

NON TECHNICAL SUMMARY

**ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT STUDY FOR THE
PROPOSED DRILLING OF EIGHTY (80) GEOTHERMAL STEAM PRODUCTION
WELLS FOR EXPANSION OF ELECTRICITY POWER GENERATION AT GREATER
OLKARIA GEOTHERMAL FIELD IN NAIVASHA SUBCOUNTY.**

Environmental and Social Impact Assessment for drilling of eighty wells was undertaken and the report submitted to National Environment Management Authority (NEMA) in June 2012. All the eighty wells were to be drilled at Olkaria Geothermal Field. The ESIA was undertaken using internal capacity. The proposed drilling of geothermal wells falls under the projects listed under schedule II of the Environmental Management and Coordination Act (EMCA), 1999 for which ESIA is mandatory. Besides ensuring compliance with this requirement, the ESIA was a prerequisite requirement for funding of the proposed project by the Exim Bank of China.

The scope of the proposed project covered construction of access roads, well pad and pond preparation, laying of water supply lines, construction of concrete cellars, well cementing, drilling of a total of 80 geothermal wells and well discharge tests. Drilling of the geothermal wells was to be carried out by Great Wall Development Company (GWDC) from China, a contractor, whereas the rest of the activities were to be done internally by Kenya Electricity Generating Company Limited (KenGen).

The objective of the proposed project was to drill production wells that would supply steam to generate 560MWe of electricity and to drill reinjection wells for ensuring sound disposal of geothermal fluids coupled with recharge of the reservoir. The 560MWe of electricity was to be made possible via construction of Olkaria I unit 6 -70MWe, Olkaria IV -140MWe, Olkaria I unit 4 and 5 -140MWe, Olkaria V -140MWe conventional power plants and 70MWe wellhead projects. Separate ESIA studies for individual power plants, including the steam gathering system, were to be carried out at a later stage. Energy being a key enabler of economic development in line with Kenya's Vision 20103, the proposed project was justified.

The ESIA study was carried out in line with the administrative guidelines provided under Environmental (Impact Assessment and Audit) Regulations, 2003. The objective of ESIA was to identify potential positive and negative environmental impacts associated with the proposed project and make recommendations on how to enhance the positive impacts on one hand and to mitigate the negative environmental impacts on the other.

Public consultation was a critical ingredient of this ESIA study. Two public meetings, one at Kamere trading centre and the other one at the Olkaria Maasai cultural centre were held in order to listen, record and/or address the views, concerns and compliments of the local communities bordering Olkaria Geothermal Field. The meetings were chaired by the area chief (local administration) to promote transparency and fair representation. The public meetings were complimented with a key stakeholders meeting comprising of line ministries, Ngos, neighbouring flower farms and the sub-county administration. This meeting was chaired by the then District Commissioner of Naivasha subcounty (currently designated as Deputy County Commissioner).

The main significant environmental and/or social aspects identified by the ESIA study included; vegetation clearing especially for the well pads that were to be located with Hell's Gate National Park, dust, hydrogen sulphide emissions, blowout, solid waste generation, use of fresh water from Lake Naivasha, influx of workers at Olkaria (immigrants in search of jobs), disposal of geothermal fluids, soil erosion and falling objects.

The proposed mitigation measures that were to be implemented in order to ensure environmentally sound sustainable development included:

- Supplementing fresh water from the lake with brine as drilling fluid;
- landscaping and rehabilitation of disturbed sites with native vegetation;
- minimization of project foot print by drilling multiple wells on the same well pad;
- containment of drilling fluid in properly designed recirculation ponds;
- use of a proper functioning blowout equipment;
- use of permit to work system when carrying out drilling operation;
- measurement of hydrogen sulphide gas and noise levels'
- proper enclosure of the diesel generators to minimize noise emissions;
- provision of solid waste container and offsite disposal mechanism;
- enforcement of personal protective gear;
- use of improved silencers during vertical discharge tests to minimize noise emissions and;
- sensitization of workers on communicable diseases like HIV/AIDS.

An Environmental and Social Management Plan was developed in order to guide implementation of the proposed mitigation measures. The significant aspects were to be integrated with Environmental Management System (EMS), ISO 14001:2004 for which KenGen is certified. The ESIA study was reviewed, approved and license issued by NEMA on 14th November 2012.