



## Annex 7-9 Field Report of JICA Survey Team

### Summary of Environmental & Social Issues Along the Proposed Routes

#### 1. Introduction

The proposed transmission routes Olkaria–Lessos and Lessos–Kisumu (two alternatives in each case) were explored in field visits made by the JICA Survey Team during late June (22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup>) and early-mid July (5<sup>th</sup>, 17<sup>th</sup>, 18<sup>th</sup>, 19<sup>th</sup>, 21<sup>st</sup>) 2009. The resulting route descriptions are reported in detail in a separate report. The present summary draws attention only to the more notable features / issues.

#### 2. Summary Descriptions

##### Route 1 (Preferred Route)

##### **Part A. Olkaria to Lessos**

This route follows the existing powerline over most of its length, but deviates westwards to the south of Lakes Elementeita and Nakuru, and then northwards to run to the west of Lake Nakuru, before rejoining the existing route at Ngata Farm to the west of Nakuru City. This deviation was designed to avoid the conurbation of Nakuru.

From Olkaria II power station, the route initially passes through **Hell's Gate National Park** in parallel with the existing 132kV line. Following the Topographic survey commissioned by the JICA Survey Team, the very 'tight' route through the flower farms south of Lake Naivasha was rerouted further south to avoid the farms and associated housing.



Olkaria Power Station II  
Near Olkaria Gate, Hell's Gate N.P.



Hell's Gate National Park  
Near Eliza Gate, Hell's Gate N.P.



Southern Part of Hell's Gate N.P.



South to Lake Naivasha along Road D323

From the Naivasha sub-station the route takes a northerly direction through sloping ground in the Maela area, where there is the possibility of some limited erosion during construction.



Old Naivasha Road  
Eastern Site of Lake Naivasha



Dump Site by Municipal Council of Naivasha

Further on, the line passes close to a **dumpsite** managed by Municipal Council of Naivasha. It is noted that this attracts birds and also that burning of waste at the dump occurs. Birds and smoke are both inimical to transmission line operation. People scavenging at the dumpsite have also stolen steel bars from the transmission towers. The Municipal Council will therefore have to exert greater control over the dumpsite in future.

The route passes through the Kenya Wildlife Service Training Institute (KWSTI) site (however, it was avoided by realignment in Sept. 2009), the bushland of which also serves as a sanctuary for wildlife, including impala, gazelle and warthog. Each side of the sanctuary, are areas with several houses, some of which are slum dwellings constructed within the wayleave. To the east of the main Nairobi-Naivasha-Nakuru road, the route runs through an extensive area of polytunnels (plastic greenhouses) which can be either avoided or compensated.





Marula Estate between Naivasha and Gilgil

The line passes through the **Marula Estate**, with some zebra, impala, Thompson's gazelle, warthog, buffalo and baboons present, mixed with grazing cattle. The estate runs a small ecotourism business and exports flowers. The route passes through bare land to the south of Lake Elementeita and then through the Soysambu Conservancy in which zebra, eland, gazelles and baboons can be seen, along with the cattle and sheep. Neither of these two wildlife areas should be affected by the project, apart from the landscape impact.



South to Lake Elementeita



Elementeita Village

Following the JICA Survey Team's Topographic Survey, the next part of the line was rerouted further south to avoid Elementeita village and Lake Nakuru National Park. In the 25 km before the new route rejoins the existing route, it passes through a large number of **small farms** with associated houses which will require some resettlement.



South to Lake Nakuru



South-west to Lake Nakuru (Bagaria Village)

At the Deloraine Estate, the existing line deviates from the road to pass through the southern slopes of the Mount Londiani Forest Reserve, which has been considered as a “biodiversity hotspot<sup>1</sup>.” However, this part of the reserve has certainly been heavily degraded since it was a natural forest and is mostly farmed now.

Near Equator Station the route crosses the main road close to **Lake Narasha**. Care will be needed in constructing the new line through the ‘pinch-point’ between the existing transmission line and the lake, to avoid its pollution by soil particles, oils/grease, etc. Physical and biological methods of soil stabilisation should be used during construction.



Lake Narasha

Beyond Lake Narasha, the line passes through Timboroa Forest, but this is a plantation forest of *Pinus sp.*, *Cupressus spp* and *Eucalyptus spp*. Further on it passes along the northern fringes of the Northern Tinderet Forest, through *Cupressus sp* and *Pinus sp* plantations and farmlands (dotted with *Acacia sp*, *C. macrostachyus sp*, and *Grevillea sp*) before entering the Lessos substation through an undeveloped part of the village.

<sup>1</sup> “The biodiversity hotspot” is interpreted as an environmentally sensitive area which has more environmental values such as indigenous trees but also is degraded in Kenya according to local environmental experts.



Tinderlet Forest near Equator

### Part B. Lessos to Kisumu

The first 25 km of the existing Lessos to Kisumu line is common to both alternative routes. Much of this passes through 'tea estate country' of **extensive tea gardens**, and *Eucalyptus* plantations. There are very few buildings in this tea environment, and the line passes well away from estate workers' housing.



