This report was compiled by two members of the UNJLC Fuels Team from mid-March to mid-April 2006 and relates to the conditions that existed at the time.

The UNJLC Fuels Team extends its deepest appreciation to the Government of the Sudan and the Government of Southern Sudan, the UN agencies and offices, non-governmental organisations, government organisations, aid agencies, members of the Sudanese and Kenyan oil and fuels industry, including Nile Petroleum, Nile Bakri, Petronas, and Shell and several other companies and sources without whose kind assistance this report would have been impossible. Each of these organisations gave freely of information and advice to the extent that they were free to do so, and provided invaluable advice to the authors on various aspects of the Sudanese oil market.

Copies of this report are available at www.unjlc.org or through the Office for the Co-ordination of Humanitarian Affairs (OCHA), House 290, St. 110, Garden City (near UNMIS Headquarters), Khartoum, Republic of the Sudan.
Addendum: Latest Developments
Severe Fuel Shortage in Juba and Throughout East Africa

In the period between the preparation and publication of this report, developments in countries neighbouring Southern Sudan have illustrated starkly the fragility of the Southern corridor, the inadequacy of fuels storage (and hence the extent of buffer stocks to deal with a supply disruption) and the fact that the limited barge offloading capacity in Southern Sudanese Nile River ports precludes reliable supply of fuels from the north by barge.

In the fortnight ending April 28th, 2006, fuel shortages emerged throughout the Great Lakes region from Kenya through to Uganda, Rwanda, Burundi, eastern Democratic Republic of Congo and Southern Sudan. On April 28th, 2006, it was reported that the fuel station in Juba was out of fuel. Certain UN agencies ran out of supplies, in part because of a management issue within these agencies. Nevertheless, were supplies more available, this could have been dealt with swiftly. The fuel shortage may affect humanitarian operations and could have serious security implications.

In Nairobi on the last weekend in April, service stations were out of petrol and had very little diesel. Reports indicate that there was even less fuel in Kenya north of Nairobi and on the Indian Ocean coast. The entire Shell network was understood to be out of fuel. Lokichoggio was very short of fuel.

The root cause of the crisis appears to lie with Mombasa Port and the Kenyan Government enforcing a law obliging all re-export fuel (i.e. that used in Southern Sudan and Uganda) to be moved by the Kenya pipeline and not by road. It appears that an estimated 40% of fuel ostensibly destined for re-export (and thus being tax exempt) was finding its way back into the domestic Kenyan market. This, of course, adversely affects the Kenya Treasury. With the capacity of the pipeline being barely sufficient to meet the needs of Nairobi (if that), supply beyond Nairobi has, in effect, dried up. The fuel handling facilities at Mombasa cannot process fuel imports quickly enough, with the result that ships carrying fuels are waiting at anchor, incurring demurrage.

The situation has been exacerbated by the greater demand caused by power supply problems in Uganda. Falling water levels in Lake Victoria have reduced the country’s hydroelectric power output, forcing Uganda to rely on power generation using petroleum products, all of which must be imported through Kenya. Despite large buffer stocks of fuels, reports indicate that fuels prices in Kampala and other parts of Uganda are rising in anticipation of shortages. Rwanda has recently commissioned a new power station, placing further strain on the system.

Increased use of generators in Kenya to compensate for the unreliable mains power supply and lesser hydroelectric output, caused in part by the drought which has affected the Horn of Africa, has also added to demand.

The problem could be eased partially by oil traders moving fuel on Kenya Railways but most firms are reluctant to use this as it is too slow and troublesome. The capacity is, in any event, limited. Fuel could also be flown in, but this is expensive.

Transport capacity will be severely reduced by the effect of the rains, placing much greater reliance on the relatively small fleet of 6x6 and 8x8 trucks in the supply chain

A further issue is drums as discussed in Section 5 of this report. The supply of drums in Kenya is now extremely limited following the closure of the country’s main manufacturer. This leaves the sole major source of drums as Port Sudan, far removed from imported bulk supplies in Mombasa.

Improved advance planning and more solid contracting on the part of the UN could have helped to avoid such situations. An announcement by UNMIS about the long-term fuel contract – first tendered more than six months ago – would have triggered the investment necessary to install sufficient storage to provide a buffer for such crises. So too would contracting by the humanitarian agencies with terms that encouraged suppliers to provide storage. Without decisive action by the UN in the coming weeks and action by the Government of Southern Sudan to clarify land issues necessary for fuels installations, the situation will only deteriorate further. The private sector will not make the long-term investments needed to build the supply chain without indications that they will be paid.
EXECUTIVE SUMMARY

United Nations operations in Sudan over the next three to five years will require fuels supplies in excess of those available through Sudan’s domestic refining industry. For the foreseeable future, supplies will continue to be supplemented by imports through Port Sudan and, for Southern Sudan, through the increasingly fragile supply chain from Mombasa.

