

Environmental Audit Report for Lion Petroleum Corp On oil and gas exploration in Block 2B of Isiolo and Wajir Counties



Vintage line dung in the '1970s

New lines by Lion Petroleum

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Executive Summary

The auditor has read all the project reports presented to him which comprises of the initial EIA report conducted and approved by NEMA two years ago; an assortment of records by the community liaison officer showing the minute, photos and the dairy of community events right from the beginning of the project to present. The records also include reports on specialized HSSE study made to focus more closely on issues of health and safety in relation to their field situations and operations. Among the records provided also include a copy of the NEMA licence issued to approve the activities of the project. Other documents include information on the project activities, location of the project and the activities undertaken so far.

The auditing also proceeded to inspect the activities on the ground with a view to verify the records in reports and also to assess the level of compliance to each of the conditions stated in the licence. The ground assessment also focused on assessing the extent to which the EMP has been followed and to assess the level to which community participation has been implemented. We developed a matrix of a score card that we used in the field and made three independent assessments by three individuals to reduce on biases.

The findings have shown that the project operations followed very closely the impact mitigation measures provided in the ESMP. The project management went further to commission another study in addition to the EIA based ESMP, specifically to give more directions on HSSE impacts prevention and management.

Due to lack of baseline information from which impacts can be easily deciphered, the auditor based assessment on the longitudinal analysis methodology that utilises space for time techniques. In this type of analysis, changes in the project area that can be associated with the activities of the project are measured or ranked in comparison to the situation outside the project area. This is very well established methodology especially in social sciences.

The results show that most the environmental parameters used in the assessment had no significant impact to cause any concern. In a number of cases the assessment showed positive impacts meaning that the project has improved the initial status of the parameter to better conditions. These include the socio-economic parameters of the people living in the project area. Other parameters that showed an improvement include the soil microbes which were found to benefit from the activities.

It has been concluded that the prescribed EMP has been followed adequately and this is the reason for very low levels of impacts in the project.

The auditors have recommended for the management continue to seek advice from environmental experts if the project proceeds to the drilling phase and if the financial

resources will allow. This advice can extend to assisting in community liaison when it comes to environmental projects.

Introduction

An Environmental Audit (EA) is a systematic documentation that is periodically done on an on-going project with an objective of evaluating how the activities and processes of the project conform to the approved environmental management plan of that specific project and how the project operations adhere to sound environmental management standards and practices. The aim is to promote a safe and healthy environment at all stages of project operations, including the preparation, operations and the de-commissioning stages. According to EMCA 1999, and the environmental impacts assessment and audit regulations of 2006, the proponent needs to take all practical measures to carry out a self-auditing mechanism to ensure implementation of an environmental management plan (EMP).

The activities of the project whose audit results are contained in this report were reviewed by NEMA in 2011 and licence issued (Licence reference No. 9521) for the proponent to carry on the activities described in this report. In accordance to NEMA regulations (EMCA 1999, and the environmental impacts assessment and audit regulations of 2006), such a project is required to conduct self or internal environmental audits regularly (in the first year of occupation) and every two years of the project cycle, commission an environmental audit to be conducted by a NEMA registered environmental expert and the report submitted to NEMA. This report has been prepared following an audit conducted for this purpose.

In pursuant of this statutory requirement the proponent has commissioned this audit not only to comply with NEMA conditions but also to confirm their self internal audits done earlier as required by law but also to seek advice on any improvements in the way they manage the environment in the project operations area. This is demonstrated by the comprehensive terms of reference for this audit that go beyond just an assessment for the test of levels of compliance to include a demand for advice on how to improve environmental management in the project. The proponent wants to use this audit exercise as a tool to improve on project management.

The objectives for this Environmental Audit

The objectives of this environmental audit are three fold:

- a) Assess the environmental sustainability of the project operations
- b) Assess the levels of compliance with the recommended ESMP and the NEMA conditions as stipulated in the licence
- c) Recommend areas for improvement

Based on the established environmental management and monitoring procedures provided in the EIA report and the records of internal evaluation and monitoring activities, this audit will assess the sustainability of the set recommendations and give an independent opinion and recommend any necessary adjustments to the process.

The audit will assess to see if all the NEMA conditions given at the time the licence was issued have been followed.

The audit will also make recommendations on the areas that require improvements to enhance compliance and the environmental and social sustainability while minimising and reducing impacts.

Environmental Audit Study

The Second Schedule of the Act (EMCA of 1999) specifies the projects or activities that must be subjected to EA. These include an activity that is *out of character* with its surrounding; any structure of a scale not in keeping with its surrounding; and major changes in land use.

It is under these statutory requirements that NEMA recommends an audit to be conducted every two years by a registered expert to assess the levels of compliance to environmental regulations and standards, and that a report on this audit be submitted to NEMA for approval.

An audit study is undertaken on a regular basis by an individual expert, i.e. a qualified and authorized environmental auditor (or inspector), or a firm of experts, registered by the National Environment Management Authority (NEMA).

The goal of EA is to establish if proponents of projects are complying with environmental requirements and enforcing legislation. NEMA oversees administration of EA. The enforcing

legislation is the Environmental Management and Coordination Act (EMCA) of 1999, and The Environmental Regulations, No 56 of 2003, Part V, which deals with Environmental Audit and Monitoring. According to these regulations, (Part V, 31 (7)), an Audit Report shall include, BUT not limited to, the following information:

- a) The past and present impacts of the project;
- b) The responsibility and proficiency of the operators of the project;
- c) Existing internal control mechanisms to identify and mitigate activities with a negative environmental impact;
- d) Existing internal control mechanisms to ensure the workers' health and safety; and
- e) The existence of environmental awareness and sensitization measures, including environmental standards, and regulations, law and policy, for the managerial and operational personnel.

Terms of Reference for Environmental Audit

The following are the terms of reference provided by Lion Petroleum Corp (hereafter referred to as the project proponent) to Dr. Joseph Mworira Maitima (hereafter referred to as the auditor).

The proponent requires the auditor to review all project documents depicting the project design, operation procedures, public consultation and awareness activities, and all the environmental and social impact mitigation efforts undertaken with a view to assess the extent to which ESMP has been followed and to inform on ways of improvement to ensure compliance to the statutory requirement of an EA

The main specific tasks are:

1. Task: (a) conduct an audit of the project documentation based here in Nairobi and
 - (b) a visit to the field to audit the seismic contractors base camp and the post survey impact of the acquisition of the seismic data on the project area (i.e. Bull Dozer lines)
 - (c) Gaining NEMA approval of the audit and the granting of a new 2 year license to undertake further seismic exploration in the same area.
2. Timeline: Licence renewed before expiry of present licence - 15 Sep

Scope of Environmental Audit

An environmental Audit should appraise all project activities, including the production of goods and services, taking into consideration environmental regulatory frameworks, standards, health and safety measures and sustainable use of natural resources. This audit report specifies:

- a) The objectives, scope and criteria of the audit;
- a) The relevant environmental laws and regulatory frameworks on health and safety, sustainable use of natural resources and acceptable national and international standards;
- b) The levels of compliance by the proponent with the conditions of the environmental management plan;
- c) The appropriateness of existing project documentation related to all procedures in place for control and corrective actions in case of emergencies;
- d) How the records of incidences and accidents are made and the likelihood of future occurrence of the incidents and accidents;
- e) How the project employees, the local and other potentially affected communities views on health and safety issues

Audit criteria

An audit is a process to assess the performance of an activity against certain criteria that are either general in practice or are set to be followed in the course of project implementation. They are either conducted during the process of project implementation or are conducted at the end of the project. Although audits are partially aimed at generating information to inform the project managers on ways to improve or the need to maintain performance levels towards fulfilling the general practice standards, Audit is different from monitoring and evaluation for Monitoring and evaluation aims at evaluating the performance in respect to achieving the goals through the intermediary milestones that are expected to lead to the final output and outcome.

In environmental audits the standards are the general statutory requirements either local, national and international, or the environmental management and monitoring standards set out in the EIA report made by an environmental expert and confirmed by a state agency mandated by a legislated law to oversee the compliance of project managers to the standards. Audits are therefore legal instruments to testify that a project proponent has acted in accordance to the law and in accordance to the agreement made between the proponent and the state agency.