Tea Farm near Nandi Hill

The route then descends the Nandi escarpment where care will be needed to avoid erosion during construction work on the steep hillside. The route then follows the foot of the Nandi escarpment eastwards all the way to Kisumu. This route is entirely through large scale **sugarcane land**, with a handful of large farmhouses on the alluvial fan at the foot of the escarpment wall, which could easily be avoided. Moreover, the existing access roads across the sugar between the farms and the main W-E road would provide ready-made access for construction of the line. The backdrop of the escarpment wall would also mask the landscape impact of the new line.

Following the JICA topographical survey, the final part of the route into Kisumu was modified to take a loop to the south, thus avoiding the area congested with housing to the east of the substation.





Nandi Escarpment

**Route 2 (Rejected Route)**

**Part A. Kisumu to Lessos**

At the Kisumu sub-station, the two existing lines (from Muhoroni and Sondu Miriu) pass on either side of a small housing area. The new line will be routed to one side of this housing to avoid the need for relocation.



Around Kisumu Sub-station



Near Muhoroni



Near Rabuor, Southeast to Kisumu

The existing line tracks across the Kano Plain through abandoned rice land now used for maize and grazing. There are hardly any houses along this swampy route. (It is noted that this area is a good habitat for wetland birds, with Crested Cranes, Grey Herons, Hammerkopfs, Egrets, White Stork, Glossy Ibis, Sacred Ibis having been observed.)

The line then passes through 'sugar estate country', consisting of extensive sugar fields, a few tree remnants of a former forest and virtually no houses. The route passes in the vicinity of the Songhor Prehistoric Site, but this can be easily avoided by the new line.

The line then ascends the Nandi Escarpment through farmland, passing some small patches of natural forest. The terrain is steep, so care will be needed to avoid soil erosion due to the construction of access tracks.

#### **Part B. Lessos to Olkaria**

The initial part of this route passes through hilly countryside, highly truncated by streams. The potential for erosion during construction is high, and maintenance access could be challenging. The route then cuts through the Tinderet Forest Reserve, along the line of an existing track. This appears to be mostly a plantation of exotic tree species, with some patches of natural forest. The southern part of the Tinderet forest area is considered a biodiversity hotspot for invertebrates.



Around Lessos

View of Northern Tinderlet Forest from Lessos

The route then cuts through the **Western Mau Forest Reserve**, which is composed of some plantation forest on the lower slopes, but dense natural forest higher up. It serves as a forested corridor between the South Western Mau Forest Reserve and the northern parts of the Mau Forests Complex. The route would need to pass up a very steep slope through natural forest. This would be very challenging for construction, which would probably require helicopter transport for the transmission tower components.

Cutting of the RoW would have three implications:

- Loss of a significant area of natural forest within a Forest Reserve.
- Risk of initiation of soil erosion on the steep western slope, especially at tower construction sites.
- Severance of the forest corridor, which may restrict wildlife movements.





Southern Part of Eastern Mau Forest



Southwestern Part of Eastern Mau Forest

The route also passes through part of the Eastern Mau Forest Reserve. The Eastern Mau is a biodiversity hotspot, being a critical habitat for *Cisticola aberdare*, Yellow backed and Blue duiker, the Giant Forest Hog and the Bongo. Parts of the forest were **excised from Reserve status** in 2001.

However, the route does cut through some remaining natural forest of the Reserve (plant species here include *Warburgia salutaris*, *C. macrostachyus*, *Podocarpus sp*, *Markhamia sp*, *Dombeya sp*, diverse climbers, ferns and shrubs such as *Grewia sp*, *Crotalaria sp*, *Urtica massaica*), from which it emerges at Ololongwe Swamp.

Beyond Ololongwe Swamp, the route passes along the southern fringes of the Eastern Mau Forest Reserve in a south-westerly direction for 20 km, and then along the northern fringes of Mau Narok Forest Reserve. The route descends the **Mau Escarpment** through an area heavily dissected by the tributaries of the Enderit and Marmanet Rivers. Construction access to this area is likely to be challenging due to the steep terrain, and the potential for erosion during construction is likely to be high. Further on, it is noted that less than a kilometre to the northeast of the route is the Eburru Forest which is considered a biodiversity hotspot for all taxa.



Mau Narok



Ndabibi Estate, West to Lake Naivasha



Eastern Edge of Eastern Mau Forest  
West to Lake Naivasha

The route then passes through an area of **generally flat cultivated terrain**, with a very slight slope towards Lake Naivasha, after which it connects to Olkaria 2 through the bushland of Hell's Gate National Park. The wildlife found in this area includes giraffe, buffalo, warthogs and zebra amongst others.