To its credit and in accordance with a key recommendation of UNJLC’s North Sudan 2004 fuels survey, the UN peacekeeping mission (now the largest user of fuels in the UN family within Sudan since a massive reduction in aviation fuels usage by WFP) is importing all its fuel requirements, thus avoiding distortion of the local market or damage to the prospects for sustainable growth after the expected departure of the mission in the first half of the next decade. In the meantime, opportunities exist for the UN as a whole to adopt a far more effective and economical approach to fuels through a common services approach with a unified fuels contract.

Opportunities also exist for improving the pace of economic development in Southern Sudan through facilitating greater participation of the private sector in co-operation with the Government of Southern Sudan, in the development of the local fuels infrastructure.

UPSTREAM: Over the past two years, Sudan has continued the remarkable development of its upstream oil industry, providing plentiful sources for refining into usable fuels. Crude oil production by 2007 – mostly destined for export - is expected to near one million barrels per day (bpd), equivalent to important mid-level OPEC producers such as Algeria. This is a notable given that first major oil exports occurred less than seven years ago. Prior to that, production was in the tens of thousands of barrels per day. This achievement rests not only on successful exploration but on three main crude oil pipelines from inland oilfields to newly-expanded Red Sea export terminals.

The gradual implementation over the past year of the December 2004 Comprehensive Peace Agreement between the North’s National Congress Part and the South’s SPLM/A has helped open up long-delayed oil exploration in geologically promising Southern Sudan. Further new exploration is also taking place in the west and north. Discoveries and developments in these areas may well add to the country’s production and allow greatly improved fuels availability, combined with improved fuels transportation infrastructure. However, given the lead time required to find, prove, develop and exploit oil reserves, substantial new production from these areas cannot be expected for at least the next five to ten years.

DOWNSTREAM: Development of Sudan’s downstream sector – refining – has not paralleled that of crude oil production. It cannot yet meet the burgeoning increasing in demand, especially for diesel and for aviation fuel. The growth in demand for diesel alone in 2005 is estimated at about 30%.

About 90% of the country’s 100,000bpd refining capacity at the time of writing is concentrated in one refinery, at Khartoum. Although the capacity of this main refinery was successfully increased in 2005 by a relatively modest amount and is expected to further increase in the second half of this year with the start up of a new cracker unit (originally scheduled for November 2005 but delayed), the next major increase in national refining capacity is not scheduled for another three years, when the new Port Sudan refinery should be commissioned.

SUPPLY GAP: Sudan presently refines more gasoline than it needs and exports this surplus, but it will continue to need to import diesel and aviation fuel for the foreseeable future to bridge the gap between local supply and demand. The diesel market in particular is distorted by heavy demand from fuel-hungry gas turbine power stations. These plants are bearing a disproportionate amount of the electrical base load whilst much-needed and more efficient thermal and hydroelectric power capacity is under construction. Furthermore, economic growth is being constrained by limited diesel supplies. Demand for diesel should slacken temporarily when the new cracker unit opens mid-2006 at Khartoum’s Galli refinery then again when a major new hydroelectric plant is commissioned in late 2007. However, it will soon be taken again up by the requirements of growth and development. The consensus among several leading fuel supply companies in Sudan is that imports will continue for as long as economic growth is limited by a lack of fuels, whilst refining capacity catches up with demand. Local supply and demand is unlikely to be in balance before the end of the decade.
EXECUTIVE SUMMARY (cont’d)

THE SUBSIDY: The Government of Sudan is presently subsidising the Khartoum Gaili Refinery and imports to ensure a lower-than-market price for all hydrocarbon fuels. It is understood that this cost amounts to about US$1bn annually. This is unsustainable and the subsidy and is likely to be withdrawn, perhaps in a phased manner, in the near to medium term. This may result in a 25% increase in fuels prices affecting in turn affect not only growth but the cost of the UN humanitarian community’s operations with substantial increases in transport costs.

THE DARFURS: In the past two years, the supply chain to the Darfurs has developed to a point where, absent a major supply disruption, there are few supply concerns due to the reduction of the aviation fuels requirement by WFP. There is even sufficient storage in place to deal with planned events such as a maintenance shutdown of the Khartoum Refinery. Much of this development has been the result of private sector investment in storage and transport. Fuels logistics into and within the Darfurs are generally sufficient to meet the current needs of UNMIS, the humanitarian community, the African Union forces, and the new requirements of oil exploration activities, now commencing in Northern Darfur.

The only foreseeable events which may strain fuels logistics in the Darfurs are increased Government use in the region in response to international developments or the deployment of UN peacekeepers in support of or superseding the African Union. The former could occur at any time; the latter is unlikely before early 2007.