The criteria used in environmental audits are therefore based on the conditions set by the state authority and the legal institutional frameworks covered in the activities of the project. These conditions have set the mitigation measures required and actions required to achieve the measures. The conditions set by the authority are specific and have to be complied with alongside the environmental management and monitoring procedures contained in the EIA report.

Audit methods

The methods used for the audit include a study of the documented project performance from project reports and a field visit to inspect the status of environmental conditions in the area of operations and to validate information gathered in the reports. The field work was done by three assessors comprising of an economist with experience in social studies, a health specialist with experience in the area and an ecological assistant with experience in collecting field data.

The three conducted interviews with residents of the area, project management and operational staff, and the local administrators. The views collected by the three auditors were collated in a discussion to make sure that the assessment was agreeable by the three and reasons for reaching an assessment verdict was agreeable to all.

For physical environmental impacts a matrix pre-prepared for this study was used to assess and rank the status of various environmental parameters as outlined in the matrix table (appendix 1). The rankings were made from 1 to 5, where 1 is the lowest and 5 the highest. Where there was no change a score of 0 was made. Each of the assessors scored the rankings

independently on a separate sheet of paper and made comments that led him to arrive to the ranking. The reason for making three independent assessments and rankings was to reduce bias that may arise due to personal or human error and preferences. The three assessment rankings were averaged to give the final assessment ranking.

Site inspection matrix

A site assessment matrix was developed by the auditing team to capture the status of various environmental parameters that were indicated in the initial environmental impacts assessment report as being the potential areas of impact due to the development and the areas identified in the environmental and social management and monitoring plan as requiring monitoring both during the preparation, construction and decommissioning phases.

Description of the project

The operations of project as presented in all documents and as observed on the ground during the audit inspects was for prospecting for oil and gas deposits in Block 2B as shown in the map (figure 1). The method used is seismic technologies to study the geological stratigraphy of rocks beneath the surface. Seismic technologies is based on sending sound waves from the earth surface to below ground and recording the refractions and reflection back to the ground where they are recorded by a computerized system.

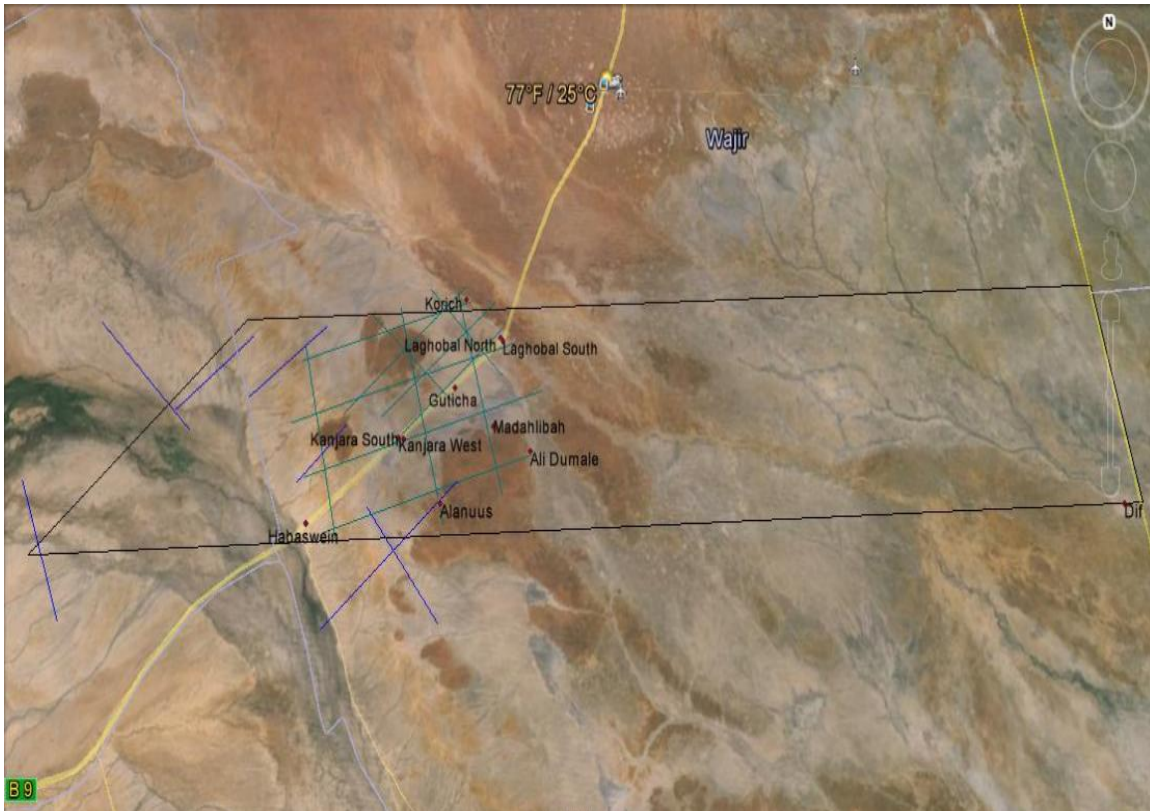


Figure 1: Map showing the location of the project area, distribution and lengths of the cutline's (Light blue lines) – Source: Google map for Oil and Gas Exploration in Block 2B (April 10th 2013)

As very well documented in the project operation documents, the project comprises of cut lines along which the seismic profiling equipment move. The cut lines are only 2 meters wide and run for several kilometres as shown in figure 1. The cut lines are made by cutting down (threshing) shrubs and leaving the soil undisturbed except for the movement of vehicles and people as they transmit and record seismic profiles. The process of producing and transmitting the seismic waves causes noise and as the equipment is transported along the cutline may raise little dust

The project has built camps to house project staff and store the equipment as well as other equipment and other items of necessity to camp occupiers and the operations of the project. These equipments comprise of vehicles, tractors, wires, computers, an assortment of seismic apparatus, office facilities, fuel storage, food stuff, and tents; personal belongings, and facilities like toilets etc.



Figure 2: Photo of the old (A) and new (B) cut lines

A comparison of two cut lines where one (b) is an improvement of the other (a). In (b) the cut line runs around the big trees that fall on the seismic survey line to avoid cutting it down as in the case of (a). Lion Petroleum Corp used the one that avoids cutting down big trees.

Project profile

B

Following the environmental impact assessment conducted by Lion Petroleum for Oil and Gas exploration in Block 2B located in Garba Tula District, Isiolo County and the rest in Wajir County of the Eastern and North Eastern Region of Kenya, Lion Petroleum were awarded an exploration License No. 9521 on 15th September 2011.

Commencement of the oil and gas exploration on block 2B begun on 25th November 2012, with the camp constructed and operated by BGP crew number 8638 E. Prior to the camp construction there were various sensitization meetings done in various locations and they took meetings minutes and filed them. Line survey of block 2B started on 28th December 2012 and recording of seismic data commenced on the 13th of January 2013. By March 13th 2013 the project had finished the collection of over 400 kilometres of seismic data.

Following the first stage completion of data collection Lion Petroleum sort to conduct an annual audit of their operations and submit it to NEMA as a statutory obligation.

Organizational structure

The organization chart presented below (figure 3) was obtained from the environmental management plan prepared by BGP for the project management. The structure shows how four departments of the operation crew link up to the top management of GBP and the Lion

Petroleum Corp through the chief of party. The HSSEA group is linked to the four operation departments and is responsible directly to the chief of party. The HSSEA team comprises of medical staff, security staff, radio operators for communications and waste handlers. The HSSEA group is supplied with sufficient resources for HSSE management. These resources include personnel, equipment, training, etc. The department is managed by two HSE Advisors. Initially one HSE assistant was on board but latter two other HSE assistants were added.

The organization has environmental management assistant or expert assisted by waste handlers. Presumably one of the advisors is an environmental expert and is able to advise the waste handlers on best ways to manage the environment and is responsible for the implementation of EMP at a high level of decision making.. The CLO should be linking the project management with the local people in the formal public participatory procedures. It is clear that the structure lacks a clear link to the public because it does not show how the community Liaison officer who maintains a community dairy features in the chart. It is necessary to show the linkage to know whether he/she is in the decision making level.