### **3. Environmental and Social Concerns by the Alternative Route**

#### **Olkaria to Lessos - Route 2**

From the above route descriptions, it is very clear that Route 2 (Olkaria to Lessos via the Mau Forest) would be not preferable, by reason of the following provisions of the JBIC Guidelines for Confirmation of Environmental and Social Considerations (2002):

- It is likely to have significant adverse impact on the environment.
- It is a project in a sensitive sector, specifically 'Power transmission lines involving large-scale logging'.
- It has sensitive characteristics, specifically 'Large-scale logging'.

- It is located in or near sensitive areas, specifically located in the following areas or their vicinity:
  - A National Park (Hell's Gate) and nationally-designated protected areas (various Forest Reserves).
  - Areas considered to require careful consideration by the country or locality (The Mau Forest is highly important for the conservation of water resources, soils, biodiversity and timber supplies. Its conservation is a high Government priority and of great current political importance.)
  - Primary forests or natural forests in tropical areas
  - Habitats with important ecological value (particularly the Mau Forest)
  - Habitats of rare species requiring protection under domestic legislation, international treaties, etc. (particularly the wildlife of the Mau Forest<sup>2</sup>)

#### **Olkaria to Lessos - Route 1**

The alternative route from Olkaria to Lessos, largely following the existing transmission line, would be more suitable than Alternative Route 2. The following points should be noted:

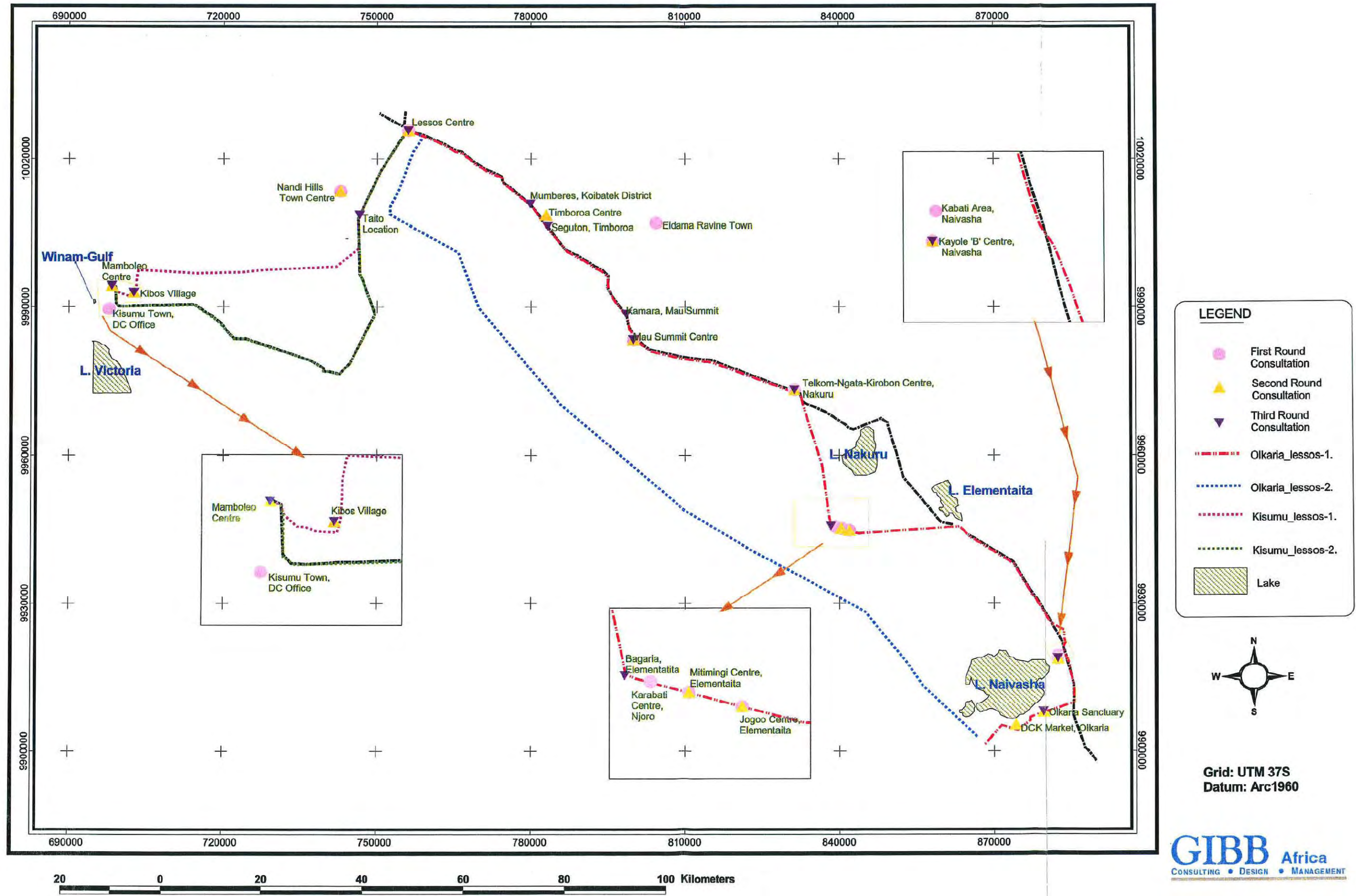
- Whilst the line needs to penetrate the Hell's Gate National Park boundary to link with Olkaria II Geothermal Power Station which is inside the park, it will run along an existing transmission line RoW and will not cause a significant increase in the existing impact of that transmission line on the park environment.
- The line has been re-routed to avoid houses at Sulmac and Sher Karuturi farms
- Marula Estate is a private reserve converted from rangeland and is not national protected area. The existing transmission line already runs through the estate and the environmental effect of routing the transmission line through it would be limited to landscape intrusion, as is also the case with Soysambu Conservancy.
- The existing line is sufficiently far to the east of Naivasha town to avoid the need for large-scale involuntary resettlement. The planned deviation of the new route to the south and west of Lake Nakuru will also avoid the need for resettlement in the vicinity of Nakuru city.
- The existing line already passes through the Mount Londiani Forest Reserve. The new powerline will not cause a significant increase in the existing impact on the reserve environment, which is in any case already degraded. The same applies to the route through Timboroa Forest, which is a plantation forest of exotic tree species having no great ecological value.

