 1km from the existing transmission lines. This proximity minimises the Project cost and its environmental and social impacts.
- **Land suitability:** Sites that facilitate easy construction conditions (relatively flat land with deep soft soil and few rock outcrops or water bodies) were favoured during Site selection. Flat land is extremely important as it reduces earth work during construction hence minimising the impact on the landscapes and also decreases shadow effects.
- **Landowner consent:** The selection of the Site where the land owners are supportive of the development of renewable energy is essential for ensuring the success of the Project. The land was purchased in 2015.
- **Environmental and socio-economic impacts:** Consideration was given to identifying a Site with a low level of biodiversity value and low visual impacts.
- **Workforce:** The availability of a potential work force in the surrounding area was taken into consideration.

Solar energy is considered to be the most suitable renewable energy technology for this site, based on the site location, ambient conditions and energy resource availability. There are a number of different solar energy technologies that include:

- Fixed PV plants;
- Tracking PV plants (with solar panels that rotate to follow the sun's movement);
- Concentrated Solar Power (CSP) plants; and
- Concentrated PV Plants.

Financial, technical and environmental factors were taken into account when choosing the type of solar power technology for the site. This included consideration of the local solar resource and its likely generation output, the economics of the proposed facility and availability of government feed-in tariffs and energy production licenses, and the requirement for other development inputs such as water resource requirements. PV is the most environmentally sensitive technology for the preferred site as large volumes of water are not needed for power generation purposes compared to the CSP option. CSP requires large volumes of water for cooling purposes. PV is also preferred when compared to CSP technology because of the lower visual profile.

The remaining types of technologies were evaluated and the preferred configuration was selected based primarily on the operating environment. The PV power facility will install tracking structures, as discussed in the *Sections* below.

Fixed Mounted PV System

In a fixed mounted PV system, PV panels are installed at a pre-determined angle from which they will not move during the lifetime of the plant's operation. Misalignment of the angle of PV panels has been shown to marginally affect the efficiency of energy collection. There are further advantages which are gained from fixed mounted systems, including;

- The maintenance and installation costs of a fixed mounted PV system are lower than that of a 'tracking' system which is mechanically more complex given that these PV mountings include moving parts.
- Fixed mounted PV systems are an established technology with a proven track record in terms of reliable functioning. In addition replacement parts are able to be sourced more economically and with greater ease than with alternative systems.

- Fixed mounted systems are robustly designed and able to withstand greater exposure to winds than tracking systems.

Tracking System

In a dual axis tracking system PV panels are fixed to mountings which track the sun's movement. There are various tracking systems. A 'single axis tracker' will track the sun from east to west, while a dual axis tracker will in addition be equipped to account for the seasonal waning of the sun. These systems utilise moving parts and technology including solar irradiation sensors to optimise the exposure of PV panels to sunlight. A single axis tracker is considered to increase a solar park's energy output by up to 25 percent depending on location.

5.3 *SITE LAYOUT ALTERNATIVES*

The layout of the solar panels is crucial for maximising energy production during the sunlight hours. This variable has been the main factor in selecting the proposed layout, as well as topographical, geographical and environmental and social variables. The layout can be modified to a limited extent in order to optimise these variables.

For the purpose of this study ERM considered what would be a worst case from an environmental and social perspective and used a layout with the largest anticipated footprint in line with the conservative approach taken in assessing impacts.

5.4 *GRID CONNECTION ALTERNATIVES*

Access to the grid was a key factor in the site selection exercise. In determining the transmission line route for the grid connection the Project considered the following factors:

- Distance between the Site and the transmission line, which would influence not only cost but also the number of towers required and therefore the extent of any land take;
- Presence of existing rights of way or wayleaves that could be utilised;
- Technical considerations including location of the proposed substation and where to cut the existing Turkwell to Lessos Transmission Line;
- Presence of other infrastructure including schools, REA transmission lines and roads;
- Environmental considerations including the presence of any sensitive areas;
- Social considerations in particular the nature and extent of any physical and / or economic displacement that would occur.

As a result of these considerations and in consultation with KPLC two preferred options were developed:

Option 1: crossing four plots of privately owned land with the proposed substation located on privately owned land adjacent to the existing transmission line.

Option 2: crossing six plots of privately owned land with the proposed substation located within the Project site.

Both options avoid any displacement of housing but will result in some economic displacement.

5.5

NO-GO ALTERNATIVE

A no project option will mean that any potential impacts are not manifested but the economic as well as environmental benefit of this technology will also be lost.

This scenario means that the Project will not inject an additional 40MW of power into the national grid, which is in contradiction to the objectives as laid out in Kenya's Vision 2030. With demand for electricity growing at an average of 5-8 % per annum, without investment in new sources of electricity, the country will have a shortfall in years to come if all factors remain constant.

The No-Go alternative is thus not a feasible alternative and is not supported.

6.1 GENERAL OVERVIEW AND APPROACH

This *Chapter* of the Report provides a description of the existing physical and biological conditions of the Site and surrounding areas, which may directly or indirectly be affected by the proposed 40MW PV Plant. It is essential that the baseline conditions of an environment are characterised in order to accurately predict the potential effects the Project may have on the environment. The collection of baseline data therefore focused on providing information to support the assessment of any potential impact of the Project. Information was therefore collected at the following levels:

- *National Level:* Secondary information was collected at national level to provide a high level contextual overview of Kenya.
- *County Level:* Secondary information was collected at the county level aimed at providing a contextual overview of Uasin Gishu County.
- *Project Site:* Secondary and primary information was collected within the Project Site specifically within Kipchamo Village where the Project is located. This included a 500m radius (Area of Influence) from the Site.

In order to collect the above information, the following methodology was employed:

- *Desktop Study:* A desktop review of publicly available data such as the Uasin Gishu County Integrated Development Plan 2013-2018 was carried out to investigate the natural environment that exists at the three levels outlined above.
- *Site Investigations:* Site visits were conducted on 30th April, 2015 as well as between 9th and 12th June 2015 and 30th June – 03rd July, 2015. During the site visits, information pertaining to the natural environment, particularly related to existing flora, fauna, soils and hydrology within the Area of Influence, Project Footprint and Project Site were photographed and GPS data was collected.

A map showing the biophysical environment of the project area can be found in *Annex B2*.

6.2 GEOGRAPHICAL CONTEXT

The Project Site is located in Kipchamo Village, Kesses Division, within Uasin Gishu County. Uasin Gishu County is one of the 47 counties in Kenya. It has a total area of 3,345.2 km² and extends from longitude 34°50' to 35°37' east and 0°03' and 0°55' north. Uasin Gishu County shares common borders with Trans

Nzoia County to the north, Kakamega to northeast, Elgeyo Marakwet and Nandi to the east, Baringo to the southeast; Kericho to the south, as shown in Figure 6.1 below.

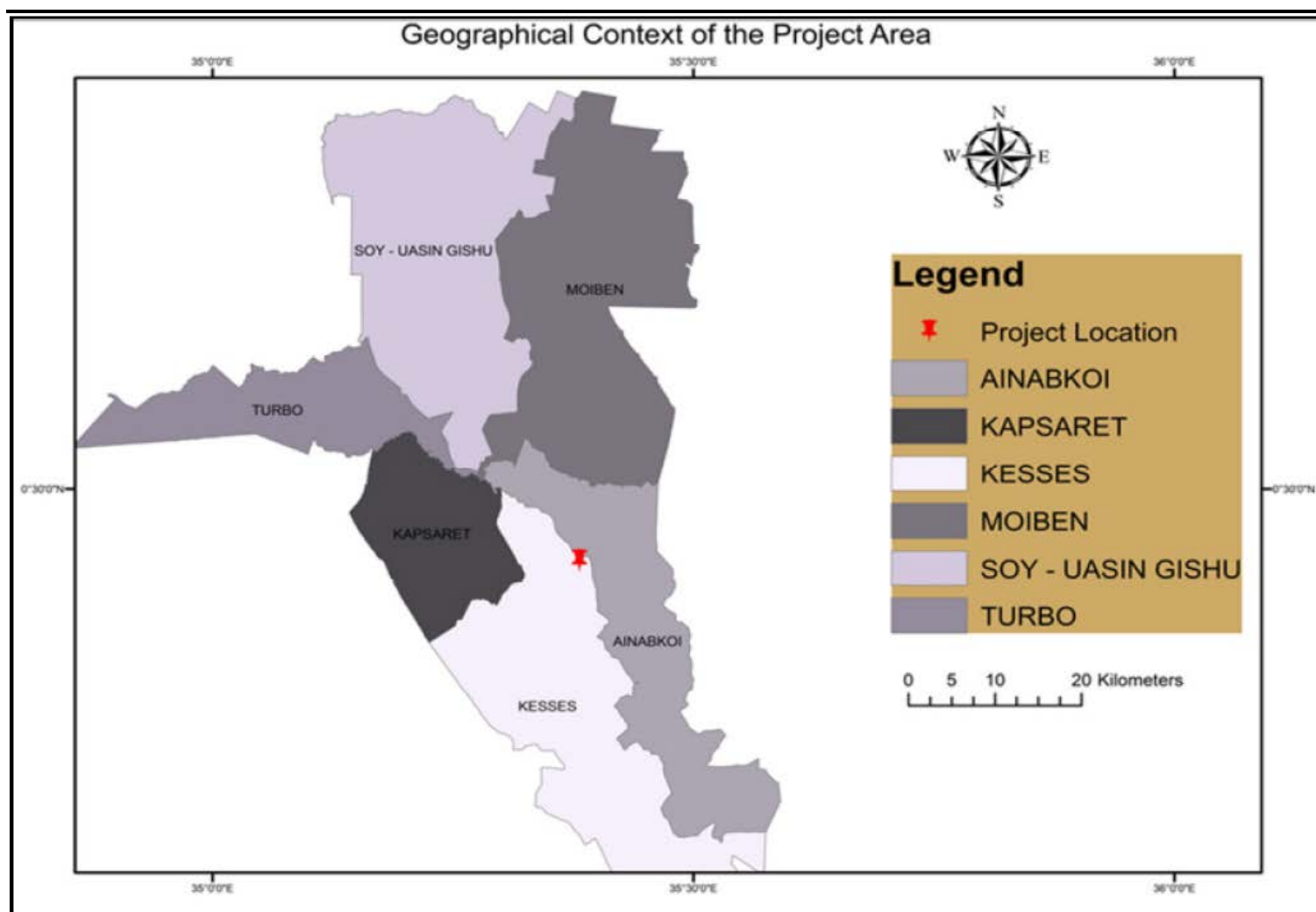
Figure 6.1 Map Showing the Counties of Kenya



Source: <https://opendata.go.ke/facet/counties> (2012)

The County has three main regions namely Eldoret North, Eldoret South (also referred to as Wareng), and Eldoret East, which are further subdivided into six constituencies: Soy, Turbo, Kapseret, Kesses, Ainamkoi and Moiben. The Project therefore lies in Kesses Constituency which is located within Eldoret South Sub County (as shown in Figure 6.2 below), and it covers an area of 692.1 km²

Figure 6.2 Geographical Context of Kesses Constituency in Uasin Gishu County



Source: ESRI Data, 2013

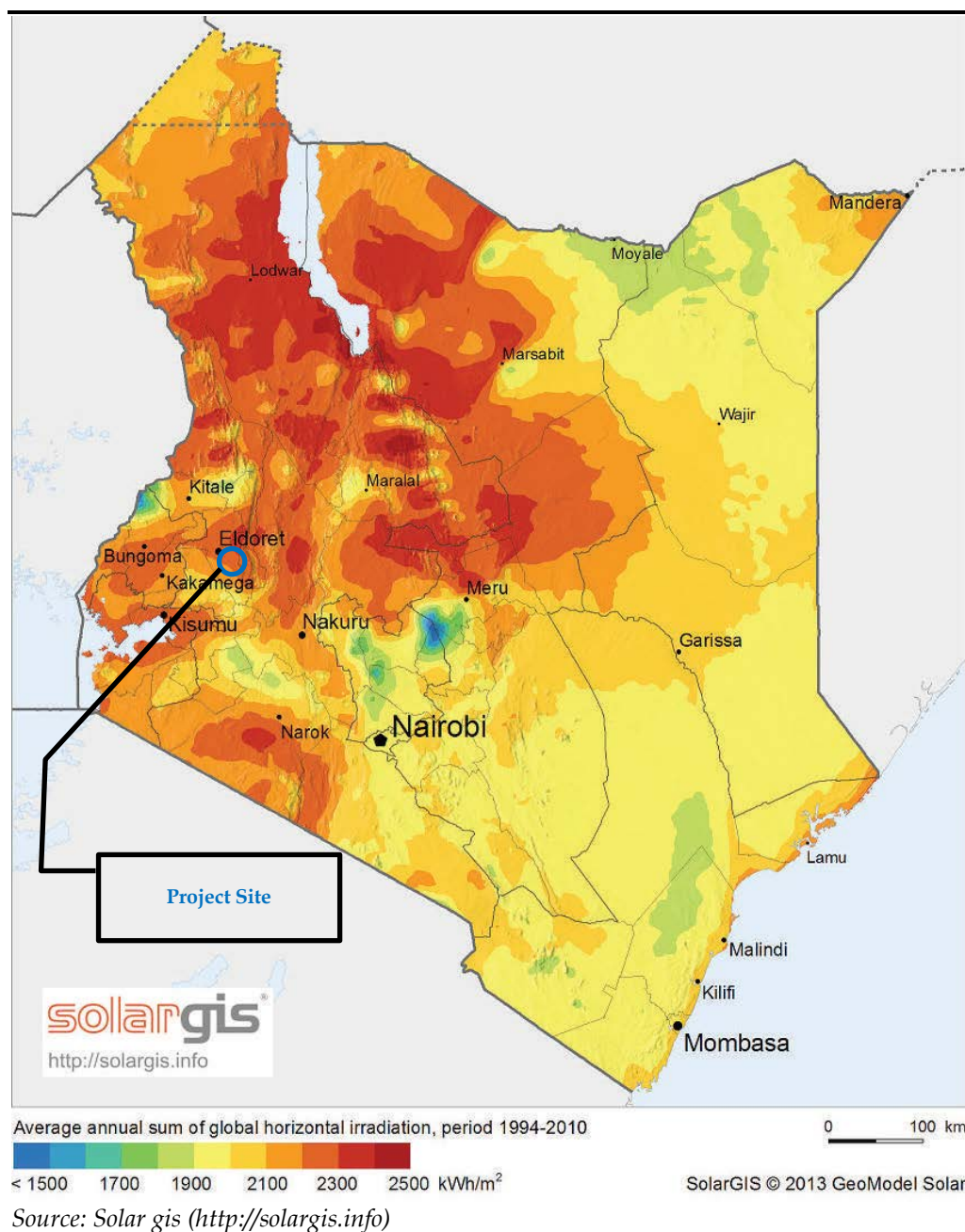
6.3 CLIMATIC CONDITIONS

6.3.1 Solar Resource

Kenya is located on the equator and extends four degrees on either side; as such it receives a considerable amount of solar radiation. Solar resource ⁽¹⁾ (quantified in watts per square meter (w/m^2)) is used to quantify a location's ability to host a PV plant. The Site is located in Western part of the Rift Valley west of Kenya within the northern hemisphere of the equator, and therefore by being close to the equator receives an average solar irradiance of 2,400 kWh per square metre per month as shown in *Figure 6.3*.

(1) Solar resource is the amount of shortwave radiation received from above by a surface horizontal to the ground.

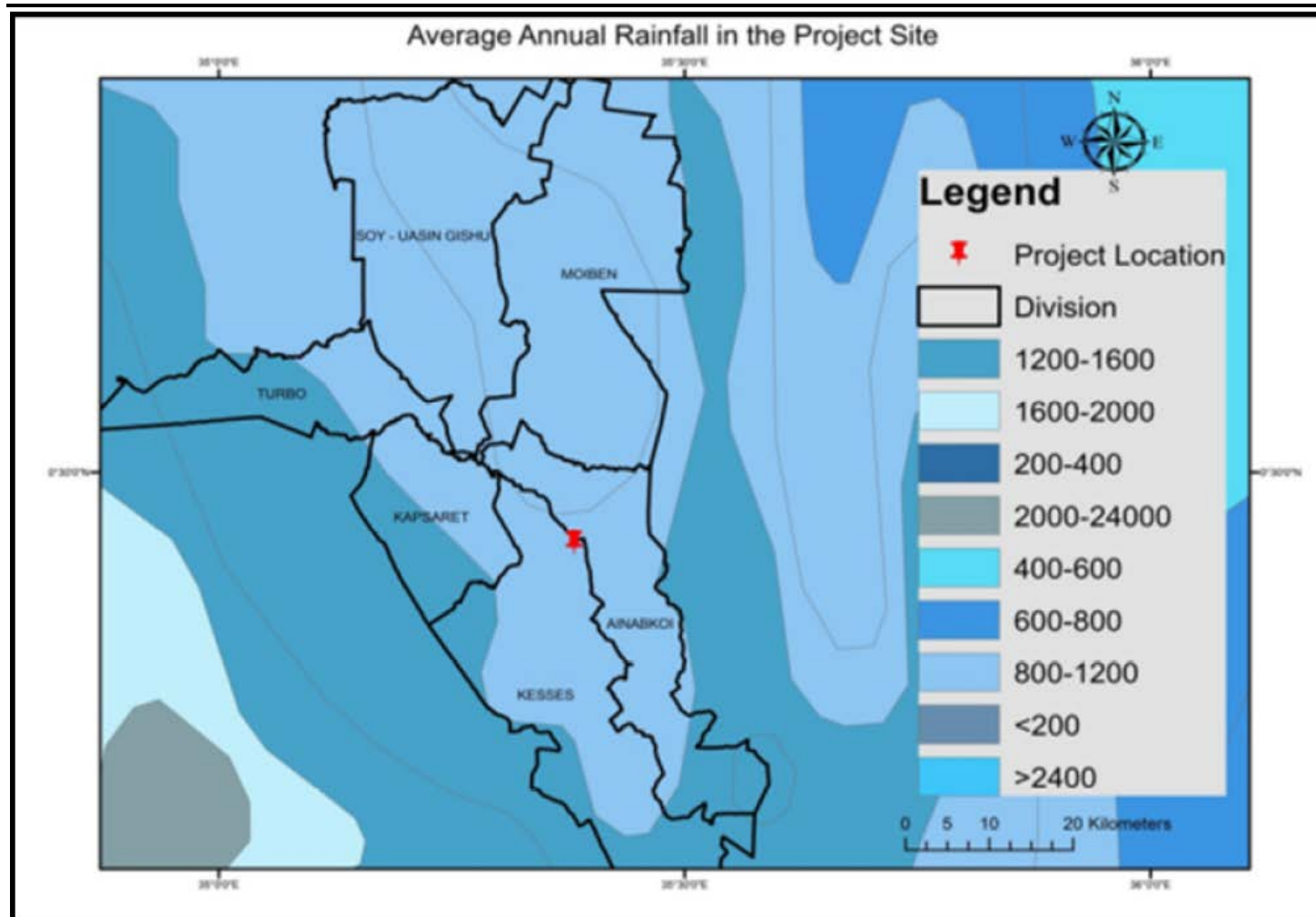
Figure 6.3 *Solar Irradiation in Kenya*



6.3.2 *Rainfall*

The Project is located on a plateau and has a cool and temperate climate. Rainfall in the area is high, reliable, and evenly distributed. The area has a rainy season from April to September, with a peak in August, and a relatively dry, or better called drier season from October to March. The period of lowest rainfall is between January and February, but the area still receives average monthly rainfall of between 29 and 40 litres/m² in January and February respectively. The annual rainfall ranges between 900 and 1200 mm as shown in Figure 6.4, below.

Figure 6.4 Average Rainfall Distribution in the Project Footprint



Source: ESRI Data, 2013

6.3.3 *Temperature*

Due to the high altitude in the area, temperatures are relatively low and range from to 12°C in July to highs of 23°C in March (Uasin Gishu County, 2014). The average temperature in the area is 18°C during the wet season with a maximum of 26.1°C during the driest season (February) and a minimum of 8.4°C in the coolest season in June.

6.3.4 *Atmospheric Conditions*

The Project Area falls outside Eldoret Town where the major sources of air pollution are as a result of industry, construction, increased development activities and related amenities (predominantly cars). Due to the relatively rural location of the Project there are limited sources of air pollution currently existing. During the site visit, the main sources of air pollution observed was dust generated by tractors and cars moving along Plateau Road and noise generated by the train and vehicles passing on the East end of the Site.

6.4 *TOPOGRAPHY*

The general landscape in the area is undulating plateau. The Site is located in Agro-ecological Zone III characterised by an elevation of 900-1800m above sea level (Infonet Biovision, 2014). This zone is the most important for agricultural cultivation.

Kipchamo Village is characterised by gently undulating topography as evidenced by *Figure 6.5*. There are no predominant mountains or hills nearby that may result in shading of the Site and the Site itself is flat with gentle slopes towards the North West.

Figure 6.5 *Photo of Site at Ground Level Showing Typical Landscape*



Source: ERM Site Visit 9th June, 2015

The Site lies in the greater Uasin Gishu Plateau, which is part of Western Zone of the Rift Valley where phonolite lavas rest directly on the basement rocks. On top of the basement, the geology comprises tuff phonolite, agglomerates, and sediments. The majority of the soils in the project area are covered by deep black cotton soils and shallow red clay mixture that spread most of the Plateau area, which overlie the Uasin Gishu phonolites base- rock structure. The geology is dominated by tertiary volcanic rock with no known commercially exploitable minerals (CIDP, 2013). The Site is characterised by red clay soil as observed on as depicted by *Figure 6.6* below.

Figure 6.6 *Soil Type in the Project Site*



Source: ERM Site Visit 9th June, 2015

HYDROLOGY (GROUND AND SURFACE WATER)

Uasin Gishu County is located within the upper Lake Victoria basin catchment zone and all the rivers in the County drain into this lake. The major Rivers within the County are Sosiani, Kipkaren, Kerita, Nderugut, Daragwa and Sambu which are tributaries to the River Nzoia that also drains into Lake Victoria.

The dominant hydrological features in the Project Area include the Kipsinende River (a tributary of the River Kipkaren), located 3 km north of Site and the Ngeria Dam located 1.6 km north of the Site. The River Kipsinende, north of the site, runs in easterly direction. Its sources are in the Kaptagat (Pombo-Sabor) Forest, located 13.5 km East of the site. It was reported that the Ngeria Dam is too shallow and during the rainy season it overflows and floods onto the Road.

Water used on the surrounding farms is obtained from wells with an average depth of 40 feet ⁽¹⁾, as well as from the River Kipsinende. All year round, water is mainly obtained from the wells, but in the dry season, the Kipsinende River is also used as a water source to supplement supply in the community. It was reported that the Kipchamo community access water from the Kipsinende River as it is pumped to a concrete water tank located near the village.

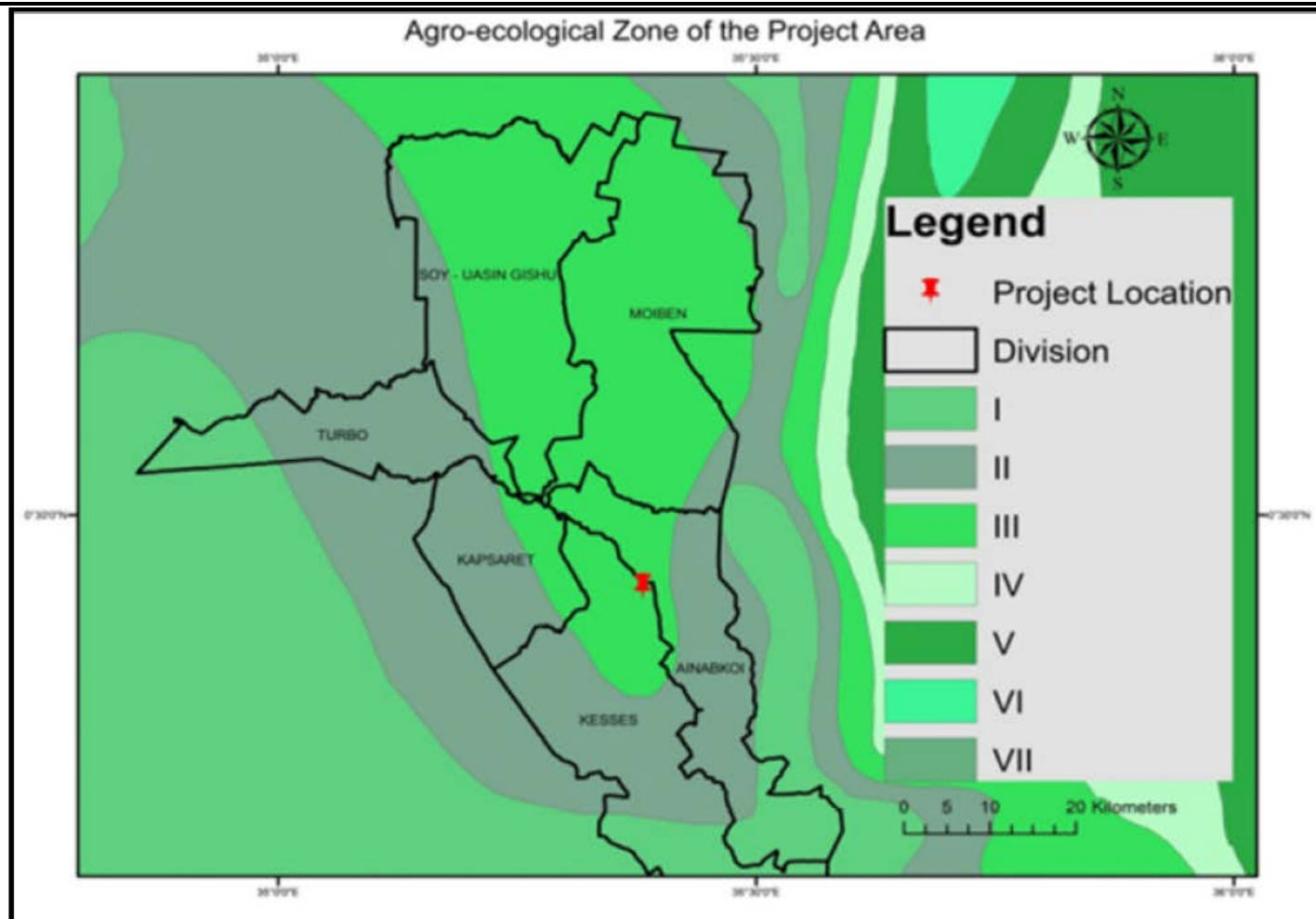
There are no rivers or streams located within the Site. The drainage flow on site during wet season follows a North West direction towards the Kipsinende River north of site.

6.7 *FLORA*

The Site lies in Agro-ecological (AE) Zone III (*Figure 6.7*) which is a medium potential zone (Infonet Biovision, 2014). This AE zone is the most important for agricultural cultivation and several legume fodders are grown here in crop-livestock systems as evidently observed in the Plateau area. Vegetation in this zone is a dry semi-deciduous type that varies from dry lowland forest to bush land.

(1) Information from guided Transect walk with Local Farmers during Site visit on 9th June, 2015

Figure 6.7 Agro-ecological Zone of the Project Site



Source: ESRI Data, 2013

Common plant species within Agro-ecological zone III include *Hyperenia* and *Cymbopogon*, *Themeda triandra*, *Panicum maximum*, *Seteria Sphacelata*, *Sporobolus pyramidalis*, *Bracharia brizantha* (Congo signal), *Bricharia siluta*, *Chloris gayana* (Rhodes grass) and *Cynodon dactylon* (Star grass). These flora species characterise the general landscape in Uasin Gishu County.

Several tree species are also found within the Zone including; *Euphorbia obavalifolia*, *Cordia africana*, *Strychnos henningsii*, *Diospyros abyssinica*, *Albizia schimperiana*, *Ochna holstii*; *Eucalyptus globulus* (Blue gum), *Chionanthus battiscombe*, and *Teclea spp.* as well as *Calodendrum capense* and *Zanthoxylum usambarense*. There is also quite a lot of *Acacia mearnsii* (Wattle) found in this area

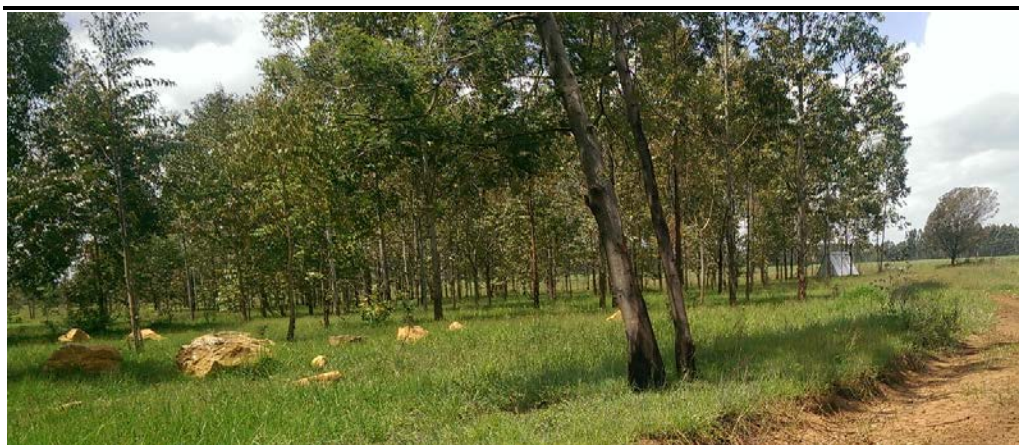
The Site was observed to contain mainly *Cynodon dactylon* (Star grass) and *Eucalyptus globulus* (Blue gum). Blue gum trees are not indigenous, and are limited to the boundary of the Site, while *Cynodon dactylon* is limited to unploughed sections within the Site (Figure 6.8 and Figure 6.9 respectively). All the tree species are utilised as sources of wood fuel and for marking boundaries by the local community. The species found on-site are common and characteristic of most of the dry sub-humid to semi-arid areas of Kenya. No species of conservation concern were identified.

Figure 6.8 **Grass Species (Star grass) Observed on Site**



Source: ERM Site Visit 9th June, 2015

Figure 6.9 *Blue Gum Trees Planted Along the Site Boundary*



Source: ERM Site Visit 9th June, 2015

6.8 *FAUNA*

There is no existing or proposed National Park/Reserve or protected area (s) within the Project Footprint. The ecological study found no areas of faunal significance or sensitivity within the natural habitat of the site.

The observed avifauna on-site includes the Grey Crowned Crane (*Balearica regulorum*) as shown in *Figure 6.10* below. The Grey Crowned Crane occurs in eastern and southern Africa and inhabits wetlands such as marshes, pans and dams with tall emergent vegetation, riverbanks, open riverine woodland, shallowly flooded plains and temporary pools (IUCN, 2015). The Grey Crowned Crane is listed as endangered as its population has declined 50-79% across most of the species' range over the last 45 years (ICF, 2015). This species is not migratory although it may make variable local and seasonal movements depending on the abundance and distribution of food, nest-sites and rainfall (IUCN, 2015). Specific to the Project Site the Grey Crowned Crane occurs in habitats such the shallow wetlands (such as around the Ngeria Dam, approximately 1.6 km north of Site) in the Plateau area in Nyaru Village. No evidence was observed of there being any nests or roosting areas on the site.

It is important to note that at the time of the field work studies, only the Grey Crowned Crane was observed; as the sighting of avifauna is dependent on time of the year and day.

Figure 6.10 *Fauna Observed Onsite - Grey Crowned Crane*



Source: ERM Site Visit 9th June, 2015

There are no other known endangered fauna and avifauna species found within the Project Site.

6.9 **SUMMARY**

Box 6.1 *Biophysical Features and Sensitivities Related to the Project*

- The Site is located on a flat ridge that gives an opportunity for maximum sunshine exposure of the Panels to generate high power.
- There are no predominant mountains or hills within or nearby the Site to result in shading
- The Climate in the area provides a viable solar resource for the Project.
- No species of conservation of fauna/flora concern were identified on-site.
- The Site contains mainly *Cynodon dactylon* that is found in the unploughed sections of the Site and *Eucalyptus globulus* which is limited to the Site boundary.

7.1 INTRODUCTION

The purpose of this *Chapter* is to describe the socio-economic receiving environment within which the Project is located. The baseline provides a critical contextual component for identifying and assessing any potential socio-economic impacts of the Project.

A brief description of Uasin Gishu County's socio-economic context is provided below, with further detail provided at the local level for Saroiyoi and Lengut Sub-Location, forming the key focus of the socio-economic baseline.

Information provided in the following sections is as collected from primary data collection through observations whilst on site, as well as consultative discussions, specifically Focus Group Discussions (FGD) and Key Informant Interviews (KII) with elders, chiefs, health care professionals, teachers, men and women from the Location. Socio-economic baseline data gathering was undertaken in three villages which are located on the boundaries of the Project site:

- Kipchamo Village;
- Mosop Village (also known as Nyeru); and
- Chepkigen Village.

The area is also sometimes referred to as Plateau which was the name once given to the wider area reflecting the fact that the site is located within a large plateau.

Information was also sought from secondary data sources such as the Uasin Gishu County Integrated Development Plan (CIDP) 2013-2018 and publicly available ESIA Reports for other studies carried out in the area.

A map showing the baseline socio-economic environment of the Project Area can be found in *Annex B3*.

7.2 ADMINISTRATIVE STRUCTURE

Uasin Gishu County is divided into the following six Sub-Counties:

- Turbo;
- Soy;
- Ainabkoi;
- Moiben;
- Kessess; and

- Kapseret.

The Sub-Counties are further sub-divided into fifty-one Locations and ninety-seven Sub-Locations. Uasin Gishu County has a total of 30 Wards (to coincide with the County Assembly Wards of the County Government) of which six are within Kesses Sub-County as illustrated in *Table 7.1* below.

Table 7.1 *Uasin Gishu County Administrative and Political Units and Size*

Sub-County	No. of Admin. Units (Wards)	Est. Pop. 2013	Area KM ²	Pop. Density per KM ²
Ainabkoi	4	117,962	479.9	246
Kapseret	5	184,347	415.8	443
Kesses	6	114,529	581.6	197
Moiben	6	158,451	777.1	204
Soy	5	268,925	768	350
Turbo	4	179,442	322.7	556
UG County	30	1,023,656	3,345.1	306

Source: KNBS, 2009

While the National Government is responsible for overseeing national safety and security, and coordinating national government functions, the National Government also ensures the effective coordination of Government functions and services at the County and Sub-County levels, through the Office of the County Commissioner, their Deputies and Assistant Commissioners and the Local Area Chiefs.

The County Executive is led by a Governor who is directly elected by the people. The Governor of Uasin Gishu County is H.E Jackson Mandago. The County Executive is charged with the responsibility of exercising executive power at the county level, implementing laws for administration of the county as well as carrying out other executive functions of the county (Commission on Revenue Allocation, 2015).

The Project is administratively located in Kipchamo Village, Saroiyoi Sub Location, Kipchamo Location, Kesses Division, Kesses Constituency, Kesses Sub County, Uasin Gishu County.

7.3 *DEMOGRAPHIC PROFILE*

7.3.1 *County Level*

According to the Kenyan National Bureau of Statistics (KNBS), 2009, Uasin Gishu County has a population of 894,179 people: specifically 448,990 (50.2%) females and 445,189 (49.7%) males. Of the total population, 38.6% of the population reside in the urban areas; Eldoret City with approximately 200,000 inhabitants is the biggest population centre. The rest of the county population is reported to live in the rural areas.

Uasin Gishu is largely a cosmopolitan region; the majority of the population are Nandi who form part of the Kalenjin ethnic group. Apart from Kalenjin sub tribes, other communities with a notable presence in the county, particularly in urban settlements, include the Luhya, Luo, Kamba and Kisii tribes as a result of in-migration from other Counties. In-migration is largely driven by employment opportunities, availability of farmland and educational infrastructure and services, as well as intermarriage between different groups.

Based on 2009 National Statistics, young people are the most populous. *Table 7.2* shows a demographic projection of Uasin Gishu County, which shows that the population is expected to increase year on year, with an average annual growth rate of 3.62%.

Table 7.2 *Demographic Projections of Uasin Gishu County*

Description	2009	2013	2014	2015	2016	2017
Total population	894,179	1,022,941	1,059,767	1,097,918	1,137,443	1,178,391
Total Number of Households	202,291	231,421	239,752	248,383	257,325	266,589

Source: KNBS 2009 – 2013

Table 7.3 provides the demographic projections for the six Sub Counties in Uasin Gishu County. All of the Sub-Counties have the same projected growth rate as Uasin Gishu as a whole. By 2017, when operations are expected to commence the population of Kesses will be 131,933 people.

Table 7.3 *Demographic Projections as per Sub Counties*

Sub-County	No. of Administrative Units (Wards)	Est. Sub-County Pop. 2013	2014	2015	2016	2017
Ainabkoi	4	117,962	122,209	126,608	131,166	135,888
Kapseret	5	184,347	190,983	197,859	204,982	212,361
Kesses	6	114,529	118,652	122,924	127,349	131,933
Moiben	6	158,451	164,155	170,065	176,187	182,530
Soy	5	268,925	278,606	288,636	299,027	309,792
Turbo	4	179,442	185,902	192,594	199,528	206,711
County Total	30	1,023,656	1,060,508	1,098,686	1,138,239	1,179,215

Source: KNBS 2009 – 2013

During the FGDs the number of people and household size was estimated for each village as follows:

- Kipchamo Village: 2,000 people and 150 households
- Mosop Village: 300 people and 123 households
- Chepkigen Village: 2,000 people and 200 households

The average household size was estimated to be around 6 to 8 people with women typically having 4 to 7 children, while in the previous generation women would have up to 13 to 14 children. It should be noted that many households consist of multiple generations living on one plot of land.

The population distribution in the area is approximately 60% female and 40% male. This difference was attributed to women living longer and higher female birth rates. In addition, in some of the villages (for instance Kipchamo) a high out-migration by the men was noted.

The men from Mosop village estimated that:

- 25% of the population is below 18 years of age;
- 40% of the population is between 18-35 years old;
- 25% of the population is between 35-60 years old; and
- 10% of the population is over 60 years old.

In Kipchamo and Chepkigen similar statistics were given, with working age men and women making up the majority of the population.

As established in the FGDs, there has been considerable migration into the area from Nandi and Keiyo as people move closer to Eldoret, which is the fastest growing town in the County, in search of employment opportunities. In 2009, there were 11,000 people in Kipchamo Location, but now the population stands at 20,000 people.

Communities also indicated that men of working age also migrated out of the area in search of employment opportunities in larger towns. However, as their wives usually remain in the area they are generally considered within the population numbers provided.

Gender Roles

Gender roles are strongly defined in all villages, with women generally being housewives and taking care of the children. Women also take responsibility for collecting water and firewood for cooking, as well growing vegetables such as tomatoes, spinach, onions. Men generally work and normally acquire the income derived from farming. However, both men and women also work casual jobs for survival and to pay for schooling costs (e.g., on larger farms

doing weeding, harvesting and sowing). There are also a number of female headed households in the area due to the men traveling to other areas in search of work.

The majority of the women reported that they have no ownership and control of productive assets such as land, and all of the women interviewed indicated that they did not have title deeds for land, forming an important barrier to gender equality and economic development.

7.4 EDUCATION

7.4.1 County Level

According to the CIDP (2013), Uasin Gishu County has 576 Early Childhood Development (ECD) centres, and 422 primary schools with an enrolment rate of 89.5%. This high enrolment rate is attributed to the Free Primary Education (FPE) strategy of the Kenyan Government. It is important to note that the enrolment rate of girls at 91% is higher than that of boys at 88%. Additionally, the primary transition rate to secondary level stands at 59.9%, and the County has 129 secondary schools.

At the Tertiary Education Level, the County has 2 public universities (Moi University and University of Eldoret), 2 private universities, a national polytechnic, a technical college and several constituents of major universities. These institutions play an important role in providing knowledge and skills particularly to the youth.

7.4.2 Study Area

There are approximately three nursery schools namely Plateau, Lengut and Inland. Primary schools include Lengut Primary (in Lengut Village), Chemeneê Primary (in Chepkigen Village) as well as Mogojoret Primary (in Mosop Village), which is the closet to the Site (less than 100 metres to the east, as illustrated in Annex B3). Secondary Schools include Isaac Kosgei (in Chepkigen Village), Plateau Girls (in the East Constituency) and Keringet Secondary (in Kipchamo Village), while Colleges include the African Institute College and Ritt College, both located in Plateau Village. However, it was reported that the schools lack facilities in terms of classrooms, equipment and teachers.

The women from Mosop village reported that families cannot afford to send their children to Secondary School and that the majority reach Primary School (Standard 8). The parents are typically able to send one child to Secondary School, but not all their children. The cost of secondary education and the distance to suitable secondary schools were identified as barriers to continuing education.

The majority of people of working age in the three villages have only completed primary education at most, although there are a small number of people who have achieved higher levels of education. As such, the skills base in the villages is relatively low.

7.5 ECONOMIC PROFILE

7.5.1 County Level

The County's main economic activities include large-scale wheat and maize farming, dairy farming, horticulture and sports tourism. The County is also a manufacturing hub, with numerous industries and factories providing employment to its urban population. Some of these industries include Raiply Wood Factory, Rupa Textile, Kenya Pipeline Company, Kenya Cooperative Creameries (KCC), as well as corn, wheat and pyrethrum factories all within Eldoret Town.

Eldoret International Airport, located approximately 16 km South of Eldoret Town, and 17 km from the site, is an important economic hub for handling commercial cargo goods.

7.5.2 Study Area

Most households in the study area rely on small scale farming of maize, wheat, sorghum and millet as the major source livelihood (commercial and subsistence). The average land plot size is around 1 acre. Maize and wheat are the most important crops in the area as they provide a cash income. Households reported that approximately 70% of maize is sold and 30% kept for subsistence, similar numbers were reported for wheat. The farmers tend to sell their products either to the Cereals Board of Kenya, or directly to individual buyers/middle men who come straight to their farms. The Cereals Board is reported to pay higher prices than middlemen but payments are often delayed, as such farmers tend to prefer to sell to middle men who pay promptly.

Maize planting is carried out once per year between March and November. The maize takes six months to mature and as such, the remaining three months are split between time spent in preparation of land or harvesting. It was reported that wheat is planted in June and harvested in October

Other crops grown in the area includes tomatoes, kale, beans which are grown for subsistence and not for sale.

Most households also keep livestock, however, the majority do not have land/space for pasture, so they graze their cows along the side of the road. As with crops milk is both used for subsistence and sold. Farmers sell approximately 75% of their products from dairy farming mainly to Brookside Dairy. The average household has approximately 5 cows, but the more

wealthy families with large pieces of land can have up to 900 cows. Other small-scale livestock farming carried out the area includes keeping small numbers of sheep, pigs and goats which are sold, as well as chickens that are kept for their eggs.

Approximately 50% of the men from Mosop village are employed formally, as for example, policemen, teachers in the nearby schools, in the army and the nearby Sossian Flower Farm. Others are employed in Eldoret Town (both casual and formal jobs). Formal employment in the other villages was reported but involved a smaller percentage of men albeit in similar occupations. There were no industrial activities observed in Kipchamo Location. Most of the industrial activities observed in the area were horticultural farming at the Sossian Flower farm, North East of the Site.

As indicated in Figure 7.9 below, the previous site landowner has a small work force employed on a permanent and temporary basis, engaged in activities such as planting, cultivating crops grown at different seasons (wheat and maize), the majority of which come from Chepkigen village. However, during the period of maize planting and harvesting, more casual labourers are employed. Other economic activities noted on the site include charcoal making/ burning (Figure 7.10).

Figure 7.1 **Wheat and Maize Farming On-Site**



Source: ERM Site Visit (June 2015)

Figure 7.2 **Livestock Keeping Activities On-Site**



Source: ERM Site Visit (June, 2015)

Finding suitable markets for farmers has been a challenge for farmers in the area. It was reported that the Cereal Board delays payment for produce, and that while they do have access to credit facilities to buy equipment, the interest rates are too high to enable them to access the money.

7.6 LAND AND LAND USE

7.6.1 County Level

According to the CIDP, 2013- 2018 Uasin Gishu County has an average land holding of 5 hectares in rural areas and 0.25 of hectares within Eldoret Town. Land use varies considerably across the County. In 2012, there were 919 landless households distributed over various schemes, with Turbo Settlement Scheme accounting for 658 households, Jabali Settlement Scheme 161 households, and Maili Tisa 100 households. Some of the landless are squatters living in gazetted forests; immigrants from other countries and those who became landless by virtue of selling family land.

7.6.2 Study Area

It was noted that majority of land within Mosop, Kipchamo and Chepkigen (as well as the wider Plateau area) is designated for agricultural use where livestock is reared, or crops such as maize and wheat are grown on both small and large scale farms.

Virtually all land is owned by men, in particular older men in the area. This is because traditionally sons inherit land from their fathers. In general, the inherited land is subdivided once the elderly die between the sons. However, many sons are currently using plots of land owned by their fathers. As a consequence of this inheritance system land plots are getting smaller and smaller. Currently most men own land plots of around 5 acres but it is estimated that the next generation will only have 1 acre plots (similar to the size they are currently working). This represents a significant challenge in terms of maintaining livelihoods. Women in the area have usage rights only due to the inheritance system, and because most of the cash income is controlled by men.

Most people in the area have land title for their land plots or a member of their family will hold the title.

It is possible to lease land in the area, however this is usually only for a year and only within the community. People lease land to raise money for school fees while the main driver for renting is the small size of land plots.

During the FGD, the men from Mosop reported that land disputes are rare and the Chiefs and Elders are usually able to resolve any disputes that do occur. In Kipchamo Village, family disputes over land mainly arise when a

will has not been written or when sub-divisions are deemed unfair. Again the Chiefs and elders are mainly able to resolve these disputes.

The other reason for land disputes relates to people selling or leasing land without following due process. It was stated that it was common for people to lease land plots to multiple people, and that if this was done without involving the Chief then it was impossible to determine who had rights to the land. In relation to selling land it was stated that people sometimes did this without the involvement of land surveyors meaning that land was sometimes sold prior to the sub-division, or selling plots without maintaining access to their remaining plots.