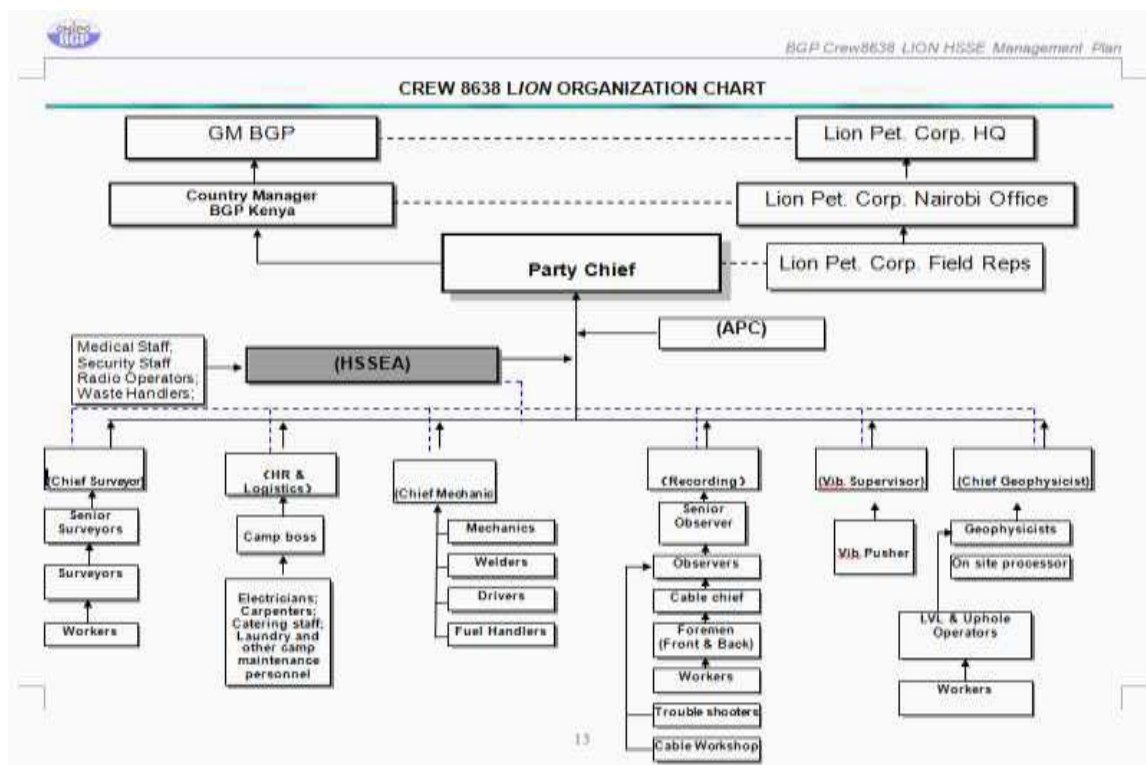


Figure 4: Obtained from EMP by BGP

Production processes involved

The project is undertaken in four phases, the planning phase, the preparation phase, the operation phase and the decommissioning phase. During the planning phase the project designs were laid out identifying the sites the locations to build the campsites, the locations to do the cut lines for seismic surveys and all the logistical arrangements for getting to the site including public sensitization and awareness. The preparation phase on the other hand involved recruiting staff, setting up the camp sites, and moving the equipment and personnel to the site. The operation phase is the actual production process of conducting the seismic surveys that starts with cutting the lines, moving with the seismic profiling equipment along the cut lines and sending seismic waves through the earth strata to record the reflections and refractions with a computerized recorder of the stratigraphic layers of rock formations beneath the earth surface. The decommissioning phase that is yet to be done comprises of pulling out of the exploration site or changing gears from exploration to drilling if this is considered appropriate.

ESMP provided in EIA Report

NEMA is the authority mandated by the constitution of Kenya to approve such plans and once approved they become legally binding for the project managers to follow in the project implementation process. The ESMP therefore becomes the framework on which environmental monitoring and evaluation and auditing are based in addition to the conditions provided by at the time of approval.

Conditions for EIA Approval

The following are NEMA conditions of approval on the basis of which the licence was issued. Added to each of the conditions are comments (*in italics*) by the auditor indicating the level of compliance during the project implementation at the stages of project planning and project operations.

1. General Conditions

1.1. This approval is for seismic exploration for oil in Wajir and Isiolo Districts.

The project has been only on seismic exploration of oil and gas in Wajir and Isiolo. No other exploration method has been used and no other site has been explored except in the sites designated as Block 2B in Wajir and Isiolo Counties.

1.2 The license shall be valid for 24 months from the date of issue

The activities stipulated in the licence started in 2012 within the two year period of the licence

1.3 The proponent shall provide the final project accounts (final project costs) on completion of construction phase. This should be done prior to project commissioning/operation/occupation

The project is on- going. Camps built in the sites are temporary and comprise of one base camp. This will remain for the entire period.

1.4 Without prejudice to the other conditions of this license, the proponent shall implement and maintain an environmental management system, organizational structure and allocate resources that are sufficient to achieve compliance with the requirements and conditions of this license.

The auditor after carefully assessing all the prescribed parameters in the environmental management system is convinced that the management has implemented and maintained sufficient compliant measures. The management has designed and implemented an acceptable organizational structure and has allocated sufficient resources as required by NEMA licence.

1.5 The Authority shall take appropriate action against the proponent in the event of breach of any of the conditions stated herein or any contravention to the Environmental Management and Co- ordination Act, 1999 and regulations there under.

The auditor based on the assessment made during the month of August 2013 is here re-affirming NEMA that the management of the referred project has not acted in any breach of the conditions stated or as required by EMCA 1999.

1.6 This licence shall not be taken as statutory defence against charges of pollution in respect of any manner of pollution not specified herein.

The project management did not use the license as an excuse to cause any pollution other than those arising from the activities of the project and anticipated impacts as documented in the environmental and social impacts of the project. The proponent has taken adequate measure to reduce and mitigate impacts as was recommended in the environmental management and monitoring plan.

1.7 The proponent shall ensure that records on conditions of licenses/approval and project monitoring and evaluation shall be kept on the project site for inspection by NEMA's Environmental Inspectors.

This requirement was complied with as during the time of auditing exercise, the recordings of licenses, monitoring and evaluation records were available on the project site.

1.8. The proponent shall submit an Environmental Audit Report in the first year of occupation to confirm the efficacy and adequacy of the Environmental Management Plan.

The environmental audit results provided in this report are within the first year of project operations and thus serve to be in compliance of this condition.

1.9. The proponent shall comply with NEMA's improvement orders throughout the project cycle

The proponent or project management have been ready to comply with any NEMA order for improvement. However, due to the high level of compliance, there has been no such order over the project period since it started.

2. Exploration Conditions

2.1. The proponent shall ensure that a NEMA officer is attached to the crew during the exploration period.

NEMA officials were aware of the ongoing operations in both counties and were invited down on numerous occasions. However, due to the elections and that the initial seismic phase finished more quickly than expected, they did not make it down to the site. The invitation will be repeated for the next phase."

2.2. The proponent shall ensure that the seismic crew separates grey and black water and that the water is treated before discharge to the environment as per the Environment Management and Coordination (Water Quality) Regulations 2006.

The auditing team was satisfied that this requirement of liquid waste management was complied with adequately. The grey and black water systems were separate and no untreated water was discharged to the environment.

2.3. The proponent shall ensure that the Local Community is aware of the project activities throughout the project cycle.

The project management has made sufficient efforts to create public awareness on the project operations since the project operations begun. The management has had several meetings with the local leaders, administrations and the general residents to brief them on the project activities. Minutes of the meetings held with communities and photographs taken in the meetings were made available to the environmental auditors among the project records reviewed. A clear community participation diary has been maintained throughout the project and records of the diary were made available to the audit team.

2.4. The proponent shall ensure that all excavated material and debris is collected, re-used and where need be disposed off as per the Environmental Management and Coordination (Waste Management) Regulations 2006.