#### **Lessos to Kisumu – Routes 1 and 2**

Both of the alternative routes between Lessos and Kisumu would be preferable in terms of environmental considerations since the alternative routes 1 and 2 do not pass through any forests or protected areas. However, in terms of social considerations, Alternative Route 1 is considered preferable to Alternative Route 2 due to the size of resettlement.

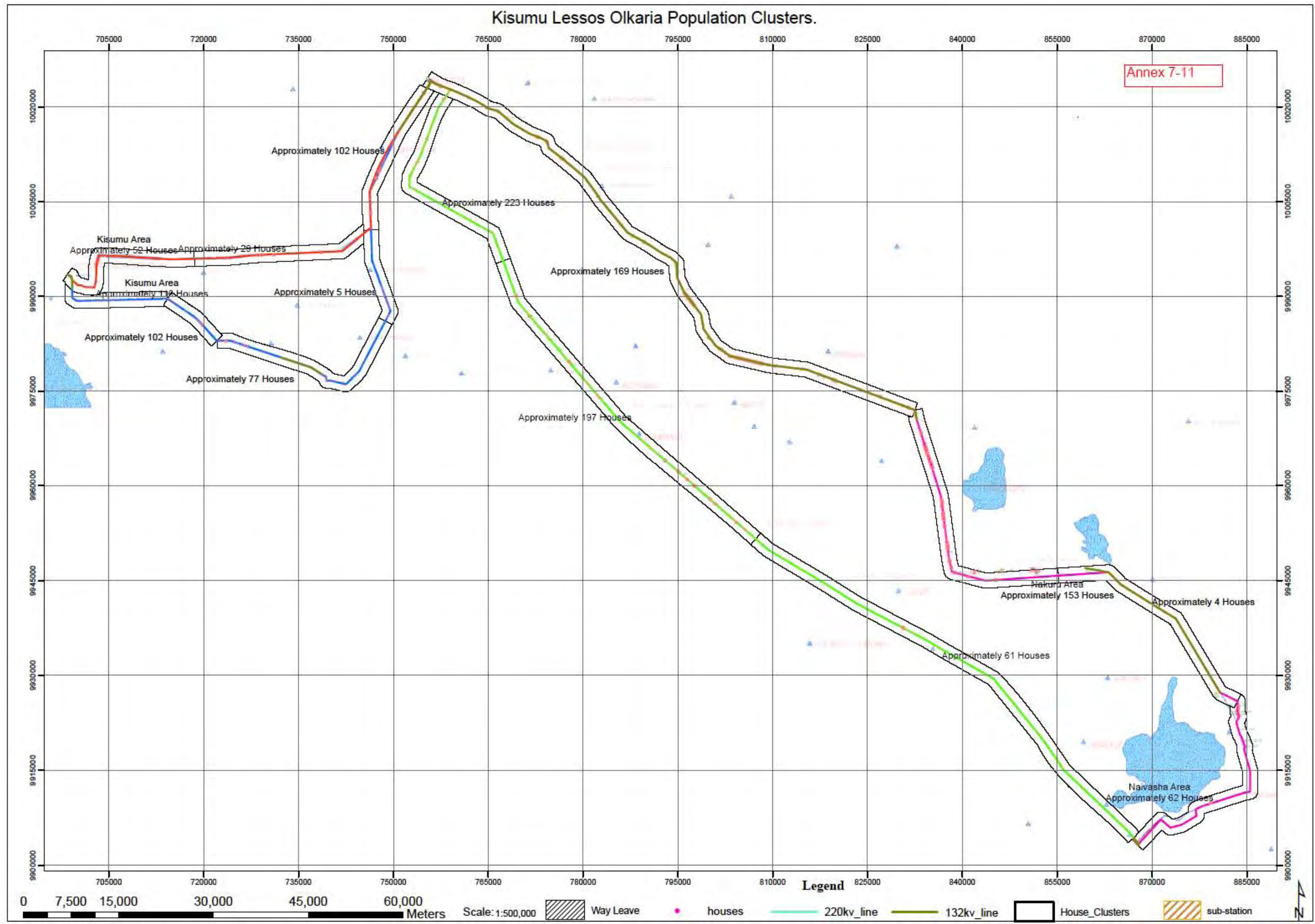


**Annex 7-10 Location Map of Public Consultation Meetings**



**Annex 7-11 Location Map of the Affected Residential Structures  
Summary Results of the Topographic Survey**





**Annex 7-12 Newspaper Advertisement on NEMA's Information Disclosure of the EIA  
Report**



**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY**  
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 P.O. BOX 6783V - 00200, Nairobi, Kenya  
 Tel: (254 020) 605522, 601V45, fax: (254 020) 608VW7  
 E-mail: dgnema@swilkkenya.com | ebsite: www.nema.go.ke

**NOTICE TO THE PUBLIC TO SUBMIT COMMENTS ON AN ENVIRONMENTAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED CONSTRUCTION OF KISUMU-LESSOS-OLKARIA TRANSMISSION LINE UPGRADING PROJECT**

Pursuant to regulation 21 of environmental (impact assessment and audit) regulations, the national environment management authority (NEMA) has received an Environmental Impact Assessment Study Report for the implementation of the Proposed Construction of Kisumu-Lessos-Olkaria Transmission Line Upgrading Project.

The Kenya Power & Lighting Company Limited (KPLC) and Kenya Electricity Transmission Company Limited (KETRACO) plan to construct a 220kV transmission line from Kisumu through Lessos to Olkaria. The Olkaria-Lessos line is a 220kV double circuit line expected to be adjacent to the existing transmission line, while the Kisumu-Lessos line is also a 220kV double circuit which provides an alternate path from Lessos-Muhoroni-Kisumu to supply Kisumu area. The length of the targeted transmission lines is approximately 255km, with approximately 170km between Olkaria and Lessos, and 85km between Lessos and Kisumu. The new transmission line requires a Right-of-Way of 40m (way-leave). The existing substations at Olkaria, Lessos and Kisumu will be expanded to cater for the proposed line.

The project anticipates the following impacts and mitigation measures:

Possible Impacts	Mitigation Measures
Visual & aesthetic impacts	<ul style="list-style-type: none"> <li>Review visual intrusiveness of current tower design;</li> <li>Maximize straight-line runs to reduce the need for angle towers;</li> <li>Locate new towers adjacent to already existing high-impact visual features, such as forests or cliffs;</li> <li>Where possible, locate the new line adjacent to existing power lines</li> </ul>
Land take	<ul style="list-style-type: none"> <li>KPLC to follow Land Administration Laws of Kenya, and Way-leave Rules;</li> <li>Community sensitization on alternative land uses</li> </ul>
Social Impacts	<ul style="list-style-type: none"> <li>KPLC will identify all potential Project Affected Persons (PAPs) &amp; develop a Resettlement Action Plan (RAP) to address economic losses, physical resettlement &amp; loss of land or land rights</li> </ul>
National Parks & Conservancies	<ul style="list-style-type: none"> <li>Transmission line to be located immediately adjacent to, and parallel to, existing line so as to reduce creation of new impact zones</li> </ul>