7.7 SOCIAL INFRASTRUCTURE

7.7.1 Energy Access

County Level

In 2009, Uasin Gishu County had 29.55% electricity coverage, compared to the national average which stood at 22.69% (MOP Census, 2009). Eldoret South Constituency, where the Project is located, recorded electricity coverage of 7.5% in the rural areas and 43.9% in the urban areas. Solar coverage in the same area was 1.9% in the rural areas and 0.6% in the urban areas. Other significant sources of energy for lighting in Eldoret South Constituency were lantern lamps at 55.7% (rural areas) and 33.7% (urban areas), while tin lamps accounted for 33% (rural areas) and 19.7% (urban areas) (MOP Census, 2009).

Study Area

In general, the Site was observed to have electricity coverage, through the Rural Electrification Authority (REA). *Figure 7.6* shows the overhead electricity connection and distribution lines observed in the nearby Mosop Village. However, at the time of the site visits very few households within the community were connected due to the costs associated with connection. The main sources of power are therefore paraffin for light and firewood for cooking (the women collect fallen branches, including from within the Project Site). Solar power was also reported to be rare, due to the cost.

Figure 7.3 **Overhead Electricity Distribution Lines Observed in Mosop Village**



Source: ERM Site Visit, June, 2015

7.7.2 **Water and Sanitation**

County Level

According to the CIDP 2013- 2018, the major source of water for Kesses Division is from springs/ wells or boreholes, at an average of over 81 % (KNBS Census, 2009). The 2009 Census also noted that Uasin Gishu County in general had better water coverage of 88.9%, as compared to the country average of 66.5% during the same period. The major modes of sanitation for Kesses Constituency were pit latrines, which accounted for 92%, and 85% for the rural and urban areas respectively. Other modes of sanitation were connection to main sewers, 6.3% and 0.3% in the urban and rural areas of Wareng District respectively (KNBS Census, 2009). In general, Uasin Gishu County recorded a relatively higher improved sanitation of rate at 98% compared to the national average at 87.8%.

Study Area

From consultations with the residents of Kipchamo, Mosop and Chepkigan villages it was noted that most of the community members rely on boreholes and hand dug wells as a major source of water for domestic use. Across the villages it was reported that these water wells are however prone to drying up during the dry season and for this reason, local community members are forced to fetch water from River Kipsinende, located approximately 1 to 2km from the village. However, in Kipchamo and Chepkigen villages people stated that there are some boreholes that are year round. It was stated that most surface water sources are used for bathing and livestock, as such they have to boil the water or use purification tablets before drinking. A water treatment plant is currently being developed to treat this water but it not complete.

Most of the households in these villages stated that they used pit latrines, which are mainly shallow pits.

County Level

Uasin Gishu County has an extensive road network comprising over 300 km of tarmac roads, 549 km of murram and 377 km of earth roads. It also has 170 km of railway line with 8 railway stations (CIDP, 2013). In addition, there is an inland container depot. The Eldoret International Airport and two airstrips are also located in Uasin Gishu making it the region's service hub.

Study Area

The Site is accessible from the Plateau Road (E282A) that runs along the Nakuru- Busia Railway line and borders the North side of the Site (*Figure 7.7*). The railway line is used to transport cargo from Nairobi and Mombasa to Eldoret Town.

Plateau Road is an earth road and is located less than 2 km north from the Site. Plateau Road links the Site to the Eldoret-Nakuru- Nairobi Highway. The road is about 10 km from the Eldoret-Nakuru-Nairobi Highway junction. Additionally, the Site is accessible from Ngeria Centre located about 5 km east from site. It was reported by communities that during the rainy season that Plateau road becomes unpassable due to the amount of mud making it difficult for communities to access services.

Figure 7.4 *Access Road to Site*



Source: ERM Site Visit (June, 2015)

7.7.4 Telecommunications

County Level

Uasin Gishu County enjoys about 95% mobile coverage, which is provided by all the major service providers in Kenya. It also has 16 post offices, 4 sub-post offices, and nine licensed service couriers. It is connected to the fibre optic cable network, giving it access to fast internet connectivity.

Study Area

Mobile coverage on site is patchy; this was confirmed by the local community who confirmed that network coverage in the area is bad. There are no postal services within the project area and the community within Kipchamo, Mosop and Chepkigen villages are forced to travel approximately 15 km to Eldoret Town to receive such services.

7.7.5 Housing

County Level

According to the CIDP (2013), 45.6% of the houses built in the County are mud-walled or use wood as the main walling material. Houses built using brick or blocks account for 25.4%, while mud/slash cements account for 18.1%. The main roofing materials are corrugated iron sheets, accounting for 84.4%.

Study Area

Houses within the study area are limited to single-storey structures (*Figure 7.8*). The materials used to build homes are usually mud or cement bricks depending on the relative wealth of the owners with corrugated iron roofs. Renting of houses or rooms in the area is rare.

Figure 7.5 *Typical Homestead in Mosop Village*



7.8 LANDSCAPE

The Site is situated within a relatively flat area. Any structure in this open landscape tends to be clearly visible from a distance. Some visual intrusion into this landscape already exists in the form of the existing Turkwel- Lessos power transmission line, which is located 1km west of the site. *Figure 7.3* and *Figure 7.4* show the views from around the Site, while *Figure 7.5* is a photo taken while on Site, illustrating the view of the transmission line from the nearby Mosop Village (approximately one kilometre east of the proposed Site).

Figure 7.6 *Landscape of the Site (View from East & West of Site)*



View from East End of Site
Source: ERM Site Visit, June, 2015



View from West End of Site

Figure 7.7 *Landscape of Site (View from North & South of Site)*



View from North End of Site
Source: ERM Site Visit, June, 2015



View from South End of Site

Figure 7.8 *View of the Turkwel- Lessos Transmission Line*



Source: ERM Site Visit, June, 2015

7.9 *HEALTH PROFILE*

7.9.1 *County Level*

Health Facilities

Generally, health facilities in Kenya are grouped into six levels as follows:

- Level 1 (Community);
- Level 2 (Dispensaries);
- Level 3 (Health Centres);
- Level 4 (Sub-County/District Hospitals);
- Level 5 (former Provisional Hospitals); and
- Level 6 (National Referral Hospitals).

The health sector is financed via Government funds, private funds (fee-paying consumers) and International Donors. However, private fees account for the main income of the services, and this means that only those who can afford the health facilities have access to them.

The County has a total of 170 health facilities ranging from Level 2 to 6. Most of the facilities are concentrated within Eldoret Municipality but the catchment area extends up to Uganda, Rwanda and South Sudan. At the apex of the health system is the Moi Teaching and Referral Hospital. The average distance to a health facility in the County is 7 km, which is higher than the recommended 5 km (CIDP, 2013). *Table 7.2* below provides a summary of the health facilities in the County.

Table 7.4 *Summary of Health Facilities within Uasin Gishu County*

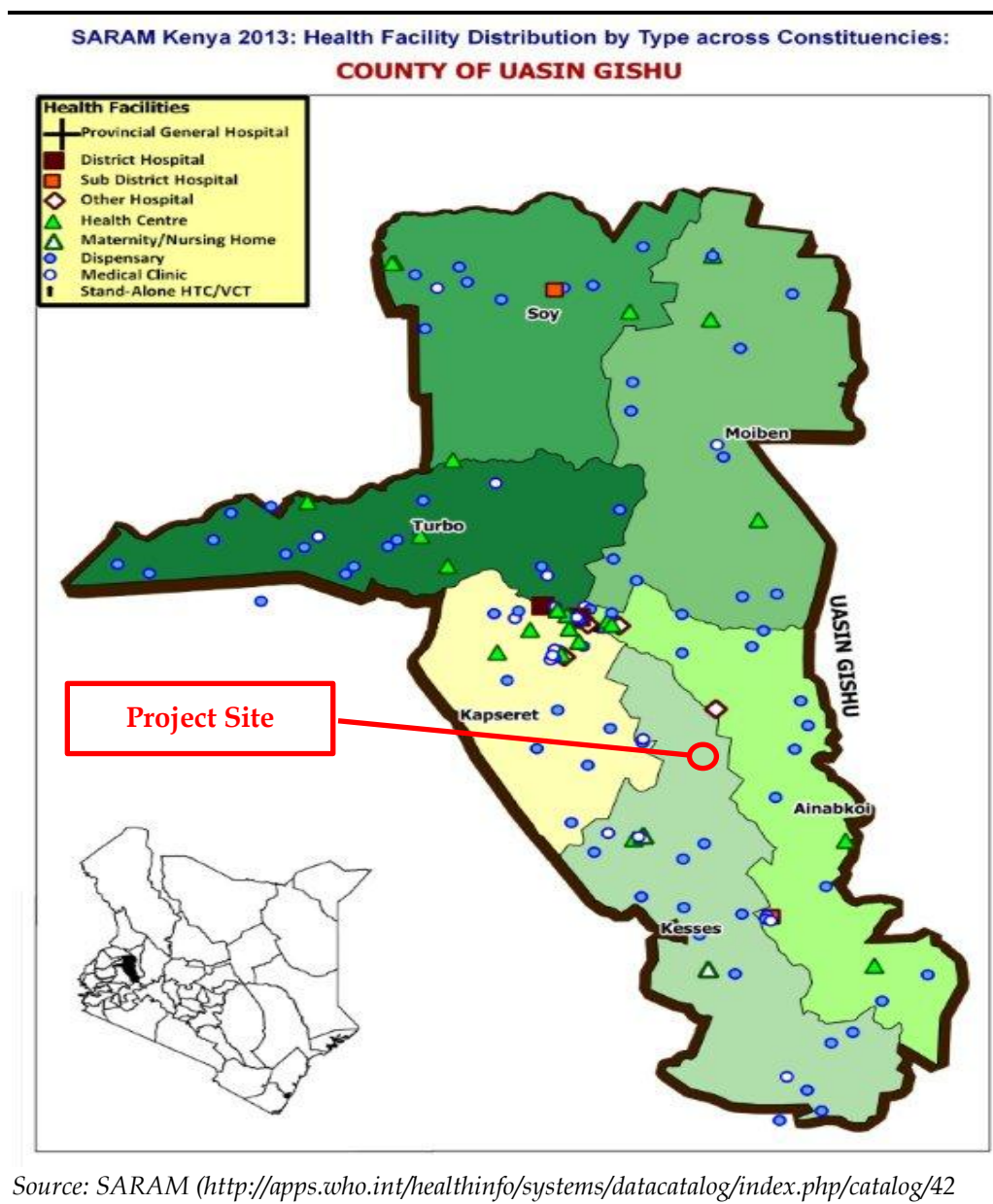
Level	Definition of Level	Public	Private
6	Tertiary Hospitals (Referral Hospital)	1	0
5	Secondary Hospital (e.g., former Provincial Hospitals)	0	0
4	Primary Hospitals (Sub-County/District Hospital)	4	5
3	Health Centres, Maternity units, Nursing Homes	24	2
2	Dispensaries, Clinics	83	51

Source: UG- County Director Public Health, 2015

The County Director of Public Health informed ERM that there are 924 health workers serving in the county's public health facilities. The doctor to population ratio in the county is 1:10,034 while that of clinician/nurse to patient is 1:2,331, reflecting a shortage of medical staff.

Figure 7.1 below shows the distribution of Health facilities in the County as per the Kenya Service Availability and Readiness Assessment (SARAM) Report, 2013.

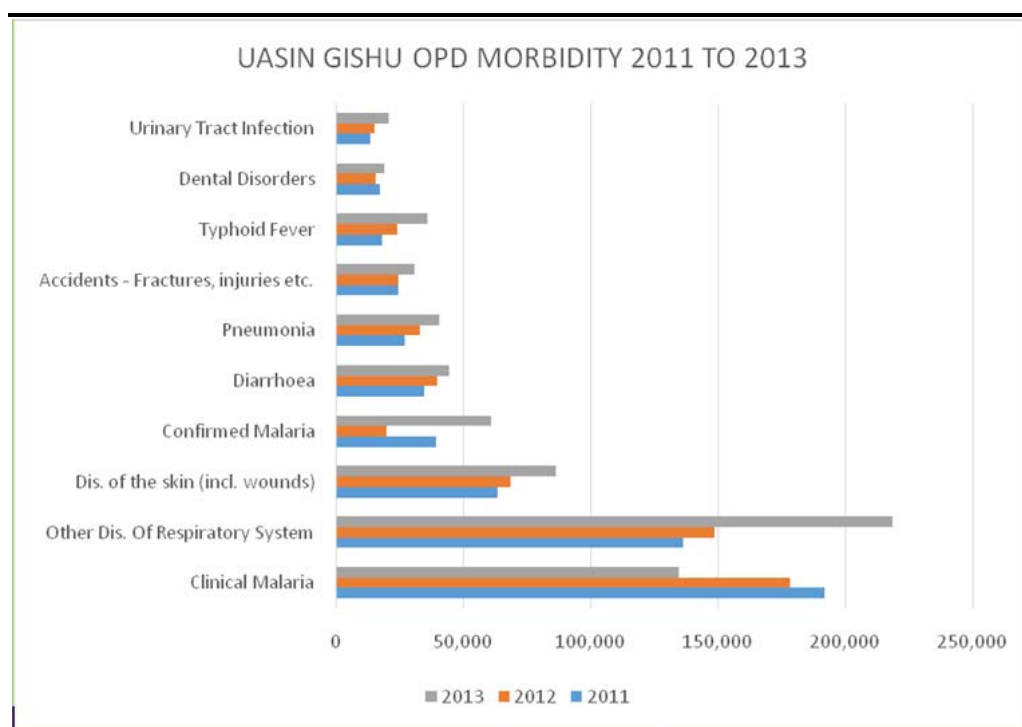
Figure 7.9 Distribution of Health Facilities in the County



Disease Prevalence

According to data received from the County Director of Public Health, Malaria is the leading cause of morbidity in the County (based on data recorded in the Office of Disease Prevention (ODP)) and as illustrated in Figure 7.2 below. However, other diseases of the respiratory system (such as Tuberculosis) increased in prevalence in 2013.

Figure 7.10 Uasin Gishu Out-Patient Department (OPD) Morbidity Chart



Source: County Director Public Health, Uasin Gishu County (2015)

7.9.2 Study Area

Health Facilities

There are three main health facilities within the project area as follows:

- Ngeria Health Centre (Government Facility);
- Plateau RCA Hospital (a Mission Hospital); and
- Moi Teaching and Referral Hospital (Government Facility).

The women from Mosop village reported that the Plateau RCA Hospital has a doctor, nurse and clinical worker as well as inpatient facilities but stated that it lacks capacity and is expensive. Only those that hold National Hospital Insurance Fund (NHIF) cards are assisted. As such, they prefer to travel to Ngeria Health Centre.

The Ngeria Health Centre is located on the main highway in Chepkigen Village and was recently refurbished and reopened. The health centre currently only treats outpatients but as part of the refurbishment, in-patient facilities were constructed.

During the rainy season, the roads are not passable, so the community is forced to walk to the hospital or be carried in wheelbarrows or on *boda-bodas*. If they are not able to get to the hospital at all during the rainy season, they seek health care from the older women in the community who practice traditional medicine. During the FGDs women stated that this can be dangerous as they can prescribe the wrong medication or misdiagnose the

symptoms. It was also stated that the women use herbs and plants to treat people. These plants are collected at a range of locations including within the Project site. Key plants were reported to be used for stomach ailments, as well as for colds and the flu.

Disease Profile

The children suffer mainly from pneumonia, cold and flu, while the adults suffer from pneumonia, typhoid, malaria and brucellosis. The elderly suffer from prostrate and skin cancer.

Malaria occurs due to the swamps as mosquitoes breed there during the rainy season (April – September), and typhoid is due to the use of untreated drinking water. Very few houses have mosquito nets as not all people understand that mosquito bites can cause malaria. However, campaigns have been run regarding malaria and HIV/ AIDS awareness and are starting to educate people on transmission routes.

7.10 VULNERABLE GROUPS

7.10.1 County Level

In the 2009 Population and Housing Census, 2.48% of Eldoret South's population was identified to have a disability. This is in comparison to 2.24% of the population in Uasin Gishu County, and the national average of 3.46%. Uasin Gishu County recorded 198,069 orphaned and vulnerable children in the 2009 population and housing census (KNBS 2009).

7.10.2 Study Area

In all of the villages visited, it was reported that there are a few disabled persons, and a small number of widows who are able to get assistance (funds) from the Government. Orphans are present in all villages and were considered to be vulnerable. It was also reported that there are a large number of young single mothers who are often educated to primary school level (Standard 8).

7.11 KEY CHALLENGES IN THE STUDY AREA

7.11.1 Alcohol and Drugs

It was reported in all the villages that alcohol and drugs are not a problem in the area, as the influence of the Church is strong and due to the presence of an NGO (ADAPT) run by the Chief which has been addressing the issue of alcohol and drugs. The men from Mosop estimated that 25 to 30% of the population (mainly male youths and the elderly) use alcohol but that only a very small percentage (less than 3%) of population are alcoholics.

Members in Mosop Village noted that alcoholism was high previously (approximately 10 years prior), but the rates have dropped rapidly largely due to intervention such as ADAPT, and Church programmes.

Within Kipchamo Village, where the Project will be located, while there are very few cases of alcoholism a rehab centre is being established by ADAPT.

Poverty and Unemployment

Poverty and unemployment are the main issues affecting the area. This has subsequent effects on access to higher education (University) for the youth as their parents lack fees. For those that are able to access higher education, they face a challenge getting a job once they graduate.

Prostitution

Within Chepkigen Village, it was reported that there are prostitutes along the main highway but not within the villages. However, as the towns/trading centres grow in population size, the issue of prostitution is likely to increase as witnessed in Chepkigen Trading Centre and Ngeria Junction. In these areas, the number of prostitutes is increasing due to poverty and the presence of transport workers who take rest stops in the area. The transport drivers are the main clients and as such cases of STDs and HIV/AIDs are also reported to be increasing.

Crime

During the FGDs, the communities stated that crime is very low and disputes are generally resolved by the Chiefs and Elders, which are mainly related to land (as discussed in *Section 7.7.2*).

Water Flow

It was reported in Kipchamo Village that another cause of conflict is over water flow in the rainy season. When a farmer puts in a drainage canal, it can then overflow to the neighbouring farm and damage the crops.

7.12 *ARCHAEOLOGY AND CULTURAL HERITAGE*

The site has no significant sites of archaeological and cultural heritage and therefore this is not discussed. There is an initiation site located to the east of the Project site on the opposite side of the road from the Project site. However, this will not be impacted by the Project.

7.13 *ADDITIONAL SOLAR POWER PLANTS IN THE STUDY AREA*

It is important to note that there are other proposed Solar PV Plants in Kessess including a similar 40MW Solar Plant approximately 1km east of the site

(Alton Energy), and an adjacent 40MW Solar Project (*Eldosol Energy*) north of the site (ref Annex B4 for the map showing the location of all three plants). All three solar farms will produce a total of 120MW of Power, which is expected to improve the industrial capacity of Kessess.

7.14

SUMMARY

Box 7.1

Socio-Economic Features and Sensitivities Related to the Project

- Development in the area is sparse, limited to single-storey structures which will not result in shading.
- The majority of women have no ownership and control of productive assets such as land, which is a significant barrier to gender equality and economic development.
- Women are predominantly engaged in unpaid domestic work and within the subsistence agricultural sector.
- There is a readily accessible labour force of semi-skilled and un-skilled labour as the youth are the most populous.
- Access roads will need to be upgraded prior to the construction phase by the Project.
- There are two other 40MW proposed solar PV Plants, one approximately 1km east of the Site, and another adjacent to the Site (by Eldosol Energy), which means that a total of 120MW of Solar Power will be generated from the area.

This *Chapter* presents a summary of the stakeholder engagement undertaken as part of the ESIA process. It also serves as a summary of a more detailed Stakeholder Engagement Plan (SEP), which presents the engagement approach and identifies stakeholders and the mechanisms through which stakeholders have been engaged. The complete SEP is included in *Annex D1*.

The engagement process has been designed to meet both Kenyan legal requirements for public participation in relation to a Project Report and international requirements for engagement as outlined in the IFC Performance Standards.

8.1

OBJECTIVES OF STAKEHOLDER ENGAGEMENT

The objectives of engaging stakeholders and the community during the ESIA process and beyond include:

- **Ensuring understanding:** An open, inclusive and transparent process of culturally appropriate engagement and communication will be undertaken to ensure that stakeholders are well informed about the proposed Project as it develops. Information will be disclosed as early and as comprehensively as possible and appropriate.
- **Involving stakeholders in the assessment:** Stakeholders will be included in the scoping of issues, the assessment of impacts, the generation of mitigation and management measures and the finalisation of the ESIA report. They will also play an important role in providing local knowledge and information for the baseline to inform the impact assessment.
- **Building relationships:** Through supporting open dialogue, engagements will help establish and maintain a productive relationship between the Project and stakeholders. This will support not only an effective ESIA, but will also strengthen the existing relationships and build new relationships between Eldosol Energy and stakeholders.
- **Engaging vulnerable peoples:** An open and inclusive approach to consultation increases the opportunity of stakeholders to provide comment on the Project and to voice their concerns. Some stakeholders, however, need special attention in such a process due to their vulnerability. Special measures will be considered to ensure that the perspectives of vulnerable stakeholders are heard and considered.
- **Managing expectations:** It is important to ensure that the Project does not create or allow unrealistic expectations to develop amongst stakeholders about Project benefits. The engagement process will serve as one of the

mechanisms for understanding and then managing stakeholder and community expectations, where the latter will be achieved by disseminating accurate information in an accessible way.

- **Ensuring compliance:** The process is designed to ensure compliance with both local regulatory requirements and international best practice.

One of the key outcomes of engagement should be free, prior and informed consultation of stakeholders, where this can be understood to be:

- **Free:** engagement free of external manipulation or coercion and intimidation;
- **Prior:** engagement undertaken in a timely way, for example the timely disclosure of information; and
- **Informed:** engagement enabled by relevant, understandable and accessible information.

8.2

APPROACH TO STAKEHOLDER ENGAGEMENT

Stakeholder engagement for the ESIA has been undertaken using a staged approach in line with the various phases of the ESIA process as follows:

- scoping Engagement;
- baseline data gathering;
- ESIA engagement; and
- disclosure.

An outline of the objectives and activities for each phase is provided in *Sections 8.2.1 to 8.2.4*,

8.2.1

Scoping Engagement

Scoping phase engagement was undertaken during a four day trip in June 2015. The broad objective of the engagement was to:

- notify stakeholders of the Project and the ESIA process;
- formally initiate the engagement process and introduce the Proponent and ESIA team; and
- provide stakeholders with an opportunity to ask questions and give input to the Project.

Engagement during this phase focused on county level engagement and community leaders, as well as the identification of interested and affected stakeholders.

The following engagement materials were generated during the Scoping phase to support engagement activities:

- PowerPoint presentations for County government level engagement and engagement in formal settings (*Annex D2*); and
- Background Information Document (BID) (*Annex D3*).

These materials were written in non-technical/ accessible language and provide information on the following:

- the background to and description of the Project;
- information on the Project proponent;
- the environment in which the Project will be developed;
- information on the ESIA process and timelines;
- potential impacts associated with the Project; and
- information on ESIA consultants.

8.2.2 *Baseline Data Gathering Engagement*

Baseline data gathering was conducted both in the scoping trip and in parallel to the ESIA engagement trip (see section below).

As baseline data collection occurred in parallel to the stakeholder engagement activities, it also provided stakeholders an opportunity to provide feedback or ask any questions regarding the Project. This involved engagement with various County government departments, health and educational facilities and community members.

8.2.3 *ESIA Engagement*

During the drafting of the Impact Assessment the engagement team returned to site to gather stakeholder comments and feedback on the potential impacts identified to date. This engagement was targeted at allowing local stakeholders an insight into the predicted impacts and mitigation and to contribute their local knowledge to the assessment and mitigation process. This phase of engagement involved the following tasks:

- **Materials:** preparation of a flyer translated into Nandi (*Annex D4*), presentation and comments / response sheets (*Annex D5*) that discussed the findings of the ESIA including accessible descriptions of impacts and mitigation measures.
- **Impact Assessment and Mitigation:** the engagement team met with relevant stakeholders to discuss the potential impacts and mitigation identified by the ESIA team, and provide up to date information on the Project. This involved a series of meetings including with County government officials, a public meeting and various community meetings.

- **Update SEP:** following the ESIA engagement the SEP was updated to reflect the activities conducted to date, as well as the key outcomes of the engagement activities.

8.2.4 *Disclosure*

In the final phase of engagement the Project will:

- **Incorporate Feedback:** All feedback received from stakeholders has been documented, considered and where relevant incorporated within the ESIA report.
- **Disclose the final ESIA Report:** Once the final ESIA has been developed the Project proponent will submit the final updated ESIA document to the Authorities.

8.2.5 *Post ESIA Engagement*

The Project is committed to continuous engagement with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the SEP will therefore feed into and inform on-going stakeholder engagement as the Project moves into these stages, ensuring that two-way dialogue with those affected, both positively and negatively by the proposed Project is maintained.

The aim will be to ensure that the Project remains in contact with all interested parties and cognisant of their concerns, and that these are addressed in an effective and timely manner. At each stage a detailed schedule of activities and events will be developed and widely disseminated so that people know how to interact with and participate in the Project.

8.3 *PROJECT STAKEHOLDERS*

A stakeholder is defined as any individual or group which is potentially affected by the Project or who has an interest in the Project and its potential impacts. Different issues are likely to concern different stakeholders, and so different types of stakeholder have been grouped based on their connections to the Project.

Table 1.1 identifies the range of stakeholder groups that have been identified and included within the stakeholder engagement process to date.

Table 1.1 *Stakeholders Identified to Date*

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
Government	- National regulatory bodies - Government agencies	National Government are of primary importance in terms of establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with Kenyan Law throughout all stages of the Project life-cycle.	- Office of Member of Parliament - County Commissioner - Deputy County Commissioner - Assistant County Commissioner - Office of County Director - Environment - Office of County Director - Physical Planning - Office of County Director - Water - Office of County Director - Lands - Office of County Director -Energy - Office of County Director - Education - Office of County Director - Social Development - Office of County Director - Public Health - Office of County Director - Infrastructure (roads) - Office of County Director - Agriculture

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
Traditional authorities	Key County Authorities	County government are also of primary importance as they are responsible for implementation of legislation, and development plans and policies at the County level. The County will also have a role in issuing permits and processing applications associated with the Project. In addition, Uasin Gishu County will be impacted by the Project and will need to be kept informed of progress and plans in their area, to consider the Project activities in their policy-making, regulatory and other duties and activities.	- Office of County Governor - Office of County Senator - Office of Deputy Governor - Office of Member of County Assembly - Office of Women Representative - Office of County Administrator - Office of Sub-County Administrator - Office of Ward Administrator - County Executive - Lands - County Executive - Environment - County Executive - Physical Planning - County Executive - Energy - County Executive - Legal - County Executive - Education & ICT - County Executive - Social Development - County Executive - Public Health - County Executive - Infrastructure - County Executive - Agriculture - County Executive - Water - County Executive - Labour
	- Politically appointed authorities - Customary authorities	Local community leaders acting as representatives of their local community. Meetings with traditional authorities will follow local practices and should be held prior to any wider communication in local communities in order to respect the political and social structures.	- Chief - Assistant Chiefs - Elders

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
Communities	Project affected communities including: • registered and customary land owners; • residents and occupiers of land; and • members who use of or access to land and resources.	Households and communities that may be directly or indirectly affected by the proposed Project and its activities. This includes people living on land affected by the Project, through direct land take or by social and environmental impacts, and other people who visit or use land or resources that may be affected.	Villages of: • Mosop • Kipchamo • Chepkigen
Vulnerable groups	• Women • Female headed households • People with physical / mental health illnesses and disabilities	Vulnerable groups may be affected by the Project by virtue of their physical disability, social or economic standing, limited education, lack of employment or access to land.	Members within the following villages: • Mosop • Kipchamo • Chepkigen
Civil Society	• Community Based Organisations • Community of Other Associations • Research and Academic Institutions	Organisations with direct interest in the Project, and its social and environmental aspects and that are able to influence the Project directly or through public opinion. Such organisations may also have useful data and insight and may be able to become partners to the Project in areas of common interest.	• Moi University • Plateau RCA Hospital • Local community saving associations
Non-Governmental Organisations (NGOs)	• National • Local	NGOs with direct interest in the Project, and its social and environmental aspects and that are able to influence the Project directly or through public opinion.	• ADAPT (local NGO)

A total of five meetings were conducted during the Scoping and ESIA engagement phases. Records of the meetings conducted both in the Scoping and ESIA engagement phases including the attendance registers and are included in *Annex D6* and photos are presented in *Annex D7*:

The key questions and concerns raised by stakeholders during both phases of engagement are outlined in *Table 1.2*, and further detail is included in the SEP (Annex D1).

Table 1.2 *Outcomes of Scoping and ESIA Engagement*

Theme	Issue
Employment	Employment for local communities
	Recruitment process
	Skills transfer for local communities
Environment	Changes to water drainage channels
	Impacts to birds in the area
	Waste storage and disposal
Resettlement	Confirmation on whether resettlement will be required
Transmission Line	Health impacts of the proposed transmission line
	Loss of livelihoods due to transmission line
	How compensation and lease payments for the wayleave for the transmission line would be managed
Health	Perceived radiation impacts from the PV panels
	Electrocution impacts from overhead transmission line
Community Development	Request for investment in infrastructure (roads and water) in the local area
	Request for investment in educational facilities in the local area
	Request for investment in health facilities in the local area
	Investment in local livelihood activities including milk production, storage and sale
	Support for vulnerable groups in particular orphans
Cultural Heritage	Impacts to initiation site (identified to not be located on the Project site)
Visual and Physical	Visual impacts of the PV panels when in operation
	Perceived interference with planes landing at the Eldoret International Airport

In accordance with international good practice the Project has established a specific mechanism for dealing with grievances. A grievance is a complaint or concern raised by an individual or organisation who judges that they have been adversely affected by a project during any stage of its development.

Further detail on the grievance mechanism process is outlined in the SEP.

Stakeholder engagement has been monitored and reported through the following means:

- updates to the stakeholder database; and
- records of all consultations held.

These records have been updated throughout the ESIA. Thus the SEP and the records that are created as a result have served as a tool, not only to plan engagements but also to record previous phases of the process.

9.1 OVERVIEW

The proposed solar PV plant will result in both positive and negative environmental and social impacts. This *Chapter* outlines the impacts and presents ways to avoid to significantly mitigate the unavoidable negative impacts.

9.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

9.2.1 Impacts on Soils, Hydrology and Hydrogeology

The construction, operation, and decommissioning phases of the proposed Solar PV Plant may impact soils, surface water, and groundwater in the area as summarised in *Table 9.1*:

Table 9.1 *Impact on Soil, Hydrology and Hydrogeology*

Summary	Construction	Operation
Project Aspect/Activity	Removal of top soil, soil compaction and soil erosion associated with site clearance and preparation, road construction, assembly area etc.	Soil erosion around the cleared areas, roads and at the foot of the PV panels.
	Increased sediment load in the drainage channels as a result of erosion leading to surface water pollution and reduced water quality.	Impacts on surface water and groundwater as a result of fuel and oil spillage, or pollution from cleaning detergents.
	Decreased amount of groundwater as a result of groundwater abstraction for project activities, should borehole water be used.	Decreased amounts of groundwater as a result of abstraction for the project activities, if abstraction is from a borehole.
	Increase storm water runoff from a decrease in infiltration and increased surface runoff.	Reduction in groundwater recharge through infiltration as a result of paved surfaces and PV panels.
Impact Type	Direct	Direct
Receptors Affected	Soils on site underlying the construction areas, PV sites, roads etc.	Soils in the vicinity of cleared areas, roads and PV sites
	Surface water and groundwater quality at or near the Project Site.	Surface water and groundwater quality at or near the Project Site.

Construction Phase Impacts

Preparation of the site for the establishment of PV arrays, underground cables, access road(s), temporary laydown area and buildings (control and accommodation) during the construction phase will require vegetation clearance, some site levelling, grading and soil compaction.

The area required for the PV array locations, buildings and access tracks linking infrastructure (PV Footprint) will be considerable. The total PV Footprint of the facility could be up to 301 acres.

Several changes in the characteristics of the soil may result from the excavation and compaction of soil for the foundation. Excavation activities are known to alter the soil's structural stability and therefore reduce its structural integrity. This may inhibit rehabilitation and thus increase the erosion potential of the soil at the project's closure.

Compacting the soil to lay the foundations, erecting temporary structures, and passage of heavy vehicles (trucks, tractors etc.) can reduce the soil's percolative ability and thereby increase run-off either on specific routes or over a large area. Together with the laying of foundations and erecting of ancillary structures, this will lead to further changes in the surface and subsurface hydrology by altering the flow and recharge rates at the project site.

Areas cleared of vegetation in preparation for the Solar Power Farm are prone to rain and wind erosion. Vegetation cover is an important physical factor that influences soil erosion. Intact vegetation cover reduces the impact of raindrops on the soil, slows down rate of surface runoff allowing for percolation, filters sediment load in the surface runoff and binds the soil together providing stability. Increased soil stability enhances the soil's physical resistance to erosion and improves the water absorption ability of the soil. The effects of potential soil erosion and increased sediment load in surface runoff may extend to the surrounding areas of the project site if appropriate control measures are not put in place.

Soil compaction might result in decreased permeability meaning decreased infiltration and increased runoff. Without appropriate measures in place, runoff from PV panels, compacted areas, hard-standing areas and paved surfaces may increase erosion and increase the sediment load entering the drainage channels.

The permanent removal of the top soil alters the soil profile, which inhibits the soil rehabilitation, which may, in turn, increase the potential of soil erosion.

Nature: The loss of topsoil, changes in the soil profile through compaction, potential soil erosion and contamination will have a **negative direct** impact on the soils of the Site.

Impact Magnitude –Medium

- **Extent:** The extent of the impact is **local**. Although the impacts are predominantly limited to the boundaries of the Site, there is a chance they may extend beyond the Site.
- **Duration:** The duration would be **long-term** since although removal of topsoil and compaction in areas of the Site will occur largely during the construction phase, the effect may continue through the Project lifecycle.
- **Intensity:** The intensity is **medium** although topsoil removal and soil compaction may be limited to specific areas of the Site, potential erosion may affect a larger area.

Likelihood – It is **likely** that this impact will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Operational Phase Impacts

Soil erosion caused by storm water or surface water runoff may occur during the operational phase as a result of additional impervious surfaces onsite, such as the gravel compacted roads, the laydown and storage areas used for the construction phase, and the panels themselves, resulting in increased runoff. In addition, although the disturbance associated with the construction phase will have ended, unless mitigation measures are undertaken, loss of topsoil may continue during the operational phase of the Project. No topsoil clearing is anticipated during routine operation and maintenance of the facility, although effects of wind could exacerbate erosion where vegetation cover has been removed.

Obstructions such as poles supporting the PV structures, building foundations and compacted gravel tracks on the Site may concentrate water flows into catchment areas feeding surrounding drainage lines. Surface water flows diverted along tracks and infilled trenches could also result in the formation of eroded gullies or dongas.

It is also important to note that the Site has a very gentle gradient and will be covered with vegetation, both between and under the panels. Therefore, there should be negligible impact on rainwater infiltration.

Nature: Routine operational and maintenance activities may result in a **negative direct** impact on the soils at the Site, whereas PV panels acting as wind breaks result in a **positive direct** impact on soils located in the vicinity of the PV Footprint.

Impact Magnitude –Medium

- **Extent:** The extent of the impact is **local**; the impacts are predominantly limited to the Site boundaries but may extend to the immediate surrounds of the Site.
- **Duration:** The duration would be **long-term** as the soils may be affected at least throughout the operational phase of the Project.
- **Intensity:** The intensity is **low** since the source of the impact will be limited to areas inside the infrastructure footprint, however, significant loss of soil can result from erosion caused by excessive runoff if not mitigated adequately.

Likelihood – It is **likely** that these impacts will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Mitigation Measures

Design Phase

- Clearing activities will be kept to a minimum and will only be undertaken during agreed working times as permitted by suitable weather conditions. If heavy rains or severe winds are expected, clearing activities will be put on hold. In this regard, the developer and EPC contractor will be cognisant of local weather forecasts and the seasonal climate characteristics of the Study Area.

Construction Phase

Following the clearing of an area, the surfaces of all exposed slopes will be roughened to retain water and increase infiltration (especially important during the wet season). Any steep or large embankments that are expected to be exposed during the rainy months will either be armoured with fascine like structures or vegetated ⁽¹⁾.

- Regular diversion berms will be built on gravel compacted roads.
- The removal of vegetation and soil cover will be restricted to only those areas necessary for the development. In particular, the unnecessary removal of groundcover vegetation from slopes will be prevented, especially on steep slopes.
- Soil conservation measures will be implemented such as stockpiling topsoil or gravel for the remediation of disturbed areas.

(1) A fascine structure usually consists of a natural wood material and is used for the strengthening of earthen structures or embankments.

- Stockpiles will be vegetated or appropriately covered to reduce soil loss as a result of wind or water erosion.
- Disturbed areas will be rehabilitated as soon as possible to prevent erosion.
- Work areas will be clearly defined and where necessary demarcated to avoid unnecessary disturbance of areas outside the development footprint.
- Fuel, oil and used oil storage areas will be contained in bunds of 110 percent capacity of the stored material. Fuels will be stored in above-ground storage tanks.
- Spill containment and clean up kits will be available onsite and clean-up from any spill will be appropriately contained and disposed of.
- Construction vehicles and equipment will be serviced regularly and off site.
- Construction vehicles will remain on designated and prepared compacted gravel roads. The additional creation of access roads will be kept to a minimum. Where roads need to be created, a dual tyre track road will be used rather than clearing the entire road width.

Operational Phase

- Laydown or infrastructure assembly areas not required during the operational phase of the PV power facility will be re-vegetated with indigenous vegetation to prevent erosion immediately after these areas are no longer required for construction.
- Bi-annual monitoring of erosion in the vicinity of roads, PV arrays and other hard-standing surfaces will be conducted before and after the rainy season to ensure erosion sites can be identified early and remedied.

Residual Impacts

Assuming the above stipulated mitigation measures are implemented, the residual impact significances for the construction and operational phases are reduced to *Negligible* negative.

Table 9.2 ***Pre- and Post-Mitigation Significance: Loss of Topsoil, Soil Compaction and Erosion***

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MODERATE NEGATIVE	MINOR NEGATIVE

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Operation	MINOR NEGATIVE	NEGLIGIBLE

Impact on Hydrology and Hydrogeology

Construction Phase Impacts

As mentioned in *Section 9.2.1*, soil compaction and vegetation clearance may increase the intensity and volume of surface water runoff as a result of a decrease in water infiltration recharging the groundwater. This may impact drainage lines within the Site by exacerbating erosion features, and increasing the sediment load of the water entering these channels when they are flowing. Increased run off from hard standing areas could result in the creation of drainage lines and damage to solar infrastructure and installation equipment by debris, and the deepening and lateral erosion of channels and loss of infiltration.

Water will also be required for construction purposes, which will most likely be supplied from either a borehole dug on Site, or the nearby River (taken on site by truck and stored on Site). In the first alternative, the quantities expected to be needed are a fraction of the daily Eldoret Town consumption, thus not implying any significant issue in terms of competition for scarce resources for city supply. The abstraction of water in the second case, may impact on the available water sources at site if the abstraction rate is unsustainable and exceeds the rate of recharge, and if it taps on the same aquifer.

During construction, water will be required for use for sanitary and drinking purposes by on-site workers. It is estimated that 50 litres per worker per day will be required during this period.

Depending on the results of the geotechnical study, concrete piles may be used for the mounting structures. It is estimated that a single pile will require 0.6 m³ concrete, totalling 4,800 m³ for the site. This volume of concrete will require 1,700 m³ water.

In the event that a vibratory driven pile is used for mounting structure foundations, water will only be required for the construction of the buildings and ancillary infrastructure on site.

Depending on local rainfall and evaporation rates, water may also be required for dust control during construction. A maximum estimate for dust control for a 40 MW project under conditions of low rainfall and high rates of evaporation would be in the region 800 m³ over the construction period. It is considered that in this region of Kenya, significantly less water will be required for this purpose.

Nature: Surface and groundwater impacts resulting from soil compaction, increased sediment load, water usage could result in a **negative direct** impact.

Impact Magnitude – Low

- **Extent:** The extent of the impact is **local** since the impacts are limited predominantly to the boundaries of the Site.
- **Duration:** The duration for impacts to the creation of new drainage channels would be **permanent** since the Site's natural pattern of runoff would be permanently altered.
- **Intensity:** The intensity is **medium** since runoff is expected to be of a low to medium level of intensity, in addition to the fact that the quantity of dangerous goods stored onsite will be relatively small.

Likelihood – It is **likely** that this impact will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Operational Phase Impacts

Soil erosion caused by storm water or surface water runoff may occur during the operational phase and result in an increase in the sediment load of onsite runoff. Obstructions such as foundations and roadways may concentrate water flows into catchment areas feeding surrounding drainage lines. Similarly, flows diverted along tracks and infilled trenches may also result in soil erosion, creating new gullies or dongas. These impacts will last for the duration of the operational phase.

Surface water and groundwater impacts associated with leaks and spills are reduced during the operation phase since on-site storage of hydrocarbons and site activities will be considerably reduced.

The total developable area for the solar project would cover up to 300 acres (approximately 121 hectares) with the panels covering approximately 129 acres (52.5%) of this area. The panels will be poled mounted directly into the ground, with limited areas that may require concrete ballast. It is estimated that the total hard-standing impermeable area association with project, such as building foundations, ballasts, will cover less than 2% of the project site. There will also be compacted gravel roads within the site, but these shall remain as permeable areas. Therefore it is considered recharge to groundwater from rainfall will not be significantly affected by the Project.

The principal use of water for on-site operations is for panel cleaning. It is estimated that the cleaning of modules would require 75 litres per mounting structure per annum, based on two washes per year.

It is noted that panel washing is required mainly to remove accumulations of dust on the panels, which is reduced by periods of rainfall. As a result, fewer

than two washes per year may be necessary, proportionately reducing the estimated water consumption for the site.

Site personnel are expected to require less than 1,000 litres per day during the operation phase, resulting in a total estimated water requirement for the site of 8,000 m³ per annum during the operational phase.

Box 9.4

Operational Impact: Impact on Surface and Groundwater

Nature: Increased sediment loads in runoff during routine operational and maintenance activities and reduced groundwater recharge may result in a **negative direct** impact on surface and groundwater.

Impact Magnitude –Medium-Low

- **Extent:** The extent of the impact is **local** since the impacts are limited predominantly to the boundaries of the Site or in the vicinity of the Site.
- **Duration:** The duration for increased sediment loads and reduced groundwater recharge would be **long-term**.
- **Intensity:** The intensity is **low** since the size of a spill is likely to be small given the limited volume of product to be stored onsite. Intensity for change in flow during the operation phase and increased sediment load will be **medium** and for reduced groundwater recharge **low** since the natural groundwater recharge from rainfall in the area is low.

Likelihood – It is **likely** that this impact will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE-MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Mitigation Measures

Construction Phase

- Any drainage lines on site are to be covered with appropriately designed culverts so as to result in zero impedance to natural surface water flows. Such culverts are to be inspected monthly to make sure they are free of soil and other materials that may impede the passage of water.
- Safety training focused on operational procedures, emergency procedures and safe working practices, information on specific hazards, first aid and fire-fighting will be included in the job induction training (including casual workers), prior to the commencement of construction

Operational Phase

- Water use and recycling plan, to reduce abstraction rate.

- Eldosol to obtain a water abstraction permit from Water Resources Management Authority (WRMA) if abstracting from the River or sinking a borehole. Any borehole will also require a separate EIA to be carried out.
- Staff to receive training on the correct operation of storage tanks, as well as maintenance and repair procedures when leaks are detected.
- Site will be managed to ensure the project area remains fully vegetated throughout the project lifetime.

Residual Impact

Assuming the above stipulated mitigation is implemented, the residual impact significances on surface and groundwater are reduced to *Minor* negative in the construction and operational phases (Table 9.3).

Table 9.3 *Pre- and Post-Mitigation Significance: Impacts on Surface and Groundwater*

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MINOR NEGATIVE	MINOR NEGATIVE
Operation	MODERATE-MINOR NEGATIVE	MINOR NEGATIVE

9.2.2 *Impacts on Flora, Avifauna and Habitats*

This sub-section discusses the impacts the proposed project may have on flora, avifauna, including the destruction, degradation, or fragmentation of habitat. The potential impacts are assessed and mitigation measures to reduce the impacts are also outlined.

Table 9.4 *Impact Characteristics on Flora, Fauna and Habitats*

	Construction	Operation
Project Aspect/ activity	(i) Loss of maize and wheat plantation associated with Site clearance, road construction, building and PV array support construction etc. (ii) Erosion and clearing of topsoil (loss of habitat and habitat fragmentation). (iii) Disturbance of drainage areas. (iv) Disturbance/displacement of avifauna associated with noise and movement of construction equipment and personnel.	(i) Disturbance to avifauna associated with the operation of the PV power facility and movement of vehicles. (ii) Collision and/or electrocution of avifauna with project infrastructure, especially the transmission line. (iii) Loss of avifauna habitat to space occupied by PV panels and associated infrastructure, and disturbance / displacement associated with routine maintenance work.

	Construction	Operation
Impact Type	Direct Negative	Direct Negative
Receptors Affected	(i) Maize and wheat plantation (ii) Avifauna on Site (iii) Invertebrates and insects	(i) Maize and wheat plantation (ii) Avifauna on Site (iii) Invertebrates and insects

Habitat Loss-Destruction, Displacement and Disturbance

Construction Phase Impacts

Clearance of maize and wheat will be undertaken which is required for the establishment of the PV power facility's infrastructure including for the PV arrays, buildings (including an operational control centre, office, ablutions and a guard house), fencing, access roads and internal road network and storage and lay-down areas, resulting in permanent loss of vegetation within the Site. Necessary space is also required to be kept between rows to avoid shadow effects from one row to the next. These rows will remain free from any construction. The total area of the PV Footprint could be up to 301 acres

Box 9.5

Construction Impact: Habitat Loss-Destruction, Displacement and Disturbance

Nature: The construction phase will require clearing of a the maize and wheat plantation for construction of access roads, PV arrays, buildings and laydown areas, resulting in a direct negative impact on the natural vegetation of the 301 acres.

