



SUDAN TRANSITIONAL ENVIRONMENT PROGRAM

SCOPING STATEMENT FOR A PROGRAMMATIC
ENVIRONMENTAL ASSESSMENT OF OIL EXPLORATION
AND PRODUCTION ACTIVITIES IN SOUTHERN SUDAN



September 2007

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PHOTO: WIDE-OPEN SPACES: The floodplains adjacent to the Sudd often seem empty but look closely and they are often well populated areas. Crowned cranes perch on the plains along the Sudd Wetlands of Jonglei State where the White Nile Petroleum Company is currently exploring for oil. In the hazy distance, the distinctive silhouettes of many "luaks" or barns of a Dinka village attest to the high cattle numbers in the area.

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Prepared by Jon C. Cooper, Consultant and Thomas Catterson, STEP Team Leader, for International Resources Group (IRG).

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International Resources Group

1211 Connecticut Avenue, NW, Suite 700

Washington, DC 20036

202-289-0100 Fax 202-289-7601

www.irgtd.com

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ACRONYMS

CPA	Comprehensive Peace Accords
ECOS	European Coalition for Oil in Sudan
GONU	Government of National Unity
GOSS	Government of Southern Sudan
PEA	Programmatic Environmental Assessment
SOW	Scope of Work
STEP	USAID/Sudan Transitional Environment Program
USAID	U. S. Agency for International Development
USDOE	U.S. Department of Energy

GOVERNMENT OF SOUTHERN SUDAN (GOSS) MINISTRIES

MAF	Ministry of Agriculture and Forestry
MARF	Ministry of Animal Resources and Fisheries
MEWCT	Ministry of Environment, Wildlife Conservation and Tourism
MH	Ministry of Health
MIM	Ministry of Industry and Mining
MLHPU	Ministry of Housing and Public Utilities
MTR	Ministry of Transportation and Roads
MWRI	Ministry of Water Resources and Irrigation

PART A: THE SCOPING EXERCISE

INTRODUCTION AND RATIONALE FOR THIS STEP ACTIVITY

Performance Measure No. 9 was added to the STEP contract by USAID/Sudan as part of the first major modification and calls for the “enactment and operationalization of GOSS petroleum exploration and production policies and standards that incorporate environmental best practices used in other petroleum exporting countries.” As noted in USAID/Sudan’s new *Strategy Statement, 2006-08*, there are excellent prospects for continued exploration and exploitation of oil resources in the Sudan.

Oil exploration and production, however, has the potential for major adverse impacts on the environment, societies and economies (“Dutch Disease”) and many of these can result in resource-based conflicts such as land-use, water-use and loss of resources due to pollution. Although USAID has no direct programs related to oil in Sudan at this time, it has included this performance measure as part of its commitment to the capacity building mission under the STEP program.

In responding to this mandate, STEP has chosen to use the framework and methodology of a Programmatic Environment Assessment (PEA), as an approach for working on this activity in close collaboration with its principal counterpart organization, the GOSS Ministry of the Environment, Wildlife Conservation and Tourism (MEWCT). The PEA methodology, and in this case, the first step of a Scoping Exercise, is useful in establishing a systematic procedure for asking questions about potential impacts from oil-related activities. Depending on the outcome of the scoping, the next step, within the context of the preparation of a PEA would be to carry out a careful and selective analysis of the potential adverse impacts, using a thorough data gathering procedure, and to develop a set of recommendations about measures to avoid, mitigate or compensate for these impacts. These measures would form the basis for environmental management planning to be employed by the many interests concerned with oil exploration and production in Southern Sudan.

THE SCOPING EXERCISE

During March 2007, an Oil and Environment Consultant carried out a first general reconnaissance of the impact of oil exploration and production on the environment of Southern Sudan under the aegis of STEP. His role was to explore the feasibility of achieving this STEP Performance Measure by carrying out a Programmatic Environmental Assessment (PEA) of petroleum exploration and production practices to ensure that the policies and standards are well grounded in the local realities of the sector. The first step was to gather materials through literature and interviews to create a Scoping Statement for a future Programmatic Environmental Assessment (PEA). While not linked to intended USG investment in the Sudan oil sector, or to regulatory requirements of USAID, the PEA is informed by approaches and guidelines of USAID’s Environmental Procedures (22 CFR 216.6(d)).¹

The scoping statement activity was conducted as a joint exercise with the STEP GOSS counterpart Ministry of Environment, Wildlife Conservation and Tourism, as is consistent with the major goal of capacity building. Staff from the Ministry accompanied the consultant to all his scoping activities. The activities were carried out in a consultative manner, as is typical with accepted practice in the field of environmental assessment. The consultant met with five other Government of Southern Sudan (GOSS) Ministries in order to have the widest opportunity for obtaining all relevant information and viewpoints on known adverse impacts related

¹ Information regarding the PEA approach and USAID’s environmental regulations can be found on the following Website: www.encapafrika.org. The PEA used by USAID is similar to a Strategic Environmental Assessment (SEA). The SEA approach is similar but not USAID driven, or specific, and apply to environmental assessment at the planning and program or policy level, to ensure that environmental issues are addressed from an early stage in the formulation, planning and implementation process, and are incorporated throughout this process

to oil exploration and production in Southern Sudan for the Scoping Exercise. These consultations were also seen as increasing the opportunities for capacity building related to the environment and petroleum exploration and production—a particular matter of concern to many in the GOSS.

Hence, the expected results of the Scoping Exercise are as follows:

- A good deal of the information in Sudan about the environmental impacts of oil exploration and production is anecdotal and sometimes misleading, obscuring the more salient realities. One goal of the scoping is to compile as much good information as possible on the topic so as to provide the interested reader with a useful reference piece and inform the growing national debate about the environmental impacts of the oil industry.
- There have been some misgivings expressed by both USAID and the GOSS about the feasibility of going ahead with an environmental assessment of oil exploration and production in Sudan and/or in Southern Sudan. One of the objectives of this report is to provide the decision-makers in both organizations with a sense of the challenges and opportunities for carrying out such a study so that they might make the final decision or not as to whether to proceed.
- The usual intent of any Scoping Exercise is to focus the ensuing environmental assessment on the most critical issues and thereby ensure that the follow-up exercise is sufficiently analytical to characterize and even address the concerns.
- Finally, from the more practical perspective, the Scoping Exercise makes it possible to properly design the follow-up environmental analysis or assessment (in this case, a suggested PEA) and identify the team and the level of effort required to carry out the analysis that will lead to a generic environmental management plan for avoiding, mitigating and compensating for the immediate and indirect adverse impacts of oil exploration and production.

