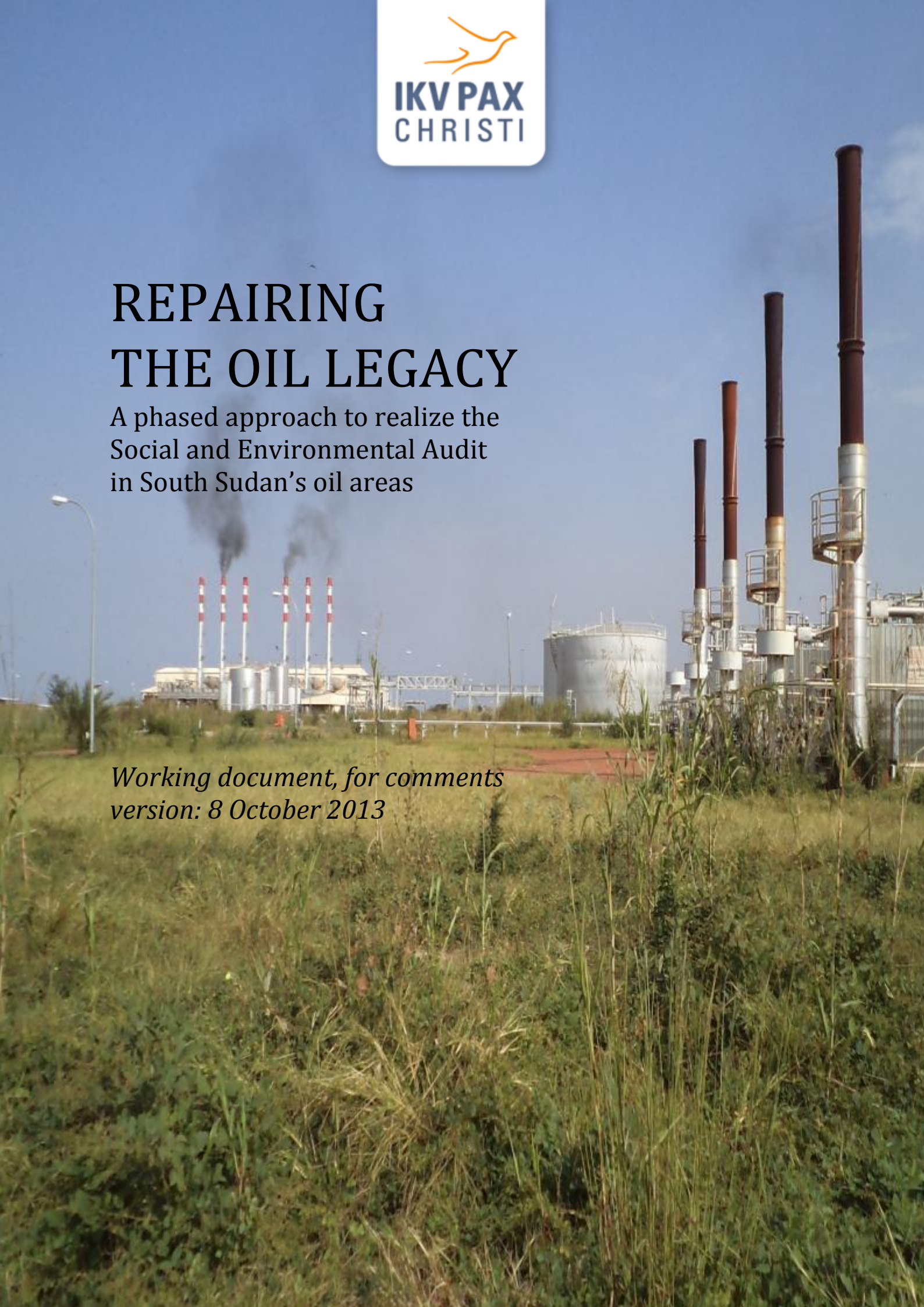


# REPAIRING THE OIL LEGACY

A phased approach to realize the  
Social and Environmental Audit  
in South Sudan's oil areas

*Working document, for comments  
version: 8 October 2013*



# COLOPHON

*October 2013: draft version for comments*

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Cover photo: WNPOC (now SPOC) petroleum facilities Block 5A, Unity State, 2011

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IKV Pax Christi works for peace, reconciliation and justice in the world. We join with people in conflict areas to work for a peaceful and democratic society. We enlist the aid of people in the Netherlands who, like IKV Pax Christi, want to work for political solutions to crises and armed conflicts. IKV Pax Christi combines knowledge, energy and people to attain one single objective: there must be peace!

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## **About the European Coalition on Oil in Sudan**

The European Coalition on Oil in Sudan (ECOS) was established in 2001 by a large group of European organizations working for peace and justice in Sudan and now South Sudan. It is hosted by IKV Pax Christi. ECOS calls upon Governments and the business sector to ensure that oil wealth contributes to peace and equitable development.

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# Summary

The oil industry inherited by South Sudan was developed at a time when the strategic objective of the Government of Sudan was to get a maximum of oil out as quickly as possible. The policies to minimise social and environmental impacts were sub-standard and the industry's expansion happened in the middle of a civil war. During the Interim Period from 2005-2011, when the war was over, there were no fundamental changes in the industry's environmental and social performance. The little research available confirms that the petroleum industry in South Sudan has negatively impacted the natural environment and the living conditions of the local communities in the oil areas. However, the precise extent of the damage is unknown to date as it has never been researched comprehensively.

Since 2012, the Joint Operating Companies (JOCs) active in the operational concession areas are obliged by South Sudanese law to carry out a Social and Environmental Audit (SE-Audit), in cooperation with the Ministry of Petroleum, Mining and Industry (MPMI). It is of utmost importance that the scope of this audit is comprehensive enough in order to:

- determine improvements for operational procedures so additional damage can be avoided;
- Determine the necessary clean up and rehabilitation of existing damage and repair of the causes of past damage
- assess the social impacts and build the much needed 'social licence to operate'.

Only with an SE-Audit that addresses the above three dimensions, the foundation can be laid for a clean chapter in petroleum industry management in South Sudan.