Impact Magnitude –Medium

- **Extent:** The extent of the impact is **on-Site** as the impacts will be limited to the boundaries of the Site.
- **Duration:** The duration would be **long-term** as the plantation on the Site would be affected at least until the Project decommissioning.
- **Intensity:** The intensity is **high** given the high level of disturbance that is likely to accompany the construction activities.

Likelihood – The impact has a **definite** likelihood of occurring.

IMPACT SIGNIFICANCE (PRE-MITIGATION) –MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Operational Phase Impacts

The impacts on habitat are largely restricted to the construction phase. Operational phase impacts are likely to be restricted to maintenance activities within the Site. As such these impacts are considered to have a low intensity, and an overall *Moderate-Minor* significance.

Nature: The operational phase will require clearing of some habitat for maintenance of the PV power facility such as from under PV arrays and away from access roads.

Impact Magnitude – Low

- **Extent:** The extent of the impact is **on-Site** as the impacts will be limited to the Site boundary
- **Duration:** The duration would be **long-term** as the plantation on the Site would be affected at least until the Project decommissioning.
- **Intensity:** The intensity is **low** given that the density of the vegetation at the Site is low, and there would only be a need for occasional vegetation clearance for maintenance.

Likelihood – The impact is **likely** to occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) –MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Mitigation Measures

Construction Phase

- Vehicle movement to be restricted to defined tracks, which should be clearly demarcated.

Operational Phase

- Any cleared areas which do not have some vegetation cover to protect the soil will be re-vegetated with locally occurring species and monitored to ensure recovery is taking place.
- Exclusive use of designated roads and accesses for vehicles. No off-road driving is permitted.

Residual Impact

Assuming the above-mentioned mitigation measures are implemented, the construction phase impact significance is reduced to *Negligible* and the operational phase impact significance is reduced to *Minor Positive*.

Table 9.5 *Residual Impact Significance: Habitat Loss – Destruction, Disturbance and Displacement*

Impact	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction: Destruction and Loss of Natural Vegetation and Sensitive Plant Communities	MINOR NEGATIVE	NEGLECTIBLE

Impact	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Operation: Impacts of Maintenance Activities on Habitat	MINOR NEGATIVE	MINOR POSITIVE

Impacts on Avifauna

The observed avifauna on-site includes the Grey Crowned Crane, which is an endangered species. However, it inhabits wetlands, roosts in water along rivers and marshes and is a generalist in terms of feeding. Its main threats include live trapping (for trade), egg collecting and hunting.

Impacts of Associated Infrastructure

Certain bird species are attracted to the PV arrays, using the erected structures as prominent perches, sheltered roost sites or even nesting sites, and possibly foraging around the infrastructure in response to changes in the distribution of preferred foods (plants growing under the arrays, other animals attracted to the PV power facility). Such scenarios might be associated with fouling of critical components of the solar infrastructure, bringing local bird populations into conflict with the facility operators.

Construction and Maintenance of the Transmission Line

Some habitat destruction and alteration inevitably takes place during the construction of transmission lines and associated roadways.

Electrocution on Power Infrastructure

Avian electrocutions occur when a bird perches or attempts to perch on an electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen 2004b, Lehman et al. 2007).

Construction Phase Impacts

Box 9.7

Construction Impact: Avifaunal Disturbance

Nature: All construction activities would result in a **negative direct** impact on the avifauna at the Site; disturbance associated with noise and movement of construction equipment and personnel at the Site may deter many bird species from the area and disrupt the breeding of sensitive species or those breeding within the development area, especially large terrestrial and raptor species

Impact Magnitude –Low

- **Extent:** The extent of the impact is **local** as the impacts would be beyond the Site boundaries.
- **Duration:** The duration would be **short-term** as the disturbance would last for the construction phase.
- **Intensity:** Local populations of priority species will be disturbed, however this will be for a limited period of time. The extent of the habitat disturbed is small when compared to the surrounding available habitat, so the effect on processes will be **medium**.

Likelihood – The impact is **definite** to occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) –MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Operational Phase Impacts

Box 9.8

Operational Impact: Avifaunal Disturbance

Nature: Operational activities would result in a **negative direct** impact on the avifauna at the Site; disturbance or displacement of large terrestrial species and raptors by routine maintenance activities.

Impact Magnitude –Medium

- **Extent:** The extent of the impact is **local** as impacts would be beyond the Site boundaries.
- **Duration:** The duration would be **long-term** as the disturbance would last for the duration of the operational phase.
- **Intensity:** Some species may be displaced for the duration of the project however these species are likely to adapt due to the availability of similar habitat, therefore the magnitude of the change will be **low**.

Likelihood – The impact is **likely** to occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) –MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **moderate-high**.

Nature: Operational activities would result in a **negative direct** impact on the avifauna at the Site. Mortality of large terrestrial species and raptors, as well as overflying wetland birds, may result from collisions with the transmission line or by electrocution on new power infrastructure. The risks of increased incidence of collisions are however minimal given the nominal length of the new transmission line required to connect the Project to the national grid (via the existing 220kV Turkwel- Lessos transmission line)

Impact Magnitude –Medium

- **Extent:** The extent of the impact is **regional** given that bird ranges may extend well beyond the Study Area.
- **Duration:** The duration would be **long-term** as the ecology of the area would be impacted for the duration of the operational phase.
- **Intensity:** Individuals of threatened species may be killed in collision/electrocution incidents, so the intensity of change will be **medium-high**.

Likelihood – The impact is **unlikely** to occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) -MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **moderate**.

Mitigation

Construction Phase

- Personnel present during the construction and operational phase will receive environmental education so as to ensure that that no hunting or killing of avifauna (especially the Grey Crowned Crane which is an endangered species) occurs at any stage during the Project. The Proponent will develop and implement a disciplinary procedure for staff caught conducting such activities.

Operational Phase

- Any electrocution and collision events that occur should be recorded, including the species affected and the date. This can be done, for example, by Site Security during their regular patrol. The Staff can be provided with an environmental checklist that details what to look out for. It is important to note that if repeated collisions occur, then further mitigation and avoidance measures may need to be implemented.

Residual

Provided that the above mentioned mitigation, and any further mitigation requirements identified by on Site monitoring work are applied wherever possible post-construction, this development should have a limited impact on avifauna. Therefore, provided that mitigation is effectively applied, it is not likely that the development of the Site would generate significant long-term impact on the listed avifauna present.

The overall significance ratings for the construction phase residual significance are reduced to *Moderate-Minor*. The operational phase residual significance rating for disturbance to avifauna is reduced to *Negligible*, and operational avifaunal mortality residual significance rating is reduced to *Negligible*.

Table 9.6 *Residual Impact Significance: Impacts on Avifauna*

Impact	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction: Disturbance	MODERATE NEGATIVE	MODERATE-MINOR NEGATIVE
Operation: Disturbance	MINOR NEGATIVE	NEGLIGIBLE
Operation: Avifaunal Mortality	MINOR NEGATIVE	NEGLIGIBLE

9.2.3 *Impacts on Air Quality (Local)*

Local Air Quality

The works involved in the proposed project during the construction and operation will emit various air pollutants which can have negative effects on both human and environmental health at a local level.

Table 9.7 *Impact on Local Air Quality*

Summary	Construction	Operation
Project aspect/activity	Emissions from construction vehicles and machinery. Particulate emissions due to soil disturbance.	Dust and emissions from movement of vehicles and equipment during operation and maintenance.
Impact Type	Direct negative	Direct negative
Stakeholders/Receptors Affected	Neighbouring residents, road users, construction personnel, flora and fauna.	Neighbouring residents , flora and fauna.

Construction Phase Impacts

During the construction phase, the main sources of air pollution will be through soil excavation, which will raise exhaust fumes and in particular particulate dust levels in the immediate project vicinity (see *Figure 9.1*).

Figure 9.1 *Typical Dust Generated During the Construction Phase*



Source: Solar farms ECO work case study (undated)

Box 9.10 *Construction Phase Impacts*

Nature: The construction phase will result in air pollution from excavation activities as well as exhaust fumes.

Impact Magnitude –Minor

- **Extent:** The extent of the impact is **local**. Although the impacts are predominantly limited to the boundaries of the Site, there is a chance they may extend beyond the Site
- **Duration:** The duration would be **short-term** as the disturbance would persist for the duration of the construction phase.
- **Intensity:** The intensity is **medium**.

Likelihood – The impact has a **definite** likelihood of occurring.

IMPACT SIGNIFICANCE (PRE-MITIGATION) –MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Operational Phase Impacts

Minimal dust generation is expected to occur during the operational phase of the project caused by maintenance vehicles passing along the access roads (that will be upgraded) which will be infrequent. Therefore, the impact of dust generated during the operation phase is not considered any further.

Mitigation Measures

Construction phase

- Spraying water on soil before excavation and periodic road wetting to reduce nuisance dust levels;
- Visual inspection of dust pollution from roads and the construction site and appropriate intervention if dust levels are too high;
- Speed restriction of construction vehicles to a speed of 30 km/h or less;
- Maintenance and servicing of machines and engines off-site;
- Use of registered petrol stations;
- Grievance procedure for dust complaints;
- The use of appropriate Personal Protective Equipment (PPE) such as dust masks in particular for construction workers.

Residual Impact Significance: Local Air Quality Impacts

Assuming the above stipulated mitigation measures are implemented, the residual impact significances for the construction phase is reduced to *Minor* negative.

Impact	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction: Impacts from Soil Excavation and Exhaust Fumes	MINOR (NEGATIVE)	NEGLIGIBLE

9.2.4

Waste and Effluent

Waste and effluent will be generated during the construction and operational phases of the PV power facility. The key types of waste generated and/or activities these arise from are set out below:

Table 9.8 *Impact Characteristics: Waste and Effluent*

	Construction	Operation
Project Aspect/ activity	Construction activities including excavation/ trenching, unpacking of solar components, accommodation facilities on Site and ablution facilities.	Maintenance activities, personnel and general office facilities.
Impact Type	Direct negative	Direct negative
Stakeholders/ Receptors Affected	Surrounding habitat.	Surrounding habitat.

Construction Phase Impacts

All wastes generated from the project will be categorised as either *non-hazardous* or *hazardous* following an assessment of the hazard potential of the material, in line with the Environmental Management and Coordination (Waste Management) Regulations of 2006.

During construction, general wastes produced will include plastics, metal and wood shavings, ceramics, bricks, glass, cardboard, cement, paper, paints and sealants (see *Figure 9.2*). Packaging material wastes will also be accumulated from unpacking of PV Array equipment (see *Figure 9.3*).

Figure 9.2 *Typical General Waste*



Source: Solar farms ECO work case study (undated)

Figure 9.3 *Typical Packaging Waste: Wooden Pallets and Cartons*



Source: Solar farms ECO work case study (undated)

The following hazardous wastes will also be produced from construction activities.

- Batteries (including large lead acid type);

- Oily rags and absorbents;
- Used oil and oil filters - from generators or vehicle maintenance;
- Contaminated water - slops and oily water from drip trays; and
- Sewage from toilets.

Waste will be temporarily stored on-site before the EPC contractor removes it off-site to an appropriate waste facility. Waste storage on-site increases the potential of wastes and effluents being leached into the soil and groundwater leading to soil and groundwater contamination and harming the natural environment. During the rains water can also accumulate in waste, encouraging the breeding of mosquitoes. Piles of waste also provide habitats for rats, snakes and other vermin. If there is any waste (especially food waste) left around the Site, then raptors will also be attracted to the Site.

Accumulated waste also reduces the aesthetic beauty of the environment, and increases the risk of wind-blown litter. Waste and effluent can also be washed away by storm water and surface runoff into drainage channels, contaminating the nearby water bodies resulting in reduced water quality.

Box 9.11 *Construction Impact: Waste and Effluent*

Nature: Construction activities that produce waste would result in a **negative direct** impact on the Site.

Impact Magnitude – Medium

- **Extent:** The extent of the impact is **local** as impacts may be just beyond the Site boundaries.
- **Duration:** The duration would be **short-term** as impacts may last just beyond the construction of the PV power facility.
- **Intensity:** The intensity is likely to be **medium** as levels of waste volumes generated will be high based on the large workforce required on-Site.

Likelihood – The impact has a **definite** likelihood of occurring

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Operational Phase Impacts

Operations and maintenance of the PV power plant is not expected to involve hazardous materials, or to generate hazardous waste. PV panels, array enclosures and inverter/transformer enclosures will not produce waste during operation.

Once the PV panels have reached the end of their 25 year life cycle, they will be collected and recycled as appropriate. A decommissioning plan will be developed prior to decommissioning to detail how the PV panels and the other major electrical items will be responsibly reused or recycled.

The PV panels will possibly be cleaned once or twice a year to remove dust accumulated on the surfaces of the modules during the operational phase of

the project. The water used for cleaning will not contain any harmful chemicals or additives and will not be heated. Therefore the water is not regarded as wastewater and the water will be allowed to percolate into the soil.

Box 9.12 *Operation Impact: Waste and Effluent*

Nature: Operation activities that produce will result in a **negative direct** impact on the Site.

Impact Magnitude – Low

- **Extent:** The extent of the impact is **local** as impacts may move just beyond the Site boundaries.
- **Duration:** The duration would be **long-term**, potentially lasting the duration of the operation of the PV power facility.
- **Intensity:** The intensity is likely to be **low** owing to the small number of personnel present on Site during the operation phase and few waste generating activities.

Likelihood – The impact has a **definite** likelihood of occurring

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Mitigation Measures

Construction Phase

- A Waste Management Plan (WMP) will be produced for the construction phase following the principles of:
 - waste minimisation at source,
 - segregation for reuse,
 - recycling, and
 - disposal of waste.

With detailed measures stipulated such as:

- using waste minimisation techniques such as buying in bulk;
- allocating responsibilities for waste management;
- identifying all sources of waste;
- ensuring wastes are handled by personnel licensed to do so especially in the case of hazardous waste;
- making suitable facilities available for the collection, segregation and safe disposal of the waste;
- creating waste collection areas with clearly marked facilities such as colour coded bins and equipment for handling the various waste types; and
- The collection of wastes that cannot be reused or recycled to be collected by approved waste contractors and transferred to an

appropriately (NEMA) licensed waste management facility for treatment and ultimate disposal.

- The construction and commissioning phases will require the use of hazardous materials, such as fuels and greases, solvents and paints. Fuels will be stored on site in temporary aboveground storage tanks.
- Trucks and construction vehicles will be serviced off site.
- The use, storage, transport and disposal of hazardous materials used for the project will be carried out in accordance with all applicable Kenyan regulations, and Material Safety Data Sheets (MSDS).
- It is proposed that the EPC Contractor supply the required temporary ablution facilities and be responsible for the treatment and/or removal of sewage wastes off site. The EPC Contractor must ensure that the contracting company is accredited and has the necessary permits to remove sewage waste.
- The sewage will be treated in accordance with the municipal sewage works policies and guidelines, as per the WMP for this Project.

Operational Phase

- Although the operations phase is not expected to produce hazardous waste, any PV panels that are destroyed and require replacement should be appropriately recycled, where possible, or sent back to the manufacturer (e.g. a leading global provider of comprehensive photovoltaic (PV) solar energy solutions can propose to take back spoilt or decommissioned panels).

Residual Impact

If the mitigation measures stipulated above are implemented, the residual impact significance will be reduced to *Minor* during the construction phase and remain *Minor* during the operational phase.

Table 9.9 *Pre- and Post- Mitigation Significance: Waste and Effluent*

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MODERATE NEGATIVE	MINOR NEGATIVE
Operation	MINOR NEGATIVE	MINOR NEGATIVE

9.3 *SOCIO-ECONOMIC IMPACTS AND MITIGATION MEASURES*

9.3.1 *Impact on Livelihoods*

The proposed Solar Plant will be located on privately owned land which is currently being leased to a private individual. The lease will expire in December 2015 following harvesting of the current crop rotation. The land will then be transferred to the Project for development free of any

encumbrances. The change of land use process is being implemented in line with Kenyan law.

In addition, a transmission line will be required connecting the power plant to the existing KPLC Transmission Line from Turkwell to Lessos located to the west of the power plant side. There are two potential routes which could be created as outlined in *Chapter 5* and *Annex B1*. Both routes involve the creation of a 40 metre wayleave within land plots owned (under formal title) by members of the neighbouring community as well as the placement of two or three towers.

Land owners and users along both routes have been engaged with as part of the ESIA process and have agreed in principle to lease land to the Project subject to commercial negotiations. This process including meeting minutes is described in more detail in *Annex F*.

Table 9.10 *Impact Characteristics: Livelihood*

Summary	Construction	Operations
Project Aspect/ Activity	Disturbance to/interruption of crop production.	Presence of 40 meter wayleave including restrictions on land use within the wayleave.
	Disturbance to/interruption of grazing land.	Loss of access to land under towers.
	Loss of economic trees	
Impact Type	Direct, negative	Direct, negative
Receptors Affected	Maize and wheat farmers, land owners and users	Maize and wheat farmers, land owners and users

Construction Phase Impacts

Construction of the wayleave will result in the temporary loss of access to land. The area of land affected will be determined by the wayleave but also access routes and construction work areas for constructing the towers and stringing the lines.

The affected land is currently used for economic activities including growing crops such as maize, wheat and vegetables as well as the need to cut economic trees (including cypress, wattle, bluegum, figs and avocados). Depending on when construction activities are undertaken this could result in the loss of crops used for subsistence and cash incomes resulting in adverse impacts to livelihoods if not appropriately compensated. In addition, the construction activities will require fences to be cut and could result in the loss of timber structures used for farming (such as calf sheds and milking areas).

Depending on the selected route either 4 or 6 land owners or users will be affected. It should be noted that while the land title is usually owned by the eldest male within a family plots are often shared between family members. Therefore the affected crops may not belong to the landowner.

Finally the construction of the proposed transmission line may result in unplanned or accidental damage to crops, trees and structures to assets outside of the agreed construction areas or on neighbouring land plots. This could result in loss of livelihood for those impacted if not compensated for.

Box 9.13 *Construction Impact: Loss of Livelihood*

Nature: The loss of livelihood will be a direct and negative impact to the land owners and users Impact Magnitude – High • Extent: It is anticipated that the potential impacts of loss of livelihoods factors will have impacts at the local level. • Duration: The impacts identified are expected to be linked to the construction and therefore short-term. • Intensity: The intensity will be high given that in the absence of mitigation the affected households are likely to lose access to areas of their land used to sustain their livelihoods. Likelihood – It is likely that this impact will occur during the construction phases. IMPACT SIGNIFICANCE (PRE-MITIGATION) -MODERATE NEGATIVE Degree of Confidence: The degree of confidence is high
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Mitigation Measures

- The wayleave will be designed to avoid all physical structures.
- Eldosol Energy will carry out valuation of all the assets (through a Registered Land Valuer) to ensure that affected households are compensated adequately based on current market rates and can participate in informed negotiations regarding leases.
- The Project will negotiate leases for the land and associated compensation for any losses based on the principle of willing buyer -willing seller.
- Construction activities will be scheduled to be undertaken during the dry season to avoid impacts to the harvest. In the event that this is not feasible compensation for loss of crops will be paid to the owner of the crops or land user.
- Compensation for any expected losses e.g. economic trees, fences etc. will be paid in advance to the owner of the asset.
- Any unplanned damage or loss of assets affecting any household, as a result of construction, to structures, crops trees or other assets will be paid for in line with agreed rates.
- The Project will engage with affected households on a continual basis regarding the construction process so that they can make informed choices about undertaking livelihood activities on their land during the construction period.

- The Project will implement a grievance mechanism and will investigate and respond to any complaints or grievances regarding the leases, loss of assets (planned or unplanned) damage to crops etc. in line with this mechanism.

Residual

If the mitigation measures stipulated above are implemented, the residual impact significance will be reduced to *Minor* during the construction phase as individuals will receive compensation to restore their livelihoods.

Operation Phase Impacts

During operations restrictions will be placed on land use within the 40mtr wayleave notably structures and trees will not be permitted for safety reasons. However landowners will be able to continue to grow crops such as maize, wheat and vegetables and graze animals. Land around the base of the tower will no longer be available for economic activities. This represents a relatively small area of land (approximately 5 x 5mtr).

During operation it is not expected that there will be any further disturbance to land. However, the Project will have the right to access the wayleave and undertake planned and unplanned maintenance activities along the line which may result in damage to crops.

Box 9.14 ***Operation Impact: Loss of Livelihood***

Nature: The loss of livelihood will be a **direct** and **negative** impact to the land owners and users)

Impact Magnitude – Medium

- **Extent:** It is anticipated that the potential impacts of loss of livelihoods factors will have impacts at the **local** level.
- **Duration:** The impacts identified are expected to be linked to the operational phase and are therefore **long-term**.
- **Intensity:** The intensity will be **low** given that in the absence of mitigation the affected households will be able to continue to use the wayleave to undertake livelihood activities albeit with some restrictions.

Likelihood – It is **likely** that this impact will occur during the operations phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) -MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**

Mitigation Measures

- The Project will pay leases for the wayleave and land around the base of the tower in line with the negotiated agreements.

- Compensation for any losses associated with planned maintenance will be paid in advance in line with agreed rates. Where possible activities will be planned for the dry seasons. Any unplanned damage due to maintenance to structures, crops trees or other assets will be paid for in line with agreed rates.
- The Project will engage with stakeholders on a regular basis to inform them of any planned or unplanned activities. This will include ensuring the grievance mechanism remains open to landowners /landusers for the duration of the Project.

Residual

If the mitigation measures stipulated above are implemented, the residual impact significance will be reduced to *Negligible* during the operational phases.

Table 9.11 *Pre and Post Mitigation Significance: Loss of Livelihoods*

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MODERATE NEGATIVE	MINOR NEGATIVE
Operation	MINOR NEGATIVE	NEGLIGIBLE

9.3.2 *Impacts on Employment, Procurement and the Economy*

The development of the proposed PV Solar Farm will result in a positive economic impact in Uasin Gishu County and Kenya as a whole by affecting the national, county and local economy to varying degrees.

Impacts from the Project include direct employment opportunities mainly during construction. Indirect employment generated by the procurement of goods and services for the Project and induced employment related to jobs ensuing from the expenditure of incomes associated with direct and indirect Project related jobs.

All impacts will be most significant during the construction and decommissioning phases of the Project when the workforce and procurement of goods and services will be at its peak.

Table 9.12 *Impact Characteristics: Employment, Procurement and the Economy*

Summary	Construction	Operation
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Summary	Construction	Operation
Project Aspect/ Activity	Direct employment of local workers and contractors. Indirect employment through the procurement of goods and services. Induced employment as a result of direct and indirect employment. Lease agreements with landowners. Increased inflation linked to increased demand for accommodation, goods and services (and the possible lack of supply). Increased revenues as a result of taxation.	
Impact Type	Direct, indirect and induced positive impacts and negative impacts.	
Stakeholders/ Receptors Affected	Local communities, local/ county and national suppliers, and directly and indirectly affected landowners.	

Direct Employment and Training

Construction Impacts

The construction and operation of the PV Power Plant will create direct employment opportunities across different skills levels, from unskilled to highly skilled labour. It is estimated that during the construction phase activities, at least 250 jobs will be created. The construction phase is scheduled to take at least 12 months from start to completion. Construction phase activities will include; site clearance, road construction, general construction, assembly, and site security.

An additional direct benefit during the construction phase is the opportunity for 'on-the-job' training for local people. The highly skilled technicians can provide training to local employees, increasing their skills level so that they will be employable on other Projects. The potential impact on direct employment and training during the construction phase is described in *Box 9.14*

Box 9.15 *Construction Impact: Direct Employment and Training*

Nature: The creation of direct employment and training opportunities will be a **direct** and **positive** benefit to those employed and to the local economy.

Impact Magnitude – Low - Medium

- **Extent:** Employment will be created for Kenyans at a **local, provincial and national** level depending on skills and capacity availability.
- **Duration:** Employment generated during the construction phase will take place over a 10 month period and will therefore be **short-term**.
- **Intensity:** The intensity will be **low to medium** as approximately 250 jobs will be created.

Likelihood – It is **definite** that this impact will occur.

Degree of Confidence: The degree of confidence is **high**

Enhancement Measures

The objective of enhancement measures is to optimise the opportunity for direct employment and training for the work force at a local, provincial or national level. It is recognised that due to the nature of the project, and given that the technology is still relatively new in Kenya, some specialised skills will be sourced from outside Kenya.

- Eldosol Energy will notify identified representatives of the County Government of the specific jobs and the skills required for the Project, prior to the commencement of construction. This will give the local population time prior to the commencement of construction to enable them to attain the relevant skills to be employable on the Project, where appropriate. This is applicable to un-skilled and semi-skilled workers.
- The Project will prioritise the employment of unskilled labour from Kipchamo Location in the first instance. In the event that the position cannot be filled from it will then advertise further afield.
- The Project will develop a fair and transparent employment policy and process that manages out any potential nepotism. The policy will be shared with the nearby communities.
- No workers will be hired at the Project site. This process will assist in discouraging opportunistic employment seekers arriving at the Project site in search of employment.

Residual Impact

The implementation of the above enhancement measures should ensure that the direct employment and training benefits would increase to *Moderate* positive significance during the construction phase and remain of *Minor* positive significance during the operation phase. The pre- and post-mitigation impacts are compared in *Table 9.13*

Operation Phase Impacts

The project would generate around 35 jobs during the operational phase, which are expected to last the full operational life of the plant. The majority of these positions will be skilled. However, there will also be a limited number of semi-skilled and unskilled opportunities. As with the construction phase where possible priority will be given to people from Kipchamo location in order to maximise local employment.

Table 9.13 *Pre- and Post- Enhancement Significance: Direct Employment and Training*

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	MINOR - MODERATE POSITIVE	MODERATE POSITIVE
Operation	MINOR POSITIVE	MINOR POSITIVE

Construction Impacts

The construction of the proposed PV Power Facility will create opportunities for the supply of goods and services to the Project and in turn, indirect employment will be created in the supply chain. Although the EPC Contractor will obtain specialised components from suppliers outside the Country, it is likely that everyday supplies will be obtained from local suppliers. The construction hospitality and service industries are likely to be the largest beneficiaries within the supply chain.

During the construction phase the personnel will need to be housed close to the site ⁽¹⁾. Therefore there will be business opportunities for the local hospitality industry (e.g. accommodation facilities, restaurants) and a potential opportunity for income generation from short-term rental accommodation. The Site is located approximately 13.5 km South East of Eldoret Town, which has a well-established hospitality industry, offering a selection of accommodation and dining options.

There may be further opportunities for local companies to provide catering to construction teams on site during the day. Other potential opportunities exist through activities such as laundry and cleaning services, waste/ recycling collection and landscaping.

In addition, suppliers of goods and services (quarrying and brick production, carpentry, plants and gardening, road work, etc.) will be required to facilitate the construction activities.

The potential benefit of procurement and indirect employment opportunities during the construction phase are described in *Box 9.15*.

Box 9.16 ***Construction Impact: Procurement and Indirect Employment***

Nature: The procurement and indirect employment and procurement opportunities will have a **direct** and **positive** benefit.

Impact Magnitude – Low – Medium

- **Extent:** There will be opportunities for businesses to provide services to the project at a **local, county and national** level depending on services offered and capacity availability.
- **Duration:** Business generated during the construction phase will be **short-term**.
- **Intensity:** The intensity will be **low - medium** as it will create a steady flow of business opportunities for a limited time only.

Likelihood – It is **definite** that this impact will occur.

Degree of Confidence: The degree of confidence is **medium** given that actual figures are not yet available due to the early stage of this project.

(1) At this stage it is not clear where construction personnel from outside the local area will be housed.

Enhancement Measures

The following enhancement measures will be implemented to ensure that business opportunities emanating from the Project are maximised:

- The Proponent will include requirements for local employment in the contract that they establish with the EPC Contractor and require that the contractor recruits in accordance with the Proponent recruitment policy and RFP documents.
- The Proponent will encourage local companies to apply, where appropriate, as part of the Stakeholder Engagement Plan (SEP), which is a continually updated document.
- The Proponent should ensure that all tenders are advertised

Operation Phase Impacts

During the operation phase, procurement opportunities will be limited to maintenance work for cleaning of PV panels. The demand for new solar panels for PV Power Facility will be limited to the replacement of damaged or faulty panels. Impacts of the indirect employment and local procurement in the operations phase are described in *Box 9.16*.

Box 9.17 *Operation Impact: Procurement and Indirect Employment*

Nature: The procurement and indirect employment opportunities will have a **direct positive** benefit.

Impact Magnitude – Low

- **Extent:** There will be opportunities for businesses to provide services to the project at a **local, county and national** level depending on services offered and capacity availability.
- **Duration:** Business generated during the operation phase will take place over the life span of the Project, approximately 25 years and will therefore be **long-term**.
- **Intensity:** The intensity will be **low** as there will be limited activities during the operation phase.

Likelihood – It is **likely** that this impact will occur.

Degree of Confidence: The degree of confidence is **medium** given that actual figures are not yet available due to the early stage of this project.

Enhancement Measures

Eldosol Energy should continue to implement measures outlined during the construction phase to maximise local employment opportunities.

Table 9.14 *Pre- and Post- Enhancement Significance: Procurement and Indirect Employment*

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	MINOR POSITIVE	MODERATE POSITIVE
Operation	MINOR POSITIVE	MINOR POSITIVE

Induced Economic Benefits

Construction Impacts

Employment and procurement (discussed in the *Sections* above) will be most significant during the construction phase of the project, bringing additional income into households. The increase in disposable income (via the project workers) will result in increased demand for goods and services, and greater spending within the local community. *Box 9.17* describes the construction phase impact of induced economic benefits.

Box 9.18 *Construction Impact: Induced Economic Benefits*

Nature: The induced economic benefits will have a **direct** and **positive** benefit.

Impact Magnitude – Low

- **Extent:** There will be increased spending at a **local** level resulting from increased levels of disposable income and a greater demand for goods and services.
- **Duration:** The construction phase will take place over a 12 month period and will therefore be **short-term**.
- **Intensity:** The intensity will be **medium** as it will create a relatively small, *albeit* steady flow of spending in the local area, but for a limited time only.

Likelihood – It is **likely** that this impact will occur.

Degree of Confidence: The degree of confidence is **medium** given that actual figures are not yet available due to the early stage of this project.

Operation Phase Impacts

Fewer job opportunities exist during the operation phase (approximately 35), and for those gainfully employed during this phase, they will continue spending within the local community. However, as a result of the reduced job opportunities induced employment opportunities will be also be limited.

Nature: The induced economic benefits will be a **direct** and **positive** benefit.

Impact Magnitude – Low

- **Extent:** There will be increased spending at a **local** level resulting from increased levels of disposable income and a greater demand for goods and services.
- **Duration:** The operation phase will take place over a 25 year period and will therefore be **long-term**.
- **Intensity:** The intensity will be **low** as there will be limited induced economic benefits during the operation phase due to a very small number of employees. The landowners will benefit from income earned through the lease agreement with the Proponent.

Likelihood – It is **likely** that this impact will occur.

Degree of Confidence: The degree of confidence is **medium** given that actual figures are not yet available due to the early stage of this project.

Enhancement Measures

The induced benefits brought about by the Project can be enhanced through maximising local employment and procurement thereby increasing the number of induced employment opportunities locally. Refer to the enhancement measures for maximising local content given in the sections above.

Table 9.15 *Pre- and Post- Enhancement Significance: Induced Economic Benefits*

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	MINOR POSITIVE	MODERATE POSITIVE
Operation	MINOR POSITIVE	MINOR POSITIVE

Increased Revenue Generation

Construction and Operation Impacts

The construction and operation phases of the Project will also increase the economic activities in the County, and revenue for the National Government through taxes. Box 9.19 describes the construction and operation phase impact of increased revenue generation.

Nature: The increased revenue generation will have a **direct** and **positive** benefit.

Impact Magnitude – Low

- **Extent:** There will be increased revenue generation at **local** and **national** levels resulting from increased economic activities.
- **Duration:** The construction phase will be **short-term** and the operations phase **long-term**.
- **Intensity:** The intensity will be **medium** as it will create a relatively small, *albeit* steady flow of spending into the County and the relatively small nature of the Project to generate taxes which will be for a limited time only.

Likelihood – It is **likely** that this impact will occur.

Degree of Confidence: The degree of confidence is **medium**

Enhancement Measures

The induced benefits brought about by the Project can be enhanced through maximising local employment and procurement. Refer to the enhancement measures for maximising local content given the sections above.

Table 9.16 *Pre- and Post- Enhancement Significance: Increased Revenue Generation*

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	MINOR POSITIVE	MODERATE POSITIVE
Operation	MINOR POSITIVE	MINOR POSITIVE

9.3.3

Increased Social Disturbance Factors

The project is located in a predominantly rural setting. The population density of the immediate area is low and the majority of the surrounding land is used for agriculture and is therefore undeveloped. The introduction of construction activity into a rural environment can result in social change. This change is typically linked to the arrival of unskilled workers (directly related to the project), as well as opportunistic job-seekers into an area. Influx to an area can increase levels of crime, drug and alcohol abuse and place additional pressure on existing infrastructure and services. It is, however, considered unlikely that there will be large-scale influx into Kipchamo and the surrounding areas given the relatively short construction period and the limited number of employment opportunities. Opportunistic workers are more likely to settle in Eldoret, which is unlikely to be impacted by the presence of limited number of additional people due to its size.

Table 9.17 provides a summary of the characteristics of the potential impacts linked to influx of workers and job-seekers.

Table 9.17 *Impact Characteristics: Social Disturbance Factors*

Summary	Construction	Operation
Project Aspect/ activity	Construction staff, transport workers and potential influx of opportunistic job-seekers.	Operation staff.
Impact Type	Direct and indirect, negative impact.	Direct, negative impact.
Stakeholders/ Receptors Affected	Local residents of the area. Landowners/ users of neighbouring farms.	Local residents of the area. Landowners/ users of neighbouring farms.

Construction Impacts

Approximately 250 people will be employed during the construction phase which will last for 12 months. It is expected that the majority of unskilled positions will be filled with residents from the local area, thereby limiting the size of the external workforce to mainly semi-skilled and skilled workers.

The presence of construction workers and any opportunistic job seekers in the Project area presents the potential for impacts to local communities as outlined below.

- **Petty Crimes:** There is a chance that petty crimes e.g. theft of tools, crops, household items and farm materials may occur near the project site and neighbouring farms. As crime levels are currently low this may result in negative relations between communities and the Project.
- An increase in disposable income within the project area (among workers) could result in **an increase in alcohol and drug abuse** which is currently at low levels within the local communities and again could result in negative relations between communities and the Project.
- **Increased demand for services** including access to health care and schools could affect the quality and availability of these services for the local population which can result in negative relations between communities and the Project. However, such impacts are likely to be limited due to the size of the workforce, duration of construction and the fact that the workforce is unlikely to bring their families to the area.

Box 9.20 describes the construction phase impact as related to an increase in social disturbance factors.

Nature: Increased social disturbance would be regarded as a **direct** (as related to workers) and an **indirect** (as related to job-seekers), **negative** impact.

Impact Magnitude – Low

- **Extent:** It is anticipated that the potential impacts of increased social disturbance factors will have impacts at the **local** level.
- **Duration:** The impacts identified are expected to be linked to the construction period and therefore **short-term**.
- **Intensity:** The intensity will be **low** given the influx into the area of workers and opportunistic job-seekers is expected to be limited.

Likelihood – It is **likely** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium** given that the extent of the influx of job-seekers is unknown.

Operational Phase Impacts

During the operation phase, there will be fewer permanent workers onsite (up to 35 permanent staff). As such, it is likely that the social disturbance factors above will not be experienced to the same extent during the operation phase compared to construction phase. Given the limited job opportunities in Kipchamo Location, it is considered unlikely that people (directly employed and opportunistic job seekers) will stay in the Project area following the end of the construction phase in the hope of further work.

Theft or vandalism of the PV panels or associated infrastructure may be of some concern during the operation phase but will not affect the nearby communities. Box 9.21 describes the operation phase impact of increased social disturbance factors.

Nature: Increased social disturbance would be regarded as a **direct** (as related to workers) and an **indirect** (as related to job-seekers), **negative** impact.

Impact Magnitude – Negligible

- **Extent:** It is anticipated that the potential impacts of increased social disturbance factors will have impacts at the **local** level.
- **Duration:** The impacts identified are expected to be **long-term** as they will persist for the life of the project.
- **Intensity:** The intensity will be **negligible** given the small workforce.

Likelihood – It is **likely** that this impact will occur during the operation phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – NEGLIGIBLE

Degree of Confidence: The degree of confidence is **medium**.

Mitigation Measures

The objectives of mitigation are to limit, where possible, social disturbance factors brought about by the construction and operation of the Project. Furthermore, mitigation should ensure that contractors manage their workers in such a way that the impacts are limited.

Specific measures include:

- Eldosol Energy and their appointed EPC Contractor will develop an induction programme, including a Code of Conduct, for all workers (including contractors and their workers). A copy of the Code of Conduct to be presented to all workers and signed by each person.
- The Code of Conduct will address the following aspects:
 - respect for local residents including guidelines for interaction;
 - no hunting or unauthorised taking of products or livestock;
 - zero tolerance of illegal activities by construction personnel including: unlicensed prostitution; illegal sale or purchase of alcohol; sale, purchase or consumption of drugs; illegal gambling or fighting;
 - compliance with the Traffic Management Plan and all road regulations; and
 - description of disciplinary measures for infringement of the Code of Conduct and company rules.
- If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary procedures that could result in dismissal. Livestock or crop theft should be noted as a dismissible offence.
- Eldosol Energy will develop and implement a grievance procedure that is easily accessible to local communities, through which complaints related to contractor or employee behaviour can be lodged and responded to. Eldosol Energy must respond directly to such complaints. Key steps of the grievance mechanism include:
 - circulation of contact details of 'grievance officer' or other key Project contacts.
 - Awareness raising among local communities (including all directly affected and neighbouring residents) regarding the grievance procedure and how it works.
 - Establishment of a grievance register to be updated by the Proponent, this should include all responses and response times.
- The Proponent, together with the appointed EPC Contractor must develop a means of monitoring access to the site, prohibiting unauthorised access to the site and ensuring that all visitors report to the site office.

- Only formal channels for employment will be used, following advertisement of jobs. No employment will be given at the gate.
- The Proponent will award a contract to an appropriate security company, to provide 24 hour security at the site. The security company will comply with the above mentioned Code of Conduct.

Residual Impact

The implementation of the above mitigation measures should reduce the construction impacts from one of *Minor* to *Negligible* significance, and the operation impact will remain of *Negligible* significance. The pre- and post-mitigation impacts are compared in Table 9.18

Table 9.18 *Pre- and Post- Mitigation Significance: Social Disturbance Factors*

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	MINOR NEGATIVE	NEGLIGIBLE
Operation	NEGLIGIBLE	NEGLIGIBLE

9.3.4 *Impact on Disease Transmission*

As stated above, the project is located in a predominantly rural setting consisting of small communities. The only exception is Chepkigan Village which extends to the Nairobi-Eldoret Highway at Ngeria Junction. Sex workers are known to operate at this location and the presence of truck drivers and workers could result in increase in the numbers of sex workers and the potential for transmission of sexually transmitted infections including HIV/AIDS.

The presence of an external workforce can also contribute to the transmission of other communicable diseases including TB and respiratory tract infections both of which are already known to occur in the Project area.

Construction activities have also been associated with increased transmission of malaria, if sites are not appropriately managed breeding grounds can be created leading to increased prevalence of mosquitos and therefore potential for transmission. Malaria is known to be present in communities near the Project site.

Table 9.19 provides a summary of the characteristics of the potential impacts to disease transmission.

Table 9.19 *Impact Characteristics: Disease Transmission*

Summary	Construction	Operation
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Summary	Construction	Operation
Project Aspect/ activity	Construction staff, transport workers and potential influx of opportunistic job-seekers. Construction site management	Operation staff.
Impact Type	Direct and indirect, negative impact.	Direct, negative impact.
Stakeholders/ Receptors Affected	Local residents of the area.	Local residents of the area.

Construction Impacts

While the construction phase is only expected to last 12 months and the number of workers is small there will also be truck drivers in the area. As such, the Project could impact on the transmission of STIs including HIV/ AIDS due to the following:

- transport drivers, who typically have higher rates of HIV or STIs than the general population, may engage in casual high risk sexual activity with sex workers at Ngeria Junction;
- the presence of construction workers could result in the mixing of people with higher HIV or STI prevalence rates than the host community which may promote the transmission of STIs;
- presence of a mainly male local and external workforce with disposable incomes who may engage in high risk sexual activities with commercial sex workers;
- existing stigma around STIs including HIV/ AIDS may affect people's willingness to seek treatment.

In addition, the rate of spread of other communicable diseases may increase within communities as a result of the construction due to the potential for close living arrangements within the workforce which are known to contribute to the transmission of TB and respiratory diseases and interaction of the workforce with the community including as a result of local-non local workforce interactions.

Modifications to the environment during construction as well as the creation of small water pools in wheel ruts, footprints or man-made containers could lead to the creation of new breeding grounds for vectors and therefore increased transmission of malaria.

Box 9.22 describes the construction phase impact as related to an increase in social disturbance factors.

Nature: Increased transmission of diseases would be regarded as a **direct** (as related to workers and transport drivers) and an **indirect** (as related to job-seekers), **negative** impact.

Impact Magnitude – Medium

- **Extent:** It is anticipated that the potential impacts of increased social disturbance factors will have impacts at the **local** level.
- **Duration:** The impacts identified are expected to be linked to the construction period and therefore **short-term**.
- **Intensity:** The intensity will be **medium** given the number of transport workers; influx into the area of workers and opportunistic job-seekers is expected to be limited. However, the consequences of increased disease transmission can be longer term and spread beyond those initially affected.

Likelihood – It is **likely** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **medium** given that the extent of the influx of job-seekers is unknown.

Operational Phase Impacts

During the operation phase, there will be fewer permanent workers onsite (up to 35 permanent staff) and transport movements will reduce significantly. As such, it is likely that the disease transmission factors above will not be experienced to the same extent during the operation phase compared to construction phase.

Nature: Increased transmission of diseases would be regarded as a **direct** (as related to workers and transport drivers) and an **indirect** (as related to job-seekers), **negative** impact.

Impact Magnitude – Low

- **Extent:** It is anticipated that the potential impacts of increased social disturbance factors will have impacts at the **local** level.
- **Duration:** The impacts identified are expected to be **long-term** as they will persist for the life of the project.
- **Intensity:** The intensity will be **low** given the small workforce and limited number of truck movements. However, the consequences of increased disease transmission can be longer term and spread beyond those initially affected.

Likelihood – It is **likely** that this impact will occur during the operation phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Mitigation Measures

The objectives of mitigation are to limit, where possible, disease transmission as consequence of construction and operation of the Project. Furthermore,

mitigation should ensure that contractors manage their workers in such a way that the impacts are limited.

Specific measures include:

- Eldosol Energy must develop and implement an HIV/AIDS/malaria policy and information document for all workers directly related to the Project. The EPC Contractor must implement this policy. The information document will address factual health issues as well as behaviour change issues around the transmission and infection of HIV/AIDS as well as malaria.
- Eldosol Energy will make condoms available to employees and all contractor workers during construction and operation.
- The Worker Code of Conduct for all Project personnel should include guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local communities.
- As part of the Worker Code of Conduct, Eldosol Energy will explicitly forbid all Project personnel from engaging in illegal activities including the use of commercial sex workers and transactional sex which could affect the reputation of the company and or its relationship with communities. Anyone caught engaging in illegal activities will be subject to disciplinary proceedings.
- Truck drivers will be prohibited from stopping at the roadside in Ngeria Junction or other communities in the Project area,
- If workers are found to be in contravention of the Code of Conduct, which they will be required to sign at the commencement of their contract, they will face disciplinary procedures that could result in dismissal.
- Accommodation should be provided to external workers in accordance with international good practice on workers' accommodation, including IFC / EBRD standards.
- The Project will implement measures to reduce the presence of standing water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds.
- Eldosol Energy should provide insecticide-impregnated bed nets act as a physical barrier to repel and kill mosquitos for workers that have been provided accommodation.

Residual Impact

The implementation of the above mitigation measures should reduce the construction impacts from one of *Medium* to *Minor* significance, and the operation impact will remain of *Minor* significance due to the severity of the health outcomes in the event of transmission of disease. The pre- and post-mitigation impacts are compared in Table 9.18

Table 9.20 *Pre- and Post- Mitigation Significance: Disease Transmission*

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	MODERATE NEGATIVE	MINOR NEGATIVE
Operation	MINOR NEGATIVE	MINOR NEGATIVE

- The Proponent must develop and implement an HIV/AIDS/malaria policy and information document for all workers directly related to the project. The EPC Contractor must implement this policy. The information document will address factual health issues as well as behaviour change issues around the transmission and infection of HIV/AIDS as well as malaria. The Proponent will make condoms available to employees and all contractor workers.
- Eldosol Energy should provide insecticide-impregnated bed nets act as a physical barrier to repel and kill mosquitos for workers that have been provided accommodation.

9.3.5 *Traffic Impacts*

This sub- section considers the impacts to traffic and road users during the construction and operation of the PV power facility.

Table 9.21 *Impact Characteristics: Traffic*

	Construction	Operation
Project Aspect/ activity	Delivery of PV components and construction equipment. Delivery of concrete. Construction personnel commuting to and from Site.	Operational personnel commuting to and from Site. Delivery of replacement PV components.
Impact Type	Direct negative	Direct negative
Stakeholders/ Receptors Affected	Road users Neighbouring residents	Road users Neighbouring residents

Construction Phase Impacts

During the construction phase, it is expected that there will be increased vehicle movements in the area as trucks will be required to transport materials and equipment such as PV panels and frames to the site. Infrastructure required for the proposed PV power facility, including support structures, PV

modules, frames, as well as machinery will be transported to and from the site from various locations in the County. The increase in traffic could create noise, dust ⁽¹⁾ and safety (including injury or even death due to accidents) impacts for other road users and people living or working within close proximity to the roads on the selected transport route.