BACKGROUND TO OIL ACTIVITIES IN SOUTHERN SUDAN

With 1.1 million square kilometers (km²) under license, the “Sudan has more licensed exploration acreage than any other African country. There are, however, relatively few blocks making the average block size massive, at around 54,000 km²” (Wood Mackenzie 2007).² Furthermore, “despite having a drilling density much lower than other countries, exploration success has been very high and now Sudan ranks as the sixth largest producer in Africa” (ibid). Oil revenues form the backbone of the Southern Sudan economy, provide in excess of \$1.2 billion per annum. The Sudan (GONU and GOSS) is now the third largest exporter of oil in Africa and that is expected to grow as new exploration continues at a fast rate (USDOE, 2007). Under the CPA (peace accords), the Government of Southern Sudan is to receive a 50% share of oil revenues. While there is some disagreement over the location of the border between Southern Sudan and the North, it appears that over 60% of the oil fields are in the Southern Sudan Region (ECOS, 2006).

In Southern Sudan until 2006 there was only one major project (Blocks 1, 2, 4, operated by the Greater Nile Petroleum Operating Company in the Muglad Basin), one export pipeline and one crude oil blend (See Figure 1, ECOS, 2006). In late 2006, several facilities were completed and production was almost doubled, with an estimated 434,000 barrels per day (ECOS, 2006). From the three blocks (1, 2, 4) production and exploration has expanded to blocks 5a, 5b, 6, 4 (full on-stream in 2006), 3, and 7 (ECOS, 2006). A new major pipeline is being constructed from the Melut Basin to Port Sudan. Block 5b and block B are expected, respectively, to be on line by 2011 and 2013 (ECOS, 2006). Of the total export of the 434,000 barrels per day, oil fields that occur in the area south of the demarcation line (block 1, part of 4, parts of block c, block 5a and 5b, block b, block 3 and the majority of block 7), there is production of approximately 250,000 barrels per day or

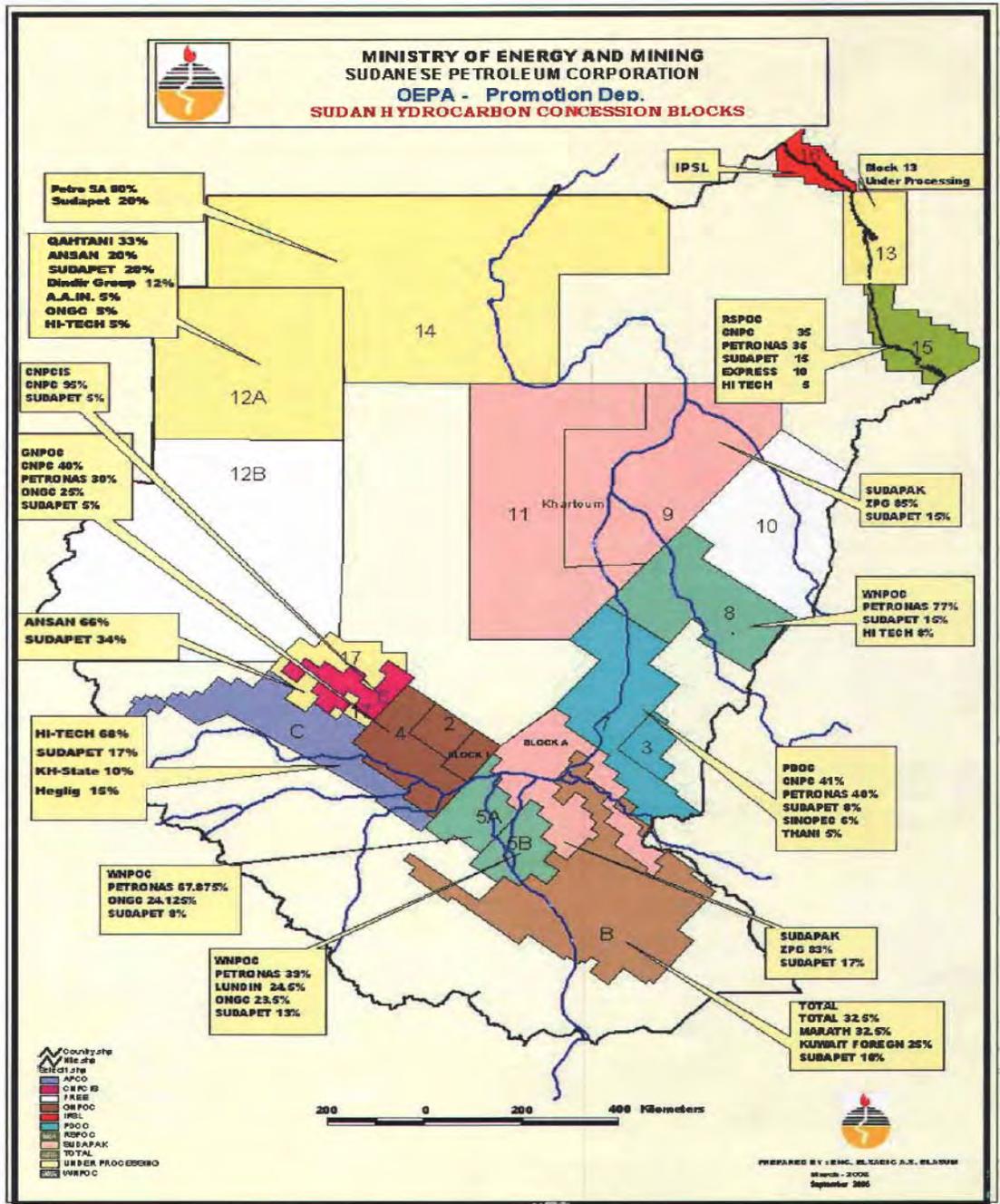
² Other key African oil producing countries have average block sizes much smaller than those of Sudan. For example, in Nigeria, the average block size is only 1500 km², Angola- 3500 km², Algeria- 4500 km², Libya- 5500 km², and Egypt- 4000km² (Wood Mackenzie 2007). This suggests the need for enhanced regulatory capability over individual operators in Sudan because they control such large areas.

approximately 60% of 2006 production (ECOS 2006). Production in the south is expected to rise faster than the north fields, resulting in an increasing contribution of income from the southern fields. Rising production in the south further increases the concern over environmental impacts of these fields.

Oil exploration and production activities are large industrial activities and have the potential to have major adverse impacts on the human and ecological environment. These activities include construction of access roads for exploration and more permanent roads for production, setting seismic lines and other devices for exploration, generation of sanitary and other wastes from construction and production camps, production and disposal of large volumes of drilling muds and other wastes during exploration and production, large volumes of produced water during production, and finally potentials for oil spills from production wells, pipelines, transfer stations and depots. Potential off-shore production exposes the marine environment to similar environmental hazards. All of these activities are expected to occur in Sudan and this scoping statement is designed to identify particular features of these activities that may impact the environment. Not included in this planned assessment are the industrial oil refining steps of oil production.