There are several challenges that need to be addressed, like the absence of clear baseline data or how to differentiate between damage incurred pre- and post- 2011 (Independence). Also, in order to show the causal relations between activities and their impact, an SE-Audit must have a high level of detail. Such a comprehensive SE-Audit would require extensive evidence gathering (field work), take time (several years) and a very substantial budget (millions of dollars). The JOCs are required by law to foot the bill but they are reluctant, the more as the pipeline shut-down from January 2012 – April 2013 temporarily disrupted revenues and their future production levels are uncertain.

It is not realistic to expect that the SE-Audit can address all questions at the desired level of detail at once. Therefore, this paper proposes the South Sudan SE-Audit to have a phased process, starting with a broad inventory followed, by gradually zooming in on key areas. It recommends and explains a four-phased approach and concludes with a Terms of Reference (ToR).

# 1. Introduction

South Sudan became an independent state on 9 July 2011. One of the many challenges of the new state is to manage the inherited oil industry sustainably and to deal with past (and future) environmental and social impacts. There are numerous indications that all petroleum areas incurred substantial social and environmental damage. This has led to a negative image of the industry among many South Sudanese citizens, especially those living in the oil areas of Unity State and Upper Nile State. It is of paramount importance that the scale of the industry's social and environmental impact is assessed and made publicly known as a basis for remediation, improving the performance of the industry and prevent further damage. Of equal importance is that the damage is repaired and compensated in order to reconcile with the victims and build a much needed support base for the industry – especially as it is the key driver of economic development.

The challenge South Sudan is facing<sup>1</sup>, would normally require a number of initiatives to be taken: baseline studies, Strategic and Project Environmental and Social (& Health) Impact Assessments, audits. The special interest of the Government for now, as laid down in South Sudanese legislation, is on the identification of historic social and environmental damage caused in the past in order to repair that damage and improve industry performance.

To determine the environmental and social damage up to now, the execution of a Social and Environmental Audit (SE-Audit) is key.<sup>2</sup> Such audit is obliged by the South Sudan Petroleum Act 2012 and the Transition Agreements<sup>3</sup>, to be carried out and financed by the contractors or licensees.<sup>4, 5</sup>

This obligation concerns the following oil concession areas and companies:

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<sup>1</sup> Bopp Solutions/ ECOS (2012)

<sup>2</sup> For a discussion of the all instruments needed to manage the industry sustainably, see Bopp Solutions/ECOS, 'Effective application of Environmental and Social Impact Assessment in South Sudan', January 2012.

<sup>3</sup> In January 2012, Transition Agreements (TAs) were signed between the Government of South Sudan and the petroleum companies of the operational concession areas. This forms a supplement to the Original Exploration and Production Sharing Agreements (Original EPSA) which the companies signed with the Government of Sudan.

<sup>4</sup> The Petroleum Act (July 2012) refers to an independent Social and Environmental Audit, while the Transition Agreements refer to a Health, Social and Environmental Audit (HSE Audit). Basically these are the same tools, as an SE-Audit can also include health aspects.

<sup>5</sup> The Transition Agreements also include the obligation to perform a Financial Audit of the industry. The two audits certainly have common concerns. E.g. the SE-Audit will refer to the financial dimension of social and environmental impacts (estimation of damages, costs of remediation, etc.). However, the financial audit will also address broader financial issues (fiscal policy, transparency, the issue of the redistribution of oil revenues in its social, spatial and sector wise dimensions). While the need for collaboration between the two audits is recognized, this paper focuses only on the SE-Audit.

<b>Concession</b>	<b>Joint Operating Company (JOC)</b>	<b>Companies<sup>6</sup></b>
Block 1/2/4, Unity State	GNPOC, renamed Greater Pioneer Operating Company (GPOC)	Chinese National Petroleum Company (CNPC), Petronas Carigali Overseas, ONGC Videsh
Block 5A, Unity State	WNPOC-I, now Sudd Petroleum Operating Company (SPOC)	Petronas, ONGC Videsh,
Block 3/7, Upper Nile State	Petrodar, now Dar Petroleum Operating Company (DPOC)	CNPC, Petronas, Sinopec Tri-Ocean

This paper discusses the objectives, benefits and limitations of an SE-Audit and concludes with a Terms of References (ToR) for such audit. This ToR defines an SE-Audit which:

- is required by the Law of South Sudan;
- is realistic and practically feasible;
- determines present environmental and social damage;
- establishes the costs of repair of identified damages;
- identifies other areas of concern in relation to international standards.



Seismic done in 1980's still visible  
(Photo: El-Moghrabi)



Impact of seismic, 8 years after activities in Unity State  
(Photo: BS)

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<sup>6</sup> In all concession also the South Sudanese national petroleum company, Nilepet, holds a share. It is not named here, as the audit obligation only concerns the foreign companies.

## 2. Strategic Considerations

### ***2.1 Importance of an SE-Audit in South Sudan***

Since the independence of South Sudan in July 2011, the Government of the Republic is responsible for the management of an oil and gas sector that has caused adverse social and environmental impacts while under the Government of Sudan. During the civil war the oil areas became strategic areas for the warring parties.<sup>7</sup> The industry was developed amidst the violent displacement of the inhabitants of the areas. The strategy of the Government of Sudan was to get the oil out as quickly as possible. Social and environmental standards hardly mattered.<sup>8</sup> Even after the signing of the Comprehensive Peace Agreement (CPA) in 2005, inhabitants were forcedly displaced and environmental concerns went unaddressed.<sup>9</sup> Many oil and gas activities are situated in environmentally sensitive areas, including both wetlands and dry areas. These impacts are being felt today and the companies responsible for them are likely to continue or expand activities in the future.

In these areas, many people depend directly on ecosystem services for their basic needs (drinking water, building materials, harvestable biodiversity) and livelihood (livestock). There is a very close link between environmental health (e.g. ground or surface water quality and ecosystem functioning), human health (illness caused by polluted drinking water) and social effects (social and socio-economic consequences of illness). Supposedly, Environmental Impact Assessments were conducted in certain concession areas, but none were made public. The most insightful report available was produced by the Norwegian Directorate for Nature Management. Although the report is quite comprehensive, the researchers' field visits were too short to establish the real extent of social and environmental impacts.<sup>10</sup> See Annex 1 for an overview of identified oil industry related potential risks to the environment and people.