It is anticipated that the following number of trips would be required over the construction period of 12 months:

- delivery of panels: approximately 400 trucks;
- delivery of electrical equipment and components: approximately 20-30 trucks;
- delivery of prefabricated buildings: potentially 40-50 trucks;
- delivery of mounting structures: approximately 140-150 trucks; and
- earthworks: approximately 20-30 trucks.

Box 9.25 *Construction Impact: Increased Traffic*

Nature: Construction activities that increase traffic would result in a **negative direct** impact on people who use the roads along the final transport route.

Impact Magnitude – Medium

- **Extent:** The extent of the impact is **regional** as the potential impact will extend along the selected transport route.
- **Duration:** The duration will be **short-term** for the duration of construction.
- **Intensity:** The intensity is likely to be **medium**, as the increase in traffic could create a nuisance and impact on the safety of other road users. However the increase in traffic will be temporary and the frequency of Project related vehicles operating on the roads during construction will generally be low.

Likelihood – There is a **definite** likelihood of increased traffic.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE-MINOR

Degree of Confidence: The degree of confidence is **medium**.

Operational Phase Impacts

During the operational phase, it is expected that potential traffic impacts will reduce, with vehicles only required to transport infrastructure during routine maintenance and upgrading phases and the limited number of staff to/from site. Infrequent deliveries of replacement parts may be made during the lifespan of the PV power facility. Traffic impacts associated with the operation of the facility will therefore be minimal and therefore traffic impacts associated with operation are not considered further.

(1) Impacts of dust are assessed in section 9.2.3.

Mitigation Measures

- During construction, arrangements and routes for abnormal loads (if required) will be agreed in advanced with the relevant authorities and the appropriate permit will be obtained for the use of public roads. However, it is anticipated that transport will be carried out with standard containers.
- Develop a Traffic Management Plan covering vehicle safety, speed limits on roads, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and location of rest stops and accident reporting and investigations.
- Require Project drivers to be trained in defensive driving within the previous 3 years.
- All vehicles used for the project should be regularly serviced and maintained.
- Speed limits (of less than 30 km/h) should be adhered to on the Project site.
- A grievance procedure, as outlined above, will be established whereby any complaints by neighbours or affected parties are recorded and responded to.

Residual

If the above stipulated mitigation measures are implemented, the residual impact significance will be reduced to *Minor* negative for construction, due to the potential for significant injury in the event of an accident while impacts are considered *Negligible* for the operational phase.

Table 9.22 *Pre- and Post- Mitigation Significance: Traffic*

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MODERATE-MINOR NEGATIVE	MINOR NEGATIVE
Operation	NEGLIGIBLE	NEGLIGIBLE

9.3.6 *Labour and Working Conditions*

Labour and working conditions, including occupational health and safety, will need to be considered to avoid any incidents and/or injuries. Issues that need to be considered include: treatment of workers, non-discrimination, equal opportunities, as well as the provision of a safe and healthy working and living conditions. These issues should be considered not only for those employed directly by the Proponent, but also employees of the EPC Contractor and any other sub-contractors during construction and operation.

Table 9.25 presents a summary of impacts related to labour and working conditions.

Table 9.23 *Impact Characteristics: Labour and Working Conditions*

Summary	Construction	Operation
Project aspect/activity	Worker health and safety ⁽¹⁾ , workers' rights, forced labour, child labour, discrimination, equal opportunities	Worker health and safety ⁽²⁾ , workers' rights, forced labour, child labour, discrimination, equal opportunities
Impact Type	Direct negative	Direct Negative
Receptors	All workers (including contractors and sub-contractors)	All workers (including contractors and sub-contractors)

Construction and Operation Phase Impacts

Labour laws in Kenya are in line with international labour laws and Kenya has ratified seven of the eight core ⁽³⁾ ILO conventions:

- Right to Organise and Collective Bargaining Convention, 1949 (No. 98);
- Forced Labour Convention, 1930 (No 29);
- Abolition of Forced Labour Convention, 1957 (Mo 105);
- Minimum Age Convention, 1973 (No 138);
- Worst Forms of Child Labour Convention, 1999 (No 182); and
- Equal Remuneration Convention, 1951 (No 100); and Discrimination (Employment and Occupation) Convention, 1958 (No 111).

It is important to note that while the labour laws exist, there are issues with regards to implementation. Also due to the lack of employment in Kenya, workers are willing to sacrifice their rights in order to secure employment. There is therefore the risk that the EPC Contractor and sub-contractors will not operate in line with international best practice if measures to manage such risks are not enforced.

While forced labour, child labour and discrimination is known to occur in many sectors of the economy, it is unlikely that the Project or EPC Contractor and suppliers will be doing so, especially if IFC Performance Standards (PS 2) are adhered to.

With regards to on-site worker welfare, the EPC Contractor will be required to adhere to IFC PS 2: Labour and Working Conditions, Kenyan Labour Law and the ratified ILO conventions.

(1) Ref. Section 9.3.5

(2) Ref. Section 9.3.5

(3) Kenya has not ratified the 'Freedom of Association and Protection of the Right to Organise Convention', 1948 (no 87)

Nature: Construction and Operation activities that pose a risk to workers' rights as outlined above would result in a **negative direct** impact on site personnel

Impact Magnitude – Low

- **Extent:** It is anticipated that the potential risk to workers' management and rights will impact at the **local** level as skilled workers will be better able to negotiate and achieve appropriate labour and working conditions or seek alternative employment if these are not achieved.
- **Duration:** The impacts identified are expected to be **long-term** as they will last for the duration of the construction and operation phases
- **Intensity:** The intensity will be **minor** given the small workforce and the existing legal protections.

Likelihood – It is **likely** that this impact will occur during the construction and operation phases.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Mitigation Measures

Management System

The Project will develop a Human Resources Policy which the EPC contractor will be expected to adhere to through its policies and procedures. This will include a Labour and Employment Plan and Worker Grievance Mechanism. These requirements will also be passed on to any sub-contractors. Key issues with the HR management will include, but not be limited to the following:

- Provision of clear and understandable information regarding rights under national labour and employment law, and any applicable collective agreements, including those related to hours of work, wages, overtime, compensation, etc.;
- Provision of reasonable working conditions and terms of employment;
- Provision of adequate accommodation (where relevant);
- Provision of employment, compensation/remuneration and working conditions, including working hours, based on equal opportunity and fair treatment, avoiding discrimination on any aspects;
- Provision of adequate welfare facilities on site;
- Implementation of a grievance mechanism;
- Adoption and implementation of a sexual harassment policy; and
- Adoption of open attitude towards freedom of association.

EPC Contractor Management

- In the EPC Contractor contract, Eldosol Energy will make explicit reference to the need to abide by Kenyan law, international standards (in

particular IFC PS 2) and the ratified ILO conventions and Eldosol Energy's policies in relation to health and safety, labour and welfare standards.

- As part of the EPC Contractor and supplier selection process the Proponent will take into consideration performance with regard to worker management, worker rights, health and safety as outlined in Kenyan law, international standards and the Proponent's policies.
- The Proponent will provide support to the EPC Contractor and sub-contractors to ensure that labour and working conditions are in line with Kenyan legislation and IFC PS 2 through gap analysis, awareness raising and information provision, as necessary.
- Regular checks by the Proponent will be required to ensure the relevant labour laws are adhered to at all times.

Workers' Rights

- The Proponent will put in place hiring mechanism to ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation;
- All workers (including those of contractors and subcontractors) will, as part of their induction, receive training on worker rights in line with Kenyan legislation to ensure that positive benefits around understanding labour rights are enhanced. This process will be formalised within the Code of Conduct that will be provided by the Proponent;
- All workers (including those of contractors and subcontractors) will have contracts which clearly state the terms and conditions of their employment and their legal rights. Contracts will be verbally explained to all workers where this is necessary to ensure that workers understand their rights. Contracts must be in place prior to workers leaving their home location if applicable.
- The Proponent and the EPC Contractor will put in place a worker grievance mechanism that will be accessible to all workers, whether permanent or temporary, directly or indirectly employed. The Proponent worker grievance mechanism shall be open to the EPC Contractor and subcontractor workforce in the event that their grievance is not adequately resolved by their direct employer. The Proponent will then have the authority to act to resolve this grievance.
- All workers (including those of the contractor and subcontractor) will have access to training on communicable diseases and STDs and community interactions in general. This training will be developed in collaboration with local health institutions.
- Implement international guidelines regarding the construction and management of worker accommodation.
- Surveillance and assurance that no children or forced labour is employed directly, by the EPC contractor, and to the extent possible by third parties related to the project and primary suppliers where such risk may exist

Residual

The implementation of the above mitigation measures would reduce the significance of the impacts to *Negligible* negative for both the construction and the operational phases.

Table 9.24 *Pre- and Post- Mitigation Significance: Workers' Management and Rights*

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MINOR NEGATIVE	NEGLIGIBLE
Operation	MINOR NEGATIVE	NEGLIGIBLE

9.3.7 *Health and Safety*

Table 9.25 below provides a summary of the health and safety impacts.

Table 9.25 *Impact Characteristics: Health and Safety*

Summary	Construction	Operation
Project aspect/activity	Noise and vibration from construction vehicles. Risk of injuries from moving equipment and heavy materials, open foundation pits. Risk of fire.	Noise from project site traffic, inverters, the transformer, high voltage substation and maintenance activities. Risk of injuries from moving equipment.
Impact type	Direct negative	Direct negative
Receptors	Construction workers, neighbouring residents	Neighbouring residents, on-site personnel

Construction Impacts

Construction activities and processes will generate noise and particulate dust above the ambient levels in the area. Sources of noise and dust include trucks and heavy equipment either undertaking the civil works or ferrying materials, waste and equipment to and from the project site; excavation; hammering; sawing; grinding; and the use of generators.

Other health and safety risks include the risk of injuries to project personnel from general construction work, such as the use of heavy lifting equipment and the risk of fire.

Nature: Construction activities that pose a risk to health and safety would result in a **negative direct** impact on construction workers and residents in the nearby communities.

Impact Magnitude – Minor

- **Extent:** It is anticipated that the potential risk to health and safety impacts will impact at the **local** level.
- **Duration:** The impacts identified are expected to be **short-term** as they will last for the construction phase
- **Intensity:** The intensity will be **minor** given the small workforce and short construction period as well as the nature of the proposed activities.

Likelihood – It is **likely** that this impact will occur during the construction phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **medium**.

Operation Impacts

Potential sources of noise during the operation phase include project site traffic involved in maintenance, which will create mobile sources of noise. However, it is expected that noise levels from these sources would be insignificant because they do not occur on a daily basis.

Other health and safety risks during the operation phase are expected to be minimal and will therefore not be discussed further.

Nature: Operation activities that pose a risk to health and safety would result in a **negative direct** impact on site personnel and area residents

Impact Magnitude – Negligible

- **Extent:** It is anticipated that the potential risk to health and safety impacts will impact at the **local** level.
- **Duration:** The impacts identified are expected to be **long-term** as they will last for the operation phase
- **Intensity:** The intensity will be **negligible** given the small workforce and short construction period

Likelihood – It is **likely** that this impact will occur during the operational phase.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – NEGLIGIBLE

Degree of Confidence: The degree of confidence is **medium**.

Mitigation Measures

Recommended mitigation measures include:

Construction Phase

- Maintenance of equipment to ensure it remains efficient and effective.
- Construction works only during day time.
- Provision of bill boards at the construction site gates notifying people of the construction activity and timings.
- Speed limits within the project site access roads and vicinity.
- Grievance procedure for noise complaints.
- Implementing a construction Health and Safety plan that will outline all health and safety risks and which will provide a strategy for their management. This plan must be adhered to by the EPC Contractor and meet the requirements of the Occupational Health and Safety Act of 2007.
- Preparation of construction emergency plan.
- Provision of adequate personal protective equipment (PPE) to workers and training on its use as required.
- Provision of regularly maintained firefighting equipment and in easily accessible areas as well as ensuring site personnel are well trained in their use, as well as maintaining them regularly.
- Establishment of workers grievance mechanism.
- Audits by a third party contractor to ensure H&S is effectively implemented.

Operational Phase

- Develop and implement an EHS Management Plan meeting the conditions set out in the environmental authorisation, as well as this ESIA and IFC requirements
- All the employees must wear the appropriate PPE during daily operations
- Establishing emergency procedures against hazards and ensuring the workers are aware/educated about how to follow them by conducting regular drills and involving the neighbours

Residual

If the above stipulated mitigation measures are implemented, the residual impact significance will be reduced to *Minor* negative for construction, while impacts are considered *Negligible* for the operational phase.

Table 9.26 ***Pre- and Post- Mitigation Significance: Health and Safety***

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MINOR NEGATIVE	MINOR NEGATIVE
Operation	NEGLIGIBLE	NEGLIGIBLE

The visual impact will be largely limited to the operation phase. However, large machinery will be visible on Site as soon as Site preparation begins and aspects of the PV power facility will be visible during the construction phase. The visual impacts will be perceived by two types of receptors, namely:

- receptors located at a fixed point, i.e. dwellings near the Site;
- receptors who will temporarily come into contact with the PV power facility, such as passing motorists and aircrafts.

The potential visual impacts are summarised in *Table 9.27* below.

Table 9.27 *Impact Characteristics: Visual Impacts*

Summary	Construction	Operation
Project aspect/activity	Installation of the PV panels which will alter the visual landscape.	Operation of the PV power Project.
Impact Type	Large machinery visible on site, construction activities, stockpiles of materials.	
Receptors	Direct negative Neighbouring land owners and communities	Direct negative Neighbouring land owners and communities and aircraft

Construction Phase Impacts

Visual impacts on the landscape will result from the installation of the solar PV panels on the project site which will alter the landscape of the area.

Box 9.29 *Construction Impact: Visual*

Nature: Construction would result in a **negative direct** impact on the visual landscape in the area surrounding the Site.

Impact Magnitude: Medium-Low Extent: The extent of the impact is **local**, as the construction activities will be hardly visible beyond a 7 km radius (based on ESIA studies carried out by ERM for similar projects).

- **Duration:** The duration would be **short-term** since it will occur during the construction phase.
- **Intensity:** The intensity will be **medium**, as the activities will be marginally or moderately visible from surrounding area (based on ESIA studies carried out by ERM for similar projects)

Likelihood – It is **likely** that this impact will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Operational Phase Impacts

There is a perception that solar panels have the potential to create glint and glare impacts; however, PV panels are designed to absorb sunlight, rather than reflect it. This means that they are not very reflective and in fact are much less reflective than, for example, a body of water or standard glass (e.g., windows and car windscreens). Typical panels are designed to reflect only some 2% of incoming sunlight. To further minimise nuisance from reflections an anti-reflective coating is commonly added to the surface of PV cell.

Limited glint and glare can be experienced momentarily (as the sun keeps moving) at sunrise and / or sunset. The effect would not be to dazzle, as can be the case with a glass window since the materials are non-reflective. Rather, it can be described as a 'shine' or 'glow'. At these times the sun is low in the sky and reflection could be at a low level. At other times reflection is upwards, towards the sky.

There are a number of examples of large scale solar PV plants located at or adjacent to airports within Europe and the United States and each would have undergone detailed assessment to ensure no risk to the safety of aircraft. As such, visual impacts to aircraft operating from the nearby Eldoret Airport are unlikely to occur.

Therefore, the main visual effect of the installation of the PV panels in the operational phase will be the introduction of a new visual element of a technical nature into a predominantly rural and undisturbed landscape, as illustrated in *Figure 9.3* below.

Figure 9.4 *Typical Visual Impact*



Source: Solar farms ECO work case study (undated)

Nature: Operational activities would result in a **negative direct** impact on the visual landscape in the area surrounding the Site.

Impact Magnitude: Medium

- **Extent:** The extent of the impact is **local**, as the facility will be hardly visible beyond 7 km from the Site (based on ESIA studies carried out by ERM for similar projects).
- **Duration:** The duration would be **long-term** since it will persist for as long as the facility remains operational.
- **Intensity:** The intensity will be **medium**, as the PV solar facility will be marginally or moderately visible from the surrounding area (based on ESIA studies carried out by ERM for similar projects).

Likelihood – It is **likely** that this impact will occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Mitigation Measures

Construction Phase

- Site offices and structures will be limited to single storey and sited carefully to reduce visual intrusion.
- The Proponent will be required to ensure that the footprint areas of all impact sites utilised in construction and not in operation are rehabilitated and restored to previous natural vegetation.
- The fencing will be neutral in colour.
- Substations will be set as low as possible
- The area will be kept free of waste, except in designated areas. Any wastes distributed by winds will be regularly cleaned up.

Operation Phase

- Security and perimeter lighting will also be shielded so that no light falls outside the area needing to be lit. Unnecessarily tall light poles are to be avoided.
- Re-vegetation of areas not fully restored during construction.
- All structures (including panels and buildings) will be restricted to a height of less than 6 metres (single storey).

Residual

The implementation of the above mentioned mitigation measures will reduce the significance of residual impacts on the visual landscape to *Negligible* for the construction phase and *Minor* to the operational phase.

Table 9.28 *Pre- and Post-Mitigation Significance: Visual*

Phase	Significance (Pre-mitigation)	Residual Significance (Post-mitigation)
Construction	MINOR NEGATIVE	NEGLIGIBLE
Operation	MODERATE NEGATIVE	MINOR - MODERATE NEGATIVE

9.4 CUMULATIVE IMPACTS

Cumulative impacts are a result of effects that act together (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the project under consideration (e.g. the combined effect of other similar projects in the general area). An effect to a resource in itself may not be considered significant, but may become significant when added to the existing and potential effects eventuating from similar or diverse developments in the area.

Cumulative impacts have been defined as “*changes to the environment that are caused by an action in combination with other past, present and future human actions*” (Hegmann *et al* 1999).

There has been a substantial increase in renewable energy developments recently in Kenya, and legislation is evolving to facilitate the introduction of Independent Power Producers (IPPs) and renewable energy into Kenyan electricity generation.

While the preceding impact assessment *Sections* (9.2 and 9.3) of this *Chapter* have assessed the impacts associated with the Project largely in isolation, it is also important to consider cumulative impacts associated with a proposed development. This *Section* therefore examines whether the Project’s potential impacts become more significant when considered in combination with the additional existing and proposed infrastructure, including additional solar power projects, within the area.

All reasonable effort has been made to review the currently proposed position of the Project, in relation to other proposed solar power plants in the surrounding area. There are two known proposed solar power plants in addition to the Project (ref map in *Annex B4*) and all three solar farms (including Eldosol Energy) will produce a total of 120MW of Power. There is some certainty that all three developments will proceed to construction.

As these cumulative impacts are explored in more detail, the trade-offs between promoting renewable energy (and the associated benefits in terms of reduction in CO2 emissions) versus the local and regional environmental and social impacts and benefits (i.e. impacts on avifauna, landscape, employment, etc.) will become evident. It is only when these trade-offs are fully understood that the true benefits of renewable energy can be assessed.

The *Sections* below therefore explore the potential cumulative impacts in terms of the additional solar energy developments being constructed within close proximity to the Project.

9.4.1 *Soils, Surface and Groundwater*

When preparing Sites for PV panels, some developers clear the entire Site of vegetation, often leveling and grading the whole extent of the Site. This may result in soil compaction, soil disturbance and erosion which in turn may increase the intensity and volume of surface water runoff as a result of a decrease in water infiltration recharging the groundwater. As PV solar plants occupy large areas, potential cumulative impacts could be significant if not managed properly. This impact could be compounded if more than one facility were to be constructed and operated within close proximity.

However, should the stipulated mitigation measures to avoid disturbance to the soils and surface and groundwater be implemented, the cumulative impacts associated with PV power facilities in this regard are expected to be **Minor Negative**

9.4.2 *Avifauna*

The most significant potential impact on bird life by solar PV facilities relates to the displacement or exclusion of threatened, rare, endemic or range restricted species, such as the Grey Crowned Crane, from critical habitats, as well as hunting and poaching. However, should adequate mitigation measures be implemented on avifauna in the region, cumulative impacts are likely to be **Minor Negative**.

9.4.3 *Landscape and Visual Impact*

Should the additional PV power facilities be constructed in close proximity to each other in the affected project area, there is a possibility that the agricultural sense of place of the area will be undermined. This could be the result should the landscape characteristic come to be defined by the solar energy facilities or other industrial developments.

However, due to the limited visual resources in the area and the limited number of receptors, the potential cumulative impact is likely to be marginal. It should also be noted that the typical design characteristics of PV power facilities (the fact that they are constructed in close proximity to the ground), determines that they are not easily discernible from a distance and would impact marginally on receptors in the surrounding area (such as road users).

Overall, should adequate mitigation measures be implemented, the cumulative visual impact on the landscape is likely to be **Minor – Moderate Negative**.

9.4.4

Socio-Economic Impacts

Benefits to the local, regional and national economy through employment and procurement of services could be substantial should the three solar PV plants be constructed in the County. This benefit will increase significantly should critical mass be reached that allows local companies to develop the necessary skills to support construction and maintenance activities and that allows for components of the PV power facilities to be manufactured in Kenya. Over time, as businesses develop locally to meet the needs of the solar energy sector, it is likely that levels of local procurement would increase.

The potential for the proposed Project and other projects to result in greater impacts on the local and national economy as a whole is primarily dependent on economies of scale. Initially, import content will be high. However, if the sector grows in size it should provide opportunities for the growth of the local supply chain and the additional benefits that would flow from this. The introduction of additional PV power facilities could provide local economic opportunities for component manufacture with an appropriate industrial policy. The distance from other international manufacturers will also present a competitive advantage, especially for less specialised large-scale components such as PV array support structures.

If the influx of individuals into the County is not properly planned for by the Local County Government and various Power Producing Companies, there is the chance that a range of socioeconomic issues may be compounded in the long term. However, with adequate regionally-focused influx management, initiated at an early stage, there is the possibility of developing the capacity of local authorities and creating positive impacts for local communities through inter alia increased connection to the mainstream economy, improved infrastructure and services, and improved economic opportunities.

9.4.5

Conclusion

Cumulative effects and benefits on various environmental and social receptors will occur to varying degrees with the development of additional PV power farms in Uasin Gishu County. The alignment of renewable energy developments with Kenya's Vision 2030 and the global drive to move away from reliance on non-renewable energy resources is undoubtedly a positive development. The economic benefits of renewable energy developments at a Local, County and National level could be potentially significant. If the impacts are managed and appropriate monitoring implemented, the cumulative effects to environmental receptors as a result of the construction of the Project are not considered to be significant

9.5

DECOMMISSIONING IMPACTS

As mentioned in *Chapter 4*, the Project would have a minimum lifespan of at least 25 years. Once the facility reaches the end of its lifespan the PV arrays

may be refurbished, replaced or upgraded to a newer technology to continue operating as a power generating facility or the facility could be closed and decommissioned. If decommissioned, all components would be removed and the Site rehabilitated, returning to its current land use. The PV panels would be recycled as appropriate. The decommissioning and reinstatement of the Site will involve many activities that may have some environmental and socio-economic impacts.

It is anticipated that the impacts associated with decommissioning will be similar to those encountered during construction.

The comprehensive decommissioning plan should be developed prior to the decommissioning of the facility to minimise potential negative impacts and enhance positive impacts associated with decommissioning.

10.1**INTRODUCTION**

The purpose of the Environmental and Social Management and Monitoring Plan (ESMMP) is to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction, operation and decommissioning of the Project. The ESMMP specifies the mitigation and management measures to which Eldosol Energy is committed to and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESMMP also shows how mitigation and management measures will be scheduled and will ensure that the Project complies with the applicable laws and regulations within Kenya, as well as the policies of the International Finance Corporation (IFC).

The key objectives of the ESMMP are to:

- Formalize and disclose the program for environmental and social management; and
- Provide a framework for the implementation of environmental and social management initiatives.

Best practice principles require that every reasonable effort is made to reduce and preferably to prevent negative impacts while enhancing the benefits. These principles have guided the ESIA process.

Overall responsibility for the ESMMP lies with Eldosol Energy, however a number of specific activities will be carried out by the EPC Contractor. The EPC Contractor's activities will therefore be supervised by Eldosol Energy to ensure the implementation is performed as planned.

10.2**ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN
(ESMMP)**

The ESMMP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts with respect to:

- Pre-construction and construction activities;
- Operation; and
- Decommissioning.

Table 10.1 summarises the ESMMP for the Project. It describes parameters that can be monitored, and suggests how monitoring should be done, how frequently, and who should be responsible for monitoring and action.

Table 10.1 *Environmental and Social Management and Monitoring Plan (ESMMP)*

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Construction Phase						
General	Clearly set out environmental and social requirements within EPC tender documentation and include EHS scoring within EPC selection criteria.	Eldosol Energy	IFC PS 1	EHS requirements included in EPC tender documentation	Once	No additional cost
General	EPC Contractor required to develop and implement a Construction Environmental Management Plan (CEMP) meeting the conditions set out in the environmental authorisation, as well as this ESIA and IFC requirements.	EPC Contractor	IFC PS 1	EPC Contractor provide CEMP	Once	No additional cost
Loss of topsoil, soil compaction and soil erosion (Section 9.2.1)	Regular diversion berms build on gravel compacted roads Only remove vegetation and soil cover in those areas necessary development Implement soil conservation measures such as stockpiling topsoil or gravel for remediation of disturbed areas Rehabilitate disturbed areas as soon as possible to prevent erosion Clearly defined work areas demarcated	EPC Contractor	IFC PS 1	Visual audits/spot checks Amount of soil in run-off or drained water	Monthly	No additional costs on making appropriate site visits

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Impact on hydrology and hydrogeology (Section 9.2.1)	Drainage lines to be covered with culverts	EPC Contractor	IFC PS 1 IFC PS 3	Records of audits/visual inspections	Monthly	No additional costs on making appropriate site visits
Habitat destruction, displacement and disturbance (section 9.2.2)	Safety training to be included in the job induction	EPC Contractor	IFC PS 1 IFC PS 6	% of paved area to vegetated area Restoration audits and monitoring	Monthly	No additional costs
	Vehicle movement restricted to defined tracks that are clearly demarcated					
	Re-vegetation of cleared areas with locally occurring species					
	Collection/harvesting of indigenous plants from the Site be forbidden	Eldosol Energy, EPC Contractor	IFC PS 1 IFC PS 6	Records of nuisance to avifauna	Monthly	No additional costs
	Personnel to receive environmental education to ensure no hunting or killing of avifauna (especially the Grey Crowned Crane)				Prior to construction	
Impacts on local air quality (section 9.2.3)	Sprinkle water on soil before excavation and periodically	EPC Contractor	IFC PS1 IFC PS2 IFC PS3	Records of complaints	Daily	Dust masks @ KSh 100 each
	Visual inspection of dust production			Records of audits/visual inspection		Internal costs
	Controlled speed of construction vehicles					
	Regular maintenance and servicing of machines and engines off site					
	Grievance procedure for dust complaints.					
	Construction workers to have PPE (dust masks)					
	Monitor for: respiratory tract infections, especially to construction workers and neighbouring residents					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Waste and effluent (section 9.2.4)	Preparation of a Waste Management Plan (WMP)	EPC Contactor	IFC PS1 IFC PS3	Records of waste management	Quarterly by the Public Health Officer	Internal Costs
	Identify NEMA licenced waste management contractor			Records of audits/visual inspection	Monthly by the EPC Contractor	
Impact on livelihoods (section 9.3.1)	Carry out valuation of all assets through a Registered Land Valuer to ensure landowners are compensated adequately	Eldosol Energy	IFC PS 1 IFC PS 5	Individual Entitlement Matrices	Prior to construction	No cost
Direct Employment and Training (section 9.3.2)	Notify County Government Representatives of the specific jobs and the skills required for the Project	Eldosol Energy, EPC Contractor	IFC PS 1 IFC PS 2	EPC Contactor employment records	Monthly	Internal Costs
	Prioritise employment of unskilled labour from Kipchamo Location in the first instance					
	Develop a fair and transparent employment policy and process to manage out nepotism				Prior to construction	
	Training and skills development programmes					
Procurement and Indirect Employment (section 9.3.2)	Include Requirements for local employment in contract established with EPC Contractor	Eldosol Energy, EPC Contractor	IFC PS 1 IFC PS 2	EPC Procurement records	Monthly	Internal Costs
	Encourage local companies to apply					
	Ensure all tenders are advertised					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Induced Economic Benefits (section 9.3.2)	Maximise local employment and procurement	Eldosol Energy, EPC Contractor	IFC PS 1 IFC PS 2	EPC Procurement and Employment records	Monthly	Internal Costs
	Include requirements for local employment in contract established with EPC Contractor					
	Encourage local companies to apply					
Increased Revenue Generation (section 9.3.2)	Ensure all tenders are advertised	Eldosol Energy, EPC Contractor	IFC PS 1 IFC PS 2	EPC Procurement and Employment records	Monthly	Internal Costs
	Maximise local employment and procurement					
	Include requirements for local employment in contract established with EPC Contractor					
Increased social disturbance (section 9.3.3)	Encourage local companies to apply	EPC Contractor	IFC PS 1 IFC PS 2	Employment contract Recorded grievances	Monthly	Internal Costs
	Ensure all tenders are advertised					
	Induction programme, including a Code of Conduct, for all workers					
	Develop and implement a grievance procedure					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Impact on Disease Transmission (section 9.3.4)	Develop and implement an HIV/AIDS and malaria policy and information document for all workers directly related to the Project Make condoms available to employees and contractor workers Code of Conduct for all Project Personnel to include guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local community Explicitly forbid illegal activities (including use of commercial sex workers and transactional sex) as part of the Worker Code of Conduct Truck drivers to be prohibited from stopping at the roadside in Ngeria Junction or other communities in the Project area	Eldosol Energy, EPC Contractor	IFC PS 1 IFC PS 2 IFC PS 4	HIV/AIDS and malaria policy Worker Code of Conduct	Monthly	Internal Costs Cost of condoms Mosquito net @ approx. KSh 2,000 each

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Impact on traffic (section 9.3.5)	Arrangements and routes for abnormal loads to be agreed in advanced Permits obtained for the use of public roads if required. Develop and implement a grievance procedure Regular maintenance of vehicles Adherence to speed limits Develop Traffic Management Plan to cover vehicle safety, speed limits on roads, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and location of rest stops and accident reporting and investigations. Require Project drivers to be trained in defensive driving with the previous 3 years	EPC Contractor,	IFC PS 1 IFC PS 4	Incident records Records of complaints	Monthly	Cost of permit
Labour and Working Conditions (section 9.3.6)	Develop a HR Policy and Labour & Employment Plan (LEP), including worker Grievance Mechanism Ensure the EPC Contractor's contract abides by Kenyan Labour Laws/International Best Practice/IFC Standards Any on-site worker accommodation to meet IFC standards.	EPC Contractor	IFS PS 1 IFC PS 2	Employment records and other KPIs for worker rights, discrimination training Grievance records Induction documentations for all workers to include necessary items	Monthly	Internal Costs

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Impact on Health and Safety (section 9.3.7)	Regular maintenance of equipment	EPC Contractor	IFC PS 1	Recorder of accidents and incidents	Weekly	Internal costs
	Bill boards at the construction site gates		IFC PS 2			
	construction activity and timings		IFC PS 4			
	Enforce speed limits					
	Grievance procedure for noise complaints					
	Construction Health and Safety Plan					
	Construction emergency plan					
	All workers to have PPE					
Visual Impacts (section 9.3.8)	Regularly maintained and accessible firefighting equipment	EPC Contractor	IFC PS 1 IFC PS 4	Visual inspection	Weekly	Internal construction costs
	Workers grievance mechanism for HS&S					
	Training of workforce on communicable diseases and STDs and community interactions in general					
	Access roads be kept clean, minimise dust from construction traffic on gravel roads.					
	Site offices and structures be limited to single storey and sited carefully to reduce visual intrusion.					
	Building colours to reflect hues of the surrounding vegetation and/or the ground.					
	Neutral fencing					
	Substations will be set as low as possible					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Operational Impacts						
General	Develop and implement Operation EHS Management Plan meeting the conditions set out in the environmental authorisation, as well as this ESIA and IFC requirements.	Eldosol Energy	IFC PS 1	Provide EHS Plan	Once	No additional costs
Loss of topsoil, soil compaction and erosion (section 9.2.1)	Re-vegetation (no tall trees) immediately after construction with indigenous vegetation to prevent erosion Monitoring of erosion in the vicinity of roads, PV arrays and other hard-standing surfaces will be conducted	Eldosol Energy	IFC PS 1	Visual inspection	Immediately after construction	Internal construction costs
Impact on Hydrology and Hydrogeology (section 9.2.1)	Contain fuel, oil and used oil storage areas in bunds of 110% capacity of the stored material. Water use and recycling plan, to reduce abstraction rate Obtain water abstraction permit from WRMA if abstracting from the River or sinking a borehole	Eldosol Energy, Maintenance Contractor	IFC PS 1	Visual inspection Contractors water usage plan records	Before and after the rainy season (Bi- annual) Quarterly during operations	Internal construction costs
Habitat loss, destruction, displacement and disturbance (section 9.2.2)	Re-vegetate cleared areas with locally occurring species Exclusive use of designated roads and accesses for vehicles	Eldosol Energy, Maintenance Contractor	IFC PS 1 IFC PS 6	% of paved area to vegetated area Restoration audits and monitoring	Monthly	No additional costs
Impacts on Avifauna (section 9.2.2)	Record any electrocution and collision events including the species affected and the date	Eldosol Energy Maintenance Contractor	IFC PS 1 IFC PS 6	Records of nuisance to fauna Records of nuisance to avifauna	Monthly	No additional costs

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Impacts on Local air quality (section 9.2.3)	Speed control of operation and maintenance vehicles	Eldosol Energy, Maintenance Contractor	IFC PS1 IFC PS2 IFC PS3	Records of complaints	Daily	Internal costs
	Use of registered petrol stations			Records of audits/visual inspection		
Waste and Effluent (section 9.2.4)	Waste Management Plan following the principles of waste minimisation at source, segregation for reuse, recycling, and disposal.	Eldosol Energy, Maintenance Contactor, Local Public Health Office	IFC PS1 IFC PS3	Records of waste management	Quarterly by the Public Health Officer	Internal Costs
	Any PV panels that are destroyed and require replacement should be appropriately recycled, where possible, or sent back to the manufacturer			Records of audits/visual inspection	Monthly by the Maintenance Contractor	
Employment, Procurement and the Economy (section 9.3.2)	Notify County Government Representatives of the specific jobs and the skills required for the Project	Eldosol Energy	IFC PS 1 IFC PS 2	Maintenance Contactor employment records	Monthly	Internal Costs
Procurement and indirect employment, induced economic benefits, increased revenue generation (section 9.2.3)	Training and skills development programmes					
	Encourage local companies to apply	Eldosol Energy	IFC PS 1 IFC PS 2	Procurement and employment records	Monthly	Internal Costs
	Ensure all tenders are advertised					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Increased social disturbance (section 9.3.3)	Induction programme and code of conduct for all workers Grievance procedure for the local community Prohibit unauthorised access to the Site Use of only formal channels of employment Recruitment to take place in nearby towns and as per the human resources (HR) policies and procedures. Develop and implement a HIV/AIDS information document	Eldosol Energy, Maintenance Contractor	IFC PS 1 IFC PS 2	Employment contract Recorded grievances	Monthly	Internal Costs

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Impact on Disease Transmission (section 9.3.4)	Develop and implement an HIV/AIDS and malaria policy and information document for all workers directly related to the Project	Eldosol Energy, EPC Contractor	IFC PS 1	HIV/AIDS policy	Monthly	Internal Costs
			IFC PS 2			
			IFC PS 4	Worker Code of Conduct		Cost of condoms
	Make condoms available to employees and contractor workers					Mosquito nets @ approx. KSh 2,000 each
	Code of Conduct for all Project Personnel to include guidelines on worker-worker interactions, worker-community interactions and development of personal relationships with members of the local community					
	Explicitly forbid illegal activities (including use of commercial sex workers and transactional sex) as part of the Worker Code of Conduct					
	Truck drivers to be prohibited from stopping at the roadside in Ngeria Junction or other communities in the Project area					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Labour and Working Conditions (section 9.3.6)	Project adopted HR policy and procedures	Eldosol Energy, Maintenance Contractor	IFS PS 1 IFC PS 2	Employment records and other KPIs for worker rights, discrimination training	Monthly	Internal Costs
	Abide by Kenyan law, international and IFC guidelines in relation to H&S, labour and welfare standards			Grievance records		
	Hiring mechanism to ensure no employee/job applicant is discriminated against			Induction documentations for all workers to include necessary items		
	All workers to receive training on worker rights					
	All workers to have contracts and be able to join unions					
	Worker grievance mechanism					
	Access to training on communicable diseases and STDs					
Health and safety (section 9.3.7)	Voluntary STD screening of employees	Eldosol Energy, Maintenance Contractor	IFC PS 1 IFC PS 2 IFC PS 4	Recorder of accidents and incidents	Weekly	Internal costs
	Monitor to ensure no forced labour or child labour					
	All employees to wear PPE during daily operations					
	Establish emergency procedures against hazards					
	Conduct regular safety drills with workers and the neighbours					

Issue	Mitigation Measure	Responsibility for Implementation	International Best practice (IFC PS)	Completion Indicator	Frequency of Monitoring	Cost
Visual impacts (section 9.3.7)	Lighting to be kept to a minimum	Eldosol Energy, EPC Contractor	IFC PS 1	Visual inspection	Daily	Internal costs
	Use of shielded, low-level lighting		IFC PS 4			
	No naked lighting					
	Re-vegetation					
Decommissioning						
All impacts	Prepare a decommissioning plan when appropriate, specifically address how electrical equipment will be recycled or reused and include provisions already identified for the construction phase	Eldosol Energy	IFC PS 1 IFC PS 2 IFC PS 3 IFC PS 4		Before decommissioning	As per the decommissioning plan

The following *Sections* present the specific management plans foreseen for construction and operation, based on the outcomes of the impact assessment.

10.3.1

Waste Management Plan

This Waste Management Plan (WMP) is developed to manage solid and liquid wastes and to avoid any discharges into the soil or water. It establishes procedures for the storage, collection and disposal of waste, including liquid and solid waste and hazardous and non-hazardous waste.

The WMP provides for the following:

- Compliance with Kenyan waste policy;
- Outline of waste characteristics and sufficient capacity for managing waste: waste streams and quantities to be managed; and
- The WMP will be developed following Eldosol Energy Policies and will consider IFC PS3.

Furthermore, it contributes to ensuring that the capacity and the nature of collection and treatment systems are in line with the waste to be managed. The overall objective is to minimise impact of waste generated during the construction phase through the following:

- minimise the amount of waste that is generated;
- maximise the amount of waste that is recovered for recycling – including segregation of recyclable wastes at source;
- minimise the amount of waste that is deposited at landfill;
- ensure any hazardous wastes (e.g. used oils,) are securely stored and transferred to appropriate facilities;
- avoid dust impacts from handling of construction wastes;
- ensure all wastes are properly contained, labelled and disposed of in accordance with local regulations; and
- ensure waste is disposed of in accordance with the waste management hierarchy.

10.3.2

Emergency Response Plan

The Emergency Response Plan (ERP) assembles and describes in one document the site-specific actions and procedures to be taken in emergency situations occurring during construction and operations.

The objective of the ERP is to be prepared to respond to process upset, accidental, and emergency situations in a manner appropriate to the operational risks and to prevent their potential negative consequences. The ERP will clearly make a distinction between all the project phases, since the actions to be undertaken will be different during the construction, operation and decommissioning phases.

The content of the ERP can be summarized as follows:

- Kenyan legal provisions on civil emergencies;
- The identification of the potential hazards (i.e. natural disasters, civil disturbances, fire or explosions, malfunctioning of the devices during the processes, pressure issues, etc.) related with PV plant and its infrastructure installation and operation and the possible impact to the environment and health;
- Identification of the governmental authorities, the media and other relevant stakeholders to be notified and description of the procedures for communicating with them;
- The necessary measures to limit human and environmental consequences associated with project related accidents; cooperation between Eldosol Energy, local and central authorities, as well as the local community;
- Safety technical measures to be described and appropriate measures to protect the public safety or property from potential hazards;
- Preliminary description of the organization structure, and explain interactions with project and operational procedures;
- Preliminary identification of the system and procedures for providing personnel refuge, evacuation, rescue, medical treatment and repatriation; and
- Preliminary description of training activities and the arrangement for training response teams and for testing emergency systems and procedures.

Finally, the plan shall include provisions for the training of all workers on the emergency response procedures, and will include procedures related to communication to stakeholders and community improvement opportunities.

10.3.3 ***Water Management Plan***

The Water Management Plan will have the following objectives:

- Monitor water use: the Plan will set procedures for estimating water used by the project, identifying activities that use this resource and following a reporting procedure for registering used volumes of water;
- Minimize water use: the Plan will provide a series of measures to be considered for minimising the use of water;
- Document water sources and extraction locations: water sources to be used will be agreed previously with the relevant local authorities;
- Sources of water will be identified and registered in the Plan, together with the GPS coordinates and the maximum water volumes allowed from the source; and
- Record all communications with Water Authorities.

The Water Management Plan will be developed following Eldosol Energy policies and will consider all the relevant IFC PS.

Finally, the plan will include provisions for the training of all workers on how to minimise the use of water

A Traffic Management Plan (TMP) will be developed to manage construction traffic generated by the project, minimise traffic disruption and road user delay and provide for the on-going safety of road users, including pedestrians and cyclists. All of the traffic related impacts described previously can be mitigated very effectively by the implementation of standard best practices in terms of environmental controls and management practices during construction. These measures will be detailed in the TMP, which will describe in detail the measures that the Contractor will implement during the construction of the project.

The key issues addressed by the TMP in terms of mitigation measures include:

- Access to construction areas;
- Routing of construction traffic;
- Prevention of road user delay;
- Temporary traffic control and management;
- Reducing the probability of traffic accidents and improving safety for road users and others;
- Preventing and remedying road degradation;
- Road crossings; and
- Parking facilities.

The Contractor shall regularly update their TMP as the construction method is developed and vehicle movement requirements are identified in detail. The EPC Contractor will consult with the principal representative of any communities that will suffer a significant increase in traffic in order to develop awareness of the mitigation measures within the TMP.

A TMP is important both in ensuring the safety of construction personnel and local communities. The TMP is intended to be a 'live' document and its traffic management principles will form the basis for subsequent detailed construction traffic management arrangements between the nominated EPC Contractor and the road authorities as and when the site construction contract is awarded.

The TMP will include the following minimum requirements:

- Levels of development related construction traffic that will use this road network;
- Identification of key sensitivities along proposed access routes;
- Identification, demarcation and construction of access routes;
- Measures to provide for the on-going safety of road users, including pedestrians and cyclists;
- Project driver training requirements with respect to road safety and environment;
- Project Schedule;
- Roles and responsibilities for implementation of the TMP;
- Measures to prohibit "off-route" driving;
- Speed limits and methods of enforcement;

- Means to inform the community of traffic risks;
- Vehicle equipment;
- Vehicle maintenance and refuelling locations;
- Inspection, auditing and reporting; and
- Driver competency

10.3.5 *Health and Safety Management Plan*

The Health and Safety (H&S) Management Plan will be a tool that will provide a framework for the following:

- Planning for Health and Safety;
- Accident and Incident Investigation; and
- Health and Safety Auditing.

The H&S Plan will be developed following all the relevant IFC PSs. The Health and Safety Management Plan will include, at a minimum, the following elements:

- Eldosol Energy's HSE Policy;
- H&S Organisation: detailed organisation chart and description of roles and responsibilities associated to managing H&S. The organization proposed in the plan will take into account the competency of the proposed professionals, and will provide mechanisms to ensure co-operation and communication between the H&S management team members.
- H&S Standards, including: site safety inductions; hazards identification and risk assessment, including task analysis and construction hazards; H&S targets, and a procedure for safety performance evaluation and review; emergency procedures; toolbox meeting procedure; site visit registers; and MSDS sheet register
- Accidents and Incidents, including: definitions; reporting and registering procedures; root-cause analysis
- H&S Auditing, including the following: auditing plan; setting audit objectives and measuring H&S performance; site safety inspection checklists and first-aid equipment checklist

The plan will include provisions for the training of all workers and will include procedures related to communication to stakeholders and community improvement opportunities.

11.1 INTRODUCTION

The aim of the ESIA for the Project is to provide information to inform decision-making that will contribute to sustainable development. This Report is submitted to the National Environment Management Authority (NEMA), to provide information and an independent assessment, thus enabling NEMA to make an informed decision regarding whether or not to grant an ESIA licence for the Project to proceed, in accordance with the Environmental Management and Coordination Act, 1999 (EMCA). If granted, this Report will also assist NEMA to define under what conditions the development should go ahead. In considering the development of renewable energy projects, it is inevitable that there will be some negative environmental impacts. However, there is also the need to encourage renewable energy in Kenya in order to move towards more sustainable energy practices and meet targets set by the Government of Kenya. In addition, following a rigorous stakeholder engagement exercise, there is overwhelming support for the project.

Through the ESIA process, which included various stakeholder input, ERM has identified and assessed a number of potential impacts relating to the development. This *Chapter* therefore provides an overview of the ESIA findings and makes recommendations regarding key mitigation measures for the final PV Footprint.

The potential impacts associated with the development are summarised below and should be considered both in the context of the project rationale and the discussion of cumulative impacts in the previous chapter.

11.2 SUMMARY OF IMPACTS IDENTIFIED AND ASSESSED

11.2.1 Construction Phase Impacts

The potential impact from the loss of topsoil, soil compaction and erosion is primarily due to the preparation of the Site for the establishment of PV arrays, underground cables, access road(s), temporary laydown area and buildings (control and accommodation) requiring some Site levelling and grading and soil compaction. This negative impact is considered to be of *Minor* residual significance.