The following maps and graphics give an indication, albeit sometimes conflicting, of the scale and spread of oil exploration and production in Sudan. Reconciling the differences between these views of the concession areas in time and space is beyond the purview of this activity and the STEP program that is carrying it out. The magnitude of the oil resources and current efforts to exploit it, as shown in these maps, should underscore the reason for giving proper attention to environmental threats associated with these activities.

Figure I. Sudan Hydrocarbon Concession Blocks



(Source: GONU Ministry of Energy and Mining)

Figure 2. Oil Development in Western Upper Nile and Abyei Regions (1998-2003)

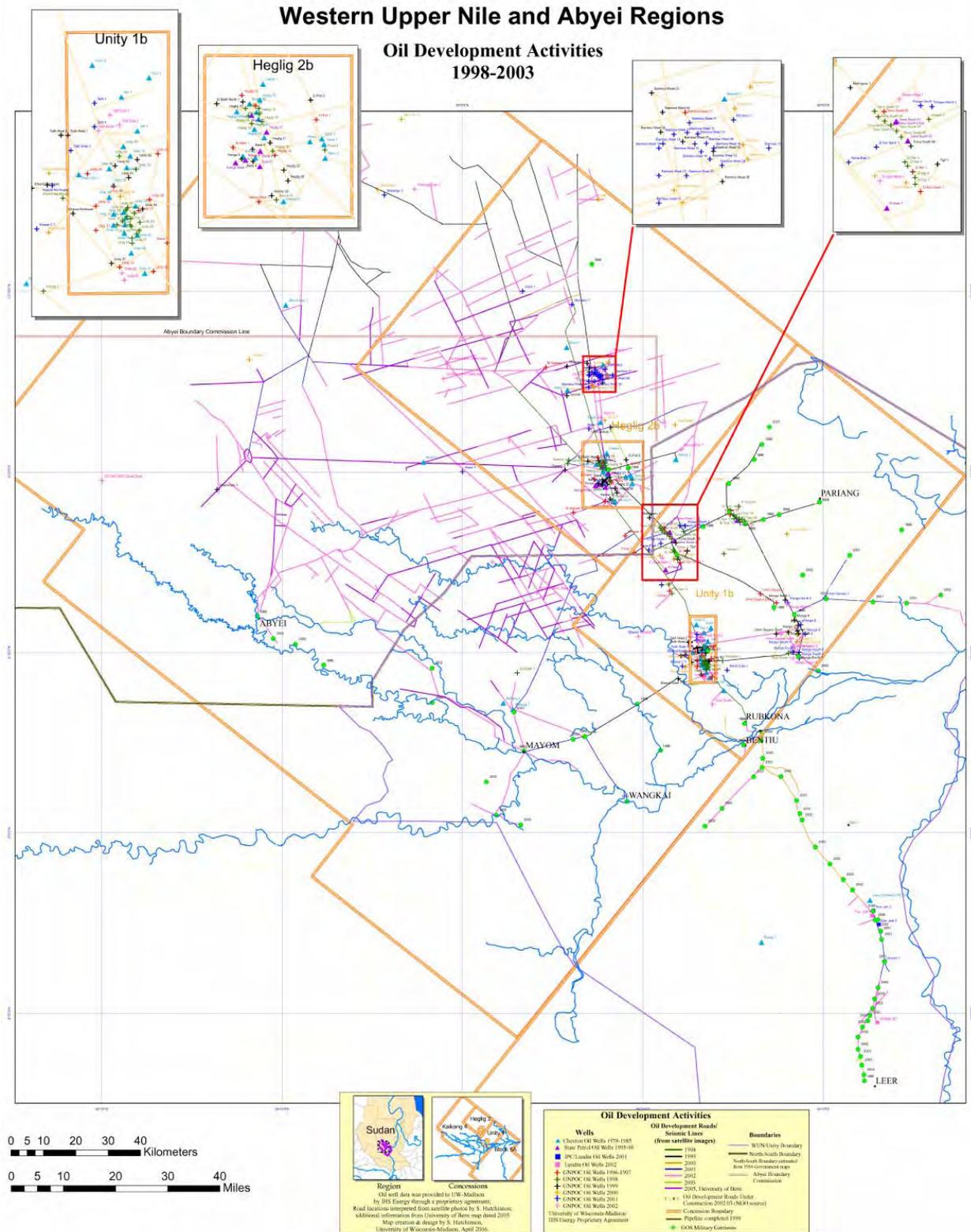


Figure 3. Another View of Oil Concessions in Central & Southern Sudan



SCOPING EXERCISE ACTIVITIES

In this exercise, the team has been using the scoping methodologies as outlined in the USAID regulations (22 CFR 216.3(a) (4)), as a model for organizing the efforts and information. Scoping is very typically applied to environmental assessments in the United States and elsewhere as a necessary early effort to ensure that the assessment efforts are focused on the most important issues. It is somewhat akin to writing a detailed job description or preparing the terms of reference for a planned work effort.

The Scoping Exercise and Scoping Statement methodology was put in place to avoid overly lengthy descriptive narratives about the biophysical and socio-environmental conditions of an area that do not do justice to the critical analytical process implied in an environmental assessment. Similarly, under these procedures it should be noted that it would be premature in the course of a Scoping Statement to develop alternatives, descriptions of the existing environment, do an analysis of potential impacts or develop avoidance and mitigation materials.

METHODOLOGY

The methodology for the Scoping Exercise was straightforward. Following one of the key principles of environmental assessment in the United States, it involved extensive consultations with a wide variety of stakeholders as a means for gathering data and information. As mentioned above while the interviews and discussions were held in conjunction with someone representing the GOSS MEWCT, the team also held discussions with other staff of this key ministry.

Additionally, a variety of key GOSS ministries were targeted as stakeholders as well for participation in these consultations. These included: the Ministry of Agriculture and Forestry, the Ministry of Animal Resources and Fisheries, the Ministry of Industry and Mining, the Ministry of Transport and Roads, the Ministry of Land, Housing and Public Utilities, the Southern Sudan Legislative Assembly, NGOs, the REO for USAID, and the World Bank.

In addition, a wide range of program-related literature was compiled and reviewed (see Annex B for the Bibliography). Although field sites could not be visited during the time that the Oil and Environment Consultant was in-country, the Team Leader had been along on a previous Scoping Exercise being carried out by the Nairobi-based firm ESF for the White Nile Petroleum Company at their exploration sites at Jalle Payam in Jonglei State.

ENVIRONMENTAL ASSESSMENT ISSUES

What follows is the most important outcome of any Scoping Exercise—the list of potential adverse environmental impacts identified during this overview of the activities and the circumstances under which they are being implemented, both bio-physical and socio-environmental. Furthermore, and again in the interest of refining the analysis, it is followed by the corollary—the issues not considered significant.