There is an urgent need to implement systems and procedures, and use tools to repair existing damage, prevent further adverse impacts and to organize and manage the oil & gas activities in a more sustainable manner. Experience in other oil and gas producing areas

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<sup>7</sup> In order to get control over and secure the areas, international crimes were committed by armed forces allied to the Government or to the Sudan's People Liberation Movement (SPLM). They included indiscriminate attacks, burning of shelters, pillage, unlawful killings and forced displacement. See: HRW (2003), ECOS (2002, 2006, 2010)

<sup>8</sup> Zaki El Hassan, The Need for a Proper Framework for Environmental and Safety Assessment in Sudan: Protecting the Citizens While Facilitating Development, presentation 2006

<sup>9</sup> CPA Wealth Sharing Agreement (art. 4.5), Sudan's Interim National Constitution (art. 208.5), and Southern Sudan's Interim National Constitution included the right to compensation for victims of the oil wars: '*Persons whose rights have been violated by oil contracts are entitled to compensation. On the establishment of these violations through due legal process, the Parties to oil contracts shall be liable to compensate the affected persons to the extent of the damages caused.*' This has never been implemented.

<sup>10</sup> Norwegian Directorate for Nature Management, *Environmental and Social Impacts of Petroleum activities in Southern Sudan*, 2009.

demonstrates clearly that, if the down side of oil production (environmental and social impact) is neglected or inadequately responded to, issues and problems will only grow bigger. Combined with little or no transparency with respect to the oil revenues and little visible benefits for the local communities, this process develops even more seriously. The clearest example of where that may lead is the situation in the Niger Delta in Nigeria: what started originally as an environmental problem and unhappiness over an absence of benefits for local communities, developed over some 60 years into a hopelessly complex environmental, social, political and financial conflict with at times the characteristics of a civil war<sup>11</sup> attracting global media attention. No actor gains from such situation as it happens at the expense of local communities as well as government and business.

A timely and effective response to environmental and social concerns is likely to prevent such a scenario for South Sudan. The longer a negatively spiral of events is allowed to develop, the longer it will take to restore a level of trust with local communities, required to enable sustainable oil production. In South Sudan, oil activities are still relatively recent, which enhances the chances for repair and the start of a new chapter. This is also in the interest of the oil companies to secure their license to operate sustainably.

## ***2.2 National legislation***

With respect to the execution of an SE-Audit, there are two relevant legal instruments in South Sudan: the Petroleum Act 2012 and the Transition Agreements signed with the companies:

### Petroleum Act 2012, section 100(8):

*When a project involves existing petroleum activities, the contractor or licensee shall carry out and pay for an independent social and environmental audit, in compliance with international standards to determine any present environmental and social damage, establish the costs of repair and compensation and determine any other areas of concern.*

### Transition Agreement, article 7.2 'Government Right to Carry out HSE Audit':

*In addition to any rights of audit and inspection afforded to the RSS pursuant to the EPSA, the RSS and the Contractor shall jointly appoint an environmental consultant of international repute selected by the Minister (acting reasonably) to carry out one audit of health, safety, environmental and social conditions, practices and other matters relating to the health, safety, environment and social impacts determined by the Minister to be included within the scope of such audit in relation to Petroleum operations and the southern contract Area throughout the term of EPSA, whether before or after Secession, in each case on the basis of applicable laws and regulations applying at the time when such health, safety, environmental and social conditions, practices and other matters being audited occurred. The scope of work of the environmental consultant selected by the Minister to carry out the audit pursuant to this Clause 7.2 shall be determined by the Minister. The Foreign Parties shall cooperate with such audit as*

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<sup>11</sup> UNEP, *Environmental Assessment of Ogoniland*, 2011.



*requested from time to time by such environmental consultant or representatives of the Minister, including by making available (or causing to make available) the books and records of [consortium] at reasonable times and on reasonable notice for purposes of the audit. The cost of each such audit shall be borne by the Contractor. Unless one or more material exceptions are discovered in such audit, the contractor shall have the right to recover the cost of such audits as an Operating Expense pursuant to Article VII of the EPSA (Recovery of Costs and Expenses and production Sharing).*

Both documents confirm the legal obligation for an SE-Audit to be performed in the operational petroleum concessions. The details differ a little, but what can be distilled is:

- The contractor or licensee (Foreign Party) has the obligation to conduct or support the implementation of an SE-Audit;
- The SE-Audit should live up to international standards
- The SE-Audit should be independently performed, with the Ministry of Petroleum, Mining and Industry determining its scope and selecting the environmental consultant;
- The costs of the SE-Audit shall be borne by the Foreign Parties.<sup>12</sup>

### **2.3 Objectives of an SE-Audit**

In essence, an audit is an assessment of a situation or a process against legislation or a reference standard. This standard can be any chosen and agreed standard as long as it is sufficiently clear and defined, e.g. national legislation, international Social and Environmental standards (e.g. from World Bank/IFC), industry standard, reference (baseline) situation or a standard dedicated to a specific purpose. The outcome of the audit is a report addressing to what extent the situation or process is meeting the chosen legislation or standard, listing the 'non-conformities' to it and what actions would be required to repair these 'non-conformities'. An appropriate reference standard can be chosen and should determine and match the overall objectives of the SE-Audit.

The first step of an SE-audit would be to define the reference standard to audit against. In the case of South Sudan this standard will be a mix of different components:

- Legal requirements at the time impacts were caused;
- (Inter)national professional and industry standards;
- The reference of the pre-impact environmental and social situation/quality.

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<sup>12</sup> The Transition Agreement specifies that when no detrimental impacts are found, the companies can recover the costs of the SE-Audit as an operating expense, while the Act states the companies will have to pay for it without preconditions. The Act (clause 19.5) asserts its own pre-eminence over petroleum agreements within South Sudanese jurisdiction, and the Transition Agreements (art. 21) recognize South Sudanese law as applicable law. Therefore in case of conflict between the two, the Act would prevail.