The destruction and loss of habitat as a result of the vegetation clearance for the installation of the PV arrays is considered to have a negligible residual significance.

Potential negative avifaunal impacts resulting from noise, pollution, possible poaching and disturbance caused by construction activities is considered to have a *Moderate-Minor* residual significance.

It is not expected that a negative visual impact will occur during construction, and this impact is considered to be of *Negligible* residual significance.

The positive impact through the creation of direct employment and training opportunities will be of *Moderate* residual significance. The positive impact of indirect employment and procurement for the local economy will be of *Moderate* residual significance. The positive impact from induced economic benefits as a result of an increase in disposable income in the local economy will be of *Moderate* residual significance.

During construction, the possible negative impact due to social nuisances, such as increased levels of crime, drug and alcohol abuse, increased incidences of sex workers, domestic violence, and the additional pressure on the existing infrastructure and services as a result of an influx of workers is considered to be *Negligible*.

The potential impact on the loss of livelihoods due to the installation of the PV arrays and loss of land for agricultural purposes is considered to be of *Minor* residual significance.

All negative impacts associated with the Project have been mitigated to a level which is deemed appropriate for the construction phase to proceed.

Table 11.1 *Summary of Pre-mitigation Significance during Construction Phase for the Layout of the PV Plant*

Section	Impact	Pre-mitigation Significance	Residual Impact Significance (Based on mitigation)
9.2.1	Loss of Topsoil, compaction and erosion	MODERATE NEGATIVE	MINOR NEGATIVE
9.2.1	Impact on Hydrology and Hydrogeology	MINOR NEGATIVE	MINOR NEGATIVE
9.2.2	Habitat Loss	MINOR NEGATIVE	NEGLIGIBLE
9.2.2	Impacts on Avifauna	MODERATE NEGATIVE	MODERATE - MINOR NEGATIVE
9.2.3	Local Air Quality	MINOR NEGATIVE	NEGLIGIBLE
9.2.4	Waste and Effluent	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.1	Loss of Livelihoods	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.2	Direct Employment and Training	MINOR - MODERATE NEGATIVE	MODERATE POSITIVE
9.3.2	Procurement and Indirect Employment	MINOR POSITIVE	MODERATE POSITIVE
9.3.2	Induced Economic Benefits	MINOR POSITIVE	MODERATE POSITIVE
9.3.2	Increased Revenue Generation	MINOR POSITIVE	MODERATE POSITIVE
9.3.3	Increased Social Disturbance	MINOR NEGATIVE	NEGLIGIBLE
9.3.4	Impact on Disease Transmission	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.5	Traffic Impacts	MODERATE - MINOR NEGATIVE	MINOR NEGATIVE
9.3.6	Workers Management and Rights	MINOR NEGATIVE	NEGLIGIBLE
9.3.5	Health and Safety	MINOR NEGATIVE	MINOR NEGATIVE
9.3.7	Visual Impacts	MINOR NEGATIVE	NEGLIGIBLE

The negative impact on loss of topsoil, soil compaction and erosion due to Site maintenance activities and potential drainage network changes on the Site is considered to be of *Negligible* residual significance. During operation the site will have limited access and is likely to reduce compaction compared to current land use

The negative impact on surface and groundwater from potential increased sediment loading in Site runoff and potential spills of contaminants is considered to be of *Minor* residual significance.

The potential impact on the loss of livelihoods Site due to the installation of the PV arrays and loss of land for agricultural purposes is considered to be of *Minor* residual significance.

The introduction of natural vegetation due during the operational phase is considered to be of *Minor* positive residual significance. However, the potential negative avifaunal impacts, primarily due to the presence of a new transmission line on the Site, which poses a threat to large avifauna through collisions and electrocution is considered to be of *Negligible* residual significance.

The negative visual impact of the PV power facility on the landscape is considered to be of *Minor-Minor* residual significance. There is the perception that solar panels have the potential to create glint and glare impacts; however, photovoltaic panels are designed to absorb sunlight (rather than reflect it), and are not very reflective – much less reflective than, say, a body of water or standard glass (e.g., windows and car windscreens). Typical panels are designed to reflect only some 2% of incoming sunlight. To further minimise nuisance from reflections an anti-reflective coating is commonly added to the surface of PV cell.

The positive impact from the creation of direct employment and training, and for indirect employment and procurement for the local economy during operations is considered to be of *Minor* residual significance owing to the relatively lower number of job opportunities compared to the construction phase. The positive impact from induced economic benefits as a result of an increase in disposable income is considered to be of *Minor* residual significance, due to relatively fewer jobs during the operational phase.

The possible negative impact of social nuisances, such as increased levels of crime, drug and alcohol abuse, increased incidences of sex workers, domestic violence, and the additional pressure on the existing infrastructure and services as a result of an influx of workers is considered to be *Negligible*. There will be a *Negligible* residual impact from increased traffic.

All negative impacts associated with the Project have been mitigated to a level which is deemed appropriate for the operational phase of the PV power facility to be sustainable.

Table 11.2 *Summary of Pre-mitigation Significance during Operational Phase for the Layout of the PV Plant*

Section	Impact	Pre-mitigation Significance	Residual Impact Significance (Based on mitigation)
9.2.1	Loss of Topsoil, compaction and erosion	MINOR NEGATIVE	NEGLIGIBLE
9.2.1	Impact on Hydrology and Hydrogeology	MODERATE - MINOR NEGATIVE	MINOR NEGATIVE
9.2.2	Habitat Loss	MINOR NEGATIVE	MINOR POSITIVE
9.2.2	Impacts on Avifauna: Disturbance	MINOR NEGATIVE	NEGLIGIBLE
9.2.2	Impacts on Avifauna: Avifaunal Mortality	MINOR NEGATIVE	NEGLIGIBLE
9.2.4	Waste and Effluent	MINOR NEGATIVE	MINOR NEGATIVE
9.3.1	Loss of Livelihoods	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.2	Direct Employment and Training	MINOR POSITIVE	MINOR POSITIVE
9.3.2	Procurement and Indirect Employment	MINOR POSITIVE	MINOR POSITIVE
9.3.2	Induced Economic Benefits	MINOR POSITIVE	MINOR POSITIVE
9.3.2	Increased Revenue Generation	MINOR POSITIVE	MINOR POSITIVE
9.3.3	Increased Social Disturbance	NEGLIGIBLE	NEGLIGIBLE
9.3.4	Impact on Disease Transmission	MODERATE NEGATIVE	MINOR NEGATIVE
9.3.5	Traffic Impacts	NEGLIGIBLE	NEGLIGIBLE
9.3.6	Workers Management and Rights	MINOR NEGATIVE	NEGLIGIBLE
9.3.5	Health and Safety	NEGLIGIBLE	NEGLIGIBLE
9.3.7	Visual Impacts	MODERATE NEGATIVE	MINOR - MODERATE NEGATIVE

ERM is confident that every effort will be made by the Eldosol Energy to accommodate the mitigation measures recommended during the ESIA process to the extent that is practically possible, without compromising the economic viability of the Project. The implementation of the mitigation measures detailed in *Chapters 9* and listed in the ESMMP (*Chapter 10*) will provide a basis for ensuring that the potential positive and negative impacts associated with the establishment of the development are enhanced and mitigated to a level which is deemed adequate for the development to proceed.

In summary, based on the findings of this assessment, ERM finds no reason why the 40 MW PV power facility proposed for the Site should not be authorised, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the ESMMP.

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Annex A:Land Contract

COUNTY GOVERNMENT OF UASIN GISHU



PHYSICAL PLANNING ACT

(No. 6 of 1996) s. 33 (1) (a) 4137

Form P.P.A.2

Registered Number of Approval....1107/2015.....

NOTIFICATION OF APPROVAL/REFUSAL/DEFERMENT OF DEVELOPMENT

To.....RADIANT ENERGY LIMITED/ELDOSOL ENERGY.....

.....P.O. BOX 13409 - 30100, ELDORET.....

Your application number as above, submitted on.....06/10/2015..... For permission to
.....CHANGE USER FROM AGRICULTURAL TO LIGHT INDUSTRY (SOLAR PV
PLANTS)..... On L.R No. / Parcel No. ...LR. NO. 6170 (A)... situated in ...PLATEAU..... Road
has beenAPPROVED.....

For the following reasons/subject to the following conditions:

- a) This approval is granted subject to the fulfillment of all the conditions indicated on this form and in the plan.
- b) It is the responsibility of the applicant to ensure that the requirements of other authorities are met fully before proceeding with the approved developments
- c) Applicants for approval of sub-division schemes should obtain a certificate of compliance from office of the County Director of Physical Planning before registration.
- d) Other conditions:
 - N/A

SIGN.....
FOR: CHIEF OFFICER
LANDS, HOUSING AND PHYSICAL PLANNING



Date.....

CC.

- County Physical Planner
- County Surveyor
- County Land Officer/Registrar



REPUBLIC OF KENYA

THE PHYSICAL PLANNING ACT
(Cap 286)

(Form P.P.A. 5)

r.4(3)

CERTIFICATE OF COMPLIANCE

Certificate No. UG VOL II / 19

Name and Address of Applicant RADIANT ENERGY LIMITED / ELDSOT ENERGY.

Type of development (Industrial, Commercial, etc.) LIGHT INDUSTRY (SOLAR PV PLANT)

On L.R./Parcel No. 6170(A)

Situated in UASIN GISHU COUNTY (Municipality, Township, etc)

Locality (Road, Street, Estate, etc.) PLATRAU

Received from DEVELOPMENT CONTROL COMMITTEE (Local Authority)

By Ref. No. MIR PA & DC / 03 / 22 - 09 / 2015 of 22 / 9 / 2015

This is to certify that the application is in compliance with:

(a) Approved Development Plan No. —

(b) Approved Subdivision/Advisory Plan No. PPD / END / CU / 024 / 15 / 16

(c) Special conditions in Notification Approval (Form P.P. 2) dated 6th OCTOBER

2015 with respect to registered application No. 4137

Issued by G. K. RAPONGO (Name of Officer)

Date of issue 6/10/2015 Fees paid (Kshs) 1000/- Receipt No. C 7998150

Departmental Seal

Signature Rapongo
For: Director of Physical Planning

COUNTY PHYSICAL
PLANNING OFFICER
UASIN GISHU
P. O. Box 1464-30100 ELDORET

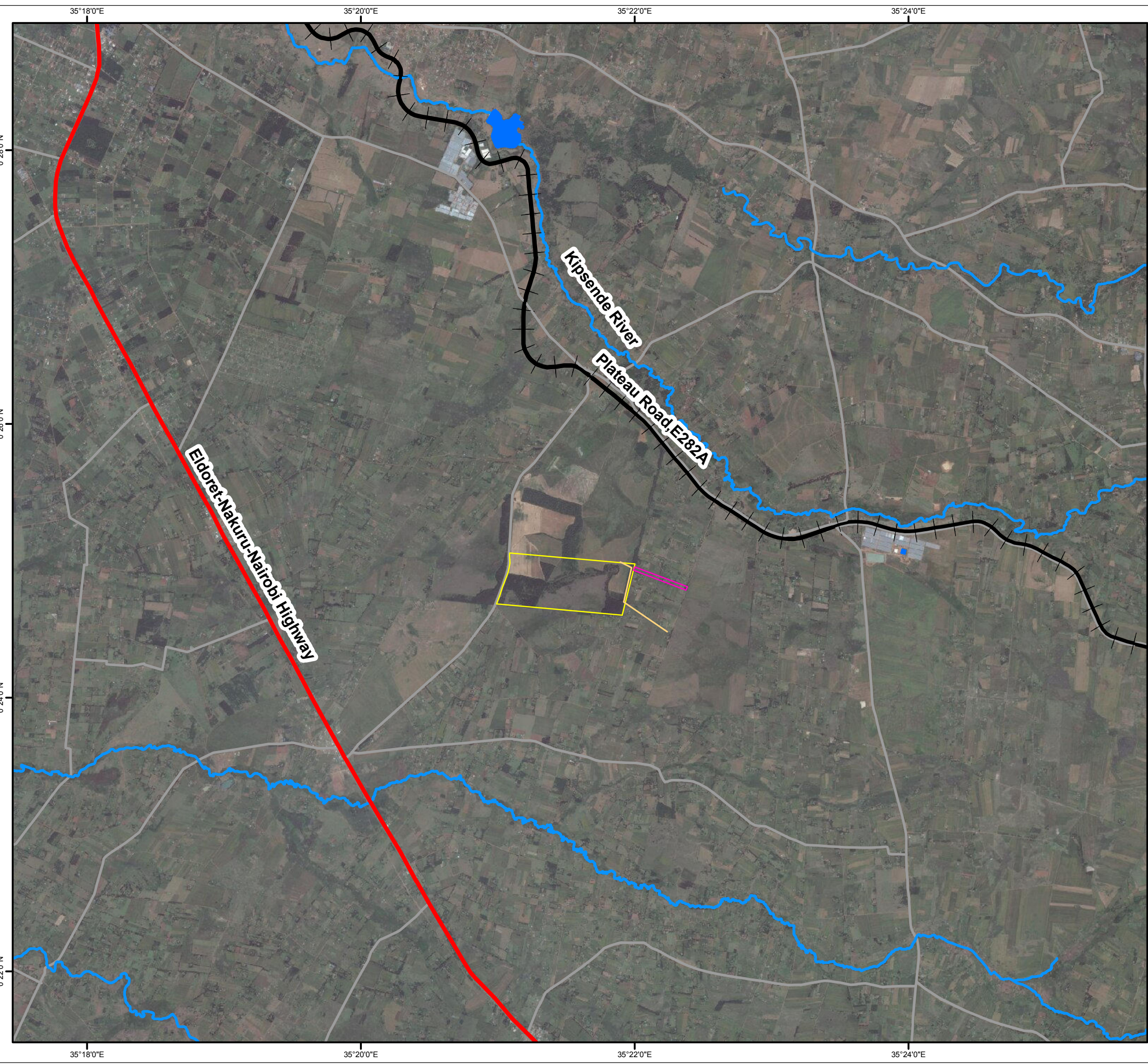
Annex B: Maps

Annex B1: Locality Map

Annex B2: Biophysical Baseline Map

Annex B3: Socio Economic Baseline Map

Annex B4: Solar Power Plants in the Area Map



Legend

- Power Evacuation Route
- Power Evacuation Route 2
- Eldoret-Nakuru- Nairobi Highway
- Road Network
- Railwaytrack
- River
- Project Site
- Waterbody

Scale:

0 0.75 1.5 3

Kilometers

N

TITLE:

Locality Map

CLIENT:

Eldosol Energy Ltd

DATE: July 2015	CHECKED: RC	PROJECT: 0275855
DRAWN: AT	APPROVED: TM	SCALE: 1 : 50,000

DRAWING:	REV:
Locality Map.mxd	0

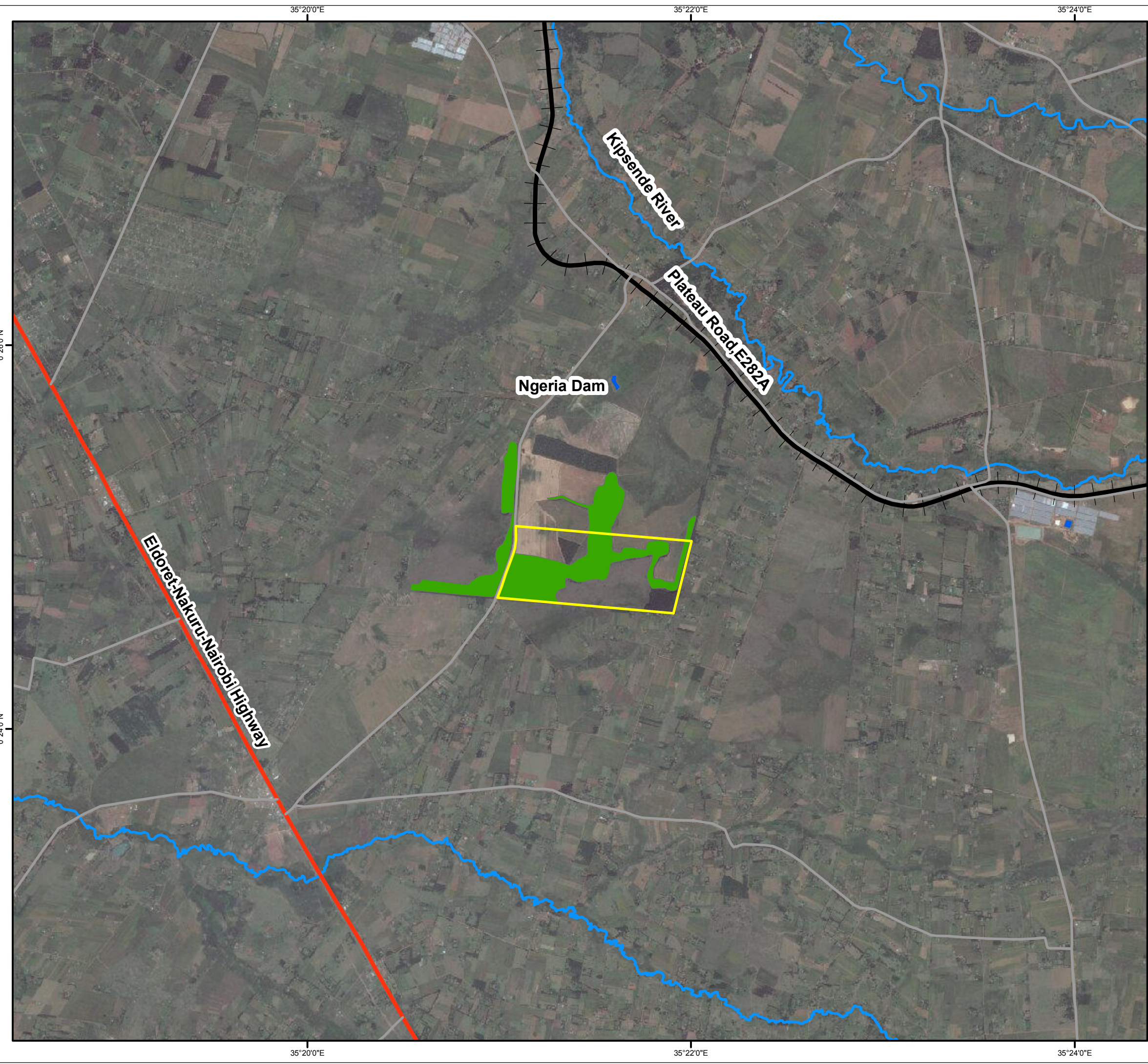
ERM

Fourth Floor, Asyst Park
GN-37/1, Sector-V
Salt Lake City
Kolkata-7000 091, India

Projection: Geographic, Datum: WGS 84
Image Source: ESRI World Imagery

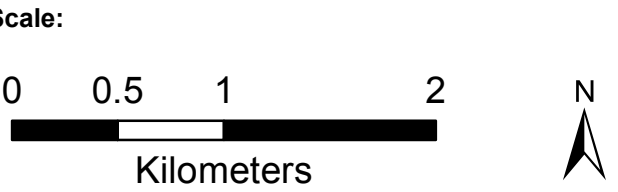
SIZE:

A3



Legend

- Eldoret-Nakuru-Nairobi Highway
- Road Network
- River
- Project Site
- Waterbodies
- Eucalyptus Plantation



TITLE:

Biophysical Baseline Map

CLIENT:

Eldosol Energy Ltd

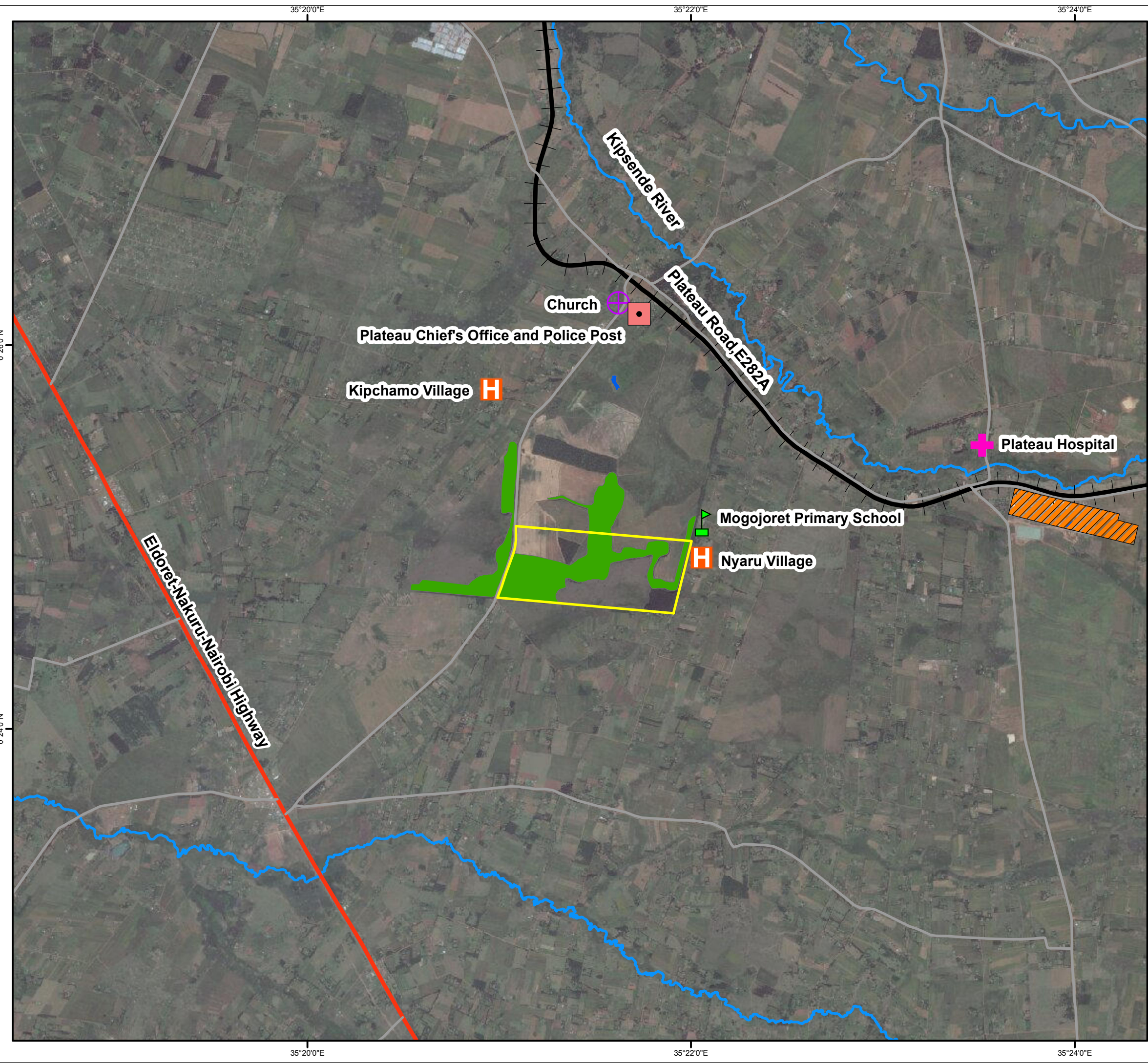
DATE: July 2015	CHECKED: RC	PROJECT: 0275855
DRAWN: AT	APPROVED: TM	SCALE: 1 : 50,000
DRAWING:		REV:
Biophysical Baseline Map.mxd		0

ERM

Fourth Floor, Asyst Park
GN-37/1, Sector-V
Salt Lake City
Kolkata-7000 091, India

Projection: Geographic, Datum: WGS 84
Image Source: ESRI World Imagery

SIZE:
A3



Legend

- Church
- Village
- School
- Chief's Office and Police Post
- Hospital
- Eldoret-Nakuru- Nairobi Highway
- Road Network
- Railwaytrack
- River
- Project Site
- Sosioni Flower Farm
- Ngeria Dam
- Eucalyptus Plantation

Scale:

0 0.5 1 2

Kilometers

N

TITLE:

Socio Economic Baseline Map

CLIENT:

Eldosol Energy Ltd

DATE: July 2015	CHECKED: RC	PROJECT: 0275855
DRAWN: AT	APPROVED: TM	SCALE: 1 : 50,000
DRAWING:		REV:
Socio Economic Baseline Map.mxd		0

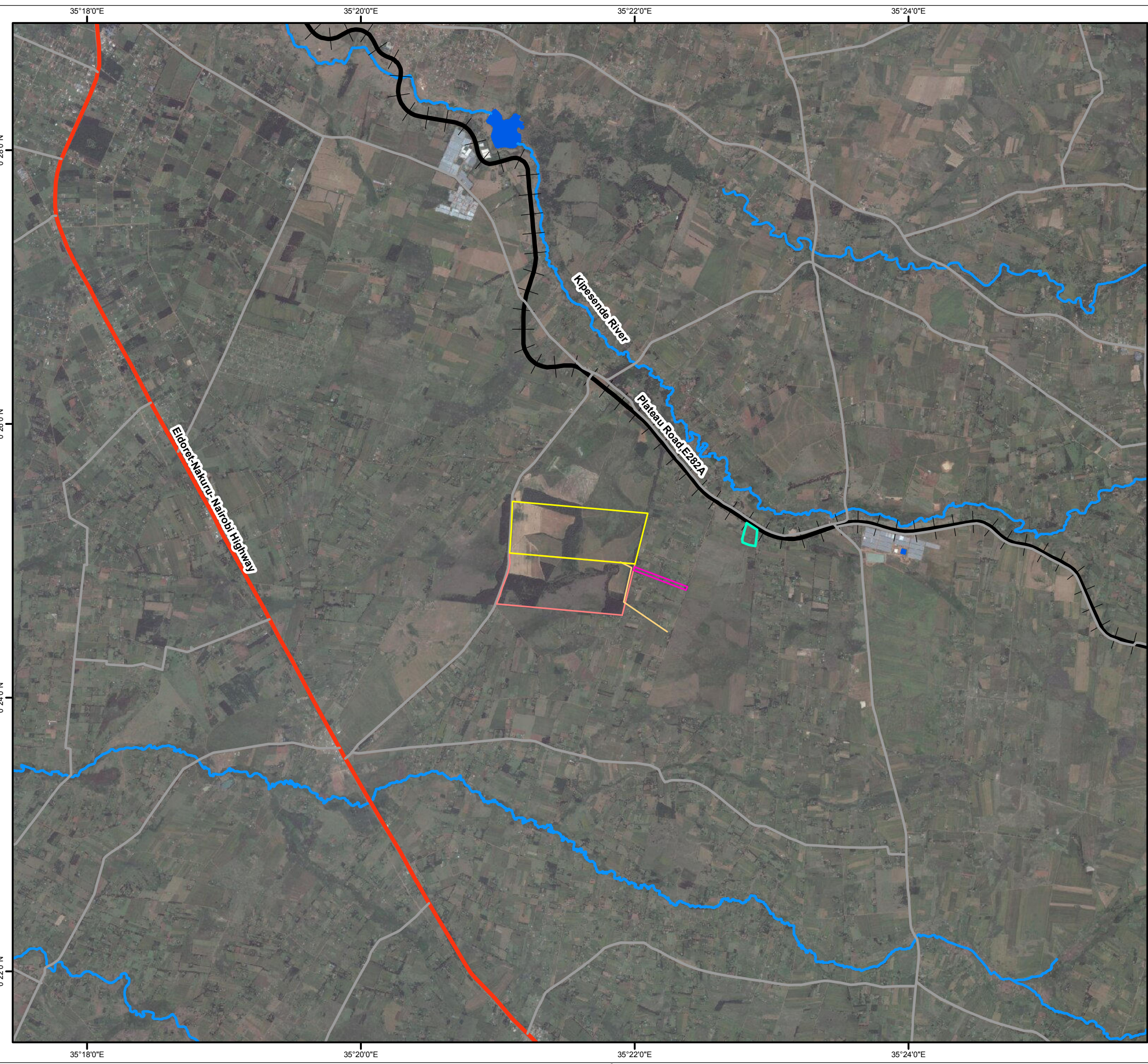
ERM

Fourth Floor, Asyst Park
GN-37/1, Sector-V
Salt Lake City
Kolkata-7000 091, India

Projection: Geographic, Datum: WGS 84
Image Source: ESRI World Imagery

SIZE:

A3



Legend

- Power Evacuation Route 1
- Power Evacuation Route 2
- Eldoret-Nakuru-Nairobi Highway
- Road Network
- Railwaytrack
- River
- Radiant Energy
- Eldosol Energy
- Additional Solar Energy Power Plant
- Waterbodies

Scale:

00.751.53

Kilometers

N

TITLE:

Solar Power Plants in the Area

CLIENT:

Eldosol and Radiant Energy Ltd

DATE: July 2015	CHECKED: RC	PROJECT: 0275855
DRAWN: AT	APPROVED: TM	SCALE: 1 : 50,000

DRAWING:	REV:
Solar Power Plants in the Area	0

ERM

Fourth Floor, Asyst Park
GN-37/1, Sector-V
Salt Lake City
Kolkata-7000 091, India

Projection: Geographic, Datum: WGS 84
Image Source: ESRI World Imagery

SIZE:

A3

Annex C:

NEMA Registration and 2015 Practicing Licence



NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
**CERTIFICATE OF REGISTRATION AS AN ENVIRONMENTAL IMPACT ASSESSMENT/
AUDIT EXPERT**

Certificate No: NEMA/EIA/RC/572

Application Reference No: NEMA/EIA/ER/1915

This is to certify M/s **Environmental Resource Management East Africa Ltd(ERM)** of
P.O Box 100798 - 00101 Nairobi
(Address) has been registered as an Environmental
Impact Assessment Expert in accordance with the provisions of the Environmental Management and
Coordination Act and is authorized to practice in the capacity of a Lead Expert/Associate Expert/Firm of
Experts (Type) **Firm of Experts**

Expert Registration No: 7264

Issued Date : 9/16/2014

Signature

(Seal)

Director-General
The National Environmental Management Authority

P. T. O.



ISO 9001 : 2008 Certified

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

License No : NEMA/EIA/ERPL/1173

Application Reference No: NEMA/EIA/EL/2161

M/S Environmental Resource Management East Africa Ltd (ERM)

(individual or firm) of address

P.O Box 100798 - 00101 Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**registration number **7264**

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

Issued Date: 1/15/2015

Expiry Date: 12/31/2015

Signature.....

(Seal)

Director General

**The National Environment Management
Authority****P. T. O.**

ISO 9001 : 2008 Certified

Annex D: Stakeholder Engagement Plan (SEP) and Public Participation Documents

Annex D1:	SEP
Annex D2:	PowerPoint Presentation
Annex D3:	Background Information Document (BID)
Annex D4a:	English Flyer
Annex D4b:	Nandi Flyer
Annex D5	Comment Sheets
Annex D6:	Minutes of Meetings and Signing in sheets
Annex D7:	Photos
Annex D8:	Stakeholder Database

Stakeholder Engagement Plan
Environmental and Social Impact Assessment

Eldosol Energy

Version 1

July 2015

www.erm.com



Eldosol Energy Limited.

July 2015

Prepared by: ERM

This report has been prepared by Environmental Resources Management, the trading name of Environmental Resources Management Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

For and on behalf of
Environmental Resources Management

Approved by: Mike Everett

Signed:
Position: Partner
Date: July 2015

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ABBREVIATIONS

Table A.0.1 Abbreviations

Abbreviation	Full Definition
AoI	Area of Influence
BID	Background Information Document
CLO	Community Liaison Officer
EHS	Environmental, Health and Safety
EMCA	Environmental Management and Coordination Act
ERM	Environmental Resources Management
ESIA	Environment and Social Impact Assessment
FHH	Female Headed Households
FGD	Focus Group Discussions
IFC	International Finance Corporation
KETRACo	Kenya Electricity Transmission Company Limited
KII	Key Informant Interview
NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
PV	Photovoltaic
SEP	Stakeholder Engagement Plan

Eldosol Energy Limited (*hereafter referred to as Eldosol Energy*) proposes to construct and operate a 40MW Solar Energy Facility (SEF) and transmission line in Kipchamo Location, Kesses Constituency in Uasin Gishu County, Kenya (the Project). The Project includes the installation and operation of solar panels (PV arrays) with a proposed output of 40 megawatts (MW), as well as a transmission line, to be connected to the national grid system through the existing 220kV Kenya Electricity Transmission Company Limited (KETRACO) - Turkwel-Lessos transmission Line.

Environmental Resources Management (ERM) has been appointed to conduct an Environmental and Social Impact Assessment (ESIA). This Stakeholder Engagement Plan (SEP) outlines the plan for engaging stakeholders as part of the ESIA process as well as the grievance mechanism that will be implemented by the Project going forward.

Stakeholder engagement refers to a process of sharing information and knowledge, seeking to understand and respond to the concerns of potentially impacted or affected individuals, and building relationships based on trust. As such, stakeholder engagement is essential for the successful implementation of the ESIA and the Project itself.

1.1

PURPOSE OF THE STAKEHOLDER ENGAGEMENT PLAN

The purpose of the SEP is to ensure that a consistent, comprehensive, coordinated and culturally appropriate approach to consultation is undertaken for the ESIA that fulfils all of the relevant legal and regulatory commitments. To this end the SEP:

- outlines the approach and plans to be adopted and implemented for engagement, showing how the engagement process will integrate into the rest of the ESIA process;
- identifies **stakeholders** and **mechanisms** through which they will be included in the process;
- serves as a way to **document** the process; and
- identifies where there will be **requirements for Eldosol Energy** and their engagement process.

Stakeholder engagement should be undertaken for the Project throughout the

planning, construction, operations and decommissioning phases. This plan focuses on consultation and disclosure activities undertaken during the ESIA.

This SEP is intended to be a 'live' document and has been updated throughout the ESIA process. Following completion of the ESIA it is expected that this document will be updated by the Project for subsequent phases based on the principles outlined within this SEP.

1.2 *STRUCTURE OF THE PLAN*

The remainder of the document is structured as follows:

- **Section 2** outlines the key standards and legislation guiding stakeholder engagement.
- **Section 3** outlines the approach to the stakeholder engagement process.
- **Section 4** presents Project stakeholders identified to date.
- **Section 5** details the stakeholder engagement activities undertaken to date.
- **Section 6** presents the Project grievance mechanism that will be available for stakeholders for the duration of the Project.
- **Section 7** presents an overview of how records of the process will be kept and monitored.

1.3 *OBJECTIVES OF STAKEHOLDER ENGAGEMENT*

The objectives of engaging stakeholders during the ESIA process and beyond include:

- **Ensuring understanding:** An open, inclusive and transparent process of culturally appropriate engagement and communication will be undertaken to ensure that stakeholders are well informed about the proposed Project as it develops. Information will be disclosed as early and as comprehensively as possible and appropriate.
- **Involving stakeholders in the assessment:** Stakeholders will be included in the scoping of issues, the assessment of impacts, the generation of mitigation and management measures and the finalisation of the ESIA report. They will also play an important role in providing local knowledge and information for the baseline to inform the impact assessment.

- **Building relationships:** Through supporting open dialogue, engagements will help establish and maintain a productive relationship between the Project and stakeholders. This will support not only an effective ESIA, but will also strengthen the existing relationships and build new relationships between Eldosol Energy and stakeholders.
- **Engaging vulnerable peoples:** An open and inclusive approach to consultation increases the opportunity of stakeholders to provide comment on the Project and to voice their concerns. Some stakeholders, however, need special attention in such a process due to their vulnerability. Special measures will be considered to ensure that the perspectives of vulnerable stakeholders are heard and considered.
- **Managing expectations:** It is important to ensure that the Project does not create or allow unrealistic expectations to develop amongst stakeholders about Project benefits. The engagement process will serve as one of the mechanisms for understanding and then managing stakeholder and community expectations, where the latter will be achieved by disseminating accurate information in an accessible way.
- **Ensuring compliance:** The process is designed to ensure compliance with both local regulatory requirements and international best practice.

One of the key outcomes of engagement should be free, prior and informed consultation of stakeholders, where this can be understood to be:

- **Free:** engagement free of external manipulation or coercion and intimidation;
- **Prior:** engagement undertaken in a timely way, for example the timely disclosure of information; and
- **Informed:** engagement enabled by relevant, understandable and accessible information.

2 KEY STANDARDS AND LEGISLATION GUIDING STAKEHOLDER ENGAGEMENT

2.1 INTRODUCTION

The stakeholder engagement process has been designed to ensure compliance with both Kenyan legislative requirements, as well as the International Finance Corporation (IFC) Performance Standards (2012). This section presents the relevant standards and legislation identifying the key Kenyan and international requirements for engagement.

2.2 KENYAN LEGISLATIVE REQUIREMENTS

2.2.1 The Kenyan Constitution

Part II Section (I) of the Kenyan Constitution encourages public participation in the management, protection and conservation of the environment.

In conducting the ESIA and stakeholder engagement process detailed in *Section 3*, the Project is ensuring the effective participation of the public in the Project, as well as identifying potential Project impacts, and how these can be managed in a manner that strives to protect both the physical and social receiving environments of the Project area.

Ongoing engagement during construction and operation will ensure that the public continue to be involved in the protection of the physical and social environment.

2.2.2 Environmental Legislation

The Environmental (Impact Assessment and Audit) Regulations

The Environmental (Impact Assessment and Audit) Regulations, 2003 outline various requirements with regards to stakeholder engagement. Section 8 and 17 provide specific requirements for stakeholder engagement during the ESIA process.

The legislative requirements outlined in the Regulations specifically relate to stakeholder engagement activities to be conducted during the ESIA process. However it has been confirmed during discussions with the National Environment Management Authority (NEMA) that a full Kenyan Regulatory EIA is not required for this Project, only a Project Report. As such, all the specific requirements for stakeholder engagement outlined under the Regulations were not conducted. However in line with international standards, stakeholder engagement activities were conducted during preparation of the Project Report, this includes stakeholder engagement activities during the Scoping and Impact Assessment Phase.

Section 59 of the Environmental Management and Coordination Act of 1999 (EMCA) outlines the stakeholder engagement requirements for both the Proponent and Authorising Authority.

As noted above, a full Kenyan Regulatory EIA is not being conducted for this Project, and therefore it is not necessary for requirements under the Act to be completed. However in aligning to international standards, the Project has conducted stakeholder engagement activities to inform the assessment in line with the requirements of the IFC Performance Standards for an ESIA. .

2.3 *INTERNATIONAL REQUIREMENTS*

In addition to aligning to national standards, the Project has committed to meeting international standards, in particular the IFC Performance Standards.

2.3.1 *The IFC Performance Standards*

The IFC Performance Standards on Environmental and Social Sustainability and the IFC Environmental, Health and Safety (EHS) Guidelines, effective since 1 January 2012, are generally accepted as the benchmark of best practice for environmental and social safeguards. These standards include guidelines for engagement.

The IFC Performance Standard 1 requires project proponents to engage with affected communities through disclosure of information, consultation, and informed participation, in a manner commensurate with the risks to and impacts on the affected communities. PS1 contains clear requirements for community engagement, disclosure of information and consultation as well as the management of grievances throughout the Project. *Box 2.1* outlines the main requirements for consultation and disclosure under PS1, the umbrella Standard on the *Assessment and Management of Environmental and Social Risks and Impacts*.

Box 2.1 ***Requirements for Public Consultation and Disclosure in Performance Standard 1***

Aim:

To ensure that affected communities are appropriately engaged on issues that could potentially affect them; to build and maintain a constructive relationship with communities; and to establish a grievance mechanism.

Who to Consult:

Specifically with:

- directly and indirectly affected communities;
- positively and negatively affected communities/individuals;
- those with influence due to local knowledge or political influence;
- elected representatives;
- non-elected community officials and leaders;
- informal/traditional community institutions and/or elders; and
- indigenous peoples, where the Project is identified to have adverse impacts on them, and
- communities in the wider area of influence (AoI).

When to Consult:

As early as possible or at the latest consultation should begin prior to construction. Consultation should be an on-going process throughout the life of the Project, i.e. iterative. Consultation should also allow for a feedback mechanism where affected people are able to present their concerns and grievances for consideration and redress.

What to Consult on:

Specifically:

- disclosure of Project information (purpose, nature, scale) throughout the Project lifecycle;
- disclosure on the Action Plan as a result of consultation, with periodic reports to demonstrate implementation;
- risks and impacts of the Project; and
- updates on actions and proposed mitigation measures to address impacts and areas of concern for affected communities.

How to Consult:

Consultation should:

- be inclusive and culturally appropriate;
- allow for free, prior and informed participation of affected communities;
- be in the language preferred by the affected communities;
- consider the needs of disadvantaged and vulnerable groups;
- be fed into the decision making process including proposed mitigation, sharing of benefits and opportunities;
- be iterative;
- be documented;
- be responsive to community concerns and grievances;
- be easily understood and transparent; and
- allow for differentiated means of engagement particularly for disadvantaged or vulnerable groups.

Where engagement relies substantially upon a community representative the client will aim to ensure that the views of affected communities are communicated, and that the results of consultation are communicated back to the community.

Source: IFC Performance Standard 1, (paragraphs 25-35), (2012)

Vulnerable stakeholders require special attention according to the IFC. Vulnerable people include those who, by virtue of their gender, ethnicity, age, physical or mental disability, economic disadvantage or social status may be more adversely affected by a Project than others, and who may be limited in their ability to take advantage of a Project's development benefits.

From previous experience of working on similar projects, as well as conducting baseline data collection, the following groups have been identified as potentially vulnerable:

- women;
- Female Headed Households (FHH)
- elderly;
- children; and
- people with physical / mental health illnesses and disabilities.

The IFC Performance Standards outline requirements for engagement with vulnerable people which should include differentiated measures to allow for the effective participation of these people. Thus the stakeholder engagement process needs to be designed to address the needs of these vulnerable groups, for example holding focus group discussions with such groups.

This section presents the approach to engagement that has been designed to comply with the national and international standards described in *Section 2*.

The ESIA engagement process involves four key phases, namely:

- scoping consultation;
- baseline data gathering;
- ESIA engagement; and
- disclosure.

A summary of the objectives and activities for each phase is listed in *Table 3.1*.

Table 3.1 *Phase of Engagement*

Phase	Objective	Key Activities	Key Outputs
Scoping Engagement	- To meet key stakeholders and introduce them to the Project and ESIA. - To generate feedback on the ESIA Report being developed, including the scope, approach and key issues to be investigated further for the ESIA. - To consult key stakeholders on the next steps in the ESIA process.	- Notification and communication on the Project and associated ESIA through: - meetings and workshops with key stakeholders; and - dissemination of a Background Information Document (BID) and presentation describing the Project.	- Engagement tools. - Record off engagement undertaken to date.
Baseline Data Gathering	To collect baseline data through a variety of methods including using participatory tools.	- Engagement for the purposes of baseline data gathering through: - Focus Group Discussions (FGD) with selected stakeholders; and - Key Informant Interviews (KII) with key stakeholders.	- Records of engagement activities undertaken to date. - Socio-economic baseline chapter of ESIA.
ESIA Engagement	- To provide stakeholders with updated Project information. - To discuss the identified impacts and proposed mitigation measures with stakeholders.	- Meetings with key stakeholder groups including: - government departments; - community members; - traditional leaders including Chiefs and elders; - key informants including healthcare and education professionals.	- Draft ESIA Report. - Engagement tools. - Record off engagement undertaken to date.
Disclosure	To notify stakeholders of the submission of the final report to regulators.	Provide the Final ESIA Report to stakeholders.	Final ESIA Report.

NB:

- Baseline data gathering and ESIA engagement were conducted concurrently while in the field.*
- The Project proponent will conduct the Disclosure phase.*

The Project is committed to continue engaging actively with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the SEP will therefore feed into and inform on-going stakeholder engagement as the Project moves into these later stages, ensuring that two-way dialogue with those affected, both positively and negatively by the Project is maintained.

The aim will be to ensure that the Project remains in contact with all interested parties and cognisant of their concerns, and that these are addressed in an effective and timely manner. At each stage a detailed schedule of activities and events will be developed and disseminated so that people know how to interact with and participate in the Project.

*4.1**INTRODUCTION*

For the purposes of this plan, a stakeholder is defined as any individual or group who is potentially affected by the Project, or who has an interest in the Project and its potential impacts. It is therefore important to establish which organisations, groups and individuals may be directly or indirectly affected (positively and negatively) by the Project and which might have an interest in the Project.

It should be noted that stakeholder identification is an on-going process, requiring regular review and updating as the Project progresses.

*4.2**STAKEHOLDER IDENTIFICATION AND MAPPING*

In order to develop an effective SEP it is necessary to determine exactly who the stakeholders are and understand their priorities and objectives in relation to the Project. By classifying and analysing the stance, influence, and interests of stakeholders it will be possible to develop an engagement approach for each stakeholder group which is tailored to meet their needs.

For the Project, stakeholders have been, and will continue to be identified on an on-going basis by:

1. identifying the different categories of stakeholders who may be affected by or interested in the Project; and
2. identifying specific individuals or organisations within each of these categories taking into account:
 - the geographical area over which the Project may cause impacts (both positive and negative) over its lifetime, and therefore the localities within which stakeholders could be affected; and
 - the nature of the impacts that could arise and therefore the types of government bodies, academic and research institutions and other bodies who may have an interest in these issues.

Details of individual stakeholders have been compiled in a stakeholder database. The database has been maintained throughout the ESIA engagement process and is a 'living document' which will be expanded as the Project develops. In particular new stakeholders are also expected to come to the attention of the Project through continuing engagement activities, field work and unsolicited contacts made with the Project.

This section describes the stakeholder groups identified to date (*Table 4.1*), and reflects information captured in the stakeholder database (Annex D8).