The project operations never made any excavations except in the few places where they used sites to build camps or areas where the truck moved within the camp and the seismic cut lines. There are no soil materials or debris were produced in the process of exploration. At the time of decommissioning the camp sites it is expected that all excavated soils at the camps will be used to re fill the excavations to return them to normal.

2.5. The proponent shall ensure strict adherence to the provisions of Environmental Management and Coordination (Noise and Excessive Vibrations Pollution Control) Regulations 2009.

Noise and vibrations are some of the pollutions emanating from seismic exploration technologies. However, these were some of the anticipated impacts and level of their pollution have been minimized and maintained within the provisions of Environmental

Management and Coordination (Noise and Excessive Vibrations Pollution Control) Regulations 2009. There has not been any complaint among the staff working in the project or from the neighbouring communities.

2.6 The proponent shall ensure strict adherence to the Occupational Safety and Health Act (OSHA), 2007

The project management has taken adequate measures to ensure strict adherence to the Occupational Safety and Health Act (OSHA), 2007. A study was commissioned by the project management to outline in detail procedures for HSSE in addition to those outlined in the EIA report. These procedures have been followed adequately. The proponent maintained a staffed and equipped clinic stocked with medicines for treating general ailments.

2.7 The proponent shall ensure that construction workers are provided with adequate personal protection equipment (PPE), sanitary facilities as well as adequate training.

The proponent adhered to these by providing adequate personal protection equipment, sanitary facilities as well as training. Auditors took photographic evidence of the sanitary facilities, examined the training manuals and inspected the personal protection equipment.

2.8 The proponent shall ensure strict adherence to the Environmental Management Plan developed throughout the project cycle.

The project management team have followed strictly the Environmental Management Plan developed throughout the project since it started.

2.9 The proponent shall ensure that the development adheres to zoning specifications issued for development of such a project within the jurisdiction of Wajir and Isiolo County Councils with emphasis on approved land use for the area.

The management has restricted all its operations to the area specified in as Block 2B within Isiolo and Wajir Counties as portrayed by the seismic maps provided below.

3. Operational Conditions

3.1. The proponent shall carry out an Environmental Impact Assessment (EIA) study for drilling in the event that oil is struck.

The proponent is yet to do any drilling and in the event that drilling will be considered appropriate, an Environmental Impacts Assessment study will be conducted before the activity starts.

3.2. The proponent shall comply with the relevant principal laws, by-laws and guidelines issued for development of such a project within the jurisdiction of Ministry of Public Health and Sanitation, Directorate of Occupational Health and Safety Services, Wajir and Isiolo County Councils, Ministry of Lands, Kenya Wildlife Services, Mines and Geology and other relevant Authorities.

The proponent is aware of all the relevant principal laws, by-laws and guidelines issued by all lead agencies for the activities being undertaken and due compliance to these regulations has been adhered to.

3.3. The proponent shall ensure that environmental protection facilities or measures to prevent pollution and ecological deterioration such as clean production approaches, soil and water protection, waste management measures are designed, constructed and employed simultaneously with the proposed project. The proponent shall undertake continuous review of the environmental management and monitoring plan as need may arise.

The proponent have made all efforts to design and implement adequate measures on environmental protection and has kept records of environmental monitoring as specified in the monitoring plan. For example the amounts and types of wastes generated have been consistently measured and records well maintained.

3.4 The proponent shall undertake continuous review of the environmental management and monitoring plan as need may arise.

The proponent has made reviews environmental management and monitoring plan and the records of these reviews were made available to the auditor

4. Notification Conditions

4.1. The proponent shall seek written approval from the Authority for any operational changes under this licence

There have been no operational changes over the period of the project operations; The only need to write to the Authority is the one we are making now to comply with the statutory requirement of an audit report within the first year of operations.

4.2. The proponent shall ensure that the Authority is notified of any malfunction of any system within 12 hrs on the NEMA hotline 020 6006041 and mitigation measures put in place

There has not been any system malfunctions ever since the project started towards the end of 2012. This has not been necessary since the project started in 2012.

4.3. The proponent shall keep records of all pollution incidences & notify the Authority within 24 hrs.

There has not been any pollution incidence to be notified to NEMA

4.4 The proponent shall notify the Authority of its intent to decommission three months in advance in writing.

The operations are still on- going and the time for decommissioning has not come.

5. Decommissioning Conditions

5.1 The proponent shall ensure that a decommissioning plan is submitted to the Authority for at least three (3) months prior to decommissioning

This is noted and at the appropriate time this compliance will be met.

5.2 The proponent shall ensure that all pollutants and polluted material is contained and adequate mitigation measures provided during the phase.

During the decommissioning time this compliance will be met adequately

Compliance with NEMA legislative and regulation frame-work

The proponent has complied will all NEMA legislative and regulatory frameworks as outlined in the project report.

These include:

National Environmental Action Plan (NEAP)

The activities of the proponent have integrated environmental considerations into their development agenda of the country by adhering to environmental standards in the operations of oil and gas exploration. The country has the energy sector as one of the main drivers of economy aimed at facilitating the country's economic and social development.

The integration process has been achieved through the application of a comprehensive framework to ensure that environmental management and conservation as an integral part of project implementation. The proponent has adopted a process of identifying environmental problems associated with the project implementation and, has raised awareness, with a view to minimising and mitigating impacts, defining policies, legislation and institutional needs, and planning environmental projects.

The 2nd NEAP (2009) has cautioned among other things, against implementation of projects that cause negative impacts on the environment such as air, noise, clearance of vegetation, water pollution, solid and liquid waste disposal resulting from operations and maintenance. The NEAP (2009) recommends control of air and noise pollution, and compliance to EMCA (1999) and its subsidiary legislations. Where such projects are necessary adequate measures must be taken to minimise and reduce these impacts.

The project management has complied with is legislation by putting in place adequate measure to control pollution to the minimum and measures to mitigate the impacts through public awareness and implementing a sound environmental management and monitoring system.

Environment and Development (Sessional Paper No. 6 of 1999)

The paper, now being developed into a full policy on environment, presents broad categories of development issues that require sustainable approach. The paper harmonizes environmental and developmental objectives so as to ensure sustainability. The paper provides comprehensive guidelines and strategies for government action regarding environment and development. With regard to wildlife, the policy reemphasizes the aims of

the Wildlife Policy of 1976 and especially the government's commitment towards involving local communities and other stakeholders in wildlife conservation and management, as well as developing mechanisms that allow them to benefit from the resource. The paper also advocates for the establishment of zones that allow for the multiple use and management of wildlife.

The project proponent has fully complied with this required as all along the project implementation period has been in constant consultations with the local communities and other stakeholders on issues of environmental and wildlife conservation as demonstrated in several reports produced during these consultations.

The Wildlife Policy (Sessional Paper No. 3 of 1975)

This is the policy that governs wildlife management in Kenya. Its goal is “to optimize returns from this resource, taking into account returns from other land uses”. The policy not only recognizes economic benefits from tourism and consumptive uses but also the intangible benefits that include aesthetic, cultural, and scientific gains that accrue from conservation of ecosystems and biodiversity.

The proponent of the project under this audit has taken good care of wild life the area and biodiversity in general in compliance to this legislation. This has been proven by the fact that since the project became operational there have been no impacts to biodiversity.

The National Biodiversity Strategy

The overall objective of the National Biodiversity Strategy and Action Plan (NBSAP) is to address the national and international undertakings elaborated in Article 6 of the Convention on Biological Diversity (CBD). It is a national framework of action to ensure that the present rate of biodiversity loss is reversed and the present levels of biological resources are maintained at sustainable levels for posterity. The general objectives of the strategy are to conserve Kenya's biodiversity to sustainably use its components; to fairly and equitably share the benefits arising from the utilization of biological resources among the stakeholders; and to enhance technical and scientific cooperation nationally and internationally, including the exchange of information in support of biological conservation.

The on-going project has the potential of reducing loss of wildlife through for example poaching by reducing the economic burden of the local people through additional income from oil and gas revues if the prospecting bears fruits.