Forests	<ul style="list-style-type: none"> <li>Before and after construction, flora &amp; fauna surveys should be undertaken by KPLC to ascertain biodiversity;</li> <li>Limit way-leave areas to 35m within forests;</li> <li>KPLC will estimate Total Economic Value of lost forest resource, &amp; allocate equivalent monies to support initiatives by KFS;</li> <li>Construct new transmission line immediately adjacent to existing line to minimize fragmentation effects</li> </ul>
Wetland Ecosystems	<ul style="list-style-type: none"> <li>Span towers across wetlands;</li> <li>Foundings of towers will be built to address wet season conditions;</li> <li>Fine tuning of tower locations in consultation with local communities</li> </ul>
Fauna & fauna	<ul style="list-style-type: none"> <li>Proposed line to avoid significant bird breeding and staging areas;</li> <li>Use of conspicuous reflectors placed at intervals along conductor;</li> <li>Transmission line to be located adjacent to prevailing natural obstacles to prevent collision</li> </ul>
Occupational Health & Safety	<ul style="list-style-type: none"> <li>Locate Right-of-Way (RoW) away from human receptors;</li> <li>Only trained &amp; certified workers to install, maintain or repair electrical equipment;</li> <li>Use of signs, barriers and education/public outreach to prevent public contact with potentially dangerous equipment;</li> <li>Community policing to be encouraged to reduce vandalism of towers</li> </ul>
Soil Erosion	<ul style="list-style-type: none"> <li>Avoid steep slopes;</li> <li>Areas susceptible to erosion shall be properly sloped &amp; compacted to reduce the effect of runoff, and shall be seeded immediately;</li> <li>Rehabilitation of exposed sites as soon as practicable</li> </ul>
Construction Material Sourcing	<ul style="list-style-type: none"> <li>Strip &amp; store topsoil separate from subsoil for major tower site excavations;</li> <li>Restrict movement of heavy equipment during wet-soil conditions to prevent subsoil compaction;</li> <li>Rehabilitation of exposed sites as soon as practicable</li> </ul>
Air quality & dust	<ul style="list-style-type: none"> <li>The Contractor to protect stockpiles of friable material subject to wind-throw by wetting, or with a barrier, vegetation, or windscreen;</li> <li>Cover loads of friable material during transportation;</li> <li>Restrict speed on loose surface roads during dry or dusty conditions;</li> <li>Suppress dust during dry periods by use of water sprays;</li> <li>Mainline haulage with green panning condition - no vehicles with open beds generate excessive black smoke;</li> <li>Enforce vehicle load restrictions to avoid excess emissions from engine overloading;</li> <li>Uncontrolled burning of woody debris &amp; construction waste to be prohibited within the wayleave</li> </ul>
Noise & vibration	<ul style="list-style-type: none"> <li>All internal combustion equipment will have properly functioning silencers or mufflers;</li> <li>Landowners along the routes to be notified about the construction schedule &amp; activities, including blasting, should it be required;</li> <li>Noise generating activities that take place near residential or sensitive institutional receptors will be restricted to between 6AM and 2MMhrs, which is defined as 'daytime' in the Kenyan noise regulations</li> </ul>
Fuel & chemical storage on site	<ul style="list-style-type: none"> <li>KPLC &amp; the Contractor shall initiate storage &amp; routine handling of fuels, lubricants &amp; other potentially contaminating substances in a weather-protected area equipped with a secondary containment system for spills;</li> <li>Storage areas shall be designed such that they will contain 11M% of the largest container/vessel stored in the storage area;</li> <li>KPLC personnel will be educated on proper use and disposal of hazardous materials</li> </ul>