Table 4.1 *Stakeholders Identified to Date*

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
Government	- National regulatory bodies - Government agencies	National Government are of primary importance in terms of establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with Kenyan Law throughout all stages of the Project life-cycle.	- Office of Member of Parliament - County Commissioner - Deputy County Commissioner - Assistant County Commissioner - Office of County Director - Environment - Office of County Director - Physical Planning - Office of County Director - Water - Office of County Director - Lands - Office of County Director -Energy - Office of County Director - Education - Office of County Director - Social Development - Office of County Director - Public Health - Office of County Director - Infrastructure (roads) - Office of County Director - Agriculture

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
Traditional authorities	Key County Authorities	County government are also of primary importance as they are responsible for implementation of legislation, and development plans and policies at the County level. The County will also have a role in issuing permits and processing applications associated with the Project. In addition, Uasin Gishu County will be impacted by the Project and will need to be kept informed of progress and plans in their area, to consider the Project activities in their policy-making, regulatory and other duties and activities.	- Office of County Governor - Office of County Senator - Office of Deputy Governor - Office of Member of County Assembly - Office of Women Representative - Office of County Administrator - Office of Sub-County Administrator - Office of Ward Administrator - County Executive - Lands - County Executive - Environment - County Executive - Physical Planning - County Executive - Energy - County Executive - Legal - County Executive - Education & ICT - County Executive - Social Development - County Executive - Public Health - County Executive - Infrastructure - County Executive - Agriculture - County Executive - Water - County Executive - Labour
	- Politically appointed authorities - Customary authorities	Local community leaders acting as representatives of their local community. Meetings with traditional authorities will follow local practices and should be held prior to any wider communication in local communities in order to respect the political and social structures.	- Chief - Assistant Chiefs - Elders
Communities	Project affected communities including: - registered and customary land owners; - residents and occupiers of land; and - members who use of or access to land and resources.	Households and communities that may be directly or indirectly affected by the proposed Project and its activities. This includes people living on land affected by the Project, through direct land take or by social and environmental impacts, and other people who visit or use land or resources that may be affected.	Villages of: - Mosop - Kipchamo - Chepkigen

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders
Vulnerable groups	• Women • Female headed households • People with physical / mental health illnesses and disabilities	Vulnerable groups may be affected by the Project by virtue of their physical disability, social or economic standing, limited education, lack of employment or access to land.	Members within the following villages: • Mosop • Kipchamo • Chepkigen
Civil Society	• Community Based Organisations • Community of Other Associations • Research and Academic Institutions	Organisations with direct interest in the Project, and its social and environmental aspects and that are able to influence the Project directly or through public opinion. Such organisations may also have useful data and insight and may be able to become partners to the Project in areas of common interest.	• Moi University • Plateau RCA Hospital • Local community saving associations
Non-Governmental Organisations (NGOs)	• National • Local	NGOs with direct interest in the Project, and its social and environmental aspects and that are able to influence the Project directly or through public opinion.	• ADAPT (local NGO)

This section provides a review of the engagement activities conducted during the Scoping and ESIA engagement phases, as well as a summary of the key outcomes.

The objective of engagement was to:

- introduce the Project and Project Proponents;
- introduce the ESIA including the stakeholder engagement team and outline the objectives of the ESIA and stakeholder engagement process;
- consult stakeholders on the next steps in the ESIA process; and
- understand stakeholders concerns regarding the Project as well as opportunities for stakeholders to work with the Project.

5.1

ENGAGEMENT ACTIVITIES

Scoping phase engagement activities were the first opportunity to engage with stakeholders, and to gain an overall understanding of stakeholder concerns and perceptions of the Project. As this was the first step in the engagement process key stakeholders were identified including county government departments, as well as potentially interested or affected communities. The scoping trip took place during June 2015 over four days, and focused on the introduction of the Project and ESIA process to County government departments and chiefs and elders within the affected communities.

Subsequently during ESIA engagement, the Project team returned to site and conducted engagement with a wider range of stakeholders. This included engagement with a range of County government stakeholders, as well as health and education professionals, chiefs and elders, community members and an NGO. The objective of ESIA engagement was to provide up-to-date information on the Project, as well as engage with stakeholders on the potential impacts of the Project and proposed mitigation and management measures.

A total of five meetings were conducted during the Scoping and ESIA engagement phases as outlined in *Table 5.1*.

For both the Scoping and ESIA phase engagement materials were developed to support engagement activities, including a:

- presentations for government level engagement and engagement in formal settings; and

- Background Information Document (BID); and
- Project flyer (in English and Nandi).

These materials were written in non-technical/ accessible language and provide information on:

- the background to and description of the Project;
- information on the Project proponent;
- the environment in which the Project will be developed;
- information on the ESIA process and timelines;
- potential impacts associated with the Project; and
- information on ESIA consultants.

Records of the five formal meetings conducted during the scoping and ESIA engagement phases including the attendance registers are included in *Annex D6* of the ESIA Report.

Table 5.1 Stakeholder Engagement Activities

Meeting type	Date	Location	Attendees
Scoping Phase Engagement			
County Government	10 th June, 2015	Office of the Deputy Governor	County Governor Deputy Governor C.E.C Environment, Water & Energy NEMA Director Chief Plateau Location
County Departmental Heads/ Representatives	11 th June, 2015	Office of the County Director Environment- NEMA Boardroom	WRMA NEMA County Physical Planning Department County Environmental Department County Water Department County Public Health Department Eldowas
Chief and Elders Kipchamo Location and Sub-location	11 th June, 2015	Kipchamo Village	Chiefs Assistant Chief Village Elders
One on One Meetings with County Government Officials	10 th -11 th June	Offices of County Executives	County Commissioner Executive Officer - Lands County Officer of Statistics – County Commissioners Office County Executive Infrastructure (roads); and County Executive Agriculture Wareng District Officer
KCAA	11 th June	Eldoret International Airport	Ag Chief Air Navigation Service
ESIA Phase Engagement			
County Government	30 th June 2015	Boma Inn Hotel Eldoret	WRMA NEMA County Physical Planning Department Viopa Consultants Ministry of Interior Area MCA

Meeting type	Date	Location	Attendees
Scoping Phase Engagement			
			Opinion Leaders Area Chief Assistant Chiefs
Public meeting	30 th June 2015	Kipchamo Village	County Governor Member of Parliament Member of County Assembly Chiefs and Elders Community members from surrounding villages including Kipchamo, Chepkigen, Mosop
Community meeting	1 st July 2015	Mosop Village	Community members including men, women, youth and elders
Community meeting	2 nd July 2015	Kipchamo Village	Community members including men, women, youth and elders
Community meeting	2 nd July 2015	Chepkigen Village	Community members including men, women, youth and elders
Health Facility	2 nd July 2015	Kipchamo / Plateau	Plateau RCA Hospital
Health Facility	2 nd July 2015	Chepkigen	Nurse – Chepkigen Health Centre
Chief	2 nd July 2015	Kipchamo Village	Chief for Kipchamo Location / ADAPT NGO lead

5.2

KEY OUTCOMES

The key questions and concerns raised by stakeholders focused on the health impacts of solar photovoltaic (PV) panels, employment and community development opportunities.

The majority of stakeholders were open to the Project progressing and demonstrated a positive attitude towards the Project. A high degree of expectation in relation to Project benefits was evident during the stakeholder engagement; in particular regarding employment opportunities, as well as community development initiatives for the local communities. The Project proponent outlined the need to further assess and understand key challenges faced within the community so as to inform their community development strategy, emphasising the need for this to be managed and implemented sustainably.

One of the key concerns raised by a range of stakeholders was the health impacts of the photovoltaic panels, and whether the panels would emit radiation causing impacts to human health. It was explained that the panels absorb radiation and therefore the impacts are likely to be minimal.

Other concerns raised centred around changes to storm water runoff and water drainage channels as a result of the PV panels, impacts to birds in the area and waste disposal.

The key issues raised across the Project, and grouped according to subject matter are identified in *Table 5.2*.

Table 5.2 *Outcomes of Scoping and ESIA Engagement*

Theme	Issue
Employment	Employment for local communities Recruitment process Skills transfer for local communities
Environment	Changes to water drainage channels Impacts to birds in the area Waste storage and disposal
Resettlement	Confirmation on whether resettlement will be required
Transmission Line	Health impacts of the proposed transmission line Loss of livelihoods due to transmission line How compensation and lease payments for the wayleave for the transmission line would be managed
Health	Perceived radiation impacts from the PV panels Electrocution impacts from overhead transmission line
Community Development	Request for investment in infrastructure (roads and water) in the local area Request for investment in educational facilities in the local area Request for investment in health facilities in the local area Investment in local livelihood activities including milk production, storage and sale Support for vulnerable groups in particular orphans
Cultural Heritage	Impacts to initiation site (identified to not be located on the Project site)
Visual and Physical	Visual impacts of the PV panels when in operation Perceived interference with planes landing at the Eldoret International Airport

6.1 PURPOSE

In accordance with the requirements of the IFC Performance Standards the Project will need to establish a specific mechanism for dealing with stakeholder grievances about the Project. A grievance is a complaint or concern raised by an individual or organisation who judges that they have been adversely affected by a project during any stage of its development. Grievances may take the form of specific complaints for actual damages or injury, general concerns about project activities, incidents and impacts, or perceived impacts.

This section outlines the approach to managing grievances which will be used during the ESIA and following phases of stakeholder engagement including during construction and operation.

6.2 GRIEVANCE PRINCIPLES

A grievance mechanism should be based on the following principles:

- **Transparency and fairness:** The process for grievance resolution should be transparent, in harmony with the local culture and in the appropriate language. It should explicitly assure potential users that the mechanism will not impede their access to other judicial or administrative remedies.
- **Accessibility and cultural appropriateness:** All stakeholders including every member of a community or group should have access to the grievance procedure. Any individual or group that is directly or indirectly affected by the Project's and its contractors' activities, can raise a grievance.
- **Openness and communication regularity:** There should be multiple channels available for individuals and groups to choose their preferred method for lodging grievances including:
 - o Verbal conversations with the Project's Community Liaison Officer (CLO) as well as telephone calls; and
 - o Written format either or in letter or email.
- **Channels of communication** should be kept open throughout the process of addressing each grievance and up to three months after the situation has been resolved.
- **Written records:** All grievances should be registered on a Grievance Form, logged by the CLO, and tracked through to resolution. This should include documentation of how the grievance has been resolved.

- **Dialogue and site visits:** All grievances should warrant discussions with the complainant and a site visit to gain a first-hand understanding of the nature of the concern. The purpose of the visit is to verify the validity and severity of the grievance.
- **Timely resolution:** The Project aims to resolve 90% of grievances within 30 days. Grievances that have not been resolved in this time frame should at a minimum have been acknowledge and investigated.

6.3 *PROCESS*

Based on the principles described above, the grievance mechanism process should involve four main stages:

1. receiving and recording the grievance;
2. investigation and site inspection;
3. response; and
4. monitoring and evaluation.

6.3.1 *Receiving and Recording the Grievance*

Verbal or written grievance should be received via various channels and should be passed to the CLO. The grievance should then be recorded on a Grievance Form and a formal confirmation along with a copy of the form should be signed by both the complainant and the CLO or Project employee receiving the grievance. The name of the village, date recorded, name of complainant, and name of the person that receives the grievance should be noted. Details of the grievance should also be recorded.

All grievances should be registered regardless of whether they are likely to be ultimately deemed not legitimate.

6.3.2 *Site Inspection, Investigation and Resolution*

The CLO shall organise a site inspection, undertaken either by himself or by an assigned member of the Project team. The purpose of the site inspection is to check the validity and severity of the grievance. The inspection should be undertaken within seven days of receiving the grievance. The CLO or assigned individual should work with other relevant members of the Project team to investigate the problem and identify measures to resolve the grievance as appropriate. This could involve provision of information to clarify the situation, undertaking measures to remedy problems or compensation for any damage that has been caused either by financial compensation or compensation in-kind, and introduction of mitigation measures to prevent recurrence of the problem in the future. Where a grievance is found to be invalid or not severe, a clear explanation should be provided to the complainant as to why this is the case.

6.3.3 *Response*

A formal response detailing how the grievance will be resolved should be provided to each complainant within 30 days where possible. Where resolution is delayed the complainant should be provided with regular updates on progress. The complainant has the right to reject the resolution proposed in which case the CLO and or assigned individual should discuss the complainant expectations and review and update the proposed resolution on the basis of these discussions. If resolution can't be agreed then the complaint has the right to seek other judicial or administrative remedies

6.3.4 *Monitoring and Evaluation*

Two to three weeks after implementing the resolution, the CLO should pay a visit to the complainant to ensure that the complainant is satisfied and to gather feedback on the grievance resolution process. The visit should be registered on the grievance log. If required, further follow up visits should be scheduled.

6.4 *ROLES AND RESPONSIBILITIES*

Implementing the grievance mechanism and recording all grievances is the responsibility of the Community Liaison Officer (CLO). However, it is likely that at times the CLO will need support from the wider Project team in investigating or resolving a grievance. Other key players are likely to include:

- The EHS Manager of the EPC contractor during construction;
- The Site Project manager during operation;
- Technical experts to determine if the complaint is feasible;
- Legal teams in cases where the grievance involves a breach in regulations or agreement on resolution can't be reached.

6.5 *REVIEW OF THE GRIEVANCE LOG*

It is essential that the grievances are logged and reviewed on a regular basis (quarterly) to determine if the same or similar grievances are being recorded at one or more location. Multiple grievances related to the same or similar issues indicate a more systemic problem within the Project which needs to be mitigated through the development of Project controls or measures.

It will be important to monitor and report on the ongoing stakeholder engagement efforts to ensure that the desired outcomes are being achieved, and to maintain a comprehensive record of engagement activities and issues raised.

To date this has been done through this SEP, and will continue through the Project's stakeholder engagement activities. As part of the SEP the following has been recorded:

- Updates to the stakeholder database; and
- Records of all consultations held.

These records and outputs are appended to the ESIA report and will be updated as the Project progresses and further phases of engagement are undertaken.

THE PROPOSED 2 x 40 MW SOLAR PV PLANTS, KESSES, UASIN GISHU COUNTY, KENYA

Environmental and Social Impact Assessment (ESIA)



The world's leading sustainability consultancy



Agenda

Introduction to Proponent & teams	2 minutes
Introduction to ERM	2 minutes
Project Description	2 minutes
ESIA Process	5 minutes
ERM's Progress to Date	5 minutes
Baseline Data	5 minutes
Summary Impacts and Mitigation Measures	10 minutes
Open Discussion	1 hour

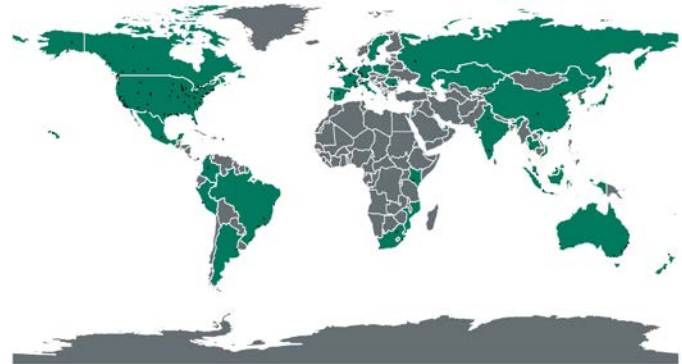
Introduction to Proponents & Teams

- ***Radiant Energy*** and ***Eldosol Energy*** are solar photovoltaic (PV) independent power producer (IPP) that is proposing to develop the Project on the outskirts of Eldoret Town, Uasin Gishu County, Kenya.
- ***3E n.v./s.a.***; appointed by the proponent are an international consultancy that specialises in delivering advisory services and software solutions for sustainable energy project development and operation worldwide.
- ***Power Engineers*** is a global consulting engineering firm specializing in the delivery of integrated solutions in a wide range of industries including power generation and delivery. In particular, Power Engineers provide expertise on feasibility studies and detailed design for overhead and underground transmission lines and substations, testing and energization, utility automation, and comprehensive program management

Introduction to ERM



- Leading consultancy providing environment, health, safety, process safety and social services for over 40 years
- Delivering innovative solutions to enable our clients to maximize performance, comply with regulations, improve corporate reputation and public perception
- Sustainability is at the heart of the services we provide and how we operate our business
- 150 offices in 40 countries
- > 5,000 professional staff
- Completed projects in > 160 Countries
- ERM East Africa Limited registered with NEMA as a Firm of EIA/Audit Experts



Project Description



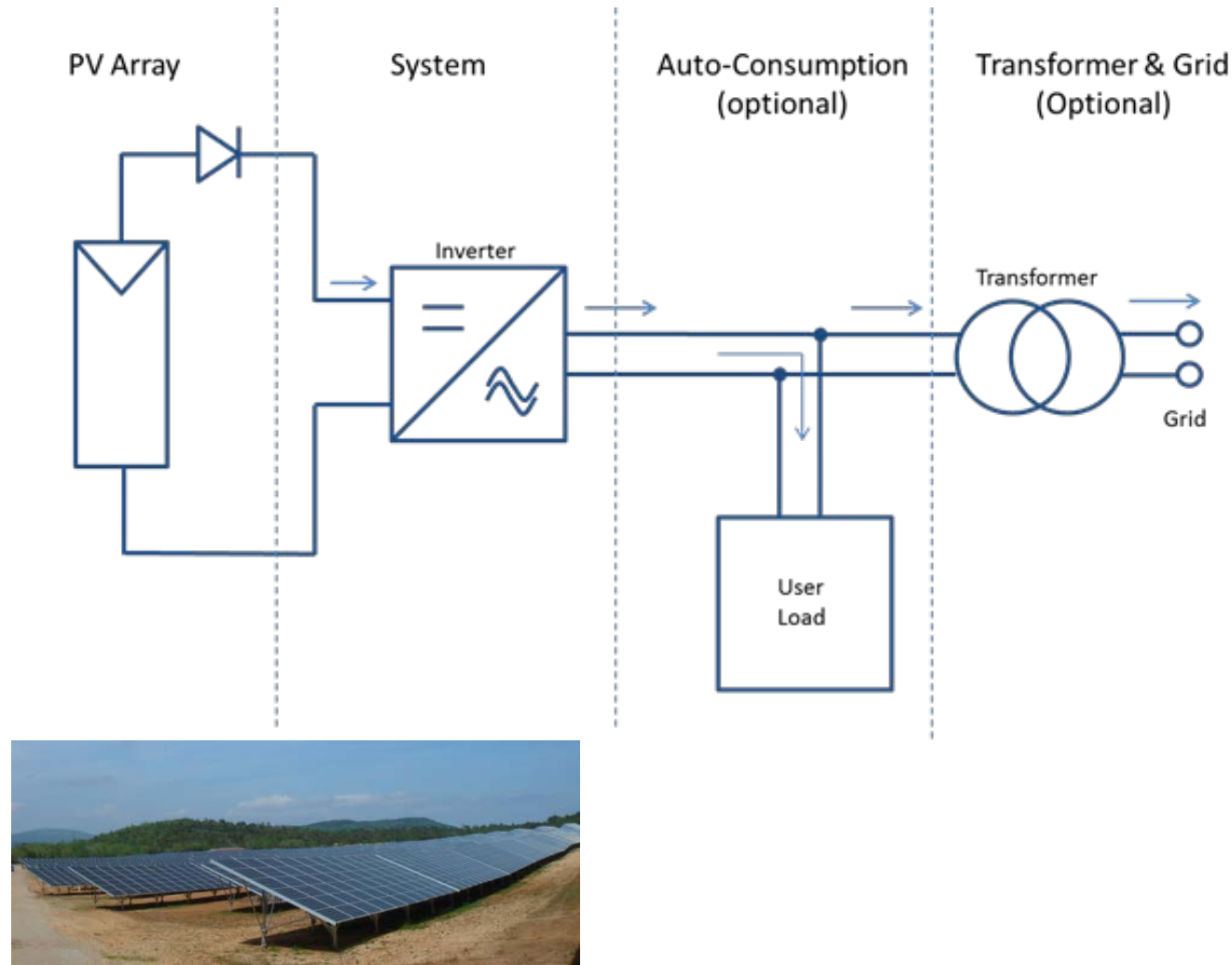
Solar PV Technology

- Solar PV modules are made up of PV cells, which are most commonly manufactured from silicon but other materials are available.
- In general, good quality PV modules are expected to have a useful life of 25 to 30 years, although their performance will steadily degrade over this period
- PV modules must be mounted on a structure. This helps to keep them oriented in the correct direction and provides them with structural support and protection.
- Mounting structures may be either fixed or tracking.
- The proposed development will include PV panels and interconnection facilities that will occupy an area of approximately 301 acres

Project Key Components

- PV solar panels/modules (arranged in movable arrays);
- PV module support structures;
- Inverter/Transformer centres (ITC)
- Auxiliary Transformer centre (ATC)
- Connection centre
- New 33/220 kV electrical substation
- Underground cabling/ connection to existing overhead power lines
- On-site buildings (including an operational control centre, warehouse);
- Access roads and internal road network;
- Drainage collection and culverts, and
- Ancillary infrastructure

Typical Solar PV System



ESIA Process

- Undertaken in full compliance with the following:
 - Environmental Management and Coordination Act 1999 (EMCA) and associated OSHA 2007 Act and Regulations (Kenya); and
 - International Finance Corporation's (IFC) Performance Standards on Social and Environmental Standards (2012)
- Aim of the ESIA: to identify significant potential impacts and mitigate any adverse impacts to the environment and people's health
- Public participation a very important part of the process
- Output of the ESIA is a Report submitted to the National Environment Management Authority (NEMA) for their decision

Progress to Date

- Baseline Study including
 - Desk studies;
 - Initial site visits (30th April, 2015);
 - Development of SEP; and
 - Second site visit (second visit on 9th- 12th June, 2015)
- Scoping/major field investigations week of 12th June, 2015, including:
 - Detailed ecological studies (transect walks);
 - Preliminary Stakeholder consultative meetings (invitations sent through telephone calls);
 - F2F interviews/meetings; and
 - Public meeting with the elders and local leaders in a meeting/*baraza* on 11th June, 2015.

Baseline Data: Locality Map- Radiant Energy



Baseline Data: Locality Map- Eldosol Energy



Baseline Data: Natural Environment

- Water Bodies: River Kipsinende; Ngeria Dam
- Trees: There are a number of trees within the study area. Trees are used as property boundaries within the study area. All the tree species are utilised as sources of wood fuel and for marking boundaries by the locals
- Farm Land: Unploughed land within the study area provides habitats for different species
- The Grey Crowned Crane, *Balearica regulorum*, is a bird in the crane family Gruidae. It occurs in dry savannah in Africa south of the Sahara, although it nests in somewhat wetter habitats such the Plateau area in Nyaru Village, north of the project site (near to the Ngeria Dam). This animal does not migrate.
- There is no existing National Park/Reserve or protected area (s) within the Project area

Natural Environment cont...

- The project site lies in Agro-ecological Zone III designated to be a medium potential zone. The zone is the most significant for agricultural cultivation and several legume fodders are grown here in crop-livestock systems.
- The general landscape in the area is undulating plateau with no significant mountains or valleys. The project area is located in Agro-ecological Zone III characterised by an elevation of 900-1800m above sea level

Bird Species Observed on Site



The Grey Crowned
Crane, *Balearica
regulorum*

Preferred Habitat:
Wetter habitats such
the Plateau area in
Nyaruru Village

Typical Vegetation



Typical Vegetation



Landscape of the Site- Partly Ploughed



Land use of the Site- Maize Plantation



Land use of the Site- Wheat Plantation



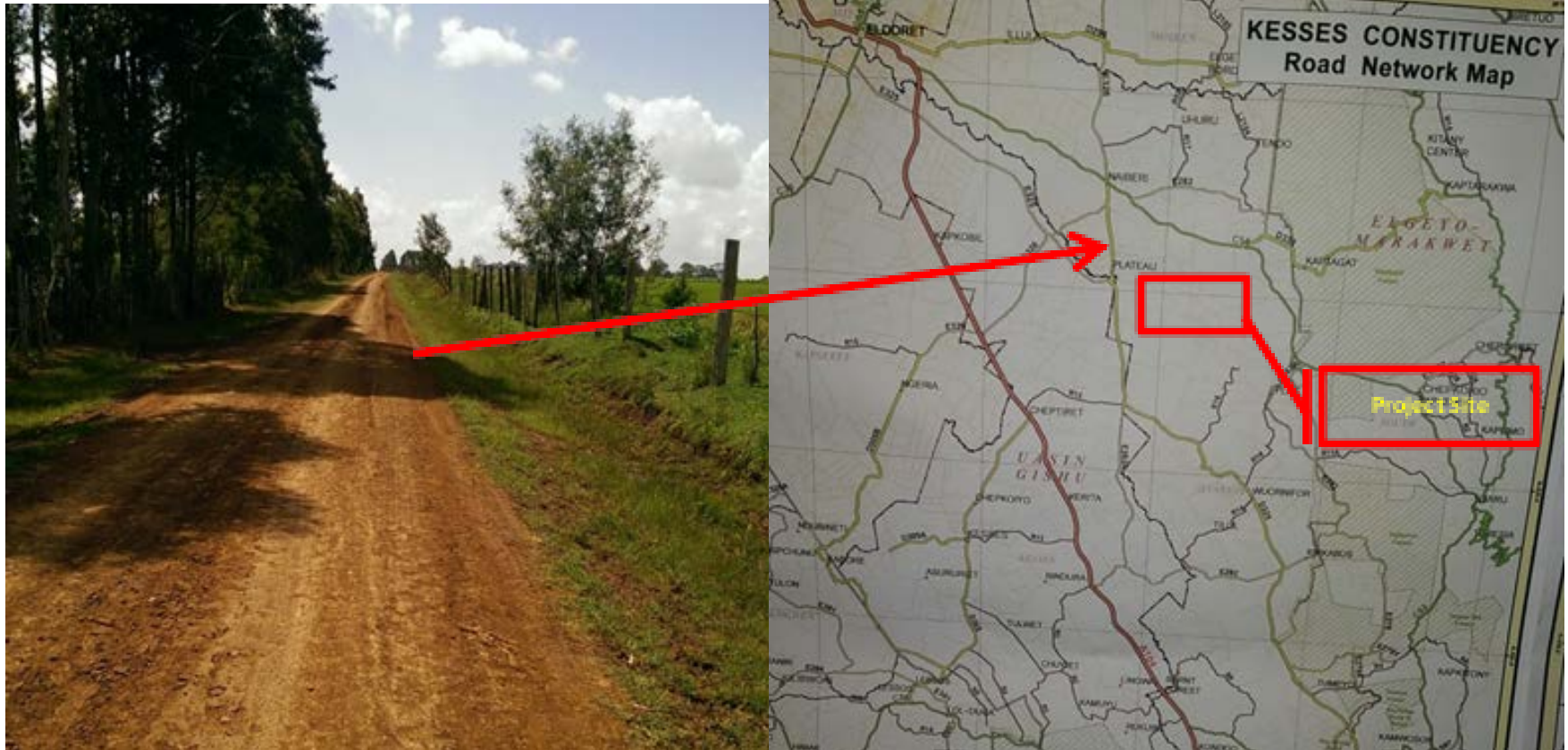
Baseline Data: Socio Economic Environment

- The proposed project is located in Saroiyoi and Lengut Sub Locations, Kipchamo Location, Kessess Division of Kessess Constituency in Kessess Sub County, Uasin Gishu County
- Within the parcel of land, there is a small work force, who are employed on permanent contracts and engage in activities such as livestock rearing and charcoal making as observed during the site visit.
- There are no day cares or universities within the project area. There are about three (3) nursery schools namely Plateau, Lengut and Inland; Primary schools include Lengut Primary, Chemeneê Primary, Mogojolet Primary and Inland Primary; Secondary Schools include Isaac Kosgei, Plateau Girls and Keringet Secondary; Colleges include the African Institute College and Ritt
- The main health facilities in the Project area are: Ngeria Health Centre (Government Facility); Plateau RCA Hospital (a Mission Hospital) and Moi Teaching and Referral Hospital (Government Facility)

Electricity Connection in Project Area



Access Road to Site (Plateau Road)



Access Road to Site (Road to Mogojoret Pri. School)



Education facilities in the Project Area (Mogojoret Pri. School)



Project team on Site during the guided Transect Walk with Locals in Nyaru Village



Initial Stakeholder Consultations in Eldoret



Public Meeting with the Heads of Departments and Chiefs and Elders of Project Area



Potential Impacts and Mitigation Measures

Impact	Mitigation
Connection to National Grid	- Geared towards Vision 2030 aim to achieve 1,260 MW of Renewable Energy by 2018 - Reduced GHG emissions
Employment Opportunities	- County Government is in collaboration with Moi University in sponsoring 150 Students through different engineering programmes to create a pool of local capacity and skills. - Training and skills developed (working with local institutions)
Habitat loss	- Rehabilitation of disturbed areas with indigenous vegetation - Ground coverage ratio: 74% open space and 26% solar panels
Visual Impact (including glint and glare)	- Buffer around the boundary of the project by planting trees - Typical panels are designed to reflect only some 2% of incoming sunlight (they absorb sunlight)
Air Emissions and Noise Pollution	Only during the construction phase but mitigation measures will be in place to reduce
Land Use and Land Take	Proponent will have a sale agreement with the private land owners
Disposal of Panels and Batteries	ERM will consult with relevant Organisations (e.g., East Africa Compliant Recycling and Smart Solar) on issues related to disposal of panels, batteries
Soil Erosion	- Minimal clearing activities - Drainage lines will be kept open - Rehabilitation of disturbed areas - Clearly defined work areas

Open Discussion

- Questions
- Issues and concerns



Background Information Document and Invitation to Comment



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED 2 x 40 MW SOLAR PV PLANTS, ELDORET, UASIN GISHU COUNTY, KENYA

June 2015

INTRODUCTION

Eldosol Energy Limited and Radiant Energy Limited propose to develop the Eldoret Solar Power Project, comprising 2 x 40 MW solar plants located in Eldoret, Uasin Gishu County, Kenya. Before Radiant Energy and Eldosol Energy can proceed with development, an Environmental and Social Impact Assessment (ESIA) study needs to be completed.

The aim of this study is to advise the Kenyan Government, as well as financial institutions lending money to the proposed Project on the expected impacts of the proposed Project, and to suggest how these impacts can be managed.

PROJECT PROPONENTS

Eldosol Energy Limited (Eldosol Energy) and Radiant Energy Limited (Radiant Energy) are both solar photovoltaic (PV) independent power producers (IPP) located on the outskirts of Eldoret Town in Uasin Gishu County.

PURPOSE OF THIS DOCUMENT

This document provides:

- A brief background and introduction to the proposed Project;
- An introduction to the Environmental Social Impact Assessment (ESIA);
- Details of the stakeholder engagement process for the ESIA; and
- An invitation for stakeholders to become involved in the ESIA process.

PROJECT BACKGROUND

The Government of Kenya, through the Ministry of Energy and Petroleum (2014) has identified that energy is key to realising Vision 2030. The generation of renewable energy will not only lead to the country's economic development, but will also supply Kenya's current needs and those of future generations in a sustainable way if effectively harnessed. The proposed Project will therefore generate electricity and reduce Kenya's dependence on non-renewable fossil fuels, with the overall aim to develop the opportunity to generate power to sell electricity to the National Grid Operator.

Renewable energy has the potential to:

- Enhance energy security and reliability;
- Mitigate climate change;
- Generate income and create employment; and
- Enable Kenya to make substantial foreign exchange savings by reducing dependence on imported fuels and its attendant price volatility (Ministry of Energy and Petroleum, 2014).

Eldosol Energy and Radiant Energy are therefore proposing to undertake the construction of 2 x 40 MW solar plants (totalling 80MW) power evacuation and sub-station near Eldoret Town, located in Uasin Gishu County. The solar plants will be connected to the National Grid.

PROJECT LOCATIONS

The proposed Projects are located on the outskirts of Eldoret Town in Uasin Gishu County, Kenya, as indicated in *Figure 1* and *Figure 2* respectively. The proposed Projects will be located on approximately a total of 601 acres of private land.

Figure 1: *Radiant Energy Site Location*



Source: Google Earth

Figure 2: *Eldosol Energy Site Location*



Source: Google Earth

PROJECT DESCRIPTION

The proposed Projects include the installation and operation of solar panels (PV arrays). Each proposed Project will have an output of 40MW at the Point of Utility Connection (PUC). The proposed Projects also include a transmission line that will be connected to the national grid system through the proposed 220kV /132 kV/33 kV Kenya Electricity Transmission Company Limited (KETRACO) substation in Lessos, located approximately 22km south of the proposed Project sites.



Figure 3: Fixed solar PV panels installed in a SEF

PHOTOVOLTAIC TECHNOLOGY

Photovoltaics use the direct conversion of sunlight into electricity at the atomic level. Materials used in the formation of photovoltaic cells have properties that allow them to absorb particles of light and release particles of energy. When these particles of energy are captured electricity is produced.



Figure 4: Aerial view of solar PV panels installed in an SEF

PROPOSED INFRASTRUCTURE AND SERVICES

The proposed projects are anticipated to have the following infrastructure and services:

- Mounting structures and foundation- Solar array support tracking system, screw-foot, rammed poles or concrete foundation, depending on soil conditions
- PV modules
- MV Transformer- Step-up transformer (400V – 22kV) located in either an outdoor or sheltered housing structure
- Inverter
- An access road will be upgraded and maintained on the entrance of the site if required.
- A 3 meters perimeter road (to be confirmed in later stage) will be constructed for maintenance purpose.

In case it is required, the site will be cleared of vegetation and debris. Foundation and platform areas will be levelled and compacted in preparation for the casting of foundations.

PROPOSED PROJECT TIMELINE

The timeline for the different phases of the proposed Project include:

- Mobilization phase: 2 months
- Construction phase: 10 months
- Testing and commissioning phase: 3 months
- Commercial operation of the proposed Eldosol and Radiant Energy Power Plants in 2017

THE ESIA PROCESS

An Environmental and Social Impact Assessment (ESIA) is being conducted in order to understand the impacts, both positive and negative, of the proposed Project. Impacts are how the proposed Project will change the area's environment and affect the people living and working there. It also identifies ways to manage any changes that may happen as a result of the proposed Project.

Specific objectives of this ESIA are to:

- Meet National legal requirements as well as international best practice for impact assessments.
- Identify and understand both the positive and negative changes and impacts (e.g., environmental, social impacts).
- Identify ways to avoid, reduce or manage negative impacts, and to enhance the positive impacts or benefits from the proposed Project.
- Involve people who are going to be affected (stakeholders) in decision-making around the proposed Project.
- Help to make sure that the proposed Project is planned better, and is better able to manage environmental and social issues and matters.

The key stages to the ESIA process are:

Screening

This is the first stage of the ESIA, where the proposed Project is screened based on project characteristics and scope.

Scoping

A full Scoping stage is currently being undertaken for the proposed Project. The purpose of the Scoping stage is to determine the scope of studies to be carried out during the ESIA. ERM will also be conducting baseline data collection during this stage.

Impact Assessment

The objective of this stage is to describe and assess how the proposed Project could affect the local environment and people, both negatively and positively, how significant the changes (impacts) are likely to be, and how the impacts can be managed.

Disclosure

During Disclosure the ESIA report will be submitted to the Government of Kenya for review and decision making.

ERM's Role



ERM is a global environmental consulting organisation with over 150 offices in 40 countries and territories employing more than 5,000 people. ERM, the world's leading sustainability consultancy, has operated throughout Africa for over thirty-five years and our Sub-Saharan Africa Business Division with over 200 employees is currently based in South Africa (Cape Town, Durban, Johannesburg and Pretoria), Mozambique (Maputo) and East Africa (Nairobi). ERM East Africa Ltd. is registered with NEMA as a Firm of ESIA/Audit Experts, Reg. No 7264.

The Environmental and Social Impact Assessment (ESIA) and associated Public Participation and Stakeholder Consultation Process will be undertaken by Environmental Resources Management East Africa Consulting Limited (ERM).

PUBLIC PARTICIPATION AND CONSULTATION

Public participation and stakeholder consultation is being carried out to identify and define the different stakeholders for the proposed Projects in Eldoret, Uasin Gishu County.

Stakeholders are defined as any people or groups that either are affected by a Project or are interested in the Project. Consultation with stakeholders is a key part of the ESIA process, with the objective to provide:

- Information about the proposed Project to people who will be affected;
- An opportunity for stakeholders to give their opinions and raise their concerns;
- Stakeholder's regular feedback about the proposed Project.

ERM as independent consultants will run the public participation and stakeholder consultation process. Our team commits to consulting stakeholders according to the following principles:

- *Free:* Stakeholders are free to express their real opinions and concerns without being influenced by other stakeholders;
- *Prior:* Stakeholders are given information before any important decisions are made on the proposed Project. It also allows stakeholders enough time to consider information that they are receiving; and
- *Informed:* Stakeholders are given enough of the right information at the right time to make sure they are able to engage in a meaningful way.

The team will also aim to ensure that the participation and consultation process is open to all people, particularly those that will be affected by the proposed Project.

Your participation will assist in identifying environmental and social consequences of the proposed Project, and ensure that these are evaluated in the ESIA process. This Background Information Document (BID) has been prepared for information purposes only.

ESIA Comment Sheet

June 2015

Should you have any queries, comments or suggestions regarding the proposed Project, please note them below. Please return your comments by 20th June 2015

Return this comment sheet to Arie Wambani of ERM East Africa Ltd:

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant?
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant?
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant?
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant
Do you support the development of the proposed Solar Power Plant?

Title and Name:			
Location From:			
ID Number			
Telephone:		Email	
Signature			

Thank you for your valuable contribution



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED 2 x 40 MW SOLAR PV PLANTS, ELDORET, UASIN GISHU COUNTY, KENYA

INTRODUCTION

Eldosol Energy Limited (Eldosol Energy) and Radiant Energy Limited (Radiant Energy) propose to develop the Eldoret Solar Power Project, comprising 2 x 40 MW solar plants and transmission line connected to the National Grid, located in the outskirts of Eldoret Town, Uasin Gishu County, Kenya. Before they can proceed with development, an Environmental and Social Impact Assessment (ESIA) needs to be completed.

WHO ARE ELDOSOL ENERGY AND RADIANT ENERGY?

Eldosol Energy and Radiant Energy are both solar photovoltaic (PV) independent power producers (IPP) located on the outskirts of Eldoret Town in Uasin Gishu County.

WHERE IS THE PROJECT LOCATED?

The proposed Project will be located in Plateau/ Kipchamo Village, Saroiyoi and Lengut Sub Locations, Kipchamo Location, Kesses Division, Kesses Constituency, Uasin Gishu County. The proposed projects will be located on 601 acres of private land, approximately 13.5 kilometres to the South East of Eldoret Town.



WHAT INFRASTRUCTURE IS NEEDED?

- ◆ Mounting structures and foundation- Solar array support tracking system, screw-foot, rammed poles or concrete foundation, depending on soil conditions,
- ◆ PV modules,
- ◆ MV Transformer- Step-up transformer (400V – 22kV) located in either an outdoor or sheltered housing structure,
- ◆ Inverter,
- ◆ An access road will be upgraded and maintained on the entrance of the site if required, and
- ◆ A 3 meters perimeter road (to be confirmed in later stage) will be constructed for maintenance purpose.

ESIA PROCESS

An ESIA is being conducted in order to understand the impacts, both positive and negative, of the proposed Project. Impacts are how the proposed Project will change the area's environment and affect the people living and working there. It also identifies ways to manage any changes that may happen as a result of the proposed Project.

Key stages to the ESIA process are:

Screening

This is the first stage of the ESIA, where the proposed Project is screened based on project characteristics and scope.

Scoping

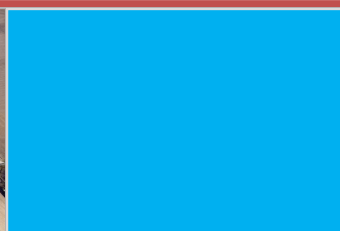
A full Scoping stage is currently being undertaken for the proposed Project. The purpose of the Scoping stage is to determine the scope of studies to be carried out during the ESIA. ERM will also be conducting baseline data collection during this stage.

Impact Assessment

The objective of this stage is to describe and assess how the proposed Project could affect the local environment and people, both negatively and positively, how significant the changes (impacts) are likely to be, and how the impacts can be managed.

Disclosure

During Disclosure the ESIA report will be submitted to National Environment Management Authority (NEMA) for review and decision making.



HOW CAN YOU BE INVOLVED?

1. Attend workshops and public meetings held during the ESIA process,
2. Contact ERM for further information, and/or
3. Send your comments to Ms Arie Wambani of ERM East Africa Ltd, arie.wambani@erm.com or: PO Box 100798-00101, Nairobi, Kenya





WENGEETAB BITONDABEMET AK TUGUK CHE TINYEGEI AK CHITO (ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT) NEBO KAARORUTIE-TAB MAAT NE GONU ASISTA NE TINYEI KIMNATETAB 2X40 MW ENG ELDORET, UASIN GISHU COUNTY, KENYA.

CHE INDOUNE

Eldosol Energy Ltd (Eldosol Energy) ak Radiant Energy Ltd (Radiant Energy) ko kampunisiek aeng' che mi taonitab Eldoret, che meche koibwech bandab tai nobo kimnatet ab asista, nebo megawatisyek aeng konyil artam (2x40mw). Teschin kimnatani national grid nebo emetab Kenya. Kotom kotestai boisiet keae chigilisiet ne noto ko Environmental and Social Impact Assessment (ESIA).

ELDOSOL ENERGY AK RADIANT ENERGY KO NG'O?

Eldosol ak Radiant Energy ko kampunisiek aeng che terter, che chobe kimnatetab kakwengset ab asista (photovoltaic), pv. Aei boisioni ko ichekei (Independent power producers) IPP. Mi kampunisiechu olenekite taunitab Eldoret eng Uasi Gishu county.

MI ANO BOISIONI (PROJECT)?

Kitou boisioni engole kiguree Plateau/kokwetab Kipchamo, Saroiyoi ak Legut sublocation, Kipchamo location, Kesses Division, Kesses Constituency, Uasin Gishu county. Kiteekyin boisioni koret ab chi, ekaisiek bakol lo ak agenge (601 acres) che mi kilomita taman ak somok ak kebeberiat (13.5 km), muret katam kong'asis nebo taonit ab Eldoret.



NEE TUGUK CHEMAGAAT KETEECH SI KISULDAE BOISIONI?

- ◆ Kelumda koitab toloita ak kariik che tonontos chenamei walingenisiekab kimnatetab kakwengseet ab asista. Tiegei itondab ng'ung'unyat.
- ◆ paipisiekab wainik ab kimnatet (pv modules).
- ◆ Transfomaisiek che kiteese kimnatetab maat kong'eetee MV 400v - 22kv, che kiteekyin kot anan ko sang.
- ◆ Nekiwalee kimnatetab AC ak DC (Inverter).
- ◆ Kichobe oret nekibune si keit ole mi boisiet (project).
- ◆ Kiae oret nebo tebesindab kakwautik kelyek somok (3 mtrs), ne robei taban koret ne kiteeche projekt. Nito ko oret ne kibune keboisiek ak keribsee.

KAKWAUTIET AB ESIA

Tesetai chigilisiet ne tinyegei ak tuguk che ibu tekseetab project eng bororiet ak kokwet, che kororon anan che yaach (che ibu asenet), eng biik che meng'isyei ak che aei boisyonik eng yuto.

Kakwautikab kamanut chebo 'ESIA':

Chigilisiet (Screening):

Ni ko kakwautiet ne tai koubei ak mosognatet ab tuguk ak baraindab meng'atet ab boror.

Keweel (scoping):

Tesetai 'ESIA' welelisiet ak chengseetab naet eng ole kiae boisiet si kenai ole borori-onito. Bendi koae data collection biikab ERM.

Walutik che tinyegei ak biik eng projektinito:

Ibe kakwautiet kampunit konegei ak kosir agobo tuguk che terter, che kororon all che yaach, che ibu teekseetab projektinito ak walutik che kiribee ak ketoretee biik ab boror.

Kabartaet (Disclosure):

Eng kabartaet, kigojin National Environmental Management Authority (NEMA) koaror tokyinet ak kotil ngolio.



EGU AGENG ENG CHEBOTO BOISIONI (PROJEKT)?

1. Nyo kanetisiet ak tuiyosiekab ESIA,
2. Kur ak ing'alalji ERM
3. Iyookyi keereng'ung' Ms Arie Wambani nebo ERM. East Africa , arie.wambani@erm.com anan PO Box 100798-00101, Nairobi, Kenya



ESIA Comment Sheet

June 2015

Should you have any queries, comments or suggestions regarding the proposed Project, please note them below.

Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? Decrease in electricity cost & opening up the area for other developmental projects.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? Fewer non skilled jobs as the community will be expecting a lot of jobs from the project
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? loss of agricultural land as no farming will take place
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - fencing of the area - proper sensitization to the community
Do you support the development of the proposed Solar Power Plant? Yes

Title and Name:	Assistant County Commissioner Caroline Andaly		
Location From:	Waring district		
ID Number	23472768		
Telephone:	0720867456	Email	Kanyji_c@yahoo.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? their will creation of jobs opportunity for youths & surrounding Community. Its gratefull to have solar power plant.

What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? due to population their will be basic things needed
(1) water
(2) residents to have power light in their houses or places

What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? there will be no disturbance as this has been well plan with all departments.

Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant

(1) healthy facilities
(2) Security

Do you support the development of the proposed Solar Power Plant?

I fully supported the project becoz it will eradicate poverty.