The National Poverty Eradication Plan (NPEP) and the Poverty Reduction Strategies Paper (PRSP)

The objective of the NPEP is to reduce the incidence of poverty in both urban and rural areas by 50% by the year 2015 as well as strengthening the capabilities of the poor and the vulnerable groups to earn income. Also it aims to narrow gender and geographical disparities and create a healthy, better educated and more productive population. The plan has been prepared in line with the goals and commitment of The World Summit for Social Development (WSSD) of 1995 and focuses on the four WSSD themes of poverty eradication, reduction of unemployment, social integration of the disadvantaged people and creation of enabling economic, political, and cultural environment. This plan is to be implemented by the Poverty Eradication Commission (PEC) formed in collaboration with government ministries; community based organizations, the private sector, non-governmental organizations, and bilateral and multilateral donors.

The NPEP emphasizes the empowerment of poor people and their communities to better manage their resources for collective advancement. The PRSP has the twin objectives of poverty reduction and economic growth. The paper articulates Kenya's commitment and approach to fighting poverty, with the basic rationale that the war against poverty cannot be won without participation of the poor themselves.

Even before the luck of finding oil and gas the project has already improved the lives of many people both in urban and rural areas by providing employment, improving access to some rare resources like water in the exploration areas, improving access to markets by buying food stuffs from them and occasionally providing transport to the local people. They have also contributed through a number of community projects: providing water tanks, delivering water, repairing dams, and are in the process of replacing an up-hole water pump in Lagobal North at a cost of over Ksh 1 million. If oil is struck in the areas the lives of many local residents and other around the country will change forever, the economy of the country will

improve not only through the sales of oil and its products to other countries but also due to presence of own source of energy.

Vision 2030

Vision 2030 the country's new development blueprint aims to transform Kenya into a newly industrializing, middle-income country to all its citizens by the 2030. The Vision is based on Three pillars; economic, social and political. Infrastructure is one of the foundations to anchor the three (3) pillars of Vision 2030. Vision 2030 aspires for a country firmly interconnected through a network of roads, railways, port, airports, waterways, and telecommunications are available to all. The Vision states that by 2030, it will become impossible to refer to any region of our country as remote. To ensure that the main projects under the economic pillar are implemented, investment in the nation's infrastructure will be given the highest priority. The objectives of the proposed project are in line with Vision 2030. Any development project that incorporates these strategies in its plans is most welcome in Kenya.

This project is in all ways relevant to Kenya's vision 2030 in all its three pillars. The economic pillar will benefit from oil revenues that will create wealth, improvement of local and national business that will serve the oil mining crew; the social pillar will benefit as the generated income will transform the livelihoods of those engaged goods and services of the industry. The political pillar will substantially gain by increasing equity of the people living in arid areas of northern Kenya that have in past been political locked out the mainstream of economic limelight of the country. People in northern Kenya will reap from the fruits of Kenya's prosperity and also feel to contribute to the growth of the country and thus have a higher political platform in the country's decision making.

Relevant International Agreements

Kenya's commitment to implement global and regional environmental agreements that influence land use can be ascertained by her acceptance, accessions and ratifications. The Multilateral Environmental Agreements (MEAs) are legal instruments that are utilized to enhance the global responsibility in the management of the environment and natural resources. Other relevant International Agreements include Conventions on Biological Biodiversity, Climate Change, Desertification, Trade in Endangered Species of Wild Fauna

and Flora, Wetlands and Vienna Convention for the Protection of the Ozone Layer. Kenya is also party to the major international human rights treaties specifically, the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights.

Implementation of this project has been conducted in compliance of environmental standards and is a proof of Kenya's commitment to international agreements on environment such as MEAs, convention on biological biodiversity, climate change, Desertification other that seek to protect the environment. The implementation also affirms the country's commitment to upholding international human rights by engaging the public in the decision making on matters that affect their environment. The project has all along kept constant community participation in the whole project implementation cycle.

Convention of Biological Diversity (CBD)

The purpose of this Convention is to ensure the conservation and sustainable use of biodiversity. The implementation of CBD impacts on land in many ways. For example, the designation of reserves or protected areas for preservation of flora and fauna restricts use of such land. EMCA, 1999 provides for conservation of biodiversity. The provisions of CBD are domesticated in the Wildlife Conservation and Management and Forest Acts.

Project implementation has adhered to the provisions of CBD by upholding the tenets of the convention. The project is a demonstration of how development like mining and oil exploration and drilling can take place without being destructive to the environment.

Results of field inspection on compliance

Scores on assessment matrix

Due to absence of baseline data most of the assessments were based on comparisons with the conditions outside the project areas or the places where project activities have not changed. For example the soil microbes' condition, the assessment compared the number of microbes in the places where the project activities have changes and the places where they have not. In most cases the areas where the project activities have overturned the soils, the increased aeration and the loosened soils appear to have made the habitat more suitable for the

microbes because the assessors found more microbes in the project areas than outside the project areas.

In other cases the changes brought about by the project caused impacts that were considered to have net negative impacts compared to areas outside the project areas. In most cases where the project had negative the management measures on impact mitigation were good to the extent that the impacts are maintained at very low levels or well minimized. For these conditions the assessment reported no impacts.

Table 1 results field audit assessment

Impacts	Analysis	Assessor			Aggregate impact
		Assessor1	Assessor2	Assessor3	
Negative					
	Noise	1	1	1	1
	Soil microbes	1	1	2	1
	Soil physical properties	1	1	2	1
	Terrestrial Environments Fauna	1	2	1	1
	Terrestrial Environments Flora	2	2	2	2
	Air quality	2	2	2	2
Positive					
	Economic Impacts	5	4	3	4
	Health and Safety Impacts	4	4	4	4
	Social Impacts	4	4	3	4
	Solid Waste	3	3	1	3
	Soil microbes	0	0	0	
No impact	Water resources (availability)				
	Archaeological, Cultural Sites	0	0	0	0
	Land Resources and Natural Heritage Sites	0	0	0	0
	Offensive Odours	0	0	0	0
	Sewerage	0	0	0	0
	Waste Water	0	0		0
	Sewerage	0	0	0	0
	Surface and Ground Water Resources Quality	0	0	0	0
	Surface and Ground Water Resources Quantity	0	0	0	0
Vibrations	0	0	0	0	
Waste Oils	0	0	0	0	

According to the field assessments the following environmental components were found to have negative impacts ranging from noise and terrestrial fauna both with very low impacts of 1, while soil microbes, soil physical properties and terrestrial environments flora had negative impacts of magnitude 2. Health and safety assessment has shown positive impacts due to

availability of a well equipped and stocked clinic where the health of workers is well maintained. A local employee of the company is better off health wise than his/her counterpart outside the camp who did not get the opportunity to get a job with the company.

Some of the rest of environmental components had either no impacts like in archaeological, cultural sites; Health and Safety; land resources and natural heritage, offensive odours; sewerage; soil microbes; and waste water. All these components were rated 0 by all the 3 assessors showing that they were very well managed.

Most of the components were found to have positive impacts meaning that project implementation activities have improved on their environmental status. The way the environmental status have been considered positive is in cases where the project activities have created habitats better for the organisms or the project activities have diversified the ecosystems to the extent that the organism have a diversified environments. A case in point is for example the soil microbes where the loosened soils seem to better preferred habitats for them. The other positive environmental conditions are in the economic and social aspects where extra financial resources brought in by the project have benefitted the community in general both economically and socially. The project has increased water availability for the residents because water is brought for them regularly.

However, most of the components show no impacts. This is due to the high level of environmental management practices employed by the company.

Sector based assessment

This section outlines the results of the assessment per sector based on field observations and the ranking per sector. As reported earlier a score of 1 shows the lowest impact while a score of 5 shows the highest impact. A score 0 indicates no impact. The score were based on comparisons with areas outside the project area where the there are no impacts from the project activities. These score however, are relative and are subject to the judgement of the assessor.

Waste generated

The project operations generate wastes from people occupying the camp, being in the form waste paper from packages, writing materials, waste food substances, and from personal

effects. Other wastes include waste from oils and petroleum in the camp, in the areas of work and in the storage areas. The assessors were impressed by the high level standards of waste management in all the project areas. The project has garbage bins where solid wastes generated are deposited by the project personnel. The wastes generated are collected and sorted out into compostable materials comprising of organics and non organics. The organics are transported to a pit where they are buried to decompose and mineralize into soil. The non organics are collected into a pit where that are combusted and the ash accumulates in the pit. At the time when the camp is migrated to another site, the ashes collected in the pit is buried in the soil

The operations produce no hazardous wastes in any of the process except the oils and other petroleum products used to fuel vehicles and run the machineries in the exploration process.