SOUTHERN SUDAN - SUPPLY: Supply into Southern Sudan through the traditional Kenya-Uganda corridor is slowing down as the Kenya pipeline continues to experience operational and capacity problems, and as the bottleneck at Eldoret, a major transfer point in Kenya en route to Uganda, worsens. Waiting time at Eldoret for diesel cargos is five to six days; for aviation fuel it is three to four days. This could be reduced with additional storage. A key cause of the delay is that the existing system cannot issue and receive stocks concurrently. After receiving stock, there is a delay whilst the product settles, is tested, batched and certified for use. It has been suggested to the Kenyan authorities that a private finance initiative, jointly with the main consumers of the fuels, could be used to alleviate the storage problem and bottleneck to the mutual benefit of all.

Import storage capacity problems which emerged recently for the first time at Mombasa have now been solved but could recur, thus holding back further development in Rwanda, Burundi, Uganda, eastern DRC and, to a lesser extent, Southern Sudan, even if the pipeline and storage issues are solved.

The capital of this region, Juba, is developing rapidly and the private sector is reacting to this. One service station, providing ground fuels, has been open for some time, supported by a previously disused depot that has been reclaimed and cleaned. Three further stations are due to be operational no later than May. The retail price at the pump is about US$1.20 per litre. This price is likely to prevail until at least early next year, after which competitive pressures will probably force a slow reduction. Rumbek already has bulk fuel installations and an oil company operating out of Bor, about 120km north of Juba on the River Nile, may build a station in the town. Construction of a new commercial fuel depot for Jet A-1 and diesel has commenced at Wau. However, supplies in the region remain overly dependent on the fragile route from Mombasa.

Humanitarian agencies in Southern Sudan will experience fuel shortages this rainy season unless adequate preparations are made and supply arrangements put in place, if not already done so.

NILE BARGES AND FUELS: The key to the development of many parts of Southern Sudan is Nile River barges. With the lack of road and rail links between north and south, and the cost and difficulty of building good all-weather roads over the next few years, barges could allow cheaper, reliable fuel supplies from Northern Sudan and less reliance on the Kenya-Uganda route. However, development of the barge fleet and the required facilities has been very slow. For example, the barge port in Juba remains rudimentary. Unloading is inefficient, slow and hazardous from both safety and environmental perspectives. A much-touted US$70mn two-year development of the port by Kuwaiti investors seems to be on hold with no clear timelines or may even have collapsed entirely, with no new initiative on the horizon. It could well be two to three years before Nile barges are an effective means of adequate supply unless substantial investment is pushed into development now.
EXECUTIVE SUMMARY (cont’d)

To address the issue of unloading fuels at Juba, we have actively engaged private sector companies present in Southern Sudan with the Government of Southern Sudan (GoSS) Minister of Industry and Minerals (whose portfolio includes oil and fuels) to ascertain whether there were any plans to address this bottleneck. There appears to be none. A short-term solution was proposed and a site located north of Juba International Airport on the main Nile waterway where two large offloading pumps could be installed. These could draw fuel off moored barges and pump it through a pipeline to large storage tanks near the town. A joint venture between the GoSS and private sector would be the most expedient way to ensure diesel fuel supplies from the North (and less reliance on more expensive fuels from Kenya) until a more permanent solution is found and a proper port built.

We noted that two commercial companies are preparing to build temporary storage facilities before the rains set in. The private sector is the only player who can effectively address the challenges of barges, ports and storage. Increased co-operation between the GoSS and the private sector should be strongly encouraged.

SOUTHERN SUDAN REFINING: It is understood that the GoSS may be planning to establish their own refinery under a joint venture with an international or foreign national oil company, using as feedstock crude oil from current or future oilfields in Southern Sudan.

The location for this refinery will be critical. The main market for such a plant will not be the relatively limited local needs but Uganda, Rwanda, Burundi, eastern DRC and north and western Kenya. A refinery in Southern Sudan to supply these areas makes strategic sense. The Khartoum Refinery will continue to be dedicated to meeting the needs of the north, the new Port Sudan refinery is designed as an added value export plant, and the Kenya Refinery at Mombasa is only able to meet part of Kenya’s own needs. **In effect, fuel from this refinery could replace that which is presently imported through Mombasa and then re-exported.**

However, such a development of a refinery with about 100,000 to 200,000bpd capacity could require an investment of about US$3bn to US$4bn and several years to implement. The GoSS in the interim could consider using small refinery units known as “skimmers”, located near the oilfields. These could supply the localised fuel needs. They are available, relatively cheap and can confer a degree of fuel independence desirable for the South.