Significant Issues Requiring Environmental Assessment

The possibility of adverse environmental impacts from oil production as a result of the environmental consequences of an oil spill is readily imagined. Oil spills have become part of the human dilemma across the globe, from the pristine waters of coastal Alaska to the Niger Delta of Nigeria. However, here in Sudan, and in particular in Southern Sudan, other more subtle impacts, direct and indirect, are possible, even in the absence of an oil spill and are already being felt in some areas of the country; these are perhaps much more difficult to remediate than the dreaded oil spill.

The following Adverse Impacts have been identified during the Scoping Exercise and determined to be significant enough to merit careful scrutiny and analysis should the decision be taken to move forward with a Programmatic Environmental Assessment or similar exercise.

POTENTIAL ADVERSE IMPACTS FROM OIL EXPLORATION AND PRODUCTION

OIL SPILL CAUSED CONTAMINATION AT EXPLORATION/PRODUCTION FACILITIES AND FROM PIPELINES

Oil facilities process large quantities of crude oil and spills at these facilities can create toxic conditions for humans and for the natural flora and fauna. Such spills will be even more difficult to contain and remediate if they occur in wetland sites or within the Sudd swamps themselves.

DISRUPTIONS TO THE LOCAL HYDROLOGY (OF VARIOUS TYPES AND MAGNITUDES AND WITH VARYING COLLATERAL ADVERSE SOCIO-ENVIRONMENTAL IMPACTS)

On the extensive flood plains of Sudan where most of the oil resources are so far being found, linear construction activities such as roads of various types, dikes, pipelines, seismic testing lines can have significant impacts. Because of the very flat lay of the land, drainage and flood patterns so critical to the agroecology of the areas are very subtle. These drainage patterns are often difficult to detect except as the flood rises and recedes. They are easily affected therefore by even minor moderations in elevation of the surface caused by construction. Examples of all of the details discussed below have already been seen as a result of the current level of oil exploitation.

The passing of heavy machinery laying out seismic testing lines has left a pattern still visible across many areas of the landscape in both old and new oil exploration areas. The result—a very slight depression that holds water a bit longer in the dry season, hence their visibility (see photo below)—may be innocuous in-situ but cumulative impact could be significant. Even minor depressions from a single pass of heavy equipment laying out these lines can lead to vegetational changes or re-routing of drainage ways.



SEISMIC TESTING LINES STILL VISIBLE: The long light strip down the center of the photo is a seismic testing line, a slight depression where the bulldozer passed. It holds a bit more humidity in the soil and hence the grass did not burn during the fire season.

Diking to isolate an area from the annual flood is obviously the other extreme. The present dike/road building along the eastern periphery of the Sudd north of Bor in Jonglei State is a major example. Diking has significant pros and cons that should be carefully examined as part of this assessment, including impacts on both sides of the dike. East of the dike/road, the operational construction season may be lengthened, adding months to the season for dryland oil exploration or other activities, reducing exploration costs. The length of access roads can be reduced if exploration sites can be reached from shorter spurs off the main dike/road. Similarly, villagers who wish to avoid the flood may benefit.

The adverse environmental impacts, however, can be quite serious, including wholesale changes in the agroecology, from periodically flooded areas to dryer lands, with changes in wildlife habitat, fisheries resources and land-use options related to livestock grazing and cropping (see photo below). There are many places on the periphery of the Sudd where pastoralist communities annually struggle over grazing and water rights, sometimes with deadly consequences between tribal groups and even among clans within a group. Southern Sudan can little afford to allow oil exploration and production activities whose impacts on the flood patterns will lead to significant reductions in grazing resources increasing the propensity for natural resources-based conflict.

Ponding of water in borrow pits, cut-off areas or as a result of diking and changes to the drainage pattern may also increase the habitat for mosquitos and other vectors of water-borne diseases.

Oil companies or their contractors, want, justifiably enough, to minimize their costs in most cases in building **access roads to exploration drilling sites**. A road is built during the early dry season to get the drilling rig into the chosen site, with little concern for more expensive drainage works. If a well comes positive, the road may be up-graded, culverts added and the potential for local impact on the hydrology diminished. If no oil is found, the question becomes “are these roads being decommissioned and obliterated to reduce their impact on the floodplain?” There is ample evidence in Sudan that the importance of the wetlands for people and the local ecology and economy are being overlooked as a result of road building associated with oil exploration and production, both on the older areas in Unity and Upper Nile and now in Jonglei. After all, these are “just swamps” and there are a lot of swamps in Southern Sudan.



OLD DIKE AT JALLE: This older dike between Jalle and Maar, once maintained by the local people, no longer keeps the flood out of the Mabior Gol depression area in Jonglei State. The plan is to rehabilitate it and use it as an access road to oil exploration sites in the area, most of which will be found on the dry (right) side.

CONTAMINATION AS A RESULT OF DISPOSAL AND RELEASE OF PRODUCED WATER

The areas in Unity and Upper Nile currently yielding petroleum are dotted with small ponds created near the well heads to hold the **“produced water”** that typically comes out of the ground from the oil wells. Produced water is produced with oil, often with high concentrations of chemicals, minerals or mixed with oil, and frequently at high temperatures. The high amounts of the contaminants (salts or chlorides, hydrocarbons, well treatment chemicals, oil separation and water treatment chemicals) can reach toxic concentrations that will pollute the surrounding areas or waters if dispersed directly into them (Exxon Mobil 2000). They are currently being stockpiled in man-made ponds adjacent to the drilling sites where the expectation is that they will be disposed of by evaporation over time.

There are also published reports of fish kills and vegetation being destroyed (water hyacinth) from direct releases of toxic produced water directly into the environment (El Moghraby 2006) in Sudan. Of additional concern is whether these storage areas built by raising berms around a holding pond could be overrun by the seasonal floods and spread their contamination widely. Similarly, what sort of a hazardous waste site will remain if and when these ponds do evaporate? In many countries, produced water is managed by re-pumping it back into the ground at the well-head but this is not happening in Sudan, probably because it adds costs to the production equation.



THE SUDD: Thousands of hectares of papyrus and reed swamps and islands and open water...a refuge, but for how long? At least some of the oil companies have pledged to assist in its protection. Others will also have to do their part.

PRODUCTION, RELEASE AND DISPOSAL OF HAZARDOUS MATERIALS USED IN DRILLING

Drilling for petroleum often involves the **use of special additives**, some of which are based on fresh water gels and others that are oil based. These “drilling muds and fluids” and the drilling solids or “cuttings” which emerge from the well contaminated with them require special treatment and disposal methods.