Title and Name:	CARO KEMBOI		
Location From:	KIPOTAMO		
ID Number	22351657		
Telephone:	0120-220-507	Email	KemCaros@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

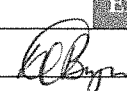
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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? (A) It is going to create job opportunities in the locality. (B) - It will rejuvenate the economic activities within the vicinity. (Locality)
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? (A) There shall be a mass influx of people coming in as employees. (B) Need ^{Basic} clean water, and electricity supply to their residential places.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? (A) There shall be a change in the Ecosystem, in terms of Afforestation. (B) Capacity Increase in schools - (C) Health facilities (Z) population -
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant (A) Build more classroom to accommodate children of the employees. (B) Improve Health facilities around. (C) Assist with the electricity supply for Informal Sector.
Do you support the development of the proposed Solar Power Plant? I do support the project 100% - God bless ELDOSOL God bless RADIANT ENERGY

Title and Name:	DANIEL C. BIRGHE ASST/CHIEF SAEV 07.		
Location From:	KIPCHAMBO LOD. SAEV 07/02.		
ID Number	3308431		
Telephone:		Email	danielchapelbirghe@yahoo.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

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Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? <i>The greation of employment to surrounding Environment, Job opportunities, Road's Accesability</i>
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? <i>There will be a mass and surge, influx of people coming to the proposed site, -</i>
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? <i>- There will be influx of people, means security</i>
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant <i>- we need clean water, There will be the need to have good Roads, maintenance. car for incogences.</i>
Do you support the development of the proposed Solar Power Plant? <i>Total Support, Just wonderful solar power plant.</i>

Title and Name:	<i>Daniel Kiplangat</i>		
Location From:	<i>ASS- Chief Lengut sub-LOC, KIPCHAM LOC</i>		
ID Number	<i>9840314</i>		
Telephone:	<i>0724525777</i>	Email	<i>Daniel.yaro@com</i>
Signature	<i>[Signature]</i>		

Thank you for your valuable contribution

ESIA Comment Sheet

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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? Creation Jobs, Improved financial Improvement of Local Community → Positive (schools) Roads Hospitals Land for Residential, Negative Pressure on Institutions Tourist attraction local-Nationals & International
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? Pressure on existing Institution e.g. school Roads Hospitals, Need for land for Residential, decrease of land for agricultural activities, mushrooming semi urbanization.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? Reduced area of free cover.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant A dispensary be build in or with within the premises, strengthening Corporate responsibility → schools etc Interaction between the Community Investor at times of Disasters etc Funding to assist TVET Nurseries.
Do you support the development of the proposed Solar Power Plant? Totally Support the project.

GEORGE K. TARUS	
Title and Name:	Chief Area → Local Administration
Location From:	KIPKHAMO
ID Number	3312749
Telephone:	Email 0722 660896
Signature	GK Tarus

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

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Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant?

— creation of jobs at the place
— it will improve our economy

What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant?

to improve the existing projects
at the area.

What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant?

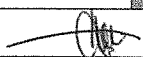
— reflection of the panell
— the cutting of the trees near
the plant.

Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant

— clinic at the area
— improve school in the area
— improve roads

Do you support the development of the proposed Solar Power Plant?

Yes I support fully.

Title and Name:	Andreas Uthig	
Location From:	Kipchamo	
ID Number	12787870	
Telephone:	0722928338	Email
Signature		

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? → Source of employment. → Corporate Social Responsibilities → Source of light. * Due to rise in population - health must be enhanced.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? → Land value goes up. → Improve Peoples living standard through employment. → Transfer of knowledge. - Achievement of vision 2030 goals in electricity.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? people selling land carelessly due to high value. - Increase in population posing insecurity.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant → community participation. → Sustainability of the project. → Ensure the 70/30 constitutional requirement in employment.
Do you support the development of the proposed Solar Power Plant? - 100% Support.

Title and Name:	HON JOSEPHINE TARUS MICA		
Location From:	CHEPTIRET / KIPCHAMBO WARD		
ID Number	14724360		
Telephone:	07121079	Email	micajosephine@yahoo.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

Should you have any queries, comments or suggestions regarding the proposed Project, please note them below.

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Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? - Reduction in the Cost of power - Clean energy
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? - Population rise as people move in search for job opportunities. - Uncontrolled developments around the place by putting up temporary structures.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? - Change in land cover - Soil Erosion
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - Plant cover crops to control erosion.
Do you support the development of the proposed Solar Power Plant? Yes.

Title and Name:	Environment/ Planner - San Kogo		
Location From:	Eldoret		
ID Number	30305320		
Telephone:	0703229444	Email	kogodan@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? - vision 2030 achievement • Employment • Increased power to the national grid. • Sustainable green development.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? • Increased population pressure due to its development. • Loss of natural aesthetics
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? • storm water • Loss of biodiversity.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant • Plan the adjacent land uses compatibility. • Consider more Community Social Responsibilities to the community
Do you support the development of the proposed Solar Power Plant? Yes.

Title and Name:	IDAHSON ABDUL HAMID (Attache)		
Location From:	PHYSICAL PLANNING DEPARTMENT.		
ID Number	27565630.		
Telephone:	0717920893	Email	idahsons@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

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Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? This will benefit schools given that we are transitioning to e-learning and ICT in education.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? - Crimes may go up. - Accidents to school children. - Population migration. - Loss of agricultural land.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? - Micro climate change. - Interference with eco-systems.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - Continuous monitoring of any impact on eco-systems. - Planting of trees. Putting up of AP camp.
Do you support the development of the proposed Solar Power Plant? Yes.

Title and Name:	REBECCA BUTALANYI - CDE.		
Location From:	MINISTRY OF EDUCATION - WINTY.		
ID Number			
Telephone:	0722687200	Email	rkakahi@gmail.com.
Signature	<u>RKB</u>		

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? More power supply will be available.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? NO or minimal negative impact.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? soil erosion through surface run off.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant Fencing the area with most suitable wall all round.
Do you support the development of the proposed Solar Power Plant? YES.

Title and Name:	MAINA SIMON		
Location From:	PHYSICAL PLANNING		
ID Number	30493483		
Telephone:	0734264444	Email	samsuajin@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

Should you have any queries, comments or suggestions regarding the proposed Project, please note them below.

Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? Access to electricity due to provision of more Mega Watts of power, Reduction of electricity bills.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? N/A
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? Waste disposal of the broken panels.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant Proper panels should be used to prevent reflection of light which might cause reflection of light to the people surrounding the area.
Do you support the development of the proposed Solar Power Plant? Yes.

Title and Name:	Modani Diana - Student.		
Location From:	Physical Planning Department.		
ID Number	29681671		
Telephone:	0701566894	Email	dmodani2@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

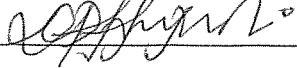
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Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? - Provision of employment to the Locals. - Decrease the power outages hours. - Raise the standard of livelihoods for locals.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? - Power Plant may not meet the Communities' job opportunities' expectations.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? - Rain water harvested by the Pannels would generate run-offs that may cause gully erosion. - Solid waste disposal during Construction.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - Follow ESIA report to the latter. - Compliance with ESIA recommendations. - construction of storm water drains from the plant to the nearest water course.
Do you support the development of the proposed Solar Power Plant? YES.

Title and Name:	Surface Water officer: PETER OKEYO		
Location From:	Water Resources Management Authority		
ID Number	0568517		
Telephone:	0705448971	Email	okeyo@yahoo.com
Signature			

Thank you for your valuable contribution

30/06/15

ESIA Comment Sheet

June 2015

Should you have any queries, comments or suggestions regarding the proposed Project, please note them below.

Return this comment sheet to Arie Wambani of ERM East Africa Ltd

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? Job creation for skilled & non skilled parties, → equalize. reduction of power expenditure.
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? → Utilization of land for power harvest instead of farming & ranching that the country has low food production.
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? → The ground cover by solar panels causing disturbance on plants & other dependent organisms in the ecosystem.
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant Ensure that low or minimal damage to the environment
Do you support the development of the proposed Solar Power Plant? Yes.

Title and Name:	James GITHIKA (Surveyor)		
Location From:	MOMBASA		
ID Number	22519742		
Telephone:	0720398935	Email	jamgithika@yahoo.co
Signature	James.		

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

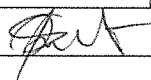
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Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? - Employment - provision of energy
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? - Loss of Biodiversity → Soil erosion → Change of life style
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? - Loss of Biodiversity - Visual effects - Waste
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - Disposal of waste through licensed waste handlers NEMA → Minimal clearance of vegetation
Do you support the development of the proposed Solar Power Plant? Yes

Title and Name:	Simat Nakumi		
Location From:			
ID Number	23029162		
Telephone:		Email	snakumi@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

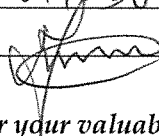
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Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? - creation of employment opportunities - input of more electricity to the national grid
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? - concentration of population leading to misbehavior - Depleting Agricultural land
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? - Noise during construction - Vegetation disturbance - Disturbance of all forms of fauna
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - Buffer the area during construction & operation - Restore vegetation through landscaping afterwards
Do you support the development of the proposed Solar Power Plant? - Yes.

Title and Name:	E. K. Sichei		
Location From:	Kinabiko area		
ID Number	23160612		
Telephone:	02694230	Email	sichei.ephos@gmail.com
Signature			

Thank you for your valuable contribution

ESIA Comment Sheet

June 2015

Should you have any queries, comments or suggestions regarding the proposed Project, please note them below. Please return your comments by 20th June 2015

Return this comment sheet to Arie Wambani of ERM East Africa Ltd:

Email: arie.wambani@erm.com

Postal Address: PO Box 100798-00101, Nairobi, Kenya

What positive impacts do you expect to emanate from the development of the proposed Solar Power Plant? - Reduce dependence on fossil fuel - Reduce carbon footprint - provide energy
What negative socio-economic impacts do you anticipate from the development of the proposed Solar Power Plant? - Introduction of immigrants - High Risks of HIV/AIDS - Relocation and displacement of people
What negative environmental impacts do you anticipate from the development of the proposed Solar Power Plant? - Solid waste generation - Increased consumption of water resources
Kindly propose mitigation measures the Developer needs to put in place during and after the development of the proposed Solar Power Plant - Sensitization and awareness on project impact - put in place RSP.
Do you support the development of the proposed Solar Power Plant? Yes

Title and Name:	County Director of Env. Valentin		
Location From:	NEMA		
ID Number	6780537		
Telephone:	0722985326	Email	vlal@nema.go.ke
Signature			

Thank you for your valuable contribution



RADIANT ENERGY

REGISTER

FOR PARTICIPANTS IN THE COUNTY GOVERNMENT (DEPUTY GOVERNOR'S OFFICE) MEETING.
10-JUNE-2015



ELDOSOL ENERGY

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED 2 x 40 MW SOLAR PV

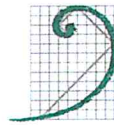
PLANTS, ELDORET TOWN, UASIN GISHU COUNTY, KENYA

PRELIMINARY ESIA STAKEHOLDER ENGAGEMENT CONTACT LIST

June 2015

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9	Silas TARRS	UG County	Director Governor Press	0721267573	Gov.
10	Robere Ngisirei	UGC-CANDIDATE	CEC CAND	0722690401	slitarrs@gmail.com

ngisirei@gmail

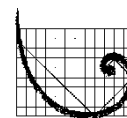


ERM

1/10

<i>Subject/Ref</i>	Minutes of Stakeholder Meeting with the County Government of Uasin Gishu for the EISA of the Proposed 2 x 40 MW Solar PV Plants (Eldosol Energy Ltd and Radiant Energy Ltd)
<i>Venue</i>	Office of the Deputy Governor, Uasin Gishu County
<i>Date of Meeting</i>	Wednesday, 10 th June, 2015
<i>Present</i>	Governor, Deputy Governor, C.E.C Environment, Water & Energy, Radiant/ Eldosol CEO & Directors, NEMA Dir, Chief Plateau Location and ERM study team
<i>Distribution</i>	Public
<i>Date</i>	16 June 2015

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Attendance Register follows these minutes.

Introduction

Dr. David Langat (DL) welcomed attendees to the meeting, outlined the purpose of the meeting and explained that the meeting was a courtesy call to inform the County Government of Uasin Gishu about the proposed solar PV Projects. DL led the participants of the meeting through introductions as well as welcoming the stakeholders to the meeting. He noted that this was an initial introductory meeting and follow up face to face interviews with stakeholders would follow. DL then invited the CEO of Radiant and Eldosol Energy Santiago Villamizar (SV) to present the proposed projects.

Project Description

SV gave a brief description of the proposed Projects. He noted that the Projects are currently in the pre-development stage. Pre-feasibility studies, as well as financial modelling, preliminary solar studies and yield estimations have already been completed.

During the pre-development phase the following activities are currently being undertaken:

- Detailed Feasibility Study;
- Interconnection Study;
- Procurement of necessary permits and licenses;
- Draft Power Purchase Agreement (PPA) under review;
- Engineering, Procurement and Construction (EPC) contractor negotiations;
- Technical Design of the power plant; and
- Environmental and Social Impact Assessment (ESIA).

He further added that the purpose of this meeting was to meet the legal requirement of public participation throughout the ESIA process and also to ensure that the proposed project is understood and is inclusive, meeting the best practice standards- both nationally and internationally. He invited Callie Philips (CP) from ERM to give a brief of the ESIA process and introduce ERM as the client's Environmental and Social Consultants to the project.

Environmental and Social Impact Assessment (ESIA) Process

CP briefly explained the ESIA and associated public participation process. She indicated the different stages of the ESIA process and current progress towards submission of the two (2) Project Reports to the National Environment Management Authority (NEMA) for the Radiant and Eldosol Energy Limited proposed projects. She explained when and how public input is sought throughout the process and emphasised the importance of such, for an integrated decision-making process.

Facilitated Discussion

The points raised during the introductory presentation were discussed in more detail during the facilitated discussion that followed. These points as well as further points raised and discussed are recorded below.

Comments/ Concerns Raised:

- *Surface Run-off*: Deputy Governor: - The area has a gentle slope, known

Response:

CP: the panels will be mounted on the ground with allowance for water to

for water settling around the low laying area of Ngeria Dam. What is the management plan for the drainage at the Power Plant with the water collected on the panels?

- *Rain water harvesting:* Governor: - Let us look into harvesting the run off and rain collected by the panels. The UG Government can work out modalities to develop the run-off in to good use (agricultural crop irrigation).
- *Local Contractors:* Governor: - It is important to include the local contractors in the building and construction of the Plants. This will ensure that local economy is supported and capacity for such projects is built up in the County and Nationally.
- *Power provision/ development:* Deputy Governor: - The proposed project is very important for our country. Affordable electricity will help boost the Country's economic growth. The National and County Governments are working hard to ensure that electricity is accessed in an affordable way as we move from diesel powered electricity (that is expensive).
- *Capacity building and University Collaborations:* Governor: - The County Government is in collaboration with Moi University sponsoring 150 students through different engineering programmes to create a pool of local capacity and skills. The proposed project can be a good opportunity to educate and build capacity on solar power technologies, for future generations.
- *Site selection:* Governor: - The proposed project site is best suited in the whole world because of the adequate climatic conditions in the region. Uasin Gishu County is more than ready for development.
- *Business Development:* Governor:- The C.E.C Environment will represent the UG Government is all requirements needed as per the law-

percolate naturally to the ground level as shown in the Background Information Document (BID). All water channels will be observed and taken into account.

SV: We will look into the project timelines and activities and use local contractors where practically possible. Most of the installations are preforms manufactured outside the country. These materials will be shipped in and transported to site where installation will occur.

SV & DL: We as investors want to play our part in developing the County and Country. We hope that the success of this 2x 40MW Plants will be a showcase for solar projects in the County and East African Region.

SV & DL: We can look at the opportunity and consider the development of internship programmes to support the capacity building initiative.

DL: The area is very favourable, there is another independent developer proposing to develop a 40MW Solar Plant close to the Radiant/ Eldosol Energy land.

CP: We will be consulting the C.E.C Environment as well as all other departments in the stakeholder engagement process.

from the different Government Departments and Ministries (Energy, Lands & Planning). We need to move together as development partners in order to empower our local economy.

- *Impact on Agriculture:* Deputy Governor: - Plateau area is an agricultural land area. The County government passed a regulation policy on land use- that zones the different areas of the County. The County will have to approve the proposed plan. The NEMA director at this meeting will have to approve the ESIA report to ensure that all negative impacts are mitigated and controlled to protect the communities and the environment.

SV & DL: All plans will be done by registered Planners and all approvals from the County and at the National Level will be sought after. All processes will be followed to the letter.

CP: We will be seeking an audience with all the department heads with the assistance of the NEMA Director in order to consult and ensure participation of all stakeholders, both at the County and Sub County level.

County Director Environment (NEMA), Mr. V. Lala: - We shall be in touch with the ESIA consultant and plan a meeting at the NEMA boardroom, inviting all the relevant heads of departments.



HEADS OF DEPARTMENTS' MEETING
ON 11-JUNE-2015
VENUE: NEMA (UG) OFFICES ELDORET

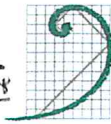


ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED 2 x 40 MW SOLAR PV PLANTS, ELDORET TOWN, UASIN GISHU COUNTY, KENYA

PRELIMINARY ESIA STAKEHOLDER ENGAGEMENT CONTACT LIST

June 2015

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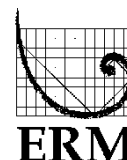


ERM

2/10/15

Subject/Ref	Minutes of Meeting: County Departmental Heads/ Representatives in Uasin Gishu County for the EISA of the Proposed 2 x 40 MW Solar PV Plants (Eldosol Energy Ltd and Radiant Energy Ltd).
Venue	Office of the County Director Environment- NEMA Boardroom- UG
Date of Meeting	Thursday, 11 th June, 2015
Present	Radiant/ Eldosol CEO, Frontier Investment Representative, NEMA Director, Representatives from the Heads of Departments Offices and ERM study team
Distribution	Public
Date	16 June 2015

Landmark Office Suites
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Lenana Road, Kilimani
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Kenya



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Attendance Register follows these minutes.

Introduction

The County Director Environment- Mr. Valentine Lala (VL) welcomed attendees to the meeting explained that the meeting was a courtesy call to inform the County Departmental Heads from Uasin Gishu about the proposed projects in the County. VL led the participants of the meeting through self-introductions as well as welcoming the Proponent and Environmental Consultant (ERM) to the meeting.

VL invited the ERM study team- Callie Phillips (CP) and Michael Waweru (MW) to give information regarding the proposed projects and welcomed the Proponent representative Santiago Villamizar (SV) to present the proposed projects.

Project Description

MW thanked the NEMA Director for inviting the participants as well as hosting the meeting. MW informed the meeting that the aim of the Background Information Document (BID), handed to each participant, was to provide the stakeholders information about the proposed projects.

SV gave a brief description of the Project. He noted that the proposed Project is currently in the pre-development stage. Pre-feasibility studies, as well as financial modelling, preliminary solar studies and yield estimations have already been completed. SV stated that the purpose of this meeting was to meet the legal requirements regarding public participation throughout the ESIA process and also to ensure that the proposed project is understood, meets with best practice standards- both nationally and internationally.

Environmental and Social Impact Assessment (ESIA) Process

MW explained the ESIA and associated public participation process. He indicated the different stages of the ESIA process and current progress towards submission of the two (2) Project Reports to the National Environment Management Authority (NEMA) for the Radiant and Eldosol Energy Limited projects. MW informed the meeting that the ESIA process was at the scoping stage and additional stakeholder meetings will be held at a later stage. MW explained when and how public input is sought throughout the process and emphasised the importance of such, for an integrated decision-making process.

Facilitated Discussion

The points raised during the introductory presentation were discussed in more detail during the facilitated discussion that followed. These points as well as further points raised and discussed are recorded below.

Comments/ Concerns Raised:

- *Land acquisition and change of land use:* What is the land acquisition status

Response:

SV: The land has been acquired from the local investor by Radiant and

and has the proponent changed the user through the County Government Physical Planning Department.

- *Neighbouring 40MW Power Plant Development:* The neighbouring proponent has not yet concluded the change of user due to land acquisition issues. The developer has conducted an EIA. Kindly do follow due process when dealing with land in UG.
- *Corporate Social Responsibility (CSR) Plans:* What are proponent's strategies to engage and empower the local community? Other projects in UG have had to amend their plans to take into account CSR and local hiring.
- *CSR Ideas Given:* The following CSR ideas should be considered for the Radiant and Eldosol Energy CSR strategies:
 - *Upgrade of access roads*
 - *Hospital/ Health Centre Improvement*
 - *Improvement of Local Schools (including Mogojoret in Kipchamo Location)*
 - *Irrigation schemes (with intense small scale farming- green houses)*

Eldosol Energy Limited; and the land is under *Change of User* processing, being led by a local physical planner. In addition, building permits and the EIA Permit are being sought.

SV: Noted, all processes are and will be follows to the letter. SV indicated that the other Project is separate from the Radiant/ Eldosol proposals.

SV: All the suggested ideas will be considered as we develop our CSR strategy.

It was proposed that the Project worked with the other developer in Plateau to maximise CSR benefits.

- *Water Use:* All water abstraction will have to be approved by the Water Resource and Management Authority (WRMA). Will you be collecting any climatic data from the area?
- *Surface Run Off:* There is a need to manage the surface run-off from the panels; drainage within the facility will have to be well considered to

CP: The proposed project is not water intensive so all applications will be done on an as needed basis.

SV: The detailed design of the proposed Solar Plant will consider the volumes required at all stages (construction and operation). We are installing a metrological station to monitor and collect climatic data. We are more than willing to share the data with any relevant agency.

CP: The design of the proposed facility's panel mounting setup allows the surface water to percolate through the soil. As indicated in the BID the

avoid excess storm water to neighbouring lands as well as collection of run off from the panels.

- *Waste Management:* Any toxic waste from the materials brought in and installed onsite should be controlled-transported, stored and managed properly.
- *Local Waste Recyclers:* Eldoret has local paper, plastic and metal recyclers. It would be good for the proponent to work with local vendors in the management of waste. All waste handlers have to be registered with NEMA.
- *Health:* The EIA needs to consider potential health impacts associated with radiation and potential toxins from waste water as well as the disposal of waste as there have been issues in UG with waste disposal from factories
- *Environmental and Community Health and Safety:* Being an unknown development and technology. It is important for the ESIA study team and NEMA to *protect* the community and to ensure that all unknown impacts and effects of the Solar PV Plant are mitigated. We are ready for development, but we also have to be cautious of the new things/developments we accept as a County and as a Country.

panels are mounted on a small concrete blocks at the base of the panel.

SV & CP: The ERM study team will include waste management in the Impact Assessment and the Environmental Management Plan (EMP).

SV: The project is reviewing which facilities it can use to handle waste.

CP: Health impacts will be considered in the ESIA. However, the panels will not emit radiation but absorb it.

Lars Jensen (LV) Frontier Invest: As a project investor/ financier we are very much involved with Renewable energy technologies, which we have seen work in other countries. We have the community and the environment at the core of our investment focus and that is why we have the best global environmental firm to do the EIA- to meet both international and Kenya standards in sustainable development.

VENUE:

CHIEF'S OFFICE - KIPCHAMBO

11⁰⁰hrs

2.00 pm

11 / JUNE / 2015



RADIANT ENERGY

LOCATION



ELDOSOL ENERGY

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED 2 x 40 MW SOLAR PV PLANTS, ELDORET TOWN, UASIN GISHU COUNTY, KENYA

PRELIMINARY ESIA STAKEHOLDER ENGAGEMENT CONTACT LIST

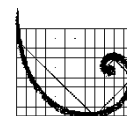
June 2015

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5	GEORGE K. TARUS (AREA CHIEF)	KIPCHAMBO	AREA CHIEF	0722 660896	Box 2148 ELB
6	JOSEPH K. RONO (CHIEF PLATEAU)	CHIEF ADMINISTRATION	CHIEF PLATEAU	0723 503466	Box 82 KAPTHAGIA
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8	ELIZABETH C. SANYI	SAROIYOT	Former CHIEF	0723 710112	elizabethc@kalooc.com
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10	Esther TOO	SAROIYOT	"	N/A	

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12	DINAH KERINGA	KIPETAMU	Community Member	0712298545	—
13	ELUATH ROTICH	KIPETAMU	Village Elder	0705654176	—
14	JOEL TOO	KIPETAMU	Community Member	0723584155	—
16	JONATHAN LETTING	KIPETAMU	Community Member	0726591311	—
17	STANBACK TANDU	KIPETAMU	Community Member	07265371258	tanuiskachack@yahoo.com
18	JULIUS MISON	KIPETAMU	Community Member	0726744357	—
19	MILSON NGETICHA	STEPKICEN MBOSEP	Community Elder	07285-061973	—
20	JOEL NUREI	KAPSINENWIE	Community Member	0710-553803	—
21	EMMY NGETICHA	KIPETAMU	TEACHER	0728933157	—
22	PHILIP K. CUGUE	KIPETAMU	VILLAGE ELDER	0721-735302	—
23	CHRO KEMBOI	KIPETAMU	BOARD ASSISTANT CHIEF OF VILLAGERS BOARD	0720-220507	—

<i>Subject/Ref</i>	Minutes of Meeting of the Chief and Elders of Saroiyoi Sub location, for the EISA of the Proposed 2 x 40 MW Solar PV Plants (Eldosol Energy Ltd and Radiant Energy Ltd)
<i>Venue</i>	Plateau Sub-location
<i>Date of Meeting</i>	Wednesday, 10 th June, 2015
<i>Present</i>	Chief and Elders Plateau Location and Sub-location, Frontier Investment, Radiant/ Eldosol CEO & Directors, and ERM
<i>Distribution</i>	Public
<i>Date</i>	16 June 2015

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Attendance Register follows these minutes.

Introduction

The Area Chief welcomed attendees to the meeting and explained that the meeting was a courtesy call to inform the communities about the proposed projects in their area. The Chief (supported by ERM) led the participants of the meeting through introductions as well as welcoming all participants to the meeting, noting that this was an initial introductory meeting and follow up meetings with stakeholders would follow.

The CEO of Radiant and Eldosol Energy Santiago Villamizar (SV) was invited to present the proposed projects.

Project Description

SV gave a brief description of the Projects: 2 x 40MW solar projects located on in Saroiyoi sub-location (Kipchamo Village). He noted that the proposed Projects are currently in the pre-development stage and that a number of studies are being undertaken to inform the development of the proposed project.

Lars Jenson (LJ) outlined the role of Frontier Investment in the proposed Projects and the importance that the Projects placed on managing the Environmental and Social impacts and the involvement of stakeholders including the community.

David Langat (DL) welcomed the participants and explained the purpose of the Projects and the value that they would bring to the County and Country. He called on the communities to work with the Project to ensure the Projects' success.

Environmental and Social Impact Assessment (ESIA) Process

Callie Phillips (CP) from ERM briefly explained the ESIA and associated public participation process, including that this meeting is being held to meet the requirements for public participation in the ESIA process. It was explained that this is an initial meeting and that the team will return to hold meetings with the wider community to explain the Project.

Facilitated Discussion

The points raised during the introductory presentation were discussed in more detail during the facilitated discussion that followed. These points as well as further points raised and discussed are recorded below.

Comments/ Concerns Raised:

- The community is ready to work with the team and welcome the Project and plan in place for the local community.
- The Projects should inform the community about what they will need in terms of employment and contractors so that the communities can prepare themselves.
- The communities want to benefit

Response:

SV thanked the participants for their positive reception to the Projects and stated that the Projects would contract local people were possible. He said that they were looking to develop a CSR strategy for the Projects which would include consideration of education.

from the Projects and own the Projects.

- Will the Projects provide energy to the local communities?

SV explained that the energy produced would feed into the transmission line between Turkwell and Lessos Substation and that Kenya Power are responsible for the sale and distribution of power. As IPPs the Projects cannot sell or provide power directly to communities.

- Impacts associated with the Projects need to be considered carefully to ensure they do not occur especially as this is new to Kenya. It is important that NEMA gives approval.

DL committed to working with the communities to improve their connection to the existing network. CP explained the ESIA process and that the Projects are in the initial phases, as such approval has not been given but the Projects were going through the permitting (licensing) process. As part of the ESIA all impacts would be considered and if needed mitigation would be developed.

- The participants welcomed the Projects and showed the sign of acceptance for the Projects.

SV thanked the community for their response and committed to working together.

- The community outlined that the biggest challenges faced are:
 - Access to water for households: during the rainy season the road are blocked as the area becomes water logged and during the dry season there is a lack of access to water.
 - Lack of access to health care facilities contributes to the high rate of diseases. The hospital is far away and while there is a plot of land that has been earmarked for a hospital it has not yet been developed. The nearest facility is Plateau Mission.
 - Schools –There are enough schools but they lack facilities i.e. classrooms so children of different ages are in one room. Text books, laboratories and desks are also not sufficient. The

SV introduced Letting Antibus as the local point of contact for the Project. SV stated that the Projects would consider these needs in developing a CSR strategy.

Project would need to review each school to determine its needs.

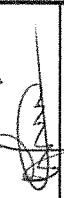
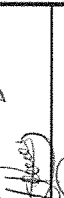
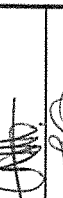
- Power- there are very few homes that have access to electricity due to the cost.
- Some of the chiefs' support orphans in their villages and would welcome support with this.

- The Ward Assistant for the MCA welcomed the team to the areas and stated that the MCA offered their support. They are aware of the Projects and welcome it to the County

SV thanked the Ward Assistant

Closing Remarks: the Chiefs, Elders and respected people promised to inform the communities about the proposed Projects and honestly relay the information that they had heard.

It was agreed that the Projects would inform the representatives (and communities) about when they would return to the communities to undertake further meetings and baseline data gathering activities.

STAKEHOLDER CONSULTATIVE MEETING REGISTER					
 ERM East Africa (Pty) Ltd Landmark Office Suites 4th Floor Laiboni Centre Lenana Road Kilimani PO Box 100798-00101 Nairobi Kenya T + 254 20 49 38 113/4 www.erm.com <i>The world's leading sustainability consultancy</i>	CLIENT	RADIANT & ELDOSON ENERGY			
	PROJECT	RADIANT & ELDOSON SOLAR PLANTS			
	DATE	30/06/2015			
	VENUE	BOMA INN HOTEL ELDORET			
	TIME STARTED	11 - 12 AM	TIME ENDED	1 PM	
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CLIENT

PROJECT	RAD1ACT 2 ELDOSOL SOLAR PLANTS
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VENUE
BOMBA INN HOTEL ELDORET

TIME STARTED	TIME ENDED	TIME
11 AM		7 PM

Organisation

PHYSICAL PLANNING

PHYSICAL PLANNING

STUDENT

dmrdani2@gmail.com

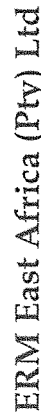
Designation

Email Address

INDEX

Signature

17 AM	TIME ENDED	7 PM
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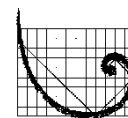
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STAKEHOLDER CONSULTATIVE MEETING REGISTER

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<i>Subject/Ref</i>	Minutes of the Stakeholder Meeting with the Government Representatives for the ESIA of the Proposed 2 x 40 MW Solar PV Plants (Eldosol Energy Ltd and Radiant Energy Ltd) in Uasin Gishu County
<i>Venue</i>	Boma Inn, Eldoret Town
<i>Date of Meeting</i>	Wednesday, 30 th June, 2015
<i>Present</i>	See attendance register
<i>Distribution</i>	Public
<i>Date</i>	30 th June 2015

Attendance Register follows these minutes.



ERM

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Introduction

The CEO of Radiant and Eldosol Energy Mr. Santiago Villamizar (SV) introduced himself, which was followed by the attendees introducing themselves. SV outlined who Radiant and Eldosol Energy are, specifically that they are separate Solar PV Projects that will share facilities. SV outlined who the various technical consultants are, and who the project sponsors are.

Project Description

SV then outlined:

- Where the Projects will be located administratively (including a map of the 2 project locations),
- The type of infrastructure to be used and specifically the type of solar panels - he noted that the panels do not produce any noise / air emissions, and are fixed structures,
- That they aim to generate energy for 25 years,
- The way in which the energy is produced from the solar panel through to the export to the grid, and
- The timescales of the project outlining from pre-feasibility studies conducted in 2014 through to operations starting in 2017.

David Langat (DL) followed on from SV as follows:

- He thanked the audience for attending the meeting. Outlining that as an Investor, he was also planning to conduct other projects within the County, such as Eldo City,
- He noted the importance of power production in line with the national strategy to increase power production, and overall importance for the county's economic development,
- Noted about employment opportunities' and aligning to constitutional rights, and ensuring that there are different level of employment and transfer of knowledge, and
- Noted the importance of investing 'at home'.

Environmental and Social Impact Assessment (ESIA) Process

Callie Phillips (CP) from ERM briefly explained the ESIA and associated public participation process. She requested attendees to sign in the attendance register and also fill in the comment forms. She noted that the output of ERM's studies will be submitted to NEMA for approval. She:

- Outlined the process that has been followed so far, and ERM have conducted to date,
- Described the baseline environment, and social environment from the PPT slides including photos,
- Outlined the potential impacts of the project, noting land use & land take, employment opportunities, and visual impacts noting that the panels won't create glare, air and noise emissions during construction, waste disposal, soil erosion, and
- Noted the end of the presentation and handed the floor to attendees for any questions / concerns.

SV noted that after 25 years, the panels can be removed and the land returned to agricultural use. He also noted that the panels do not break and do not cause

pollution.

Facilitated Discussion

The points raised during the introductory presentation were discussed in more detail during the facilitated discussion that followed. These points as well as further points raised and discussed are recorded below.

Comments/ Concerns Raised:

NEMA – Waste Department

- How are you going to dispose of waste at the end of the 25 years
- Will any people be resettled and will there a RAP?
- Does it interfere with airport and airplanes coming in?

Response:

SV explained that the change of land use was in process

CP explained that the disposal would be carried out in line with the regulations and that the Proponent would use licensed facilities. At the end of project life-span studies will be done to look for the right facilities.

SV responded that after 25 years, the panels would not be as productive as right now. The panels (or the components) can be sold or used elsewhere

CP explained that Site is on private land with one owner so there was no need to do RAP. However, for the interconnection (transmission line) ERM would carry out careful studies to avoid physical resettlement and minimise economic resettlement.

SV stated that the panels don't reflect and shouldn't interfere with airplanes. He also clarified that the airport is 12 km away from the Site. CP explained that the last time ERM were in the field, they met with the Kenya Civil Aviation Authority (KCAA) and were consulting them.

Water Resources Management Authority:
Management of storm water from the panel tops, and how will this be directed to the nearest water source? To ensure there is no soil erosion.

CP explained that the existing drainage channels will remain the same and that there would not be a change in the water patterns

DL stated that the water would run off and within the panels there will be drainage channels that direct the water into closest river.

A participant asked whether the use of steel on the panels would cause glare /

SV explained that the steel would not create glare, and explained that the

eyesore to the community

Physical Planning Department:

What made it suitable for you to choose the site? Eldoret's climate varies from time to time, and will you be able to maintain the output?

NEMA Waste Department

Is there any effect of 2 solar plants being next to each other?

Water Resources Management Authority (WRMA):

- Note to the leaders: the job opportunities are minimal as well as the fact that power isn't sold directly to the community.
- Therefore the local leaders should sensitise the communities to manage their expectations.

Governor:

- What other CSR plans do you have?
- What effect does the reflection have on communities and the environment?

NEMA:

- Will there be any effects on birds? E.g. any shocks if they land on the

same equipment is used in airports.

SV: Eldoret has good radiation in comparison to other areas. Clouds are thin, and that informed the decisions. It was also informed by the land and proximity to the land, and was advised by KPLC due to energy requirements. SV explained that there is no impact. In fact makes sense to share resources. He also mentioned the Alten Power Plant nearby and their hope to share the same transmission line. SV explained that there will be some skilled and non-skilled jobs. He also explained that they are not able to go against Kenya Power in terms of providing directly to the community.

DL mentioned that Kenya Power had carried out surveys on site, and they have made people aware of the fact that it will be directed to the national grid. He also explained that Uasin Gishu County will be one of the most solar power producers, and that the County will be important for this. He mentioned that the panels will require cleaning and therefore will require workforce to clean them.

SV explained that the panels do not reflect light; they instead absorb the light rather than bounce it off. The steel components, aim to ensure there is no glare or corrosion. The community will get used to it as well, as it doesn't have any impacts in terms of sound, reflection etc.

CP explained that project studies will start to look at what types of projects will be relevant for the area, and then the project will review that, and develop their strategy.

SV explained that the CSR activities would be strategic and not just ad hoc. There will be direction and strategy to it. The CSR has to be sustainable over the period of 25 years.

CP: the studies done by ERM earlier in the year was to identify where the site should be located, so this informed

panels?

where the site would be located, and away from the cranes and the wetlands.

SV: explanted that there would be no shocks if birds land on them.

1.1

CLOSING COMMENTS:

Stakeholder Closing Comment

SV	Thanked everyone for coming and for everyone's time.
DL	Apologised for the Governor not being able to attend as he was attending a funeral. He explained that the Governor would join the community meeting.
WRMA	He stated that the Project has value to the national development. On behalf of WRMA, he noted that the Project would not require a lot of water. He also explained that however if water is required it can be applied for at the WRMA office
DL	He explained that 2 issues came up with regards to the community meetings: water and power and appealed for Government leaders to take this into account.
NEMA	Thanked everyone for coming. Explained that NEMA's main role is to bring coordination. Under EMCA there is requirement for public consultation, which NEMA will review. Explained that the Project is very beneficial and NEMA does not foresee negative impacts.
Chief from Chiptamo	Privileged particularly for the job creation and potential CSR activities, particularly infrastructure such as roads. With regards to jobs they will also be looking at whether there is value addition in the area. Areas of focus also include areas of need including needy children for example and how the Company can help them (as they have seen it from other investments in the area).Mentioned that aim for areas to be a tourist attraction as well.
Participant	Thanked everyone there and the Investors who have decided to invest in Kipchamo. Thanks to God for the investors coming to Kipchamo, and ensuring that there is support and goodwill from the local leaders. Also happy to we have the NEMA and WRMA . Water in the area is not an issue as there is a line of water coming to the Kipchamo. Employment a challenge in the communities with the need to emphasise the Constitutional right of 70% from the community and 30% from elsewhere. Mentioned that there is going to be increase in land value, and so Stakeholders have to educate people not to sell their land just like that. Assured people coming to Kipchamo that they support the Project, and it is a pilot project in the area.
Deputy Governor	Delighted to attend the meeting. Cannot understate the importance of public participation, and the importance of involving everyone in the project. The issue of CSR is very important and that the community benefits from the project. There is a small trading centre that should be supported.

Negative impacts should be balanced by mitigation of the impact. Emphasis on the issue of job opportunities: where possible give the job to the community as there are people who are educated and skilled. The community will resist the change if they don't understand, so it is the chief's responsibility to ensure that they do. The community should not sell their land as they should wait for the land to appreciate.

Helen Langat The Project is going to benefit the community and bring about positive change.

**Gilbert
Langat** Thanked everyone for attending the meeting



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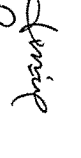
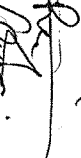
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CLIENT		RADIANT & ELDO SOL ENERGY			
PROJECT		RADIANT & ELDO SOL			
DATE		30/06/2015			
VENUE		PLATEAU VILLAGE			
TIME STARTED		2:30	TIME ENDED		
Name		Village / Location	Telephone No.	ID No	Signature
Francina Kiboi		Kipchamo	0711 253255	25922039	Kiboi
Mercy Samoei		Kipchamo	0711 253255		
Pauline Sano		Kipchamo	0710 444011	3312545	
Grina Tunoi		Kipchamo	0717 003937	28808283	
Nancy Baroo		Kipchamo			
Caroline Talam		Kipchamo	0720 039018		
Vahnan Brauer		Kipchamo	0717 866518	28704032	
Abiel Kipimui		Kipchamo	6724 815 005	28581337	
MAGBATHI JEPKOR Bhabiror		Kipchamo	0715 214891		
STEPHEN KIBET GIBOBI		Kipchamo	0727 119597	9840313	
ISMAEL K Mutui		Kipchamo	0721 800 393		
ERICK K. Kipchoge		Kipchamo	0723 100771	10744201	
Micah Kibet Chemingot		Kipchamo		9840269	
PAULINAH JEDLETING SEREN		Kipchamo	0701963956	20687754	
NODAS J. SANG		Kipchamo	0725296020	20802507	
Plumber Sammy K. nabe		Kipchamo	0729 898130	22398375	

NAME	VILLAGE	TELEPHONE NO	ID NO	SIGNATURE
John K Masing	Mosop	0721809380	4898773	
Thomas K. Sima	Mosop	0722920913	21921116	
Joseph K. Sade	Kipchamo	0725149095	22209978	
Peter K. Kego	Kipchamo	0729521879	28295901	
Jervaniak Ngey	Lengu	0716650750	5292865	
Baniel misoi	Kipchamo	0729451957	1444086	
James TARU	Kipchamo	0734519222	12468520	
Richard Sade	Kipchamo	0725335879	25371885	
Chedviri Kosgei	Kipchamo	0703444487	25372514	
Shackell (Tano)	Sehket	0726871258	22690221	
Machomo CHACHA	Sehket	0713165850	13061413	
KENNEDY ALGO	SEHKET	0726972146	20175381	
ROBERT TIRAU	Kipchamo	07163378543	28223111	
BENJAMIN MIPANO TAD	MIPANO	0704916962	2321072	
ERIZABETH MPTU	"	0725208154	21503324	
NOAH Mura	Kipchamo	0720550002	2431081	
CHARLES K. TARUS	Kipchamo	0721446365	3308746	
JOSEPH BARKEREN	Kipchamo	072259702	12683396	
DANIEL KIRWA RUTO.	PLATEAU	0721434579	12633509	
DANIEL KIPKENTBI SAMOEI	CHIMENY	0721123449	23762046	
DANIEL MICHAEL CHERKUNY	KIPCHAMO	0720896045	20057470	

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	PROJECT	RADIANT & ELDO SOL SOLAR PROJECT			
	DATE	29.06.15			
	VENUE	PLATEAU			
	TIME STARTED	2.30PM		TIME ENDED	
	Village / Location	Telephone No.	ID No	Signature	
1	Paul Kipchumba Kusgei	0716-123889	7139847		
2.	cheruiyot Kinetto	-			
3.	ALEX MAJTIM	0728127164	3312491		
4.	MRS VIVIAN KIPROTICH	0716455296	20710026		
5.	PAUL K. KOECH	0705954604	6446911		
6.	Eunice Serfer	0751349422	27456736		
7	Susan Tanes	0712009279	20476523		
8	Esther Jemutai Mugeo				
9	Emmanuel KIPRAP	0702580625	31263856		
10	Mblat CHEPTUM	0728043479	26631396		
11	DANIEL KIRWA BUTA	0721434579	12633509		
12	MARIKO KOTUT	080713110166	1117900		
13	Philip thumo	0725571647	12466988		
14					

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PROJECT		RADIANT & ELDOSOL SOLAR PROJECT			
DATE		29.06.15			
VENUE		PLATEAU			
TIME STARTED		2.30 PM		TIME ENDED	
Name		Village / Location	Telephone No.	ID No	Signature
JAMES KOSGAI			0711423820	30720271	<i>[Signature]</i>
CONVINUS KUPUTOO			0724176796	30973291	<i>[Signature]</i>
RUTH K WILSON			0725229071	24426700	<i>[Signature]</i>
EMMANUEL K. BETT			0720276327	24468090	<i>[Signature]</i>
JANUS TAVUS			072419010	22728185	<i>[Signature]</i>
FRANCIS K. LIBEL			0724785699	22493016	<i>[Signature]</i>
NICHOLAS KIWAN			0723878176	23123228	<i>[Signature]</i>
KOSGAI R. Keler			0727659408	24146385	<i>[Signature]</i>
Philip K. Muge			0720580308	23211974	<i>[Signature]</i>
WILLIAM K. TALLAM			0722211160	3315082	<i>[Signature]</i>
NABU BANDAIBAS.			0725291126	11180338	<i>[Signature]</i>
JOEL MOO			0719583723	3309828	<i>[Signature]</i>
David K. NGOSASE			0711280028	6875082	<i>[Signature]</i>
PHILIP ARUSEI			0710695041	3312898	<i>[Signature]</i>
MIPRONO SIKENGEI			0704336226	3320457	<i>[Signature]</i>

NAME

VILLAGE

TELEPHONE
NUMBER

ID
NUMBER

SIGNATURE

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	PROJECT	RADIANT & ELDOSOL ENERGY SOLAR PROJECT	
	DATE	29.06.15	
	VENUE	PLATEAU	
	TIME STARTED	2.30 PM	TIME ENDED
Name	Village / Location	Telephone No.	ID No
1 Kimoi Kotuit	Kipchamo		
2 Susan Lagat	Kipchamo		
3 Chepkurung Chelumen Tubek'yo	Kipchamo		
4 STELLAH CHEROTICH	Kipchamo	0710338266	31408428
5 JOSPHINE SANG	Kipchamo	0707849731	
6 WINNIE KOECH	Kipchamo	0707827196	3321289
7 ELLEN YEGO	Kipchamo		
8 ELZARETH TUD	Kipchamo	0710951900	17204640
9 CAROLINE LAGAT	Kipchamo		26108635
10 CHRISTINE KIPLAGAT	Kipchamo		12486476
11 REBECCA JERING	Kipchamo	0728454255	28143365
12 Naomi Chepkurung	Kipchamo	0723746179	20705359
13 ESTHER TARUS	Kipchamo	072	
14 ELIZABETH TARUS	Kipchamo	07	
15 EUNICE TARUS	Kipchamo	0704387523	

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	PROJECT	RADIANT & ELDOSOL SOLAR		
	DATE	30/06/2015		
	VENUE	PLATEAU VILLAGE		
	TIME STARTED	2:30 PM	TIME ENDED	
	Village / Location	Telephone No.	ID No	Signature
Norah Lagumbar	Langut	0710262496	25195034	
SAMUEL KIPCHUMBO	Langut	0729977457	22124691	
JOSEPH ELEMEN	-	0711327116	-	
Gideon Birnot	Kipchamo	0727377151	20294581	
Miso Kibet	Kipchamo	0724441600	14527245	
James Same	Kipchamo	0723385457	20687953	
ELKHANA BEIT	KIPCHAMO	0725730911	21646329	
NICHOLAS KIPROTU KENYOTICH	Kipchamo	0711453380	25366096	
Kiplono Misol	Kipchamo	0723094614	37815512	
MULTON KIPROTICH	Kipchamo	0724936357	31863104	
Julius KIPKAGET SONGOK	Kipchamo	0723493924	22301157	
PATRICK MWHI	Kipchamo	0726639829	23460329	
DAVID KIPKORIR KIMBO	LANGUT (Mogor)	0728543696	3313142	
PATRICK KIPROTICH	Kipchamo	0721-590764	25719596	
WILLIAM K. KOBETCH	KIPCHAMO	0923 625092	11465321	