The full report of the proposed project is available for inspection during working hours at:

- Permanent Secretary  
Ministry of Environment and Mineral Resources  
NHIF Community  
P.O. BOX 30521  
NAIROBI
- Director General, NEMA  
Popo Rd, off Mombasa Road  
P.O. BOX 67839 - 00200  
NAIROBI
- Provincial Director of Environment  
NYANZA PROVINCE
- Provincial Director of Environment  
RIFT VALLEY PROVINCE

NEMA invites members of the public to submit oral or written comments within thirty (30) days from the date of publication of this notice to the Director General, NEMA, to assist the Authority in the approval process of the project. (EIA/8/2/480)

Signature: 

(Seal)

**B. M. LANGWEN**  
FOR: DIRECTOR GENERAL

\* This advertisement is sponsored by the proponent.



**Annex 7-13 JBIC Environmental Checklist No. 14**

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation		1) Have EIA reports been officially completed? 2) Have EIA reports been approved by authorities of the host country's government? 3) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? 4) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	Yes, the EIA report was completed on 22 Dec. 2009 and submitted to NEMA on 29 Dec. 2009. Not yet. It is expected to be by mid-Feb. 2010 at earliest. Not yet. It will be clarified by mid-Feb. 2010. None.
	(1) EIA and Environmental Permits	1) Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?	Yes. The public consultation meetings were held at 11-12 venues at 3 stages: 1 <sup>st</sup> stage between 21-29 Aug. 2009; 2 <sup>nd</sup> stage between 28 Sept. and 4 Oct. 2009; and 3 <sup>rd</sup> stage between 26 and 31 Oct. 2009. The feedback from the public during consultations is recorded in the proceedings of the meetings (except 1 meeting). Yes. The overall understanding of the project except the compensation and resettlement issues was obtained during the series of public consultation meetings. Compensation and resettlement issues need to be disclosed through the public consultation of RAP. Official information disclosure of the ESIA report is being conducted by NEMA from 19 Jan. 2010 for minimum 30 days.
	(2) Explanation to the Public	2) Are proper responses made to comments from the public and regulatory authorities?	Not yet. The proper responses are planned to be made by NEMA and KPLC if there are any comments on the EIA reports from the public or lead agencies during the official information disclosure.
	(1) Water Quality	1) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? If water quality degradation is anticipated, are adequate measures considered?	Yes. The possibility of runoff during construction and water quality degradation has been noted at some points. Yes. Adequate mitigation measures are overall proposed in the ESIA report.