The use of these substances and the industrial nature of oil exploration and production in general bring up the question of the need for **properly constructed and operated hazardous waste landfill site(s)** throughout the oil production areas, so as to avoid despoiling large areas of the otherwise untouched landscape with these materials and others emanating from the camps (see below). Although these require some upfront investments, they are much cheaper than the alternative of post pollution cleanup campaigns.

POLLUTION FROM HUMAN WASTES, SOLID WASTES FROM OIL CAMPS AND/OR FUEL AND LUBRICANTS ASSOCIATED WITH MECHANIZED EQUIPMENT

Typically, petroleum exploration and production crews are housed in specially-built camps in the oil areas. These camps can be both temporary and longer-term. Off-site supply of food and beverages and a rather different lifestyle from the surrounding areas lead to a very high waste stream. Proper water treatment and sanitary waste facilities are essential to avoid environmental health risks within the camp and for adjacent communities. This will be a particular need on the floodplains where the potential for contamination of the surrounding waters and wetlands will be acute. Similarly, almost each of the drilling sites constitutes a source of a waste stream of various types that must be properly accounted for and managed. Contractors need to practice full clean-up and camp decommissioning as they move across the oil areas.

SPREAD OF CONTAGIOUS DISEASES

Many, if not most of the workers in the oil fields are typically drawn from outside the local area. Similarly, supplying the oilfields will increase truck traffic from both within Sudan and from neighboring countries. Thus, there is a significant risk of the introduction of sexually transmitted diseases, especially HIV/AIDS, especially among the local community that may not be aware of or prepared to deal with these threats.

DISRUPTION AND/OR RELOCATION OF COMMUNITIES IN THE OIL PRODUCING AREAS

It is the declared policy of the Government of Southern Sudan to avoid displacing communities as a result of oil exploration and production, especially in light of the very negative experiences elsewhere during the war. However, because many areas are still being repopulated by their IDP (internally displaced peoples), it is sometimes difficult to foresee how this will evolve in-situ. Therefore, this is an issue that requires vigilance because of its profound impact on local people.

SPECIES AND HABITAT LOSS FROM INCREASED ACCESSIBILITY TO OTHERWISE REMOTE AREAS, ESPECIALLY WITHIN THE SWAMPS OF THE SUDD

In many areas of Sudan, and in particular in Southern Sudan, oil exploration is penetrating areas that have been inaccessible and little affected by humans because they were part of the perennially flooded wetland ecosystems of the Sudd. As more people enter these remote areas, either as part of or simply following oil operations, there is **increased potential for illegal hunting**. One such example of an elephant being slain by a security detail protecting an oil concessionaire has already been reported. Recently, the Sudd was designated as a Ramsar Site, denoting its status as a wetland of global importance.



ELEPHANTS IN THE SUDD SWAMPS: The Sudd Swamps are the last refuge of many species of wildlife in Southern Sudan. The Sudd and its isolation and difficult terrain have protected them but this could change with oil exploration and production, if the appropriate controls are not put in place.

There are large numbers of wildlife species in the Sudd (see photo above) which have taken refuge there over time and now need to be protected as the living legacy of the great biodiversity assets that once characterized Southern Sudan. More penetration, even if it does not include hunting, and particularly with the use of sophisticated but noisy air boats (see photo below) will **disturb and disrupt the habitat**, and perhaps lead to its fragmentation.



AIRBOATS: The Sudd Swamps and the large herds of wildlife they harbor have traditionally been safe because of their inaccessibility. Air boats such as these, seen here at the White Nile Petroleum base in Padak, are increasingly making their appearance in the Sudd and could change all that in very negative ways and very quickly.

ISSUES WHICH ARE NOT CONSIDERED SIGNIFICANT

The following issues have been identified during the Scoping Exercise and determined not to be significant enough to merit additional scrutiny in the context of the Programmatic Environmental Assessment.

Type of Impact	Observations and Explanations
Dust	Road building materials, which include laterite materials, can lead to conditions of extreme dust when vehicles traverse these roads during the dry season (November to April). This can be an acute problem for the health of those living alongside roads, especially in the more populated areas. However, relatively low traffic volumes on the oil-related roads and low population densities in the oil sites (except near villages) make the risk for significant adverse impacts low.
Air pollution	Air pollution from the burning of wastes materials and the flaring of gas from wells is not expected to be significant in the large open areas of oil activities.
Aesthetic considerations	It does not appear that aesthetic impacts in these rural areas will affect large numbers of people and therefore the overall risk of impact is low.
Effects on cultural & historical heritage sites	There is no evidence that there will be adverse impacts on cultural and historical heritage sites.

PART B: RECOMMENDATIONS AND DRAFT TERMS OF REFERENCE FOR ADDITIONAL ACTIVITIES

OUTCOME OF THE SCOPING EXERCISE

This draft scoping statement and the SoW/Terms of Reference for the PEA will be circulated to various parties including IRG, USAID/SFO, GOSS and USAID/EA for review and comment. Should USAID in consultation with the GOSS and the counterpart ministries to the STEP Program decide that to go ahead, it will also be necessary to continue to engage the Government of National Unity (GONU) to enable the planned PEA Team to obtain official access to oil sites, particularly those in Unity and Upper Nile. The Oil and Environment Programmatic Environmental Assessment (PEA) will take place over a nine to twelve week period starting in 2007.

VARIATIONS IN THE FORMAT OF THE PEA

There will be no variations to the format typically applied for programmatic environmental assessments. The PEA Report is tentatively expected to include the following chapters and sections:

- a description of the proposed oil activities and an analysis of the need/reason for carrying them out in the oil industry and reconstruction activities in Southern Sudan;
- alternatives, if any, to proposed oil activities;
- a description of the present environment that would be affected directly or indirectly;
- the impacts that may be caused to the environment by the oil activities, including a discussion of their cumulative effect;
- proposed measures to prevent or mitigate all adverse impacts;
- a proposal for an environmental management program to cover the exploration, construction, operations and decommissioning stages of the oil activities and the needs and parameters for their maintenance and monitoring;
- an EMP action plan detailing budgets and personnel requirements and steps to ensure its effective implementation;
- proposals for a program for stakeholder consultation and public participation; and
- annexes as may be required to fully document the PEA and its findings.

THE OBJECTIVES AND OUTCOMES OF THE PEA

The PEA is expected to address the following objectives and outcomes:

- Provide the basis for a process and management structure within the GOSS (in the main involving the Ministries of Environment, Wildlife Conservation and Tourism) for environmental procedures with respect to oil activities (which include both exploration and production) in Southern Sudan.

- Generate a set of environmental guidelines within the framework of the PEA that include measures to avoid and mitigate impacts from oil activities. These may include plans for developing environmental procedures, monitoring programs and remediation programs for future oil activities, and may also include earlier oil activities that have not been covered under emerging guidelines. In this way, STEP hopes to assist the GOSS to avoid the costs of a legacy of waste, land cleanup and socio-economic disruptions due to oil activities.
- Provide on-the-job technology transfer/training opportunities for concerned GOSS ministerial staff.
- Build capacity in the Ministry for conducting systematic environmental assessments and procedures, using the USAID Environmental Regulations (22CFR216) as a model and training tool.