THE UN AND A UNIFIED FUELS CONTRACT: The most contentious issue the mission had to consider is what has become known as the **Unified Long-Term Fuels Contract.** At time of writing, this has been tendered but not let. The contract represents a unique opportunity for the UN to move towards a more unified, integrated and ultimately more globally cost-effective approach to common services.

An attempt to combine the needs of both UNMIS (UN Mission in Sudan) and the UN humanitarian agencies through what became known as the **Short-Term Fuels Contract** has encountered difficulties. Reservations were expressed by potential participating parties at the bureaucracy and uncertainty involved in the contract, the sharing of certain costs not directly related to the provision of fuels, and the fact that fuels supplied under that contract could cost significantly more than the price at commercial service stations in key locations. Negotiations are still ongoing for the appropriate terms and conditions for a Memorandum of Understanding between the agencies and UNMIS to allow the agencies to obtain fuel through this contract.

Fuels will continue to be an issue in Southern Sudan for at least the next 18 months. UNMIS is expected to be the largest user of fuels and provision has been made in the contract’s Scope-of-Works to include the humanitarian agencies under its umbrella. However, as with the short-term fuels contract, UNMIS has some costs they have to pay regardless of whether the agencies join and which they may ask the agencies to subsidise. A practical way to ensure that the cost per litre does not exceed the prevailing commercial price (as with the short-term fuels contract) should be found, even if UNMIS foregoes partial recovery of such fixed charges.

This issue should be examined comprehensively with consideration given to the real costs and whom, in the end, actually pays the bill. The UN as a whole risks creating an internal market, adding to the cost with each transaction. This will inevitably result in the UN – peacekeepers and humanitarians combined - paying more than it should. Fuels are a common commodity that all agencies – political, developmental, peacekeeping and humanitarian – require. If each agency setting up their own supply system, the ultimate losers are donors and member states. The onus is upon senior UN management to collectively resolve these issues.
# Contents

Addendum: Latest Developments – Severe Fuels Shortage ........................................ i

Executive Summary ......................................................................................................... ii

Contents ............................................................................................................................. v

1. Scope and Aims ........................................................................................................... 1

2. Assumptions and Methodology ............................................................................. 2

3. Industry Background .............................................................................................. 4
   3.1 Overview ...................................................................................... 4
   3.2 Exploration and Production .......................................................... 5
   3.3 Pipelines and Ports ....................................................................... 7
   3.4 Refineries .................................................................................... 10

4. Fuel Supply ................................................................................................................ 12
   4.1 Overview .................................................................................... 12
   4.2 Diesel .......................................................................................... 12
   4.3 Jet A-1 Aviation Fuel ................................................................. 13
   4.4 LPG ............................................................................................ 14

5. The Drums Shortage ................................................................................................. 15

6. Distribution: Fuel Corridors .................................................................................. 16
   6.1 The Northern Corridor ................................................................ 16
   6.2 Nile Barges: The North-South Route ......................................... 17
   6.3 The Southern Corridor ................................................................. 19

7. The Fuel Subsidies: A Hidden Cost to Sudan ........................................................ 20

8. Quality Issues: Sudan’s “Coca-Cola” Fuel ............................................................... 20

9. The Darfurs ............................................................................................................. 21
   9.1 Overview .................................................................................... 21
   9.2 The Darfurs Supply Chain .......................................................... 21
   9.3 Future Events .............................................................................. 22

10. Integration: Unified Fuel Contracting ..................................................................... 23
    10.1 Overview .................................................................................... 23
    10.2 Interim Contractual Arrangements ............................................. 23
    10.3 The Unified Long-Term Fuel Contract ....................................... 24

Annex A: Exploration and Production Blocks, Sudan

Annex B: Sudan: Major Fuels Logistics Routes
1. Scope and Aims

The scope of this survey is to review and clearly document for the humanitarian and peacekeeping community operating in Sudan the existing and required fuel logistics supply chain, and probable developments in the foreseeable future, so as to provide agencies with a clear understanding of the fuels logistics challenges affecting their operations, particularly in light of developments subsequent to the implementation of the 31 December 2004 Comprehensive Peace Agreement.

The survey was limited to Sudan and neighbouring countries from which fuel may be supplied overland, particularly Kenya and Uganda. This report does not address the issue of fuel supply from Sudan to the Horn of Africa countries, particularly Eritrea, Ethiopia and Somalia or supply from Chad and Libya.