To define this reference the following is to be taken into consideration:

- There are all kinds of standards for the acceptability of environmental, social and health impacts (e.g. criteria/limits for waste streams or discharges, for resettlement of people or for drinking water quality). And there is a large group of technical and industry standards on how to perform a certain project or activity (e.g. how to execute a seismic survey). These sets of standards play an important role in the decision which impacts are acceptable and which mitigation/repair measures are available and required;
- Similarly for technical or industry standards, there are a number of leading institutions and standards (OGP, IPIECA, American Petroleum Institute, ISO) and a large group of industry associations and institutions guiding what is acceptable, or a 'Best Practice', with respect to specific technical, design or operational issues. Which set of standards is relevant depends on the characteristics of the proposed project and often also on the national legislation;
- If the objective of the audit is to assess environmental and social damage caused by a certain activity or project, it is very important to have a baseline reference of the situation before that activity started (e.g. soil quality, (ground)water quality, presence of settlements, ecosystem value). If reliable baseline information is missing, as is probably the case for most areas in South Sudan, a reasonably adequate baseline can be created by looking at the undisturbed (environmental or social) situation nearby, outside the influence of the activity, or by performing interviews.
- To be legally rock-solid, an SE-Audit must be detailed (precise definition of impacts) and show the causal relations between (sub-standard) activities and the impact. This would require a comprehensive evidence gathering (field work) and as a consequence a lot of time (several years) and substantial budgets (millions of dollars).

The legally and technically required objectives and deliverables for an SE-Audit in South Sudan thus are:

	<b>Objectives</b>	<b>Deliverables</b>
1	To define and agree an adequate SE-Audit reference standard	A definition of the reference standard
2	To identify the key social and environmental impacts/issues related to past and present oil & gas activities in South Sudan	A list of key social and environmental issues/damages
3	To quantify the extend and magnitude of the environmental and social damage;	A detailed quantification of social and environmental damage (see also 2.3)
4	To assess what would be required to repair and compensate for that damage	Inventory and recommendations for technical, operational or organization solutions to repair, limit and prevent further damage to people and the environment

5	To provide the data to be able to translate the social and environmental damage observed and the consequently required repair and compensation into monetary terms <sup>13</sup>	An estimate of repair costs involved, including a proposed roadmap for a further, structured approach towards dealing with past impacts of the oil & gas industry
6	To learn from the past in order to specify appropriate and required international standards for the petroleum industry. This is also in the interest of the oil companies to secure their license to operate sustainably.	Lessons learnt to guarantee compliance with specific international standards for South Sudan's petroleum sector

## ***2.4 Damage and repair***

Although acute environmental impact is often caused by atmospheric (air emissions) or water impacts, long term impacts and damage are more often related to changes in hydrology (e.g. impacted water beds) and, particularly, soil pollution. Pollution released into the air and (flowing) water will often disperse without clearly identifiable, local consequences for the longer term. Sub-standard waste pits, dump sites, polluted soil/stream beds or ground water will stay for decades or longer and may continue to pose environmental or social threats as a 'secondary' source of pollution.

Special attention should be paid to the key ecological drivers of the ecosystems where the oil exploration and production took/takes place. For instance, in (temporary) wetland areas, hydrology (water flow) and geo-hydrology (ground water) are extremely important to the integrity of the system and very sensitive: a change of soil height of only a few centimetres may change the landscape completely.

Key areas to address in an SE-Audit from an environmental point of view are:

1. Environmental impacts which have occurred, but are no longer visible/traceable on site, e.g. atmospheric emission impacts. These can be identified by questionnaires/interviews and possibly pictures or documents;
2. Soil and water/stream bed pollution: number/location of (oil) polluted sites;
  - a. Type of pollutants (crude oil, BTEX, mercury, heavy metals, micro pollutants, NORM-Naturally Occurring Radioactive Material; waste dumps etc;
  - b. Delineation of the pollution (concentrations, horizontally and vertically, i.e. depth of pollution);
  - c. (Secondary) pollution of surface/ground water;
  - d. Risk posed to people/the environment by the pollution;
  - e. Time available/allowed for clean up and remediation (legally, environmentally, risk wise);
  - f. Clean up and rehabilitation/restoration methodologies available/applicable/allowed;

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<sup>13</sup> This does not mean that compensation necessarily should be money (cash payments) but could also be provided in kind. This should be subject to negotiations with the local population.

3. Environmental impacts caused by physical changes, in particular infrastructural and operational works affecting (geo)hydrology.

Although the various potential environmental effects require different environmental expertise to study them (hydrology, ecology, soil investigation, etc.), it is very important to keep the overview and pay attention to potential cumulative effects to the natural (and social) environment: direct and indirect impacts of oil activities (and potentially other activities in the area) may be individually harmless, but very significant in combination.

Full and detailed investigation and clean up of (oil)polluted sites can be a huge and very costly job.<sup>14</sup> Worldwide, a phased approach is adopted to deal with this: First, a general inventory involving some, but no detailed sampling. This is followed by zooming in on specific sites, trying to find responsible and most cost effective solutions.<sup>15</sup>

For South Sudan, it seems wise to adopt the internationally well respected and applied Risk Based Corrective Action (RBCA) approach. With this, an inventory of all polluted sites is made and priorities are identified based on the risk they pose to 'receptors'; people and the environment. The RBCA approach advocates to prioritise situations depending to what extend a pollution source interacts with a receptor. If the pollution does not interact with a receptor, the risk is low and there is less urgency to clean up. In case of less urgency, there is more time for clean-up and allows for other techniques, which are effective but require more time. An urgent situation with high priority for example would be a situation of oil pollution, leaking to a water source/stream being used for drinking or washing water. The same situation without drinking or washing 'receptors' would be seen as a low priority with more time allowed for remediation. See Annex 2 for more details on RBCA.