PEA METHODOLOGY

The PEA is expected to generate a list of issues (adverse environmental impacts) and suggested avoidance/mitigation measures that should be considered as part of environmental management plans (these will necessarily be generic at this level) to guide future oil activities in Southern Sudan. It should be emphasized that the PEA should not be construed as an evaluation of on-going oil activities, many of which started under times of civil war. The purpose is to bring these matters to the forefront and provide environmental management guidelines and tools so that they can be more fully considered during future oil development planning and implementation activities.

The PEA itself will follow a methodology very similar to that of the Scoping Exercise, albeit with an expanded area for field investigations and including a full multi-disciplinary team (see below). The steps involved will include: review of pertinent literature about oil exploration and production and the environment with emphasis on program specific materials; consultations with a wide variety of stakeholders concerned with the oil activities including NGOs, local communities, government officials, academics and international organizations; field visits to affected communities near oil activities; and field visits to a selected sample of oil projects in Sudan.

PEA TEAM COMPOSITION

The need for the following disciplines, team members and preliminary LOEs have been identified as making up the PEA Team:

- PEA Team Leader and/or institutional specialist– (45+ person-days)
- Environmental Specialist on oil impacts – (46 person-days)
- Engineer – tbd by the GOSS MIM (30 person-days)
- Environmental Specialist – tbd by the GOSS MEWCT (30 person-days)
- Southern Sudan Ecology Specialist – by GOSS MEWCT (30 person-days)
- Waste Disposal specialist for oil – by GOSS MEWCT or external(30 person-days)
- Economist by GOSS MEWCT(25 person-days)
- Environmental Regulatory Specialist (30 person-days)

SCOPE OF WORK FOR THE PEA

Task I. Meet with Officials of USAID and MEWCT of GOSS to explain objectives and gain directions on work. Team meets to coordinate activities and make individual assignments, plan logistics and other planning functions. Team travels to Khartoum to meet with the GONU Ministry of Energy and Mining and other related specialists and consultants familiar with oil exploration and production in the country.

Task 2. Review literature collected during Scoping Session and update as appropriate. Additional literature related to avoidance and mitigation of oil impacts will also be reviewed, as well as materials related to environmental regulations with respect to oil from other countries.

Task 3. Collect data by field visit to White Nile site. Team will be examining the “existing environment,” potential impacts, avoidance and mitigation of activities observed.

Task 4. Collect data by field visit to Unity State, Upper Nile and/or Southern Kordofan. This will depend on access to sites. The Team will have similar objects as those in Task 3.

Task 5. Collect data by field visit to Khartoum. There are reports of several EA documents that the team should try to gain access to. Meet with Dr. Asim El Moghraby on ecology of Sudd. Consult with government officials in the GONU as appropriate and agreed by the GOSS.

Task 6. Team meets to do a review of data collected and identify gaps that can be filled during this mission.

Task 7. Team prepares a draft PEA, which includes the standard sections of 1) likely types of actions associated with oil exploration and extraction, 2) alternatives, 3) existing environment, 4) potential impact of alternatives on existing environment, 5) measures to avoid or mitigate potential impacts, and 6) bibliography (minor sections omitted from this outline). The analysis will consider the ecology of areas affected (both human environment and ecological environment), identify likely oil-related activities that are expected to have significant impact (updated from scoping statement), and do a technical analysis on potential impacts on these areas (human and ecological). The team will examine technical and economic implications of alternative, avoidance and mitigation measures. The economic analysis will quantify unit costs of these measures, additional capital expenses and impacts on rates of return for the projects. Additional impacts will be estimated for impacts on the economy of GOSS. An organizational/legal specialist will review potential regulatory approaches from the international context to impact avoidance or mitigation. Again, the economist will quantify the costs of these potential regulatory changes. Drafting will include, at a minimum, the following steps:

- a) Preparation of sections on proposed action and alternatives;
- b) Chapter prepared on existing environment that includes 1) demographic and cultural issues, 2) livestock issues, 3) land tenure issues, 4) aquatic resource issues, 5) terrestrial resources, 6) biota, including fish, birds and wildlife , 7) endangered species, 8) hydrological issues, including water quality;
- c) Chapter prepared on oil activities in Southern Sudan;
- d) Chapter on potential impacts of each of items in c) on b). This shall include the economic analyses mentioned above;
- e) Development of regulatory and organizational approaches to avoidance and mitigation to be expressed as part of a standardized environmental management plan recommendations for the continuation of oil exploration and production in Sudan.

Task 8. The draft PEA will be edited for consistency of technical and policy issues. It will then be edited for clarity and submitted for review and finalized.

ANNEX A: SCOPE OF WORK



SUDAN TRANSITIONAL ENVIRONMENT PROGRAM

OIL AND ENVIRONMENT CONSULTANT

INTRODUCTION

Performance Measure No. 9 of the STEP Contract calls for the “enactment and operationalization of GOSS petroleum exploration and production policies and standards that incorporate environmental best practices used in other petroleum exporting countries. As noted in USAID/Sudan’s new *Strategy Statement, 2006-08*, there are excellent prospects for continued exploration and exploitation of oil resources in the Sudan. However, at the same time, there is considerable potential for resource-based conflict if revenues are not shared in a manner perceived to be equitable.

With that in mind, the Comprehensive Peace Agreement established the National Petroleum Commission, a North-South institution. The importance of petroleum exploration and production to the Southern Sudan can hardly be exaggerated. USAID’s *Strategy* puts it this way: *The GOSS will start its operations at near complete dependency on oil revenues, which increases the risk of corruption and conflict; misuse of resources and revenues would diminish citizens’ support for their new government and the potential for sustainable development.*

The Oil and Environment Consultant will be responsible for carrying out a first general reconnaissance of the impact of oil exploration and production on the environment of Southern Sudan under the aegis of STEP. His role will be to explore the feasibility of achieving this STEP Performance Measure by carrying out a programmatic environmental assessment (PEA) of petroleum exploration and production practices to ensure that the policies and standards are well grounded in the local realities of the sector. This first reconnaissance visit could become the Scoping Exercise required for any environmental assessment under USAID’s environmental procedures (22CFR216).