Specific aims of the survey are to:

- clearly update relevant aspects of earlier documentation, as published in the fuels surveys conducted separately on South Sudan and North Sudan in early and late 2004 respectively, of the existing strategic supply chain for fuels serving humanitarian operations in Sudan, including potential and existing capacity limitations and bottlenecks;
- identify how the humanitarian community may be more effectively served for fuel logistics, including improving access to and the effectiveness of commercial arrangements, enhancing the logistics planning process of the respective agencies and organisations, and further assisting them to optimise their logistic support;
- identify, if possible, practical recommendations for eliminating or ameliorating capacity limitations and bottlenecks;
- provide, if possible, practical recommendations for how a strengthened fuels logistic co-ordination structure may be developed within the humanitarian and peacekeeping community, including optimising the use of facilities and combining purchasing power; and
- Identify, if possible, for the United Nations and the relevant civil authorities of the Government of Sudan and the Government of Southern Sudan infrastructure development that could alleviate bottlenecks and contribute to the economy of the country and the well-being of its entire people.

The survey was conducted over a period from mid-March through mid-April 2006 by two members of the UNJLC Fuels Team. In Khartoum, visits were made to the Ministry of Energy and Mines and members of the local fuels industry including Greater Nile Petroleum Operating Company, Nile Petroleum Company, Nile Bakri Petroleum Company and Petronas. Field visits outside Khartoum were made to Juba in Southern Sudan and to several locations in Kenya, including Nairobi and Mombasa. The advice, local knowledge and contributions of Darfurs-based UNJLC logistics officers proved invaluable.

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1 These operations include but are not limited to (a) the increase in humanitarian operations in Southern Sudan subsequent to the implementation of the Comprehensive Peace Agreement between the National Congress Party (ruling party in North Sudan) and the Sudanese People’s Liberation Movement/Army (SPLM/A); (b) existing humanitarian operations in Western Sudan’s Darfurs region; (c) the presence of African Union Mission in Sudan (AUMIS) monitors and troops in the Darfurs, with the possible transition to a UN DPKO presence; and (d) deployment of UN military observers and peacekeeping forces to Southern Sudan, again subsequent to the implementation of the Comprehensive Peace Agreement.
2. Assumptions and Methodology

Assumptions used in this report are that:

- fuel dependencies (i.e. requirements) for UN agencies are generally those as contained in the tender documents of the UNMIS Unified Long Term Fuel Contract;
- the humanitarian community’s operations in the Darfurs and in Southern Sudan will continue for at least another year and most likely several years longer;
- the UN Mission in Sudan’s peacekeeping operation in the centre and south of the country will continue for at least five years;
- Sudan’s domestic grounds fuels consumption, exclusive of demand created by the UN presence, will grow by at least 8% in 2006 and probably more;
- Sudan’s domestic aviation fuels consumption will grow by about 6% in 2006; and
- the reader has a reasonable working knowledge of Sudan’s geography, its people and the climatic patterns, particularly with regards to the rainy season and its effect on logistics in Southern Sudan and the Darfurs.

This report in part updates - on a consolidated national basis - the two previous separate fuel surveys on South Sudan and North Sudan, prepared during May and August 2004 respectively. These reports can be found on the UNJLC website (www.unjlc.org). It is assumed that the reader is familiar with both of these reports.

It should be noted that since the publication of the most recent of these two reports:

- WFP’s monthly aviation fuels consumption for 2006 has dropped from about 10.7 million litres in 2005 (as documented in that report and correct at that time) to about 500,000 litres per month. This has been due in part to the implementation of WFP’s logistics strategy to shift from air to surface transport of food as the road network improved, and to pre-position commodities during the dry season when road transport is possible. A successful road building programme and more effective logistics management has allowed the replacement of air transport with less expensive ground logistics; and
- The expected monthly fuels usage for UNMIS (including the needs of the now defunct Joint Military Commission, absorbed into those of UNMIS) of about 7.6 million litres for aviation fuels and 3.3 million litres for diesel fuel did not eventuate. These estimates as provided by UNMIS proved to be excessive, in part (but not wholly) because of slower than expected deployments of peacekeeping forces and a lower level of activity of those forces once deployed. Monthly usage of diesel fuel in 2006 may be more in line with these estimates. Usage of aviation fuels will be considerably lower, perhaps by an order of magnitude.

The methodology utilised by the team is as below and as illustrated overleaf.

Firstly, we examined the sources of the fuels used in Sudan being mainly Sudan’s own oilfields, supplemented by product imports. This allowed the team to examine the key factors driving costs and in turn shaped our assessment of how planned and actual developments might impact the UN Mission. Much of this information is in Section 3 on Industrial Background. The oil industry has emerged as the key pillar of the Sudanese economy over the past seven years and is expected to develop considerably during the remainder of the UN’s mission in the country. This information is therefore crucial to a better understanding of the supply of fuels.

The next phase was to review the process by which those sources become usable fuels. This was relatively simple. For crude oil, it involves the refineries in Sudan and to a lesser extent in Mombasa; for imports, the importation process into Port Sudan and Mombasa. This allowed the team to examine the balance between requirements and outputs both today and in the future and how the UN family fits into this equation.