It also seems wise to focus, where possible, on carefully chosen in-situ, (enhanced) natural remediation techniques. Provided the RBCA analysis concludes there are no urgent risks to be mitigated, these techniques require more time than ex-situ (excavation and high tech treatment elsewhere) solutions, but are proven effective and often far more realistic and less costly to organise and implement.

On the social end, longer term damage by oil and gas activities is related to:

- Very sensitive and political 'priority one issues' like peoples' illness or death, human rights violations, directly or indirectly, partially or fully caused by the activities;
- Loss of, or damage to land and property;
- Negative impacts on living conditions or livelihood;
- Loss of opportunities.

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<sup>14</sup> UNEP, 2011

<sup>15</sup> Costs increase exponentially from general investigation to sampling to remediation

Therefore, from a social point of view the key areas the SE-Audit should address are:

- People directly or indirectly (via impacts on livelihood) expelled or resettled as a consequence of the oil activities. Particularly involuntary resettlement is a key issue;
- Temporary or permanent effects on people's health;
- Temporary or permanent impacts on land use, crops, livestock, access to water or other living conditions;
- Temporary or permanent effects on social cohesion and the socio-economic situation.



Excavated village in Concession Block 3/7, Upper Nile State, 2005



Impact of roads on drainage, GNPOC concession, 2004 (Photo: El-Moghrabi)

For social impacts a form of remedy should also be indicated. Firstly, because affected people are entitled to it. Secondly, by acknowledging the social impact and remedying it, grievances towards the petroleum industry are likely to diminish. This can stimulate the building of the social support base for the industry. There are basically two options to address the issue of remedying social impacts:

1. Establish an overview of the social impacts, with a certain level of detail which confirms the causal relationship between petroleum operations and social damage, and would suffice to initiate a compensation scheme through a negotiated process with impacted communities. This would involve extensive negotiations but no legal claims.
2. Research all socio-economic and health impacts in such detail that the causal relationship between petroleum operations and all social damage can be established and the monetary value of the damage can be determined. That detailed information could – as a last resort – support legal compensation claims.<sup>16</sup> This option would take a lot of time and subsequently a lot of funds.

The first option is likely to be most beneficial to all parties involved.

A challenge in establishing the social impacts caused by oil industry development is the fact that the industry started up during war time (see 2.1). While the severe impacts were

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<sup>16</sup> Establishing the causal relationship between operations and social impacts, plus a detailed valuation of the impacts is required to lay the legal basis for claiming compensation.

perpetrated by the warring factions, it can be argued the industry bears a level of responsibility.<sup>17</sup> Moreover, the CPA established the right to compensation for 'victims of oil contracts', by the Government of Sudan and the companies. This has never been implemented.

Also, since 2005 the oil companies have paid compensation in certain instances. Many times this was thought not to be sufficient for the loss suffered; e.g. people receiving compensation for one year's loss of crops, ignoring future harvests. At the same time, there have been cases in which compensation was paid but did not reach the actual people entitled to it, instead being taken by government officials or community leaders.<sup>18</sup>

## **2.5 Limitations to an SE-Audit in South Sudan**

Considering the execution of an SE-Audit in South Sudan to determine social and environmental impacts caused by past oil exploration and production activities, a number of complicating factors and limitations should be taken into account:

- Lack of baseline data and ecological studies/understanding of the oil producing area(s) in South Sudan poses a challenge to unequivocally distinguish between 'normal' and impacted situations, in some areas, a certain level of qualitative appreciation will have to be accepted;
- Lack of baseline data before/around July 2011 poses a challenge to draw the line between impacts caused before or after becoming an independent nation;
- Oil activities in South Sudan are ongoing in three areas: Block 5A and Block 1/2/4 in Unity State, and Block 3/7 in Upper Nile State. These areas differ with respect to environmental conditions (e.g. Sudd Wetland<sup>19</sup> in Block 5A, Machar Marches and dry land in Block 3/7), social situation (population density, livelihoods) and characteristics of the oil activities (duration of activities, production levels);
- Translation of social and environmental impacts into monetary value is not a fully scientific, objective process, but always complicated and unpredictable; subject to negotiations, local situations and politics. The best possible objective inventory and assessment of impacts is an essential basis for a repair and compensation process – but nothing more than just a basis.

It is not realistic to expect that it will be possible to address in the SE-Audit at once all questions at the desired level of detail. At the moment it is not yet clear, where the key areas of concern are and where exactly to audit/investigate. The South Sudan SE-Audit should be a phased process of starting with a broad inventory followed by gradually zooming in on key areas. In the next chapter the four-phased approach is further explained in the Terms of Reference.

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<sup>17</sup> See for a detailed argumentation ECOS (2010).

<sup>18</sup> Leben Moro, *Company-Community relations in Pariang*, workshop presentation 2012

<sup>19</sup> The Sudd is one of the world's largest wetlands (5,700,000 hectares) and the largest freshwater wetland in the Nile basin. It was designated a Ramsar site – Wetland of International Importance - in 2006.

# 3. Proposed scope of work and ToR

## 3.1 Phased approach

For the situation in South Sudan the following phases could be designed (see also figure below):

1. Desk study to gather and process available baseline information on the three concession areas and to define the reference standard;
2. Inventory (field work) of the general situation in the various blocks, identify key areas and hot spots and identify the key areas for further, detailed and quantitative investigations;
3. Quantification of the social and environmental damage of past operations at an operational and local level and identification of measures to repair the damage where possible. This third phase of the audit aims to delineate and quantify the impacts identified in phase 2;
4. Translation of quantified impacts and repair measures into financial terms as a basis for a compensation scheme. This phase requires detailed calculation and probably a lot of negotiation on these calculations.