Figure 5: Glass and plastic sorted out at the camp

Table 2: Amounts of sorted wastes

Type of Waste	Range (Kg/m ³)	Typical (Kg/m ³)
Food Waste	120 – 480	290
Burnable (mixed)	50 -180	118
Paper	30 -130	85
Cardboard	30 – 80	50
Plastic	30 – 130	65
Wood	120 – 320	240
Non-burnable (mixed)	180 – 360	300
Glass	160 – 480	195
Tins / Cans	45 – 160	90
Mixed burnable and non-burnable	140 – 180	160
Metal scrap (heavy)	1500 – 2000	1780
Metal scrap (light)	500 – 900	740
Metal scrap (mixed)	700 – 1500	900
Dirt, ashes	320 – 960	480

The operations generate wastes in the process of operations as indicated above. Wastes have huge effect on environment if they are not well managed. The project management has put much effort on waste management as was informed by the project documents and - observed in the field. The wastes are always classified into two categories: non-hazardous and hazardous wastes. These hazardous wastes like waste oil and filters are stored in waste pins in oil storage area in the base camp; used dry cell batteries are collected in re-sealable plastic bags; and shaving sticks/blades stored in locked wooden box with plastic lining. In addition, used vehicle tyres, scrap metals are stored at their respective storage areas for collection and disposal to approved waste site by a licensed local contractor. Medical wastes comprising sharps and cotton swabs are separated and stored in different plastic containers. All medical wastes were sent to Habaswein General Hospital for disposal at specific times in their medical incinerator. This has already been done severally. This information is contained in the EMP report by BDP and was confirmed during the field inspection by the auditing team.

The effects on ecological and socio-economic matters

The main objective for developing an Environmental Management Plan was to identify the major impacts produced by the of the project activities on the Environment and consequently, the means to minimise these impacts. According to the EIA report conducted on this project and the environmental audit report by Lion Oil Corp., the following are the areas that were identified to the potential impact associated with the project activities:

- Noise and vibrations from Vibroseis machines;
- Disturbance to terrestrial and aquatic (riverine) habitats, flora and fauna along survey Lines;
- Dust generation and exhaust emissions by vehicles and equipment;
- Waste generation at camp sites and other work areas;
- Disturbance to livelihood activities during data acquisition along survey lines; and interference with sensitive cultural and natural heritage sites.

These impacts are likely to cause effects on either the ecological processes affecting the composition, distribution or the functions of the ecological resources in the project areas or the socio-economic processes that provide for livelihoods among the people living in the area or whose businesses are based on social economic activities of the area.

a) Effects on Ecological Resources

Impacts to ecological resources (vegetation, wildlife, aquatic biota, special status species, and their habitats) are minimal and localized in very small areas because of the limited nature of the activities. The introduction or spread of some non native invasive vegetation could occur as a result of vehicular traffic, but this would be relatively limited in extent. Seismic surveys could disturb wildlife. The amount of vegetation cut during the establishment of seismic lines is too narrow to destroy vegetation or scare wildlife. The vegetation cut is only the shrubs as the grass and the herbaceous layer is left intact. The impact on grass and herbaceous species is due to vehicle and equipment movements along the seismic survey lines but in most of the times these annual species are dry. The area is naturally arid with only dry land adapted plant species largely scattered in distribution. Since there no subsurface soils exposed along the cut lines impacts on below ground biodiversity is minimal, limited only to the compaction of soil

by the movement of vehicles and equipment. The project has no impacts animal biodiversity except a few arboreal insects that might have nested on the cut down shrub trees.

The organisms in the project area are adapted to orbiting on large spatial areas in search of food due to the scarcity of resources in such dry habitats. Their food chains are diverse as an adaptation to life in arid environments. The area is arid and thus depicts a high homogeneity or lack heterogeneity in the distribution of ecological resources such that the cut lines of 2m wide are very unlikely to cause much disturbance on food chain of organisms. Technically, prospecting activities along the cut lines are difficult during the wet days thereby constraining operations to only the dry days, a situation that reduces the magnitude of impacts on soil organisms.

The prospecting activities carried out by the proponent are therefore of no significant impacts to the ecological processes.

b) Socio-economic matters.

Although the activities of the oil exploration phase are temporary and limited in scope, they result in socioeconomic impacts on employment and local services. Some of the members of the community have secured employment in the company as cooks, security, liaison officers and general labour. The goats slaughtered in the camp are supplied by the local community. Generally most of social economic impacts are positive as they benefit the local communities.

The only situation that could be considered to cause negative socio-economic impacts is that of having cultures foreign to the local culture which may not affect cultural believes or social ethics of the local society.

Social issues

As reported in the EMP by BPG the project has increased the number of people in the project site and within the neighbouring areas either as employees or itinerant business people. This has shown to have positive implication to the socio economics of the area. On social analysis the introduction of people of different social backgrounds to the project area increased diversity of so cultures that may have created a better understanding of other people's backgrounds: This may contribute to creating better inter ethnic relationships and build better cohesion. Some of the social impacts of the project on the society include:

- i. An increase among the local communities about on the awareness of other people's cultures
- ii. An increase in social cohesion between the tribes represented in the workforce of Lion Petroleum Corp. And the local communities
- iii. The financial gains by the local communities should have enhanced the social fabric of the beneficiaries

The effects on the environment

Noise

Noise from seismic exploration was considered to have potential impact on the surrounding communities, and people working in the project. This has been confirmed by our audit assessment, but due to the noise control measures employed by the management the impacts was found to be minimal and ranked only 2 in the assessment ranking. Some of the measures employed include regular servicing of vehicles and equipment, fitting the vehicle with noise control gadgets, and constructing the exploratory lines away from residential areas.

Vehicles and machineries are confined to the parking lot within the camp site when not in use and do not proceed to the residential area as well as there was no vehicular movement past 6pm in the evening.

Air Quality

The source of impacts on air quality was the dust produced by moving vehicles either within the camp, and movements within the prospecting area. The other source of impacts on the air quality was considered to come from fumes and exhausts of the vehicles and machines. The mitigation measure recommended for these impacts include avoiding un-necessary movements, making sure that vehicles are regularly serviced and a speed limit enforced through a drive rite system gadget to regulate speed to: (I) improve on fuel consumption so as to reduce the cost of operations, and (II) to reduce excessive noise usually associated with malfunctioning engines.

The assessment found that these recommendations have been followed and records are kept on the dates the machines were serviced.

Cultural Resources

The amount of surface and subsurface disturbance was minimal. Cultural resources buried below the surface are unlikely to be affected; while material present on the surface could be disturbed by vehicular traffic, ground clearing, and pedestrian activity. Adequate public consultations were made to identify areas with cultural resources. Such areas were avoided. The survey conducted during this audit and others conducted earlier internally by the project crew have not come across any complaint from the public on an affected cultural site.

Health and Safety

The potential impacts on human health and safety resulting from exploration activities could include: occupational accidents and injuries; vehicle or equipment accidents, exposure to weather extremes, wildlife encounters, slides and falls on uneven terrain, adverse health effects from encounters with unfamiliar disease vectors, dust generation and emissions, and contact with hazardous materials (e.g., from spills). The potential for these impacts to occur was low because of the limited range of activities and the level of preparedness of the workers on mitigation measures.



Figure 6: Some of safety signs displayed in the camp

Land Use

Temporary and localized impacts to land use would result from exploration activities. These activities could create a temporary disturbance in the immediate vicinity of a surveying or monitoring site or an exploratory cut line (e.g., disturb recreational activities or livestock grazing).

The typical land use in the area of exploration Block 2B is livestock rearing. The inhabitants of the area are pastoralists, who practice open area grazing. The presence of oil and gas prospecting team does not have any significant impacts on land use systems in the area. The apparent impact on land use is the increase in land use intensity (grazing) as a result of increase in livestock numbers around the exploration area due to increased security in the area.