2 North and South Fuel Reports, 2004 - http://www.unjlc.org/14717/16419
2. Assumptions and Methodology (cont’d)

We then considered the area of central practical interest to the UN: supply and distribution of fuels and impact on costs. This involves the traditional and well-tested northern supply chain, the Darfur supply chain to the west which has developed well over the past two years, and the fast-developing supply chains to Southern Sudan emerging as a result of relative peace in the region. As part of this phase, we looked at the key bottlenecks and potential solutions to address them.

Finally, we reviewed the potential implications for the humanitarian community of the special case of integrated fuel contracting. The immediate question is participation of the humanitarian agencies in the existing UNMIS short-term fuel contract, something which may be of particular relevance to agencies facing the fuel supply challenges of the imminent rainy season. As part of this, we further considered what will be the successor of this fuel contract. This is what has become known as the Unified Long-Term Fuel Contract. If properly managed, this represents a key opportunity for the UN family to work together in mutually beneficial common service whilst ensuring the most effective and economical utilisation of donor and member state funding. The wisdom of a more unified and co-operative approach will be particularly evident when the government subsidies are removed from northern fuel supplies.

Owing to time constraints, we did not look at ways of reducing the UN demand through greater fuel efficiency, a factor that was addressed in our 2004 North Sudan report. Also, we did not consider the effect of the prevailing US sanctions. Although these are unlikely to be lifted in the near future, it is equally unlikely that they will be added to.

ILLUSTRATION OF METHODOLOGY USED IN STUDY

REPORT METHODOLOGY

SOURCES of FUEL
The sources are mainly hydrocarbon fuels but other major sources are covered in outline. We have elected not to cover renewable elements owing to time constraints and the pressing need to achieve solutions in Southern Sudan before the rainy season sets in.

SPECIAL CASE
The special case of the Unified Long-Term Fuels Contracts was considered. This is specific to the United Nations Mission in Sudan and if dealt with practically, affords an opportunity to make a significant difference to overall UN fuel costs.

PROCESS
The process comprises mainly refining of crude oil and importation of fuel products. We have looked at outputs and matched these to requirements (i.e. demand), largely from economic growth, highlighting areas which could present problems in the immediate future.

SUPPLY & DISTRIBUTION
Supply and distribution chains are now well-developed for the Darfurs but difficult for Southern Sudan. In the south, a lack of basic infrastructure will test all the supply chains of the agencies. The most pressing need will be this rainy season where we envisage shortages of fuel unless the agencies move quickly.
3. **Industry Background**

3.1 **Overview**

Over the past seven years, since the first substantial exports of crude oil, Sudan has emerged as an important mid-level oil producer. Crude oil production presently exceeds **500,000 barrels per day** (bpd), the vast majority of which is exported, with expectations of up between **750,000** and **one million bpd** by 2007.

With such a level of crude oil production, Sudan is potentially self-sufficient for all its fuel requirements in the foreseeable future. However, although indigenous refining capacity is increasing with the upgrading of the country’s main refinery in Khartoum and the construction of another in Port Sudan, it remains inadequate to meet the combined needs of local domestic demand and those of the UN peacekeeping forces, the African Union peacekeeping missions and the humanitarian community. The situation continues to be exacerbated by:

- the rapid increase in demand for electric power in recent years being met by the construction of gas turbine generation plants. These stations allow capacity to be brought online much quicker than is possible with thermal or hydroelectric power stations. However, gas turbine stations use diesel whereas thermal stations use heavy fuel oil and hydroelectric stations the flow of the River Nile and dams. The gas turbine stations have increased demand for diesel to the point where Sudan needs to import this fuel³;  

- the significant increase in economic growth and in infrastructure improvements in North Sudan, including dam and road building and an unascertained but very high increase in the number of private vehicles on the road placing unprecedented demand on fuel supplies; and

- The expansion of humanitarian operations in the Darfur region over the past two years, the deployment of African Union troops to the Darfurs and the deployment since 2005 of UN DPKO troops and military observers to Southern Sudan.

The reliable supply of fuels is essential to the continued success of humanitarian and peacekeeping operations in the country.

Although crude oil pipelines run from the oilfields in the centre and south to Khartoum and on to Port Sudan, the country’s only product pipelines run between Khartoum and Port Sudan. Most transport of fuels is by road tanker with some by barge on the River Nile to points south of Kosti and a very limited amount (mainly for power stations) by rail to Nyala in the Darfurs.

Despite the implementation of the Comprehensive Peace Agreement which now allows free movement between North Sudan, where most fuel supplies are produced or imported, and Southern Sudan, the logistical challenges of transporting fuel to the south and the issue of fuels quality of fuels from the North means that much of the fuel consumed in the south continues to be imported from Kenya and Uganda.