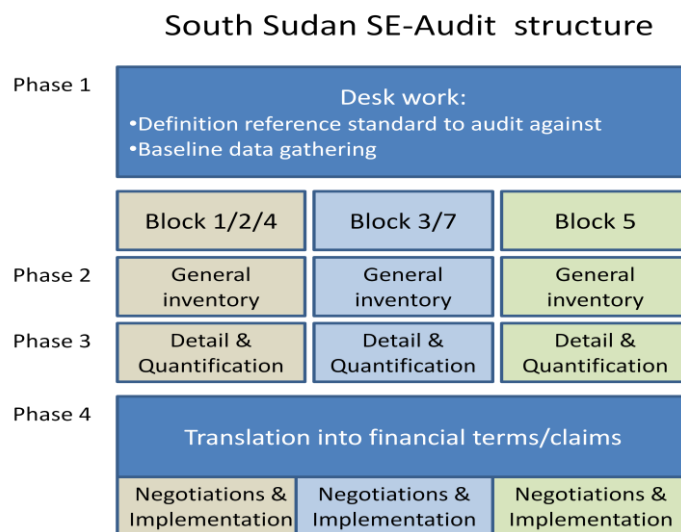


Figure: Proposed phased approach for South Sudan SE-Audit

## 3.2 Proposed Terms of Reference for Phase 1 & 2

Based on the above, the proposed Terms of Reference for phases 1 and 2 is given below. For phases 3 and 4 a rough description is provided, that should be further worked out and detailed based on the outcomes of phases 1 and 2.

<b>Introduction</b>	Since becoming an independent state in July 2011, the Government of South Sudan is confronted with an oil and gas sector, which has caused adverse social and environmental impacts in the past, is having an impact in the present and which will probably develop new activities in the future. The oil
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and gas activities are situated in environmentally and socially sensitive areas. In the area people often depend for their basic needs (drinking water, biodiversity resources) and livelihood (livestock) directly on basic ecosystem services. Section 100(8) of the Petroleum Act has come into being because the lawmaker believed there to be indications that past and ongoing impacts on people and the environment have been adverse and significant. If so, there is an urgent need to implement tools and procedures to repair present damage (prevent further adverse impacts) and to organize and manage the oil & gas activities in a more sustainable manner.

Execution of a Social and Environmental Audit (SE-Audit) to determine the present environmental and social damage and repair costs is a key step in this process.

Given the situation in South Sudan (little baseline information available), a phased approach seems practically required:

1. Desk study to gather and process available baseline information on the three blocks and to define the reference standard,
2. Inventory (field work) of the general situation in the various blocks ( 1/2/4, 3/7, 5A), possibly include inventory of undisturbed situation nearby, outside the influence of the activities, identify key areas and hot spots and key areas for further, detailed and quantitative investigations;
3. Quantification of the social and environmental damage of past operations at an operational and local level and identification of measures to repair the damage where possible. Qualified assessment where quantification is insufficiently possible. This third phase of the audit aims to delineate, quantify, and, if necessary, estimate the impacts identified in phase 2;
4. Translation of quantified and qualified impacts and repair and compensation measures into financial terms to substantiate compensation claims. This phase requires calculation and (probably a lot of) negotiation.

Social and environmental baseline data/reports on South Sudan are limited. This limited information should be gathered, synthesized and made available in the format of a 'desk-top Baseline Study of available information'.

Specifically on two topics additional baseline information should be gathered on location to be able to perform the SE-Audit:

1. Hydro/geological situation. A good, general understanding of the geo-hydrological conditions in the area is essential to be able to assess a number of key issues:
  - The risk of pollution spreading into the ground (horizontally and vertically) and the risks/threats to human health.
  - Ecological impacts. For instance in the Sudd there is one key



	<p>ecological driver for the marshes system: the water. The Sudd is a big shallow, flat, impermeable 'bath' with the river Nile coming in the South and leaving in the North. The behaviour of the water in between makes the Sudd into a unique area: wet, slowly flowing, hard to access, high biodiversity. Changes in the (geo)hydrological conditions in the area (e.g. by 'making the bath leak' by large numbers of seismic holes, by redirecting currents as a consequence of infrastructural works or affecting water quality by inadequate production water management) could dramatically impact the ecosystem with all its related characteristics and services.</p> <p>2. Local communities, lifestyle and land use. Large parts of the communities in the Sudd area/South Sudan are leading a subsistence and agro-pastoralist life, with livelihood based on a mixture of agriculture, cattle herding and fishing. They are vulnerable to adverse impacts of oil &amp; gas activities like pollution of surface or ground water (drinking water for people and /or cattle, quantity and quality of fish) and competition for (dry) grounds. Small, but also larger communities are socio/economically vulnerable with respect to the import of large work forces or other outside influences. Therefore, basic baseline demographic information is essential to prevent or repair key social impacts.</p> <p>The below are the Terms of Reference for phase 1 and 2 of the SE-Audit. For phase 3 and 4 a rough description is given, which should be further worked out and detailed based on the outcomes of phases 1 and 2.</p>
<b>Objectives</b>	<p>The objectives for a South Sudan SE-Audit would be:</p> <ul style="list-style-type: none"> <li>- To define and agree an adequate SE-Audit reference standard, matching the objectives below;</li> <li>- To identify the key social and environmental impacts/issues related to past and present oil &amp; gas activities in South Sudan.</li> <li>- To quantify the extend and magnitude of the environmental and social damage;</li> <li>- To assess what would be required to repair that damage;</li> <li>- To provide the data to be able to translate the social and environmental damage observed and the repairs required into monetary terms;</li> <li>- To learn from past mistakes/malpractices to improve present oil exploration and production standards and practice. This is also in the interest of the oil companies to secure their license to operate sustainably.</li> </ul>
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>- A definition of the reference standard</li> <li>- A list of key social and environmental issues/damages</li> <li>- A detailed quantification of social and environmental damage</li> <li>- Inventory and recommendations for technical, operational or</li> </ul>