The Oil and Environment Consultant will carry out his activities under the direction of the STEP Team Leader/Senior Environmental Policy Specialist. More specifically, his/her duties will include the following:

- The fact finding methodology will include review of pertinent literature, resulting in the compilation of a Southern Sudan relevant bibliography (annotated if time allows); widespread consultation (with industry representatives, GOSS authorities and staff, local communities, NGO representatives and other stakeholders; cooperation with on-going environmental assessment work if any of petroleum exploration and production in Southern Sudan; and direct observation through field visits to existing oil exploration/production sites.
- As information is compiled on likely adverse environmental impacts of oil exploration and production in Southern Sudan, the Consultant will develop a preliminary issues list. This list could serve as the core of a Scoping Statement required for environmental assessments under USAID regulations. In addition to identifying the issues, the consultant will further analyze available information to ascertain which adverse impacts typical of the sector can be eliminated from further scrutiny because they do not occur as a result of the activities and/or circumstances of Southern Sudan.

- The Consultant will conclude his/her activities in Southern Sudan in fulfillment of this SOW by presenting his findings to a half-day working group of GOSS personnel and representatives of the petroleum industry, assembled in Juba. Ideally, USAID/Sudan representatives present in Juba will attend this working group meeting although as an alternative, the consultant may be asked to debrief the USAID CTO in Nairobi on his way out.
- Finally, he/she will present an annotated outline of his/her report to the Team Leader before departing the country. Once this outline is approved it will be followed by a full consultancy report cum Scoping Statement for a Programmatic Environmental Assessment of Oil Exploration and Production in Southern Sudan not later than two weeks after departure.

Duty Station: Nairobi, Kenya and Juba and field sites in Southern Sudan

Duration of the Assignment: Two weeks (7 day work weeks authorized in Southern Sudan) and two days travel time into and out of the country (LOE 18 person-days).

Expected Deliverable: A Scoping Statement for an Oil and Environment PEA in Southern Sudan.

Presumptions: Because of both security issues and difficult accessibility, it will be incumbent on STEP and its counterparts in the GOSS Ministry of Environment, Wildlife Conservation and Tourism (MEWCT) to arrange for field visits in conjunction with both the concerned companies and the Government of National Unity State Ministry for Energy and Mining. Should major issues preclude extensive site visits, the outcome will be seen as a preliminary step toward achieving the performance measure albeit one that is as pragmatic as possible in guiding the development of the petroleum sector in Southern Sudan so as to enable it to avoid adverse environmental impacts.

ANNEX B: BIBLIOGRAPHY

CURRENT PAPERS

- Coalition for International Justice. 2006. Soil and Oil: Dirty business in Sudan. Washington, DC.
- Dagne, T. 2006. Sudan: Humanitarian Crisis, Peace Talks, Terrorism, and U.S. Policy. CRS Issue Brief for Congress, April 12, 2006.
- Dugak, C. 2007. Oil Exploitation in South Sudan may induce health emergency to its people. Feb. 19. Reuters.
- Economist. 2006. Sudan. Current News 14/12.
- European Coalition on Oil in Sudan. Oil and the Future of Sudan, Conference Report 1-2 November 2006. www.ecosonline.org.
- European Coalition on Oil in Sudan. Oil Development in Northern Upper Nile, Sudan, May 2006. www.ecosonline.org.
- Exxon Mobil. 2000. Environmental Assessment for Chad/Cameroon Pipeline Project—Executive Summary and Update. Report prepared for Exxon Mobil.
- Goldwyn, D. L. 2006. Implementation of the Wealth Sharing Accords: Oil, Energy and Political Implications. Paper presented to the National Defense University Conference on Sudan's Peace Settlement: Progress and Perils.
- Government of Southern Sudan (GOSS) A, 2006. Environmental Workshop, Juba, Nov. in conjunction with MEWTC and UNEP, 31 Oct. to 02 November. Juba Ruha Hotel.
- Government of Southern Sudan (GOSS) B. 2006. Ministry of Finance and Economic Planning. Approved Budget.
- Human Rights Watch. 2003. www.hrw.org/reports/2003/sudan1003/22.htm.
- Institute for Security Studies, Scarcity and Surfeit, the Ecology of Africa's Conflicts, 2002. Chapter 5, Oil and Water in Sudan, Peter Goldsmith, Lydia A Abura and Jason Switzer, <http://www.iss.co.za/PUBS/BOOKS/Scarcity&Surfeit/Chapter5.pdf>.
- Mbogo, Steve. 2006 (Sept) Oil Disputes Raise Tension among Southern Sudan Factions. <http://www.globalpolicy.org/security/issues/sudan/2006/0926oil.htm>
- Moghraby, Asim I. el, 2006. On the Development of Oil in the Sudan (an environmental perspective), November, paper given from University of Khartoum.
- Multinational Monitor, Oil and Violence in Sudan Drilling, Poverty and Death in Upper Nile State, May/June 2006, Vol 27, No. 3. <http://multinationalmonitor.org/mm2006/052006/wesselink.html>.
- Petroleum Environment and Safety Department (PES). 2007. Ministry of Energy and Mining, Khartoum, Sudan. Feb.
- Polgreen, L, New York Times. Feb 12, 2007. In Niger, trees and crops turn back the desert.
- ["Sudan seeks to develop offshore oil with Brazil's investment"](#). July 19, 2006 (Reuters, CARACAS)

- USAID. 2005. Environmental impacts assessment (EIA) of the Bor-Mabior Dike Rehabilitation project. Bor Counties, Southern Sudan. Assessment Report (Hassan, R. et al., Centre for Environmental Economics and Policy in Africa (CEEPA), University of Pretoria); Wetland Component (Marneweck, G.C. et al, Wetland consulting Services (Pty) Ltd, Geoterrimage (Pty) LTd, University of the Witwatersrand, South Africa. (July 2006); Wildlife Impacts Component (Wahungu, G. M, Department of Wildlife Management, Moi University, Kenya); Socio-economic impacts assessment component (Mungatana, E.D., and A. Njenga, Centre for Environmental Economics and Policy Analysis in Africa (CEEPA), University of Pretoria, South Africa.
- USAID. 2006. Sudan Transitional Environment Program, Programmatic Environmental Assessment (PEA) of Road Rehabilitation Activities in Southern Sudan. Report prepared for USAID/Sudan.
- U.S. Department of State. 2006. Background Note: Sudan. Bureau of African Affairs, November.
- UNEP. 2007. Post Conflict Environmental Assessment.
http://postconflict.unep.ch/download/sudan_draft_chapters/.
- USDOE. Energy Information Administration. 2007. www.eia.doe.gov/emeu/cabs/Sudan/Oil.html.
- World Bank. 2005. Sudan Multi donor trust funds first progress report. July 1 – December 31.