3 Natural Environment	(1) Protected Areas	<p>1) Is the project site located in protected areas designated by the country's laws or international treaties and conventions?</p> <p>Is there a possibility that the project will affect the protected areas?</p>	<p>Yes. The Olkaria to Lessos line will originate from the Olkaria 2 geothermal power station, which is within the Hell's Gate National Park, but there is already a power line running through the Park to extract power. Therefore, the impact on the Hell's Gate National Park would be insignificant.</p> <p>No. The Olkaria to Lessos line will avoid Lake Nakuru National Park, and there would be no significant impact on Lake Nakuru National Park.</p> <p>Yes. The Olkaria to Lessos line will pass through marginal parts of the Mount Londiani, Timboroa, Nabkoi and Northern Tinderet Forest Reserves which are also protected areas. However, the new line will be constructed alongside the existing transmission line, and the impact on the forests would be minimum.</p>
	(2) Ecosystem	<p>1) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>2) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>3) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>4) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife, and livestock?</p> <p>5) Is there a possibility that improved access by the project will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?</p> <p>6) In cases where the project site is located in undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?</p>	<p>Yes. The specialist study on fauna and flora identified only a stretch of about 4-5 kilometres of indigenous forest in the Timboroa Forest in the project site. However, according to the Kenya Forest Service (KFS) the rest of the Forest Reserve areas through which the Alternative 1 line will pass are largely plantations planted with exotic tree species.</p> <p>Yes. According to the specialist study on fauna and flora, the potential negative impact on one of the Red List plant species (Vulnerable), <i>Prunus africana</i> (Red) (<a href="http://www.iucnredlist.org/apps/redlist/details/33631/0">http://www.iucnredlist.org/apps/redlist/details/33631/0</a>) was identified in Londiani, Mau Summit and Timboroa Forests.</p> <p>The mitigation measures such as to avoid unnecessary tree clearing and to compensate the loss of forest resources for KFS's initiatives (tree planting) are proposed in ESIA.</p> <p>No. The new line through Forest Reserves which are mostly plantation forests will parallel the existing transmission line wayleave. Therefore, the impact on migration or habitat fragmentation of wildlife and livestock is insignificant. Migration of wildlife is not expected, and the livestock would be able to migrate under transmission lines.</p> <p>Not an anticipated problem, for the reason given above. The adequate measures for the impact are not required.</p>
3 Natural Environment			<p>Yes. However, very little of the route is undeveloped. Where it is undeveloped, placement of the transmission towers is likely to have a negligible effect on natural environments.</p>

	(3) Topography and Geology	<p>1) Is there a soft ground on the route of power transmission lines that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?</p> <p>2) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?</p> <p>3) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?</p>	<p>Yes. There is a variety of ground conditions along the route. In some places it may be soft (e.g. to south of Kisumu sub-station) and/or steep (e.g. Nandi Escarpment). Yes. It is usual for KPLC transmission tower foundations to be engineered to suit the ground conditions. Yes. It is expected that cutting will be needed in very few places and that adequate measures will be employed in the design to prevent landslides.</p>
4 Social Environment	(1) Resettlement	<p>1) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>2) Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</p> <p>3) Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>4) Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>5) Are agreements with the affected persons obtained prior to resettlement?</p> <p>6) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p>	<p>Yes. Soil run-off could occur from temporary access roads, borrow sites and disposal sites. Appropriate mitigation measures for soil erosion were prepared in EMP of KPLC's ESIA.</p> <p>Yes. Involuntary resettlement is expected. At this moment, JICA Study Team's topographic survey identified 330 residential structures at minimum. The exact number of resettlers' household will be identified by KPLC's RAP. Between Aug.-Sept. 2009, approx. 470 residential structures were initially identified but were reduced to approx. 330 residential structures by the realignment which was done by JICA Study Team's topographic survey team, KPLC engineers and JICA Study Team.</p> <p>Not yet. However, the explanation on relocation and compensation will be given during the public consultation meetings on RAP to be organised between Jan. or Feb. 2010.</p> <p>To be prepared. An appropriate RAP including proper compensation, restoration of livelihoods and living standards will be developed in the KPLC's RAP study which was started from Dec. 2009 and to be completed by Feb. 2010.</p> <p>It is suggested by the specialist study on socio-economics that special attention should be paid to vulnerable people such as widow-headed households in accordance with the WB OP 4.12 Involuntary Resettlement since in Kenya the RAP is usually prepared in accordance with the OP.</p> <p>Not yet. The overall agreement is planned to be obtained by the public consultation meetings to be organised in Jan. or Feb. 2010. However, the individual agreements with each affected households shall be obtained after the RAP study but prior to resettlement.</p> <p>Not yet. The organisation framework for resettlement shall be established as suggested in RAP prior to resettlement. The necessary work and budget shall be suggested by RAP and secured by the project proponent prior to resettlement. There is an existing organisation for implementation of monitoring of RAP, Resettlement Action Implementation Team, within KPLC</p>