Figure 7: A typical Land Use in the prospecting area

Paleontological and Archaeological Resources

Paleontological resources are non renewable resources. Disturbance to such resources, whether it is through mechanical surface disturbance, erosion, or paleontological excavation,

irrevocably alters or destroys them. Direct impacts to paleontological resources would include surface disturbance during seismic surveys and the construction of access roads and other ancillary facilities . The amount of subsurface disturbance is minimal during the exploration phase and paleontological resources buried below the surface are unlikely to be affected. Fossil material present on the surface could be disturbed by vehicular traffic, ground clearing, and pedestrian activities (including collection of fossils).

The National Museums of Kenya has mapped all the sites known to have paleontological resources and there is none known in Block 2B where the current exploration is based. However, since the exploration methodology does not expose the sub-surface soils, it is unlikely that such resources would be destroyed if indeed they were present. In many instances the local people will know if such resources are in their neighbourhood, especially if such resources have been mapped in their area.

Soils and Geologic Resources

Surface effects from vehicular traffic could occur in areas that contain special (e.g., cryptobiotic) soils. The loss of biological crusts can substantially increase water and wind erosion. Also, soil compaction due to development activities at the exploratory well pads and along access roads would reduce aeration, permeability, and water-holding capacity of the soils and cause an increase in surface runoff, potentially causing increased sheet, rill, and gully erosion. The excavation and reapplication of surface soils could cause the mixing of shallow soil horizons , resulting in a blending of soil characteristics and types. This blending would modify physical characteristics of the soils including structure, texture, and rock content, which could lead to reduced permeability and increased runoff from these areas.

Potential impacts to geologic and mineral resources would include disturbance on sand and gravel resources. It is unlikely that the seismic survey activities in Block 2B caused any geologic disturbance on sand and gravel or on any other minerals in the area. Impacts to soils and geologic resources are proportional to the amount of disturbance. The amount of surface disturbance and use of geologic materials during the operations by the proponent were minimal due to the insignificant land area of operations compared to the vast land area where these resources would be if they were present.

Transportation

Transportation activities are usually occasional, temporary and intermittent and are limited to low volumes of light utility trucks and personal vehicles. In any case these transportation impacts are not *out of character* with the surroundings except for the higher intensity than that by the local residents. Transportation of goods from one homestead to another and to the market places is common either by vehicles or animal traction along tracks similar to those used by the exploration team.

To minimize impacts caused by transportation, the management has constrained vehicle to move only along a single track rather vehicle creating tracks everywhere.

Visual Resources

Impacts to visual resources would be considered adverse if the landscape were substantially degraded or modified. Seismic exploration activities have no visual effects, due to the fact that no landscape transformation was caused either by building or occupying the camp site or even establishing seismic survey lines.

Water Resources (Surface Water and Groundwater)

Minimal impact to water resources (water quality, water flows, and surface water/groundwater interactions) would be anticipated from exploration activities. Vehicle movement tracks and boring of holes like pit latrines may provide a path for surface contaminants to come into contact with groundwater or for waters from subsurface formations to commingle. They may also decrease pressure in water wells and affect their quality. Most of the water used in the operations is usually delivered by trucks to the camp site because no boreholes were dug to supply water.

Prioritization of all past and on-going concerns (of the company)

The company has used three reports to guide prioritising of the on-going activities along environmental and social concerns. First was the EIA report prepared before the start of project operations. During the project operations the project management conducted two studies to develop a more detailed Environmental Management and Monitoring System (the Final HSSE Report on 2D Seismic Acquisition in Block 2B Kenya) for Lion Petroleum Corporation of Kenya); and the HSSE study that focussed to a greater detail on social and

health impacts of the project. All the reports from these studies provided the potential impacts from different activities of the project and the measures that should be taken to avoid, minimize or reduce the environmental, social and health impacts.

While most of the previous studies identified potential impacts, the audit exercise conducted in this study will provide an evaluation of the effectiveness of past activities in order to optimize on the on-going activities.

Occupational health and safety concerns

Following recommendations by all the three reports referred to above, the project management put in place a very elaborate health and safety measures to guide the operations of the project. They followed the provisions of workman's Act that was used to train and sensitize the worker on rules and procedures on health and safety.

The company has operated a first class HSSE management scheme. First the company commissioned consultants to evaluate their situation and operations set up in order to advise on general health and safety measures that should be taken. The consultants made a very detailed report on health and safety measures and risk prevention techniques. The figure below shows some of the health and safety training programmes that the staffs go through. Concessionary the company runs drills to test their preparedness for accidents or disasters.



(1) Fire Drill: Mgt. Addresses Workers (2) Paramedic Splint Mock Fracture injury (3) Drill: Radio Opt. logged events

The drills were useful as they pointed out weak areas that needed improvement especially on the aspect of human behaviours in relation to defined HSSE management system.

Table 3: Audit results of risk factors

Risk factor	Risk control
Vehicle and other machinery Accidents	All staff recruited are taken through training before hiring as indicated in the appendix, vehicle are fitted with speed detectors and errant drivers were warned and one sent off. The management routinely observe workers to identify and correct unsafe acts and poor work practices. Poor judgment by workers and poor work practices that may cause accidents. Drivers of vehicles and other machinery are always tested Additional training to staff is always provided to correct poor work habits.
Exposer to extreme weather	This is managed by limiting the time a worker is exposed to extreme heat in the area
Wildlife encounters	The camp is fenced with soil bump almost 3 meters around the camp. There has been no incident of encounter with wildlife
Falls and uneven terrain	The company is well prepared with top of the class first aid backed up with a clinic that can perform minor injuries. Where a victim may require higher medical attention, arrangements are in place for quick transfer to the hospital in Habaswein and if in critical conditions an evacuation can be done.
Dust generations and emission	Company operations on seismic surveys do not emit dust of significant amount. Most of the dust generated is from vehicle movements. To reduce dust, movement of vehicles is restricted to only the most necessary times. Within the camp dust is minimized by regularly sprinkling water on the ground.
Contact with hazardous materials	The management provides protective equipment and adequate instruction, training, and supervision to staff. Signs are also posted on and near the equipment to remind workers of how to protect themselves.

They have installed fire extinguishers in many strategic places including outside the tents where people live, workshops, car park, fuel storage areas, dining areas and all common places. Many of the long term workers are trained on first aid procedures and fire fighting techniques.

During the audit visit signs were seen in the camp indicating safe grounds in the unfortunate event of fire or any other disaster emergency.

Workers are provided with PPEs like ear plugs, helmets and mouth pads to minimise impacts on people especially those operating machines.

The campsites are supplied with equipped first aid facilities and a functioning dispensary staffed with personnel capable of providing first aid care and administering of general drugs for common illnesses.

The company maintains records of accidents that have occurred either in the campsites or in the field.

Maintenance of machinery and resource use efficiency

All the 36 vehicles and 2 up hole drill rigs are maintained regularly and kept in good condition. The company has 15 other hired vehicles that are also maintained in good condition. Maintenance of machineries and all equipment is done routinely in a camp workshop. Machineries are diesel powered. These fuels are stored safely in fuel storage area in tanks similar to those used in regular fuel stations.

- **Energy use**

Energy is an environmental concern, as it utilizes oils, solar, wind, etc. Energy used in the project is provided by oil run generators that produce electricity, in the required quantities for lighting the camps, running the workshops and powering all the equipments in the camp. The diesel powered machines are maintained to reduce smoke emissions from engines that can cause pollution. Electricity and fuel use data can be obtained from the records at the in house fuel station if there is a need to check how much electric power is used.



Figure 8: Power Distribution Unit

- **Water use**

The area has no piped water and all the water used in the camp is delivered by trucks and stored in water tanks in the campsite. The company also supplies water to the local residents on a regular basis. Due to the short duration of the project the company has not considered creating an own water source as the cost may be too high.



Figure 9: Water storage tanks

Public participation:

The project management has undertaken a through public consultation with well kept documentations of minutes, lists of participants and records of issues raised. The participants included local administrators, special interest group leaders like churches (religious leaders), and associations in the local areas. Documents of the public consultations were made available to the environmental auditor for information. During the environmental audit survey

a number of residents were interviewed to assess whether they understood the operations of the prospecting company. Indeed the residents are all aware of the activities of proponent on the area.