NAME	VILLAGE	TELEPHONE	ID NO.	SIGNATURE
JOHN J. KORAIA	KIPCHAMBO	0721802921	24145379	JK
MARTIN MURIAM	KIPCHAMBO	0729502881	27118484	JK
ANNE SEPOBON	KIPCHAMBO	0751667577	23474296	JK
Plumber: Sammy K. Nibey	KIPCHAMBO	0729898130	22398375	JK
Doctors K. Jale	KIPCHAMBO	0724445625	10948400	JK
DAVID BUSIENET	KIPCHAMBO	0700057921	31451779	JK
JONATHAN SONGOR.	KIPCHAMBO	0722563555	25353-41	JK
MILSON MARITIM	SAROTOT	0720668743	22642840	JK
NATHAN K. MURGOR	KIPCHAMBO	0723696375	23607374	JK
KIPKORR SANG	SAROTOT	—	—	JK
JOSEPH K. MUTA	KIPCHAMBO	0726804406	12972271	JK
STEPHEN K. BOIT	SAROTOT	0728239403	22768353	JK
STEPHEN K. KEMO	KIPCHAMBO	0724202763	20722667	JK
JULIUS BARNO	KIPCHAMBO	0726686373	12972385	JK
JIMMS KIMO	KIPCHAMBO	0702296607	11650502	JK
GILBERT K. RONDO	KIPCHAMBO	0712661190	24020036	JK
MARUS K. MELY	KIPCHAMBO	0726244079	23970995	JK
STEPHEN C. SEREM	KIPCHAMBO	0719468261	09440360	JK
ISAAC MARYO	KIPCHAMBO	0729262598	2302057	JK

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	PROJECT	RADIANT & ELDOSOL SOLAR PLANT	
	DATE	30/06/2015	
	VENUE	PLATEAU CLOSE	
	TIME STARTED	2:30 PM	TIME ENDED
Name	Village / Location	Telephone No.	ID No
CHRISTINA ^{ALMACH} SAIDAH ANHANGA	KIPCHAMO	0712061634	
JENNIFER CHEROP KOMEN	KIPCHAMO	0724-058-020	28055968
JOEL KIPATUN SANGOL	KIPCHAMO	0712303434	22547200
Joseph K BETT	KIPCHAMO	0711215112	5960910
ERIC K. LELI	KIPCHAMO	0703-693621	24390881
David K. Mogo	KIPCHAMO	0777518257	9840383
Charles KIPROBO	KIPCHAMO	0723881858	20704675
JAM SEARON	KIPCHAMO	0723148878	6867614
ANTHONY M SANG	KIPCHAMO	0714-910-449	3208728
GABRIEL KENBURYUWO	KIPCHAMO	072834006	10866489
JOSEPH SANG	KIPCHAMO		
DANIEL NGETICH	KIPCHAMO	0715356834	11466713
PETER K. KIEMET	KIPCHAMO	07022990570	3308556
Julius K KIPSTANHA	KIPCHAMO		5300850
Julius KIBET	KIPCHAMO	0722-936461	10760590

✓

NAME	VILLAGE	TELEPHONE	ID NO	SIGNATURE
Philip K. Luyt	Kipilembo	0721-735388	4001979	<i>[Signature]</i>
Paul LIMO	cheponoel	0722 936 668	9252053	<i>[Signature]</i>
DETER SIMEZI	cheporoel	0723 713538	0846680	<i>[Signature]</i>
Samuel Mochi	cheporoel	0724 584251	5592006	<i>[Signature]</i>
PHILIP KERING	KIPCHAMBO	0722 994422	8028426	<i>[Signature]</i>
JOSEPH SEREM	KIPCHAMBO	0706156380	3312878	<i>[Signature]</i>
Jones	Phichoro	-	-	<i>[Signature]</i>



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PROJECT	RADIANT & EIDOSOL SOLAR PROJECT					
DATE	29.06.15					
VENUE	PLATEAU					
TIME STARTED	2.30 PM		TIME ENDED			
Name		Village / Location		Telephone No.		Signature
DAVID K KOEDEL	Cherukigen	Cherukigen		0723170989		3260694
JOE K ROSE		Cherukigen		0725743277		22807291
NICHOLAS K KIWOTI	Cherukigen	Cherukigen		0718270470		72111330
HILARY K BUSIENEI		Cherukigen		0704275159		22131921
EMITH A SHIBIR	Cherukigen	Cherukigen		0706954286		13052646
MERCY J ROUCH		Cherukigen		0723023291		22923922
ZIPPORAH JEMUTHA KOSGEI	Kipchamo	Kipchamo		0726516709		27213217
SARAH SARA MUYO		Kipchamo		0710021970		264366411
MARY KOLECH	Kipchamo	Kipchamo				3312644
JAMES W. RULU		Kipchamo		0710164312		22301284
MARIAH KENNEDY	Chesegem	Chesegem		0723766080		2020661814
MOSHARAE K. P. M. L.		Chesegem		NB 0722902052		25553933
SHADRACK KIPKEMBOI	Kipchamo	Chesegem		0715050457		26564702
Grace Kori		Kipchamo				3312763
JOSINET K. KAWA	Kipchamo		0720406284		14527252	

NAME	VILLAGE	TELEPHONE NO	ID NO	SIGNATURE
MEBO	JEPTO KURAM	0724 091474	130 17718	NGA
TEDEZA	MATHENGIE	0724 582769	255477999	TH
	CHERPLEEN			
	CHERPLEEN			

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	PROJECT	RADIANT & ELDOSOL SOLAR				
	DATE	30/06/2015				
	VENUE	KIPCHAMBO LOCATION - PLATEAU VILLAGE				
	TIME STARTED	TIME ENDED				
	2:30PM					
	Village / Location	Telephone No.	ID No	Signature		
	Kipchemuror	0725329018	0584710	[Signature]		
	Kipchemuror	0721-519079	25691173	[Signature]		
	KIPCHAMBO	0716-378524	25356642	[Signature]		
	Kipchemuror		4784167			
	"	0723634689	20625883	[Signature]		
	"	07223116007	071116007	[Signature]		
	"	0720804992	20759134	[Signature]		
	"	07773241234	14526596	[Signature]		
	"	0727031121	27065564	[Signature]		
	"	0707124299	2908685	[Signature]		
	"	0728765696	28916808	[Signature]		
	"	0716821860	28549602	[Signature]		
	"	0719594562	26914462	[Signature]		
	"	0720936601	21268090	[Signature]		
	"	0702				

Name
 DANIEL OMUSIGA
 MOSES KIPKEMBOI METTE
 PATRICK K. SAWEE
 SIMON LOTLO
 RICHARD-K. TALAM
 GABRIEL KUTUB
 NELSON K. CHENAIYOT
 JOEL CHIRICHIR
 BETT HENRY
 ANN CIKIKI
 WATELA HANMILION MORAH
 ELIZABETH NAKKUNGEN
 TITUS WANGIZWA
 SAMUEL KATIKA
 JOYAN WIKESA
 EVANS BARASA

0702 239647
 07239647

NAME	Village	TELEPHONE NO	ID NO	SIGNATURE
① Wilson Ngetich	Cherukigen	0728061973	3320553	W. Ngetich
② Kipwet moro	Cherukigen	- - -	- - -	Kipwet moro
③ Julius Misoi	Kochamo	0726741357	3312886	Julius Misoi
④ Elizabeth Sany	Kipchamo	0723710112	3308745	Elizabeth Sany
⑤ Nehemia Ro	Cherukigen	0725550684	23009720	Nehemia Ro
⑥ David Kogee	Cherukigen	0787820376	9253506	David Kogee
⑦ Hillary Ruto	Kochamo	0726108963	24434699	Hillary Ruto
⑧ Ezekiel Kiprop	Kipchendo	0122041818	31779128	Ezekiel Kiprop
⑨ Samuel Kiptoo	Kochamo	0720352882	4388601	Samuel Kiptoo

PUBLIC MEETING REGISTER		CLIENT	RADIANT & EL DOSOL ENERGY
		PROJECT	RADIANT & EL DOSOL SOLAR
		DATE	30/06/2015
		VENUE	PLATEAU VILLAGE - KIPCHAMO LOCATION
		TIME STARTED	2:30 PM
		TIME ENDED	
		Village / Location	Telephone No.
		ID No.	Signature
 ERM East Africa (Pty) Ltd Landmark Office Suites 4th Floor Laiboni Centre Lenana Road Kilimani PO Box 100798-00101 Nairobi Kenya T + 254 20 49 38 113/4 www.erm.com <i>The world's leading sustainability consultancy</i>	Name		
	Benson Kiprango	Kipchamo farm/location	0725942596
	Simon Telemu	Chopnot farm	0721250797
	KIPKOSKEY CHEGOL	KIPCHAMO	0722910453
	SHADRACK K. BIRNO	KIPCHAMO	0721126712
	ABRAHAM KOSGEI	KIPCHAMO	0723528335
	SILAS SAMOETI	KIPCHAMO	0700151830
	JONATHAN NAZITIM	KIPCHAMO	0713350078
	IRENE BIRECH	BERUR VILLAGE	0713712206
	SAMUEL KERINGE	KIPCHAMO	0716668687
	GEOFFREY NYASANI	KIPCHAMO	0722584165
	PHILEMON BIRGEN	KIPCHAMO	0703429066
	KENNEDY NAIK	BERUR	0727685202
	George Kiprono	KIPCHAMO	0726867980
	RICHARDS CHEGOL		0726410281
	MURRAY K. ROY	KIPCHAMO	0728643219

NAME	VILLAGE	TELEPHONE NO	ID NUMBER	SIGNATURE
ALFRED K. TEITAT ЭЛІЯН РОТІЧ	SERUET MOSOP	0217082835 0705654176	6874965 3310157	
PURITUJEBE SHADRAEK	KIPCHAMBO Cheseyem	0715050471	26564702	
David Kimutai	Kipchamo	0721109284	—	
Marrie Tarru	Kipchamo	0722-666661	NT4BDK5C9	
Caleb Nyongosa	Kipchamo	0706879609	26080103	
THOMAS TIROP	KIPCHAMO	0713350049	26113834	
THIMO TIJIKEMBOI	KIPCHAMO	0711195833	23308510	
JACSON ROTIO	KIPCHAMO	0726150963	0724181	
JONAH ROTICH	KIPCHAMO	0728908593	20802779	

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	PROJECT	RADIANT & ELDOSOL SOLAR	
	DATE	30/06/2015	
	VENUE	PLATEAU VILLAGE	
	TIME STARTED	2:30 PM	TIME ENDED
Name	Village / Location	Telephone No.	ID No
HELEN KOECH	KIPCHAMO	0714830065	
NANCY CHOGG	KIPCHAMO	0728381711	29988960
GLADYS KORIR	KIPCHAMO	6711895675	
EMILY JELAGAT	KIPCHAMO	071260071	23957485
ANNE BETT	KIPCHAMO	072862481	9890294
MARCEY BIWOTT	KIPCHAMO	0704867930	
MARCEY JEPCHURUKA KOIN	Chertcho		
Sally Komen	Plateau		
Jane Mwangi	Plateau		
SAMSON KIPKORIR NGETICH	KIPCHAMO		10326319
ABRAHAM KIPKANGE KIECH	KIPCHAMO	0725565899	29378653
David Kosgei	Kipchamo	0728733220	14528838
Isaac Kiprotich	Kipchamo	0727676915	23697019
Nauni Bett Jeiloveri	Kipchamo	6717033665	24281972
Miriam Amoli	KIPCHAMO	6717033665	

Signature

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	PROJECT	RADIANT & ELDOSOL SOLAR	
	DATE	30/06/2015	
	VENUE	PLATEAU VILLAGE	
	TIME STARTED	2:30 PM	TIME ENDED
Name	Village / Location	Telephone No.	ID No
1. GILFUS Cheuvyett	Vipchamo	07053910987	23432963
2. SALLY BARN	Kipchamo	0708195034	12972350
3. Wamara Kooch	Kipchamo	0721760807	12689267
4. NANCY boromunda	Langut		
5. LILIAN LIMO	Kipchamo	1007179588	
6. PAMELA C. ROP	KIPCHAMO	0716798215	22639181
7. DASILWA KISIRIO	KIPCHAMO	0707946447	P.S
8. MIRIAM KOGELT	KIPCHAMO	0719-868-191	20803272
9. RACHAEL KORIR	KIPCHAMO	0714135223	22819167
10. DUSA BRIGEN	KIPCHAMO		
11. ESTHER JEPKEMEN	KIPCHAMO		
12. JANE KORIR	KIPCHAMO	0722632425	10030943
13. EDNA BETT	KIPCHAMO	0700417386	24255882
MARGARET TARSUS	KIPCHAMO	0718979645	—
ALDY KERIN	KIPCHAMO	0705230773	98 40696845



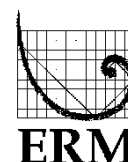
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PUBLIC MEETING REGISTER					
CLIENT	RADIANT & ELDOSOL ENERGY				
PROJECT	RADIANT & ELDOSOL SOLAR				
DATE	30/06/2015				
VENUE	PLATEAU				
TIME STARTED	TIME ENDED				
		Village / Location	Telephone No.	ID No	Signature
JOAN ELAGAI SIGEI		KIPCHAMBO	0729880104		SIGEI
Emmy Ngetich		Kipchamo	0723 533 157		Emmy
Pr. HOSSEN TARUSI		MOSOP	0722 232 237		HOSSEN
FRANCIS TARUSI		KIPCHAMBO	0728 480 017		FRANCIS
JULIUS K. SIMON		MOSOP	0722 654 771		JULIUS
LONALILWA K. KIMWAL		MOSOP KIPCHAMBO	0723 522 569		LONALILWA
SOSTEN KENAO		KIPCHAMBO	0722 563 184		SOSTEN
RUBEN KETER		CHEPKUGEN	0726 081 307		RUBEN
MICHA KEMBOI		CHEPKUGEN	0720 918 643		MICHA
JOSEPH NGATHICH		CHEPKUGEN	—		JOSEPH
ISAAC SERSER		KIPCHAMBO	0721 408 269		ISAAC
WILLIAM BOMBO		CHEPKUGEN	0726 165 733		WILLIAM
JAMES TANSU		CHEPKUGEN	0726 656 67		JAMES
ISAAC TANSU		SARODI	0714 161 058		ISAAC
SIMION KIPSTANG		MOSOP	0721 415 669		SIMION

Landmark Office Suites
4th Floor, Laiboni Centre
Lenana Road, Kilimani
Nairobi
Kenya

<i>Subject/Ref</i>	Minutes of the Public Meeting for the ESIA of the Proposed 2 x 40 MW Solar PV Plants (Eldosol Energy Ltd and Radiant Energy Ltd) in Uasin Gishu County
<i>Venue</i>	Plateau Village, Kipchamo Location
<i>Date of Meeting</i>	Wednesday, 30 th June, 2015
<i>Present</i>	See attendance register
<i>Distribution</i>	Public
<i>Date</i>	30 June 2015



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Attendance Register follows these minutes.

Introduction

The meeting was started with a word of prayer followed by introductions from the Local Chief, the Eldosol/Radiant Energy Community Liaison Officer Mr. Letting, the Member of the County Assembly, as well as Mr. Gilbert Langat (GL) from ERM who introduced the Project Team.

GL and Mr. Letting (Letting) translated the proceedings of the meeting from English into Nandi (and vice versa).

Project Description

The CEO of Radiant and Eldosol Energy Mr. Santiago Villamizar (SV) outlined the following:

- The location and objective of the project,
- The importance of everyone being there and benefits to the area,
- That the Project would be built on 600 acres,
- Local investors are involved in the project including Karim and David Langat (DL),
- Timeframes - at the moment the team is doing project feasibility studies and construction studies to inform what kind of solar plant will be constructed. These studies will continue until the end of this year and construction will thereafter follow and will take between 1 to 1.5 years and will be carried out in 2 phases. In 2016 anticipate they operation of the Radiant and Eldosol Plants, and will continue operations for 25 years,
- That the Project would not produce energy directly to homes, but connect to the National Grid.

Environmental and Social Impact Assessment (ESIA) Process

Callie Phillips (CP) from ERM briefly explained the ESIA and associated public participation process. She indicated the different stages of the EIA process and current progress towards submission of the Report to the National Environment Management Authority (NEMA). She explained when and how public input is sought throughout the process and emphasised the importance of such, for an integrated decision-making process.

She gave a summary of the potential impacts of the Project as follows:

- Changes in land use,
- Construction impacts e.g. noise, workers, air emission etc.

She added that the participants should use this opportunity to also answer any questions or concerns they may have.

Opening the Floor

The Chief thanked the Project Team for the presentations. She explained the benefits of the Project and opened the floor for questions.

The Village Elder thanked everyone and welcomed the team to Kipchamo Location. He explained that they had hope for great development to come to Kipchamo and outlined some of the challenges that the Location faces:

- Education – look at schools for investment (classrooms, laboratories)
- Water – during dry season a lot of water issues due to scarcity. With priority of water used for domestic purposes.
- Roads – seasonal, during rainy season may not be able to use them. Require

all weather land.

- Hospital doesn't exist, although land has been set aside by County Council, it hasn't been developed. The nearest hospital is Plateau Mission, so they require hospital facilities closer to the Location.

SV explained that Radiant and Eldosol were working with the Chiefs on the CSR. He stated that they understood that the area has some challenges and that Radiant & Eldosol are looking into them and developing a corporate strategy to be able to help as much as possible but with the main aim of achieving sustainability (i.e., whatever is set up it needs to be something that can operate on its own, and not donations for 25 years). He advised the Community to speak to the Chiefs as they will direct community ideas to the client.

Facilitated Discussion

The question session- discussions was facilitated by GL and Letting who requested introduce themselves before asking a question or providing a comment. These points as well as further points raised and discussed are recorded below:

Comments/ Concerns Raised:

William Tallam (WT) from the Community submitted a proposal to SV and the memorandum was as follows:

- They welcome the project and willing to offer their help,
- With regards to Employment opportunities the Project should give priority to local youth as drivers, masonries, casuals, clerks, security guards and technicians. The Project can bring in professionals in from elsewhere they cannot be sourced locally,
- The Project should form a committee with local chiefs and elders so that people employed are from the local area and agreed upon,
- They required assistance in improving standard of education, e.g., provide Keringet secondary school with space for a playground and neighbouring schools with learning facilities,
- Continue to allow use of the cultural site, used by the community as shrine for initiating boys into manhood (the shrine is not on the Project Site),
- Roads improvement.

Jonathan Kimwan:

Response:

SV noted WT's comments.

SV explained that the Project could not

- Welcomed the visitors
- Asked that Project give priority to the orphans and needs families
- Requested that the Project provide power to their homes

produce energy directly to homes, but connect to the National Grid

Women speaker:

-

- Continue with education and urging the community to work hard in education.

Youth Rep/Youth Leader:

CP handed out some maps outlining the project location.

- Welcoming the project, with 'hot and heavy' hands.
- Explained that in Chepkigen Village there is a Health Centre asked for assistance in putting up a kitchen for them in the Health Centre.
- Explained that there are also several schools that lack facilities (seats, laboratories etc.).
- Thanked the Team for coming to the village, and considering the community.
- Asked where the Project be located and whether there will be any harm to the community or displace people

Letting explained in Nandi where the project is located.

The Chief also explained administratively where the Project will be located.

SV outlined that environmental studies being conducted, and also confirm that there will be no reflection or harm caused.

Letting explained that there would be no displacement

A community member asked that since the Project was located on 600 acres of land, how could there not be radiation and the height of the solar panels
The Chief introduced people in attendance including:

SV explained that there would be no radiation, as that is what the panels will absorb. He clarified that the height would be 1.7 metred

-

- Those from the following Sub Locations: Saroyot, Lengut, Kipsinende, Kipsinendech, Kipchamo and Keringet,
- Teachers from Keringet, Chepnoet, Kipchamo and Keringet Schools, as well as the Community Learning Centre,
- Agricultural Officer,
- Chiefs and Assistant Chiefs of Lenku, Saroiyat, Kipsinende and Plateau,
- Village Elders
- NGOs including drug and alcohol prevention NGO, poverty eradication NGO
- Pastors from the AIC and Reformed Churches

Area MCA:

-

- Welcomed the Investors and Project

Team,

- Remarked on the constitution and the hope for the Kalenjin to have and secure land,
- Explained that land is critical for the Kalenjin,
- Spoke on behalf of women in the Location who require a market. She explained that there is a centre called Plateau where they need a market to sell their produce,
- Explained that when there is investment, the land value goes up but population also goes up,
- Asked that the Project kindly transfers knowledge so that after 25 years the youth will have the same knowledge as the Project Team,
- Requested for a road to Mochogoret Village,
- Asked that a Committee be set up for transparency purposes, and
- Explained that while there is the fear of the unknown, they will accept the Project to go on, since an environmental assessment is being undertaken.

David Langat:

- Explained that he, as part of the Investors, was happy to be here,
- Explained that while he stays at O'Lessos he was born in Kipchamo and even though he lived in Mombasa for years, he came home to bring empowerment to the Community,
- Stated that the Project will benefit the community in many ways
- Stated that he will request the Project Manager to employ the local youth as the first priority,
- Requested the Villages to start-up businesses (e.g., hotels, grocery shops)
- Explained that Eldoret will grow since there will be a City coming up (Eldocity)
- Thanked the Chiefs and Elders for welcoming them to start the Project in the area
- Assured participants that the Investors would bring

empowerment to the Village and
that as they value culture they will
respect the local culture

- Thanked the Governor for accepting
this Project to kick off

Charles Katana, ACC Kesses -

- Encouraged the Project to go further
by expanding CSR activities to the
entire surrounding environs

Hon Chemala -

- Thanked the people of Kipchamo
for welcoming the Project,
- Thanked H.E. the Governor for
supporting the Project

Governor of Uasin Gishu County, H.E. -

Hon Jackson Mandago

- Thanked everyone for
welcoming the Investors
- Explained that the County
Government was going to
facilitate all the processes
required
- Stated that all jobs that are non-
skilled would be employed from
the area
- Encouraged the Youth to go to
School and increase their
knowledge
- Asked the people of Kipchamo
to work with the Project
- Explained that the community
should invest in on their land
instead of selling it

Assistant Chief

- Vote of thanks

Figure 1: *Initial Consultations with the County Government Officials of Uasin Gishu County held on 10th June 2015 at the Office of the Deputy Governor*



Source: ERM, 2015

Figure 2: *Initial Consultations with Heads of Departments of Uasin Gishu County, held on 11th June 2015 at the Office of the County Director Environment (NEMA) Boardroom*



Source: ERM, 2015

Figure 3: *Consultations with Chiefs and Elders of Project Area, held on 11th June 2015 at Kipchamo Village*



Source: ERM, 2015

Figure 4: *Stakeholder Consultative Meeting held on 30th June 2015 at the Boma Inn Hotel in Eldoret*



Source: ERM, 2015

Figure 5: *Mr. Santiago Villamizar, CEO Radiant and Eldosol Energy addressing Stakeholders at the Consultative Meeting held on 30th June 2015 at the Boma Inn Hotel Eldoret*



Figure 6: *A Participant addressing the Community at the Public Meeting held on 30th June 2015 at Kipchamo Village*



Figure 7: *The Governor of Uasin Gishu County, H.E. Hon Jackson Mandago, addressing the participants at the Public Meeting held on 30th June 2015 at Kipchamo Village*



Figure 8: *Community Members at the Public Meeting held on 30th June 2015 at Kipchamo Village*



	Stakeholder Sub-Group	Name	Title	Organisation	Mobile Phone Number	Email address
1	County Commissioner	Abdi Hassan	County Commissioner UG	Ministry of Interior (National Government)	0728157553	ugcountycommissioner@gmail.com
2	Deputy County Commissioner	Chuck Masua	Deputy County Commissioner Wareng Sub County	Ministry of Interior (National Government)	0727656664	wrngdistrict@gmail.com
3	Assistant County Commissioner	Charo M. Katana	Assistant County Commissioner- Kesses Division	Ministry of Interior (National Government)	0722298868	kmaitha@yahoo.com
4	Chief	Joshua Rono	Chief of Plateau Location	Ministry of Interior (National Government)	0723503466	

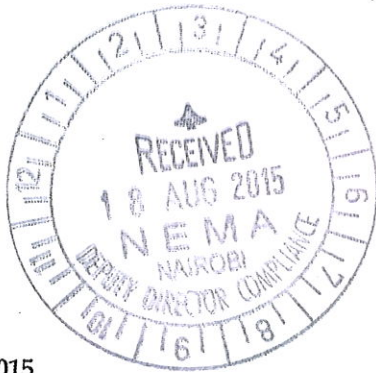
5		George K. Tarus	Chief Kipchamo Location	Ministry of Interior (National Government)	0722660896	
6	Assistant Chief	Daniel Birgen	Ass/ Chief Saroiyoi Sub Location	Ministry of Interior (National Government)	0724147049	
7		David K. Kiplangat	Ass/ Chief Lengut Sub Location	Ministry of Interior (National Government)	0724505777	
8	Office of County Director - Environment	Valentine Lala	County Director Uasin Gishu County- Environment (NEMA)	Ministry of Environment, Water & Natural Resources	0722985326	vlala@nema.go.ke
9	Office of County Director - Physical Planning	Charles Kimani	Physical Planner- Uasin Gishu County	Ministry of Lands Housing & Physical Planning	0723161809	ckmuch2009@gmail.com
10	Office of County Director -	Agnes Kosgei	Senior Supritendant Water	Ministry of Environment, Water &	0722943720	agkosgei@yahoo.com

	Water		Department	Natural Resources		
11	Office of County Director - Education	Rebecca K. Butalanyi	County Director Uasin Gishu County- Education	Ministry of Education (National Government)	0722687250	cdeuasingishucounty@gmail.com
12	Office of County Director - Public Health	Dr. Kiprotich Evans	County Director Uasin Gishu County- Health	Ministry of Health (National Government)	0720580206	kiprotich200@gmail.com
13		Gerry Luvai	Sub County Public Health Officer	Ministry of Health (National Government)	0722278637	gerlvi2001@yahoo.com
14	Office of County Director - Statistics	Munene Riungu	County Statistics Officer	Kenya Bureau of Statistics (KNBS)	0720844495	muneneriungu@yahoo.com
15	Water & Sanitation Company (WASCo)	Philip K. Kimaiyo	QAO II	Eldoret Water and Sanitation Company (ELDOWAS)	0722578755	philip_kimayo@yahoo.com
16	Water Resource Management	Peter Okeyo	Service Water Officer (SWO)	Water Resource Management	0705448977	okeyop@yahoo.com

	Authority			Authority (WRMA)		
17	Kenyan Civil Aviation Authority (KCAA)	Samson Ochieng Owalo	Ag. Chief Air Navigation Service Officer	Kenya Civil Aviation Authority (KCAA)	0788657212	eldoret@kcaa.or.ke
18	Office of County Governor	Hon. Jackson K. Arap Mandago	Governor		0722875229	jmandago@uasingishu.go.ke
19	Office of Deputy Governor	Hon. Daniel K. Kiprotich	Deputy Governor		0722771252	dkiprotich@hotmail.com
20	Office of Women Representative	Caro Kemboi	Women Rep-Assistant Cheptiret/ Kipchamo Ward		0720220507	
21	Office of County Administrator	Silas Tarus	Director Government Press		0721267573	sltarus@gmail.com
22	County Executive - Lands & Physical Planning	Robert Ng'isirei	C.E.C Lands, Housing & Physical Planning		0722690401	rngisirei@uasingishu.com

23	County Executive - Environment, Water & Energy	Mary Njogu	C.E.C Environment, Water and Energy		0722390484	cecenvironment@uasingishu.go.ke
24		Simon Kemei	Chief Officer- Environment Department		0723378122	simon.kemei@uasingishu.go.ke
25		Joseph K. Chelulei	Officer- Department of Environment		0725762915	josephchelulei@gmail.com
26	County Executive - Public Health	Sila Boit	County Administrator- Health		0722568144	silaboit@yahoo.com
27	County Executive - Infrastructure	Eng. Gideon Birir	C.E.C Roads, Public Works & Transport		0722291116	birirgidi@gmail.com
28	County Executive - Agriculture	Dr. Ambrose Cyril Cheruiyot	C.E.C Agric, Livestock Devp & Fisheries		0723707888	cyril_cheruiyot@yahoo.com

Annex E: Correspondence with NEMA



28th May 2015

The Director General,
National Environmental Management Authority (NEMA),
Popo Road, off Mombasa Road,
P.O. Box 67839-00200,
NAIROBI.

Attn: Mr. Zephania Ouma,
Deputy Director, Compliance

Dear Sir,

**RE: MEETING TO DISCUSS 2x40 MW SOLAR PLANTS (TOTALLING
80MW) POWER EVACUATION AND SUB-STATION IN ELDORET
TOWN, UASIN GISHU COUNTY, KENYA**

As per our meeting with you on the 28th May to discuss the above-mentioned projects, we would like to confirm the following:

1. That the proposed Project is comprised of 2 x 40 MW solar power plants (totalling 80MW) located in Eldoret Town, Uasin Gishu County,
2. Two (02) separate Environmental Project Reports (EPR) will be submitted to NEMA for each power plant as there are two (02) distinct Project Proponents,
3. We will carry out an in-depth evaluation of impacts and extensive consultations (stakeholder meetings and *barazas*), as opposed to distributing questionnaires,
4. We will advise the Proponents with regards to routing of the transmission line (of no more than 1km) to avoid affecting any households/people, and
5. We can submit detailed and exhaustive EPRs to NEMA with the view to seek NEMA licences at EPR level.

Once again thank you for taking the time to meet with us. It was very useful.

Yours faithfully,
for ERM Consulting East Africa Limited

Michael John Everett,
Managing Partner

**Environmental
Resources
Management**

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Co. Reg. Number: CPR/2013/124416
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A member of the Environmental
Resources Management Group

Annex F: Land Acquisition Report

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1.1

INTRODUCTION

The Solar PV Power Plant needs to evacuate the power produced. In order to achieve this it is necessary to construct a substation and transmission line to connect the power plant to the existing Turwell – Lessos transmission line.

The proposed transmission line will require a 40mtr wayleave in line with KPLC requirements and international good practice as well as the construction of a number of towers. Finally a new substation will also be constructed.

Based on technical, environmental and social considerations a number of proposed routes have been considered, which has resulted in two options:

- Option 1: crossing four plots of privately owned land with the proposed substation located on privately owned land adjacent to the existing transmission line.
- Option 2: crossing six plots of privately owned land with the proposed substation located within the Project site.

All land plots consist of houses and fenced agricultural land; other small structures for supporting farming activities are also located on the land. The main crops grown are maize and wheat. However, there are also economic trees on the land in particular cypress, wattle, bluegum, figs and avocados. Both options avoid any displacement of housing but will result in some economic displacement.

The final decision on the preferred option will be taken by KPLC in consultation with the Project based on the KPLCs requirements including consideration of the development of other power plants in the area.

The Project plans to lease the land for the 40mtr wayleave and towers for a period of 25 years. Economic activities will be allowed to continue on the land with some restrictions. These leases will be agreed via negotiated settlement with affected title holders on the basis of willing buyer-willing seller. The Project does not propose to implement compulsory expropriation to acquire the land.

1.2 LAND LEASE PROCESS

1.2.1 Introduction

This section provides a summary of the process that is being implemented to secure access to land for the transmission line. This approach has been followed for both options. However, leases will only be negotiated with the selected route option.

1.2.2 Initial Meeting with Affected People

Land owners (or their representatives) and users along the transmission line route were met with on the 22.08.15 for Option 1 and the 01.09.15 for Option 2 to outline:

- the Proposed Solar PV Power Plant;
- the requirements for the transmission line including the 40mtr wayleave and towers;
- the indicative route of the transmission line and likely location of towers;
- the land plots that would be affected;
- the approach to avoiding houses and other important infrastructure;
- the potential for economic displacement and proposed mitigation;
- the surveys that would be undertaken (outlined below); and
- the Projects approach to leasing the land based on a negotiated settlement for a period of 25years including compensation for crops and assets impacted and regular payments for the land.

Affected households were also given the opportunity to ask questions about the Project, the impacts of the wayleave and tower and the leasing process and how leases would be agreed.

During these meetings the views of affected households regarding routes were also discussed in particular if there were areas of their land plots which they would prefer to avoid for any reason so that this could be considered in the route design.

1.2.3 Topographical Survey

A team of topographers visited the proposed routes and undertook surveys to confirm the boundaries of the land plots and coordinates of all structures (noting the purpose of the structure). This was undertaken so that houses and infrastructure could be excluded from the final route alignment and all other structures could be avoided where possible.

1.2.4 Land and Asset Valuation

An independent registered land economist was commissioned by the Project to determine the presence and value of all assets including land along the proposed routes. This information was provided to both the landowners and

the Project to inform the negotiations for the lease agreements. This survey was undertaken in August 2015 for Option One and September 2015 for Option 2.

1.2.5 Stakeholder Engagement Meeting – Round Two

A second stakeholder meeting was held with affected households on 10.09.15. This meeting was attended by representatives of affected households as well as by the Chief and Village Elder. The Chief and Village Elder were invited to witness the meeting and outcomes.

During this meeting affected households were reminded about the issues covered in the first meeting. In addition, the following points were discussed:

- the process and timing for deciding which route will be selected;
- the role of KPLC; and
- the need to get agreement in principle from affected households to leasing land.

Minutes from these meetings signed by affected households are included in this annex along with an attendance register for the meetings

The main outcome of the meeting was that affected households agreed in principle and subject to commercial negotiations to lease land to the Project for the transmission line. While it is recognised that affected households have the right to change their minds, on this basis securing access to land is considered feasible.

1.2.6 Stakeholder Engagement Meeting – Round Three

Following the decision on the preferred route, the Project will meet with households along both routes to inform them of the final decision and rationale. Those on the selected route will be informed as to the next steps and timing for negotiating agreements.

1.2.7 Negotiation of Leases

Land lease agreements will be negotiated with affected households. The leases will cover the following points to address the impact of economic displacement:

- payments for leasing the land over 25years;
- compensation for expected loss of assets associated with construction activities;
- compensation for any unplanned (accidental) loss of assets during construction;
- approach to providing compensation for loss of assets due to planned or unplanned maintenance on the transmission line; and
- restrictions on land use.

While leases for land will be paid to the registered land owner, compensation for crops and other assets will be paid to the owner of the affected asset in line with international best practice.

1.3

SUMMARY

The Project has initiated a process to access land for the proposed transmission line (wayleave and towers). Following on from the stakeholder engagement activities and surveys both routes are considered feasible and on both routes landowners and users have indicated that they are willing to lease their land.

**Meeting
minutes**

Subject/Ref	Transmission Line Right of Way
Venue	Transmission Line – Plots 43-46
Date of Meeting	10 September 2015
Present	See Attendance Register Santiago Villamizar Radiant/ Radiant Energy CEO Letting Radiant/ Radiant Energy CLO Arundhati Inamdar Willetts DI Frontier Callie Phillips ERM David Kiplagat East Chief Wilson Ngetich Village elder
Distribution	As Above
Date	14 September 2015

The Meeting was opened with Cordial greetings and Introductions from

- **Letting:** Welcomed people to the Meeting and reminded them about the Project and introduced the Radiant team
- **Village Elder:** Welcomed people to the Meeting and thanked them for coming
- **Chief:** Welcomed people to the Meeting.
- **Santiago:**
 - Thanked people for their attendance and involvement in the process to date including engaging with the valuer and indicated that they would release the report when it was available.
 - It was stated that the Project is considering two possible wayleaves and that the selection of the final wayleave will depend on the views of KPLC and the willingness of all people along the route to lease their land for the wayleave.
 - Outlined that the purpose of the meeting was to ensure that affected people are comfortable with the process that is being proposed, leasing their land for the wayleave in principle and answer questions. People would be asked to sign the meeting minutes to reflect the discussion and outcomes.
 - It was slated that the minutes were being taken and only the affected people would be asked to sign (along with the chief and elder) to say they had understood the process. However, it is their choice to sign.
 - This signature is not binding; people can change their mind at a later date if they are not happy with the negotiations or no longer wish to lease their land.
 - This is being undertaken to be in compliance with requirements of KPLC and NEMA who want to be sure that affected people are willing to enter into negotiation.

Community Questions/ Comments

The affected people stated that they have talked a lot with the Project previously regarding the wayleave. They don't have any objections, they are just waiting for the valuation report and for negotiations.

How will the wayleave be selected and when?

KPLC will input into the selection of the proposed route and will take about 2 months but it could be longer. There is a lot which has to be determined by KPLC which the Project does not have influence over.

The owner of plot 43 stated that he is OK with the process as when the Project starts it will help develop the area, in particular the youth and provide job opportunities.

They stated that the community is waiting for the Project to come and bring opportunities. Their only concern is that the process is taking too long.

Participants thanked the Project representatives for coming to talk to them and explain the situation regarding the selection of the wayleave.

Will we still get priority for employment if we are not selected as the wayleave option?

As members of the local community and neighbours, priority will be given to you for employment opportunities, but you will have to go through the same process of hiring as other people and prove that you are good workers if you get employment.

Will you employ someone now to assist Letting (CLO)?

The Project will not employ someone at this time as there is no requirement for an additional person. However, in the future there is the possibility that someone could be employed to support Letting, especially when the Project moves to Eldoret.

It was explained that Letting will bring the meeting minutes and ask people to sign if it is as true reflection of the meeting. It was explained that they were not signing a contract.

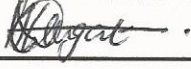
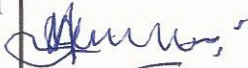
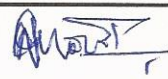
The meeting was closed with thanks and a prayer.

Meeting
minutes

Attendance Register

Philip Barasa
Rachael Barasa
Marko Kotit
Noah Chebuk
Paul Kipchumba
Andrew Kiptoo
Miriam Jepchirchir

I agree that these minutes are an accurate reflection of the meeting that was held:

Name	Name of Farm	Signature
DAVID KIPLAGAT	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) CHIEF	
TOWATHAN KIMWAL	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) VILLAGE ELDER	
NDA CHEBUK	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 43	
JOEL BARASA ARAP CHESILIN	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 44	
Joseph Barno	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 45	
MARIKO SIWA KOTUT	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 46	

Meeting
minutes

<i>Subject/Ref</i>	Transmission Line Right of Way
<i>Venue</i>	Transmission Line – Plot 52, 53, 56-59
<i>Date of Meeting</i>	10 September 2015
<i>Present</i>	See Attendance Register Santiago Villamizar Radiant/ Radiant Energy CEO Letting Radiant/ Radiant Energy CLO Arundhati Inamdar Willetts DI Frontier Callie Phillips ERM David Kiplagat East Chief Wilson Ngetich Village elder
<i>Distribution</i>	As Above
<i>Date</i>	14 September 2015

The Meeting was opened with Cordial greetings and Introductions from

- **Letting:** Welcomed people to the Meeting and introduced the Project and Radiant team
- **Village Elder:** Welcomed people to the Meeting and thanked them for coming
- **Chief:** Welcomed people to the Meeting, reminded people of the meeting that was held in Plateau and that the purpose of the meeting was to discuss the proposed transmission line and wayleave.
- **Santiago:**
 - Thanked people for their attendance and involvement in the process to date including allowing the team to measure their houses and land plots.
 - It was stated that the Project is considering two possible wayleaves and that the selection of the final wayleave will depend on the views of KPLC and the willingness of all people along the route to lease their land for the wayleave.
 - In designing the 40 meter wayleave, efforts have been made to avoid all physical structures. Within the wayleave, structures and trees will not be permitted but other activities such as growing crops and grazing cattle will be allowed. The wayleave will pass over plots 52&53 and plots 56-59. There will be towers located on 56 or 57 and 59 depending on the final detailed route design.
 - In order to inform the negotiations on compensation and rental payments, an independent valuer will come to detail all the assets within the proposed wayleave.
 - Outlined that the purpose of the meeting was to ensure that affected people are comfortable with the process that is being proposed, leasing their land for the wayleave in principle and answer questions. People would be asked to sign the meeting minutes to reflect the discussion and outcomes.

- It was slated that the minutes were being taken and only the affected people would be asked to sign (along with the chief and elder) to say they had understood the process. However, it is their choice to sign.
- This signature is not binding; people can change their mind at a later date if they are not happy with the negotiations or no longer wish to lease their land.
- This is being undertaken to be in compliance with requirements of KPLC and NEMA who want to be sure that affected people are willing to enter into negotiation.

Community Questions:

What is the impact of emissions/ radiation that will result from the Project?

The solar panels do not emit radiation but absorb sunlight and radiation. There is no effect from the panels (short or long term) as they are similar to the ones that people have on their houses. The wayleave is 40 meters wide as this is considered a safe distance to live from the transmission line in accordance to international best practice. The line will be similar to the existing Turkwel line that has been there for 20 years. The plant makes no sound and will produce no emissions.

How will the community benefit from the Plant?

Priority will be given to communities in Plateau, Eldoret and the surrounding area for employment; however it is up to the community to provide skilled and committed people. For specific technical roles, the Project company will need to bring in ex-pats but where it can it will hire locally through a transparent process.

In terms of community development, the Project developers have spoken to the Governor, Chief, Elders and community to understand their needs and are looking to deliver sustainable benefits. However the Project, can't do everything as it is not the Government. It will not be able to offer water supply to communities or provide power as all the power produced must be sold to KPLC. However the Project is looking to support education.

How will compensation be provided for the wayleave?

The Project company is still completing the final design and people's views about the wayleave are influencing the design. The valuer is coming to inform on the negotiations regarding compensation. In addition, they will try to do the work in the dry season, but if the Project damages crops or has to cut trees then people will be compensated in advance. A lease will be paid which will be agreed through negotiation but will not result in 25 years being paid up front. As a result of the negotiations, individual contracts will be developed with land owners who hold the title deed.

If there are skilled people in the area will they get employment?

Yes, they can get employment on the Project. They go through the hiring process.

Will the Project company involve an advocate in the negotiations and can the affected people do so as well?

The Project company will have a legal team and if affected people have lawyers and want to involve them they can but this will be at their own expense.

Where will the company be in 5 years if they sign the lease?

The company will be located at the site for 25 years and want to be able to interact with affected people. If the Project company does not pay the lease, then they can take the company to court. The lease will be subject to inflation. The agreement will be made with whoever holds the title deed.

Why do you have options?

KPLC have requested to have two options presented and as a business Radiant/Eldosol needs options in case agreement can't be reached on the transmission line.

We trust the Project, but who will the agreement for leasing be made with?

The agreements will be made with the Project; KPLC is the Project's client. Should KPLC undertake any activities which damage crops in the future then the Project will pay the compensation.

What will the distance between the towers be?

Depending on the final design the towers will be 300-400meters apart.

When will KPLC decide which route to select?

A decision is expected on the next 2 months but we don't know for certain.

The Project asked affected landowners if based on what they had heard today they would be willing to continue with the process to lease their land subject to negotiations. Their responses were as follows:

52: I am OK

53: I am OK

56: I wish to inform my brother about what I have heard.

57: I have no objections

58: I accept

59: I am OK

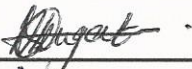
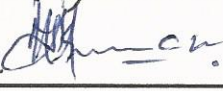
The meeting was closed with thanks and a prayer.

Attendance Register

David Kiplagat	Phillis Kiplagat
Jonathan	Pauline Bargor
Paul Kotect	Hanna Chepngeno
Elvis Kiplagat	Jane Jepkurui
Moses Kimaiyo	Caroline Jepchirchir
Elijah Rotich	Jepkemei Naumi Bett
Daniel Kimelo	Jeremiah K. Maiyo
Chepkwony Ray	Thomas Tirop
Kiplagat Koima	Joshua Kimelil
Julius Kosiklee	Risper Lagat
John K. Kigen	Samuel Kiplagat
Barochi Kiptet	Samuel K. Kiyeng
Hilary Kiriswa	Tony Barno
Stella Boson	Wilson Ronoh
Rose Limo	Fasion Kisaun
Simon Kiplagat	Jackson Busioney
Hilary Kiplimo	Priscah Kotut
Simon Kipsang	Audia Kotut
Isaac Kipruto	Wilson Ngetich
Erick Kemboi	Daniel Sego
Richard Chelal	Joel Rotich
Hilary Biwott	Noah Kipnengo
Jonathan Maiyo	Peter Samoei
Lydia Kiplagat	
Mary Chelangat	
Cjoyce chelangat	

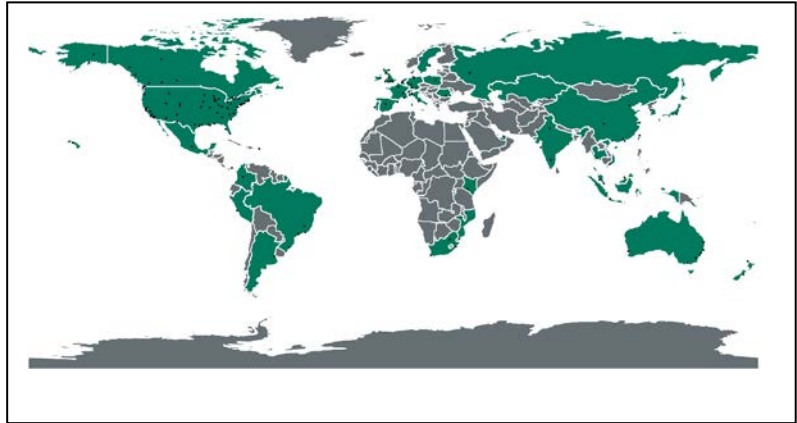
Meeting
minutes

I agree that these minutes are an accurate reflection of the meeting that was held:

Name	Name of Farm	Signature
DAVID KIPLAGAI	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) CHIEF	
JONATHAN KIMWAL	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) VILLAGE ELDER	
ELIUD K. KANDIS	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 52	
PAUL K. KOTUT	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 53	
PAULINE KIMITEI	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 56	
CHEMNITAI KIMETO	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 57	
Rose Limo	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 58	
Simon Kiplagai	CHEPTIRET/ CHEPLASKEI BLOCK 4 (MOSOP B) / PLOT 59	

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