	<p>organization solutions to repair/limit/prevent (further) damage to people and the environment;</p> <ul style="list-style-type: none"> <li>- An estimate of repair and compensation costs involved, including a proposed roadmap for a further, structured approach towards dealing with past impacts of the oil &amp; gas industry;</li> <li>- Lessons learnt to improve future oil and gas practices in South Sudan. A list of key social and environmental issues/damages.</li> </ul>
<b>Methodologies and standards</b>	<p>In the SE-Audit international standards should be followed to conduct the auditing and assessment process, methodological procedures and acceptability of outcome/impacts. These could be taken from:</p> <ul style="list-style-type: none"> <li>- IFC-Performance standards / World Bank</li> <li>- Organisation for Economic Co-operation and Development (OECD)<sup>20</sup></li> <li>- Mitigation hierarchy, Risk Based Approach (Risk Assessment Matrix), RBCA, sampling and analyses</li> <li>- IPIECA<sup>21</sup></li> <li>- OGP<sup>22</sup></li> </ul>
<b>Stakeholder Engagement</b>	<p>Stakeholder engagement is an essential element of the SE-Audit. Stakeholders bring a lot of information to the table, but also a sense of reality and issues or sensitivities which may otherwise be overlooked. Areas of a specifically important role for the stakeholders will be in the gathering baseline data (phase I), identification/investigation of social/health impacts (phase 3) and in the negotiation/acceptance of a possible compensation scheme (phase 4). During the field work period, stakeholder meetings will be organized with direct stakeholders (oil companies, communities, NGOs and Government representatives) to explain and discuss the approach and preliminary findings. Careful expectation management should be incorporated.</p>
<b>Key conditions</b>	<ul style="list-style-type: none"> <li>- Professionalism and creativity of the team to tune the SE-Audit to the specific needs of South Sudan at this moment in time, while sticking to (the spirit of) international standards</li> <li>- Baseline information will be limited/missing, but important choices will have to be made with respect to standards and regulations for the oil and gas sector: a careful balance is required between pragmatic and scientifically correct</li> <li>- The involvement of stakeholders in the process is a crucial success factor. Key stakeholders should be identified and engaged in the</li> </ul>

<sup>20</sup> OECD Guidelines for Multinational Enterprises: <http://www.oecd.org/corporate/mne/1922428.pdf>

<sup>21</sup> IPIECA is the global oil and gas industry association for environmental and social issues. See IPIECA good practice publication: <http://www.ipieca.org/publication/improving-social-and-environmental-performance-good-practice-guidance-oil-and-gas-indus-0>.

<sup>22</sup> International Association for Oil & Gas Producers (OGP) standards: <http://www.ogp.org.uk/global-insight/international-standards/>

	<p>process;</p> <ul style="list-style-type: none"> <li>- Cooperation with/participation of GoSS staff in the project.</li> </ul>
<b>Phase 1 &amp; 2</b>	<ul style="list-style-type: none"> <li>- Preparation of/agreement on detailed work plan</li> <li>- Definition and agreement on reference standard</li> <li>- Desk work: <ul style="list-style-type: none"> <li>o Literature/baseline search and synthesis</li> <li>o Preparatory work, interviews and team meetings</li> <li>o Field work preparation</li> </ul> </li> <li>- Two weeks of field work for each of the 3 areas (i.e. 3 x 2 weeks): <ul style="list-style-type: none"> <li>o on-site visits to past and present oil activities</li> <li>o (essential/limited) sampling</li> <li>o interviews with relevant staff and stakeholders</li> <li>o stakeholder workshop</li> <li>o mapping/sites areas of concern (GIS)</li> </ul> </li> <li>- Desk work: <ul style="list-style-type: none"> <li>o Analysis of findings</li> <li>o Synthesis of conclusions and recommendations</li> <li>o Prepare a detailed scope for Phase 3 and 4</li> <li>o Report writing</li> <li>o Presentation of draft report.</li> </ul> </li> </ul>
<b>Team for phase 1 &amp; 2</b>	<p>A South Sudan SE-Audit should be executed by a multidisciplinary team of experts, representing a number of disciplines:</p> <ul style="list-style-type: none"> <li>- Wetland ecology (geo/hydrology, ecology, biodiversity/wildlife, management/conservation);</li> <li>- Socio/economics (demography, land-use, livelihoods)</li> <li>- Soil and groundwater remediation</li> <li>- Auditing/Impact Assessment</li> <li>- Oil &amp; Gas practices (operational, social/environmental best practices and standards)</li> <li>- GIS expert</li> <li>- possibly include from the beginning a legal expert to prepare the way to develop an approach to determine a compensation scheme</li> </ul> <p>To contribute to capacity building, facilitate stakeholder engagement and improve continuity/rooting of the project in the wider context of the development of GoSS, the team should be completed with a number of qualified GoSS staff.</p> <p>Given the number of disciplines required, Phases 1 &amp; 2 of the SE-Audit could be performed by a team consisting of 7 experts, including the team leader. Next to these, GoSS staff should complete the team.</p>
<b>Costs &amp; period phase 1&amp;2</b>	<p>Assuming a 7 person team, the following indication of time and costs is expected:</p>

Task	# of days (complete team)	Other costs
Preparation/agreement work plan	10	
Preparatory desk work	90	Travel €10.000
Definition reference standard	30	Travel €20.000
Field work/visit (3 x 14 days, partially full team). Including a stakeholder workshop in every area	200	Travel/boarding, local transport: €100.000
Field work costs (soil and water sampling, GIS work)		€200.000
Desk work, analysis/synthesis	65	
Reporting	15	
Presentation end conclusions and draft report	10	
Project management	25	
Final report	5	
<i>Total # days</i>	<i>450</i>	
	€450.000	€330.000

Based on an assumed daily rate for international experts of €1.000 (excl. taxes), the overall costs for phase 1 and 2 are estimated at **€780.000 (excl. taxes)**

Lead time for Phases 1 & 2 is expected to be **9 months** – though depending on timing of the field work and accessibility of the areas.

**Phase 3 & 4**

The outcome of Phases 1& 2 includes a list and map of sites/areas of concern and a (qualitative) assessment of related (health) social and environmental risks.

In **Phase 3** this list will be looked at in detail and impacts and risks will be quantified to the extent possible. For soil and groundwater pollution this likely involves considerable, additional field work (horizontal and vertical delineation of pollution, identification of remediation urgency and effective remediation methodologies). Depending on the number and size of sites, type of pollution and level of (human) risk involved, such fieldwork will require considerable soil investigation resources and will be costly; ranging from millions to tens of millions of euro's. This cannot be scoped out now already. It is expected that phase 3 could take a number of years, though urgent situations can be prioritised and dealt with much quicker.