OLDER BACKGROUND MATERIALS

- American Petroleum Institute (API). 1991. Waste minimization in the petroleum industry, compendium of practices, November, Publication 849-00020.
- Ann. 1997. International Expert Meeting; Technical Background Document, Environmental Practices in Offshore Oil and Gas Activities. Nov 17-20. Noordwijk aan Zee, The Netherlands
- Green, J., and M.W. Tret. 1989. The Fate and Effects of Oil in Fresh Water. Elsevier Science.
- Petroconsultants (UK) Ltd. 1997. Operational Discharges from Offshore Oil and Gas Exploration and exploitation activities. November, the Netherlands.
- Reed, J.D. no date available. Environmental Management of Refineries and Terminals.
- Reis, J.C. 1996. Environmental Control in Petroleum Engineering, Houston, Texas.
- Thomas, D.J., G.D. Greene, W.S. Duval, D.C. Milne, and M.S. Hutcheson Date not available. Offshore oil and gas production, Waste characteristics, Treatment methods, biological effects and their applications to Canadian Regions Final Report.
- Whitehouse, A.W., Jr. 1989. The oil and gas industry. Committee on Environmental Conservation, National Petroleum Council.

ANNEX C: PERSONS CONTACTED

Name	Position	Coordinates
USAID Staff		
Allan Reed	Director for Southern Sudan Deputy Mission Director, USAID/Sudan	Tel.- +249 912501279; Email- aereed@usaid.gov
Makila James	Consul General, US Embassy, Khartoum (Juba)	makilajames@msn.com
Curtis Stewart	Economics Officer, US Embassy, Khartoum	Tel. - +249 1 83774701; email- stewartc@state.gov
West Yugulle Kayuku Labadiah	USAID/Sudan CTO STEP and Mission Environmental Officer	Tel.- +254 02 862 2428; Email- wyugulle@usaid.gov
Kifle Negash	USAID/Sudan, Supervisory General Development Officer, Sudan	Tel.- +254 722-207764; Email- kinegash@usaid.gov
Gary Alex	Economic Growth/Food Security Team Leader, USAID/Sudan	Tel. - +254 20 862 2448; email- galex@usaid.gov
Walter Knausenberger	USAID/REDSO, Senior Regional Environmental Officer	Tel. – 254-20-862-2267; email- waknausenberger@usaid.gov
Dana Ott	USAID/W Program Director, Sudan	Tel: 202-712-5883
Andrea Freeman	USAID/W, Sudan Program Specialist	Tel: 202-712-5519
Brian De Silva	USAID/W, Sudan Program Specialist	Tel: 202-712-5519; email- bdsilva@afr- sd.org
Government of Southern Sudan Authorities and Staff		
James Loro Sericio	Minister of Environment, Wildlife Conservation and Tourism	
Alfred Akwoch Omoli	Under-Secretary, Environment, Wildlife Conservation & Tourism	Tel.- +8821643332076; email- akwochomoli@yahoo.com
John Chuol Dhol	Director General for Agriculture and Extension Services, Ministry of Agriculture and Forestry	Tel. +249 811 820590 Cell +256 (0) 477105249 Sat +88216 51119787 Email: johnchuoldhol@yahoo.com
L.G. Leju Lugor	Director General for Research and Training, Ministry of Agriculture and Forestry	Tel. +249 811 820590 Cell +256 (0) 477100201 Sat +88216 43338501 Email: lejlugor@yahoo.co.uk
Daniel Wani	Undersecretary, Transport and Roads	wanijuba@yahoo.co.uk
Gabriel Matur Malek	Chairman, Lands, Natural Resources & Environment Committee, Southern Sudan Legislative Assembly	
Samuel Makwei	Under-Secretary, Ministry of Animal Resources and Fisheries	
Samuel Gonoa	Director-General, Special Projects, Ministry of Animal Resources and Fisheries	
Peter Andrea	Inspector, Range Management, Ministry of Animal Resources and Fisheries	
Ahmed Fodomula	Department of Animal Resources, Ministry of Animal Resources and Fisheries	

Name	Position	Coordinates
Philip Justin	Department of Veterinary Sciences, Ministry of Animal Resources and Fisheries	
James Yousif Kundu	Acting Director General for Energy, GOSS Ministry of Industry and Mining	Tel: 0122420215 Email: Kundujames@yahoo.co.uk
Victor Wurda LoTombe	Director-General of Environmental Affairs, GOSS Ministry of Environment, Wildlife Conservation & Tourism, Juba	Tel.- +249918073657; email- vlotombe@yahoo.com
Eng. Isaac Liabwel C. Yol	Undersecretary, Ministry of Water Resources and Irrigation	Tel: 249-811-823557 Email: Isaac_liabwel@yahoo.com Mwri.ssudan@yahoo.com
Joseph Orotu	Director of Tourism & Hotels, GOSS Ministry of Environment, Wildlife Conservation & Tourism, Juba	Tel. - +249911332820
Dr. Samson Paul Baba	Director General for Primary Health Care and Medical Services, Ministry of Health	Samson_baba@yahoo.co.uk
Angelina Jany Teny	State Minister, Ministry of Energy and Mining, Republic of Sudan	Tel.- +249 915511505; email- Angelina-teny@spc.sd
Bashir M.K. Badawi	Ministerial Advisor, Ministry of Energy and Mining, Republic of Sudan	Tel. - +249 183 774201; email- bashirbadawi@gmail.com
Others		
Andrew Morton	Project Coordinator, Post Conflict Branch, United Nations Environment Program (UNEP)	Tel.- +41 (0) 22 9178764; email- Andrew.morton@unep.ch
Colin Rees	Environmental Specialist World Bank, Washington	email- crees@worldbank.org
Jeni Klugman	Economist World Bank, Nairobi	Email- jklugman@worldbank.org
John Boyle	Senior Environmental Specialist, Africa Environmental and Social Development Department, World Bank	Tel. – (202) 473-5224; email- jboyle@worldbank.org
Sasha Lezhnev	Global Witness	202 721 5634, sasha@globalwitness.org
Akwe Amosu	Open Society Institute	202 721 5600, 5674, aamosu@osi-dc.org
Philip Ward	Chief Operations Officer, White Nile Petroleum Ltd.	Tel. - +254 020 253905; email- phil.ward@rcihosting.com
Mark Jenkins	Logistics, Public Relations and Community Development Officer, White Nile Petroleum Ltd.	Tel. +254 020 253905; email- mark_ole_jenkins2003@yahoo.com
Acuil Malith Banggol	Community Liaison, White Nile Petroleum Ltd. (also on Board of Trustees of the Boma Wildlife Training Center)	Tel. - +8821643332070; email- rumbek_star@yahoo.co.uk
Sean White	Senior Forestry Advisor STEP program	Tel. - +254 (0) 20-4453051 or cell- +254- (0) 721-383585; email- swhite@winrock.or.ke
Egbert G. Ch, Wesselink	Coordinator, European Coalition on Oil in Sudan	www.ecosonline.org
Tom Carter	Urban Management Adviser Ministry of Housing, Lands and Public Utilities, GOSS	Tom.carter@undp.org