4	(2) Living and Livelihood	<p>7) Is a plan developed to monitor the impacts of resettlement?</p> <p>1) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>2) Is there a possibility that diseases, including communicable diseases, such as HIV will be introduced due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>3) Is there a possibility that installation of structures, such as power line towers will cause a radio interference? If significant radio interference is anticipated, are adequate measures considered?</p>	<p>as shown in Section 7.5.5, the similar organizations shall be established in KETRACO.</p> <p>Not yet. RAP is planned to suggest a necessary internal and external monitoring plan for resettlement including monitoring methodology and organisation in accordance with the WB practice. Monitoring shall be conducted by KETRACO in accordance with the RAP.</p> <p>Yes, there is a possibility for the project to adversely affect the living conditions of landowners and land users unless the appropriate compensation and livelihood assistance are provided.</p> <p>Yes. There is a possibility that the project would increase communicable diseases (e.g. HIV) due to inflow of construction workers. Adequate mitigation measures such as educational programme provision by the contractor to workers and local communities are planned in the EMP of the ESIA.</p> <p>No. The necessary safety measurements would be designed by KPLC to avoid any radio interference.</p>
Social Environment	(3) Heritage	<p>1) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites?</p> <p>Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>Yes. According to JICA Survey Team's topographic survey, landscape specialist study and socio-economic study, the project does not affect archaeological and historical sites but some small churches may be affected and may have to be moved. Detailed impacts will be identified by KPLC's RAP Study.</p> <p>The ESIA mitigation measures include a 'chance find' procedure to ensure that any unexpected archaeological artefacts found during construction will be properly conserved.</p> <p>Yes. The transmission line will affect the landscape.</p> <p>Yes. The effect will be minimised by:</p> <ul style="list-style-type: none"> <li>- Running the line in parallel with an existing transmission line over the majority of the route.</li> <li>- Routing the line to avoid Lake Nakuru National Park.</li> <li>- Running the line along the foot of the Nandi Escarpment.</li> <li>- Conducting the Specialist Study for landscape to identify any further measures needed.</li> </ul> <p>Moreover, JICA Survey Team's landscape specialist study indicates that the impacts on landscape range from major to not significant (medium – small scale). To mitigate the impact, minor local diversions and minimisation of tree clearance are proposed.</p>
	(4) Landscape	<p>2) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	

5 Others	(5) Ethnic Minorities and Indigenous Peoples	<p>1) Where ethnic minorities and indigenous peoples are living in the rights-of-way, are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?</p> <p>2) Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?</p>	<p>Not yet. According to JICA Survey Team's Socio-economic study, no indigenous people were identified in the project site of Alternative 1. The detailed impacts will be clarified by KPLC's RAP Study.</p>
	(1) Impacts during Construction	<p>1) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p>	<p>There is no Kenyan law on rights of ethnic minorities and indigenous people. However, once the impact on them is identified, the international practice on ethnic minorities and indigenous people shall be adopted for ESIA/RAP.</p> <p>Yes. Appropriate mitigation measures to address construction impacts were prepared in KPLC's ESIA.</p> <p>Additionally, KPLC has a Safety, Health and Environment (SHE) Policy and an acceptable noise limit of 90 dB (A) for noise during construction/operation in accordance with the Factories and other Places of Work (Noise Prevention and Control) Rules 2005 in Section 1.5.10 of the SHE policy.</p>
		<p>2) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p>	<p>Yes. Appropriate mitigation measures to address effects on the ecosystem were overall developed within the ESIA.</p>
		<p>3) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p>	<p>Yes. Appropriate mitigation measures to address social environment issues were developed within the ESIA and will be further planned in the RAP.</p>
	(2) Monitoring	<p>4) If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?</p> <p>1) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>2) Are the items, methods and frequencies included in the monitoring program judged to be appropriate?</p>	<p>Yes. H &amp; S awareness is proposed in KPLC's ESIA and will be provided as part of the implementation of contractors' EMPs in accordance with KPLC's SHE Policy in accordance the ESIA.</p> <p>Yes. An Environmental Monitoring Plan (EMoP) for the identified negative impacts on environment was developed within the ESIA, though some details such as parameters and frequencies need to be clarified.</p> <p>Yes and No. Some details are missing especially for measurement/sampling (e.g. parameters, methods, and timeframe/frequencies), which needs to be clarified and updated.</p>
		<p>3) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p>	<p>Yes and No. responsible organizations and estimated budget are proposed in the ESIA, but personnel and equipment are not proposed yet. However, for the personnel, there is an existing SHE Department for ESIA implementation and monitoring, and a Resettlement Action Implementation Team for RAP implementation and monitoring in KPLC. Similar organisations or personnel need to be established in KETRACO.</p>
		<p>4) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>Yes. NEMA requires the proponent to conduct the Environmental Auditing within 12 months of the commencement of the operation and not more than 24 months after the completion of a project which ever is earlier.</p>

6 Note	Note on Using Environmental Checklist	1) If necessary, the impacts to transboundary or global issues should be confirmed, (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	The proposed project will not involve any transboundary impacts or global environmental issues.
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1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are made, if necessary. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.