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³ To place Sudan’s crude oil production levels in perspective, world consumption of oil is about 85mn bpd. OPEC producers Indonesia and Libya have production quotas of about 1.5mn bpd; Algeria has about 900,000 bpd and Qatar 750,000 bpd. Nigeria, Kuwait and the UAE have quotas of between 2mn and 2.5mn bpd, or about double what Sudan is expected to produce within a year. However, a greater proportion of production from all these countries goes to local consumption. Sudan is thus an increasingly important supplier to the world oil market.

⁴ Sudan’s main hydroelectric power plant is reported to be the 280MW plant at Roseires on the Blue Nile 500km southeast of Khartoum. A 300MW plant is under construction at Kajbar on the Nile’s second cataract. The major addition to hydroelectric capacity will be the 1250MW dam at Merowe, on the Nile’s fourth cataract, about 400 km north of Khartoum. Until this major plant is operational in mid to late next year, 2007, Sudan will have to continue relying on electricity generated by burning mostly diesel.

⁵ Gas turbine generators (which burn natural gas or diesel) can be installed and operational in a matter of months but have a relatively modest output. Higher capacity thermal power stations, which usually burn more abundant (and cheaper) crude oil or heavy fuel oil, as well as natural gas, take several years to build. Sudan does not yet have the natural gas infrastructure that would provide the most effective fuel for the gas turbines so must rely on diesel.
3. **Industry Background (cont’d)**

3.2 **Upstream Exploration and Production**

*The First Forty Years Through to First Major Exports in 1999*

Petroleum exploration in Sudan began in the late 1950s in the Red Sea with Italian oil major Agip Mineraria, Oceanic Oil and Sudanese company, Digna Oil, followed in the 1960s by a consortia grouping US, Kuwaiti and Sudanese interests. These offshore exploration efforts were unsuccessful during the 1960s and early 1970s until US major Chevron entered the area discovered the Suakin\(^6\) gas field in 1976. Gas is still being produced from Sudan’s Red Sea area today.

Onshore, real exploration efforts did not commence until US major Chevron was awarded exploration licences covering about half a million square kilometres of southwestern and southeastern Sudan in 1974, amounting to about 20% of the country’s area. This led to several discoveries in central-south Sudan near the towns of Bentiu, Malakal and Muglad in the late 1970s. However, in the 1980s, as a result of conflict in the area, Chevron withdrew from its concessions, leaving Sudan in the early 1990s.

In 1981, European oil major TotalFinaElf (TOTAL), in a consortium with US and what would later become Kuwaiti interests, was granted a 120,000 sq-km block (about 5% of Sudan’s area, now sub-divided into Block BA, BB and BC) in Southern Sudan, centred on Bor. The consortium obtained seismic data but declared a ‘stoppage of work’ (effectively force majeure) when insecurity made operations untenable. However, the consortium claims to retain rights to the remains of this concession, a property considered very prospective. If oil is found and developed (a process of at least five years), it will provide substantial resources to the Government of Southern Sudan and a potential supply of fuels in Southern Sudan and into neighbouring countries.

In the early 1990s, non-US foreign oil exploration firms began to return to Sudan, particularly in the centre. The Government adopted the industry-wide block system in 1993, dividing the prospective basins into 20 blocks countrywide. Chevron’s former concessions were sub-divided into smaller blocks. Canadian independent Arakis Energy and its consortium acquired one of these in the Muglad Basin north of Bentiu in 1993, bringing oil onstream in 1996 at around 2,000bpd in Blocks 1, 2 and 4 as part of the Greater Nile Oil Project (GNOP). This was Sudan’s first major oil production, all consumed internally. Further production of 10,000bpd was brought onstream from other concessions by mid-1998. Sudan was then producing no more than 20,000bpd as it had no means of getting further production to market.

Significantly, China National Petroleum Corporation entered Sudan in 1995, signing an Exploration and Production Sharing Agreement over Block 6, west of the GNOP area. Over the remaining years of the decade, Malaysian and Indian state-owned oil firms in the form of Petronas and ONGC entered Sudan and are now the major players, with Petronas active in both upstream and downstream.

Further development of the GNOP and other areas occurred in the late 1990s with a 1610 km crude oil pipeline from the fields to Port Sudan commissioned in mid-1999, allowing Sudan to produce in excess of 300,000bpd, mostly for export. The pipeline was routed past El Obeid, where it fed crude to the second (and smallest) of Sudan’s two refineries, and by Khartoum, where it fed the main refinery. First major exports from oil through this pipeline were 600,0000 barrels on 30th August 1999 with oil from GNOP’s Heglieg and Unity fields in Blocks 1, 2 and 4. Exploration and production interests in this area are now held by Chinese, Indian, Malaysian and Sudanese Government interests with the Canadians having departed.