Not all investigations of all impacts and sites have to be completed to enable the start of phase 4. As soon as there is a reasonable overview, based upon a

representative number of quantitative investigations, phase 4 could be started.

In **Phase 4**, the factual outcome from phase 3 will be used as a basis to quantify environmental and social damage in financial terms. Generally, this is more a political exercise than a scientific or investigation job. It is important that a transparent and consistent methodology/process is developed and adopted as the basis for the negotiations with communities. External experts can help to develop such a system/process. The actual negotiations seem more the responsibility and authority of the Government of South Sudan.

At this moment of time, it is too early to estimate the costs of these last two phases.



Drilling chemicals and mud  
(Photos: El-Mohgrabi)



Unlined drilling pit

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# Annex 1

## *Oil industry activities and potential risks to the environment and people*

	River system	wetland	Soils	Ground Water	Air	Ramsar area, national parks, sensitive areas and habitats	Wilderness, key and rare species	Natural food resource	land use, movements, relocation of people	Cultural heritage site, religious areas vandalism	Communities (new and existing)	Socio-cultural	Health
<b>Prospecting</b>													
Campsite	M	H	M	M	L	H	L	L	L	H	M	H	M
Access road	M	H	M	L	L	H	M	L	L	H	M	H	M
Transportation	M	H	M	M	L	H	M	L	L	H	M	H	M
Grid net clearance	M	H	M	M	L	H	M	L	L	H	M	H	M
Sounding Survey (seismic)	M	H	M	M	L	H	M	L	L	H	M	H	M
<b>Exploration</b>													
Campsites/ accomodation	M	H	M	H	L	H	M	M	M	H	H	H	H
Access road	M	H	M	M	L	H	M	M	M	H	H	H	H
Transportation	M	H	M	H	L	H	M	M	M	H	H	H	H
Site preparation/ pads	M	H	M	M	L	H	H	H	H	H	H	H	H
Drilling, well and reservoir testing	M	H	M	H	M	H	H	H	H	H	H	H	H
Plugging and abandonment	M	H	M	H	L	H	H	H	H	H	H	H	H
<b>Production</b>													
Accomodation	M	H	M	H	L	H	H	H	M	H	H	H	H
Transportation/ Supply/ Storage	M	H	M	M	M	H	H	H	M	H	H	H	H
Infrastructure (roads, air fields, canals)	M	H	M	M	M	H	H	H	M	H	H	H	H
Industrial Oilfield activities - construction	M	H	M	H	M	H	H	H	H	H	H	H	H
Power supply/ transmission lines	M	H	M	L	M	H	H	H	M	H	H	H	H
Well field development	M	H	M	H	M	H	H	H	H	H	H	H	H
dSatellite/ Fiels porcessing Facility	M	H	M	H	M	H	H	H	H	H	H	H	H
Central Processing Facility	M	H	M	H	M	H	H	H	H	H	H	H	H
Pipelines/ pumping station (internal - export)	M	H	M	H	M	H	H	H	H	H	H	H	H
Treatment facility/ injection facility	M	H	M	H	M	H	H	H	H	H	H	H	H
Maintenance	M	H	M	M	M	H	H	H	H	H	H	H	H

L= low potential risk

M = Medium potential risk

H = High potential risk

Source: Norwegian Directorate for Nature Management (2009)

# Annex 2

## ***Risk Based Corrective Action (RBCA)***

### WHAT IS RBCA?

Risk-based corrective action (RBCA) is a generic term for corrective action strategies that categorize sites according to risk and move all sites toward completion using appropriate levels of action and oversight. The ASTM (originally American Standards for Testing of Materials, now the US standardisation Institute) ) standard is a good example of a framework for implementing a RBCA strategy. With this process, regulators can make sound, quick, consistent management decisions for a variety of sites using a three-tiered approach to data collection and site review contained in ASTM's E1739 standard guide for "Risk-Based Corrective Action applied at Petroleum Release Sites."

### RBCA helps to:

Categorize sites according to risk

Allocate resources for maximum protection of human health and the environment

Provide appropriate level of oversight

Move all sites forward quickly

### You can use RBCA to:

Identify exposure pathways and receptors at a site

Determine the level and urgency of response required at a site

Determine the level of oversight appropriate for a site

Incorporate risk analysis into all phases of the corrective action process

Select appropriate and cost-effective corrective action measures

RBCA is not a substitute for corrective action, but a tool for determining the amount and urgency of action necessary. RBCA should never be used solely to justify inaction at a site or to save money.

### How does RBCA Work?

The ASTM standard (E1739) is based on a "tiered" approach to risk and exposure assessment, where each tier refers to a different level of complexity. For example, in the three-tiered approach:

#### Tier 1

Tier 1 consists of a qualitative risk-assessment based on general site assessment information. This data would need to identify obvious environmental impacts (if any), potentially affected sensitive receptors (schools, homes, water bodies, etc.), and significant exposure pathways (drinking water wells, recreational use of streams, vapor transport, etc.). When gathered for a number of sites, this information is typically sufficient to help categorize sites and determine acceptable time frames for corrective action (immediacy of response), if necessary.

#### Tier 2



Tier 2, more site-specific data is utilized to determine the appropriate risk-based actions. Here, the reasonable maximum site-specific impact is evaluated through the use of site-specific characterization and monitoring data, conservative projections of expected levels of contaminants after treatment and potential plume migration, and reasonable maximum exposure scenarios. This information is used to set conservative corrective action objectives that are protective of human health and the environment.

#### Tier 3

Tier 3 focuses completely on the site-specific conditions. More sophisticated mathematical descriptions of fate and transport phenomena are used and descriptions of the range of possible exposures/risks are generated. At this level of complexity, site specific risk assessment models may be developed. Due to the costs involved, this analysis is suited to only large sites.

It is important to note that the goal of all tiers is to achieve similar levels of protection. The difference is that, in moving to higher tiers, more efficient and cost-effective corrective action results because the conservative assumptions of earlier tiers are replaced with more realistic site-specific assumptions. Additional site assessment data may be required as sites move to higher tiers.