Environmental Management System (EMS) bench-mark questions:

The EIA project document had a summarised EMP that contained methods for environmental management at various stages of the project ranging from the preparation stage, through project operations phase to project decommissioning phase. Subsequently a follow up audit was made especially on HSSE and has further refined the environmental, social and health issues associated with seismic exploration and have shed light on mitigation measures required to minimise impacts.

However, the environmental management structures suggested are a little lacking in methods for monitoring the impacts. The EIA report is also lacking on indicators to monitor. Evaluation of the impacts of this project suffers from the lack of baseline data that would be used to show the magnitude of impacts. Having said that, the comparison between the vintage lines, which are still visible, and that of the proponent which are already becoming difficult to find in places, does allow some form of baseline to work on. Availability of indicators for monitoring would guide validation of impacts in all the three major sectors of ecological, social-economic and health. This has forced the auditing to be based on longitudinal analysis rather before and after analysis that show the impacts more explicitly. Longitudinal analysis utilises space for time techniques where changes in the project intervention area are compared with changes in a similar place where intervention has not taken place. The challenge for this type of analysis is that it is difficult to find a place where the initial conditions were the same.

To ensure that this seismic exploration project is sustainable, Environmental and Social Management Plan (ESMP) had been prepared under the ESIA report that includes;

- a) Listing of the anticipated environmental and social concerns,
- b) Environmental management actions to be undertaken by the Contractor,
- c) Apportioned the responsibility and costs for mitigation
- d) Monitoring indicators
- e) Decommissioning Actions.

The management plan presented in the EIA report gives the management principles, the broad indications of the responsibilities, with the possible implementation constraints anticipated while detailed actions are tabulated in a matrix for ease of reference and review. The report notes that the matrix was not complete in itself and continuous reviews were necessary throughout the project implementation period.

The broad factors that need to be considered in the project implementation and its post evaluations initiatives were suggested to include the following;

- (i) Preservation of the physical land forms (slopes, valleys, hills, etc.) and natural beauty (vegetation, aerial appearance, etc.) of the countryside.

- (ii) Protection of steep slopes, control of soil erosion and siltation of public sources of water (springs and streams),

- (iii) Enhancing integration of environmental, social and economic functions (hydrology, climatic conditions, topography, geology, population trends, settlement patterns, land use systems, etc.) in the project design and implementation,

- (iv) Protection and conservation of biological diversity throughout the project route,

- (v) Clear demarcation of the project activities that will ensure reduced encroachment by the adjoining landowners,

Recommendations of the Auditor

This project has been implemented in accordance to the stipulated ESMP and has fulfilled all the conditions provided by NEMA in the licence. The project management has done a highly commendable job and has shown high levels of professionalism. The few recommendations we would like to make relate to future similar projects in order to incorporate environmental management progressively as the work continues so as to spend less during the project decommissioning phase. These are as follows

1. Recommend formation of green committee comprising of people knowledgeable on issues of environment, sustainable development and community participation.
2. Recommend proponent to subscribe to government printers for the latest legal notice on environmental and public health issues to keep in touch with changes in regulatory mechanisms.
3. Future environmental impacts assessment should show the indicators of impacts and the indicators to monitor especially for the ecological impacts
4. We recommend that the Management instigate a regular internal audit of environmental issues, using expert advice if required throughout the project.

Summary of key findings and conclusions

The project has been implemented very professionally resulting into positive impacts on the society and some areas especially the soil biodiversity. Most other areas have shown no impacts due to application of very effective environmental mitigation measures. If the project closes today the local communities will left better off than when the project was starting.

Appendix 1

Lion Petroleum Corp. Environmental Audit Score Card on Impacts per site


(Fill separate sheets per site assessed and per assessor) **Rank 1 to 5 {1 the lowest and 5 the highest}**

Analysis		Ranking	Comments on Indicators
1. Soil	a. Physical Properties		
	b. Texture		
2. Climate			
3. Air Quality			
4. Surface and Ground Water Resources			
5. Terrestrial Environments:	Flora		
	Fauna		
6. Land Resources and Natural Heritage sites <i>(Explain each impact separately but score overall)</i> <u>May use separate sheet</u>			
7. Visual Aesthetics			
8. Noise			
9. Vibrations			
10. Offensive Odours			
11. Archaeological, Cultural Sites and Landscape <i>(Explain each impact separately but score overall)</i> <u>May use separate sheet</u>			
12. Waste Management	a. Solid Wastes		
	b. Waste Oils		
	c. Waste Water		
	d. Sewerage		
13. Social Impacts <i>(Explain each impact separately but score overall)</i> <u>May use separate sheet</u>			
14. Economic Impacts <i>(Explain each impact separately but score overall)</i> <u>May use separate sheet</u>			
15. Health and Safety Impacts <u>May use separate</u>			

<u>sheet</u>		
16. Any other observation (s)		

Appendix 2

Monthly HSSE Activities (Obtained from EMP by BGP)

						
						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Meetings	Weekly Training			Section Meetings		Monthly Drills
Daily Toolbox- 5:50am Daily Ops. - 7:00pm Weekly Section - 1	Incident Prevention, ERP, Environment Mgt., Equipment Safety, Fire Prevention/Fighting, Journey management, PTW/LOTO, Occupational Health, PPE, Survival- Land, Land Transport & Security, JSA, Manual handling			All Sections Head Review of any incident in previous month and preventive measures		Fire, Meuevac, Man Lost, Oil Spill Security, Evacuation
Note: Crew BGP Weekly report is: <u>Wednesday - Tuesday</u>					1 Mech./Transport Occupational Health (First Aid, HIV, Hepatitis etc., Personal Health/ Hygiene, Substance abuse)	2 Fire Team (Mech./Camp) Fire Fighting and ERP
3	4	5	6	7	8	9
AOB	Survey/Line Clearance Weekly meeting: 4th, 11th, 18th & 25th	Recording Incident Prevention & Reporting (UA, UC, NM etc.)	Camp/Logistics Weekly meeting: 6th, 13th, 20th & 27th	Survey/Line Clearance Incident Prevention & Reporting (UA, UC, NM etc.)	Mech./Transport Weekly meeting: 1st, 8th, 15th & 22nd	Vibrator & Uphole Incident Prevention & Reporting (UA, UC, NM etc.)
10	11	12	13	14	15	16
AOB	Mech./Transport Incident Prevention & Reporting (UA, UC, NM etc.)	Recording Weekly meeting: 5th, 12th, 19th & 26th	Mech./Transport & Uphole Manual handling	Vibrator Weekly meeting: 7th, 14th, 21st & 28th	Camp/Logistics Food Handlers Kitchen safety Personal Hygiene, Food preparation & preservation	Vibrator & Uphole Occupational Health (First Aid, HIV, Hepatitis etc., Personal Health/ Hygiene, Substance abuse)
17	18	19	20	21	22	23
AOB	Transport (All drivers) Transportation Safety	Camp/Logistics Occupational Health (First Aid, HIV, Hepatitis etc., Personal Health/ Hygiene, Substance abuse)	Uphole/LVL Weekly meeting: 6th, 13th, 20th & 27th	Mech. Workshop Workshop Safety	Food Handlers Kitchen safety Personal Hygiene, Food preparation & preservation	ERP/Meuevac, Mech. W/Shop, Vibs. & Uphole Refresh PTW, Confined Space & LOTO, Manual handling & lifting
24	25	26	27	28		
Senior staff Management of PTW, Confined Space & LOTO	Camp/Logistics Incident Prevention & Reporting (UA, UC, NM etc.)	Mech./Vibrator, Uphole & Plumbers Safe Work Habit (Pressure Hazards and Control)	Crew Committee meeting Safe Work Habit (Pressure Hazards and Control)			
We can make it a SUCCESS if SAFETY is first in all activities.						

Appendix 3.

Photographs of some of the sessions done by Lion Petroleum Corp in public participation.



Part of the crowd attending the sensitization Baraza at Sericho area



Participants in the seismic sensitization meeting at Habaswein library