Sanctions first imposed on Sudan by the US in November 1997 under the *Sudan Peace Act* on the basis that oil profits were being used to fuel the civil war in the South and Sudan’s alleged support of terrorism (and extended to the GNPOC in February 2000) remain in place with no clear prospects of being lifted in the near future. Even when lifted, it could still be several years before substantial Western investment can take place in Sudan’s upstream sector. Meanwhile, Chinese, Indian and Malaysian interests are securing strategic crude oil supplies.

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\(^6\) Chevron is now ChevronTexaco. Suakin is an historic island offshore Sudan, 58 kilometres south of Port Sudan. A major trading centre with a 3,000 year history and once part of a major Hajj (pilgrimage) route, it lost much of its importance after the opening of Port Sudan in the 1920’s. It is now the site of a major gas export terminal and thriving port.
3. **Industry Background** (cont’d)

3.2 **Upstream Exploration and Production** (cont’d)

*Recent Years, 2000 through to Present Day*

In recent years, the Government has further subdivided exploration blocks in Sudan and actively let many of these and previously delineated blocks. A list of these blocks, their general locations and operating companies, where let, are shown at Annex A.

**Current Financial and Administrative Arrangements:** Petroleum concessions and regulation of exploration, development and production rights are legislated for under Sudan’s *Petroleum Resource Act*. The Comprehensive Peace Agreement (CPA) between North Sudan’s National Congress Party (NCP) and the SPLM/A establishes a National Petroleum Commission which makes most strategic decisions on the oil industry countrywide. This has representation from both the Government of Sudan and the Government of Southern Sudan.

The CPA includes a wealth-sharing arrangement on production from the southern oilfields, which includes all the presently producing interests and those expected to come onstream with this year. Broadly speaking, all revenues above an annually-set benchmark price are credited to an *Oil Revenue Stabilisation Account*; at least 2% of the balance of the revenue (i.e. that up to the benchmark price) goes to the region or state from where the oil is produced, with the remainder split evenly between the Government of Sudan and the Government of Southern Sudan.

**The Block B Problem:** A major point of contention may arise in Southern Sudan. TOTAL and its partners continue to hold a major concession in Southern Sudan’s renamed *Block B* although White Nile Ltd., a British company, claims to have a concession agreement from the local authorities, if not the new Government of Southern Sudan. White Nile Ltd. is reported to have started exploration work. It is unclear when TOTAL may resume active work on the ground. At time of writing, the NPC had not made any ruling on the matter. The matter will have to be resolved sooner rather than later.

As yet, no known discoveries have been made in Block B. In any event, it will be several years – most likely at least five - before any oil that may be found can be brought into production. A pipeline to export oil from this area through Kenya would probably be prohibitively expensive. As such, depending on the political climate prevailing at the time of any development, production would be most likely linked to existing pipelines to the north for export or refining. Recent announcements on the start-up of production from fields owned and operated by the Petrodar consortium north of Block B in Blocks 3 and 7 suggest that any eventual production from Block B could be linked into the newly-commissioned Petrodar pipeline to Port Sudan.

**Natural Gas:** Historically, natural gas produced in association with the crude oil has been flared off. However as developments proceed and more production is brought onstream, it will be increasingly captured. This associated gas – together with deposits of unassociated gas - represents a valuable resource for power generation (thus reducing the reliance on diesel), clean cooking fuels, or even export.

**Total Production:** Total national crude oil production is in excess of *500,000bpd* at time of writing, and increasing as new wells and new fields come onstream. The Sudanese authorities are on record as saying that production could be as high as *600,000bpd* by mid-2006 and *one million bpd* by 2007, although it is unclear whether this factors in the inevitable decline in GNOP production from Blocks 1 and 2. Most crude oil exports are now destined for China and India.

**Challenges for the GoSS:** During the team’s visit to Juba, we discussed the future plans of the Minister of Industry and Minerals in the Government of South Sudan (GoSS), H.E. General (Rtd.) Albino Alok Alok. The Ministry appeared to have few formulated plans for managing natural resources in its area and did not appear to be working to an overarching strategy. The GoSS is still in its formative stage and the Ministry is severely under resourced. However, the Minister expressed a preference for Southern Sudan to have its own refinery and product pipeline for exporting fuels to Uganda and Kenya and then on to other East African countries. During further discussion, we outlined a number of options which the Minister appeared to appreciate. He later requested that we outline a plan and base strategy for oil and fuels exploitation and management for the GoSS. This is not within the remit of the UNJLC and it was made clear to the Minister and could be better dealt with by the World Bank or other appropriate members of the UN family active in Southern Sudan.
3.  **Industry Background (cont’d)**

### 3.3 Pipelines and Ports

(a)  **Crude Oil Pipelines:**

Sudan has four crude oil pipelines, two of which run from separate oilfields in the interior to Red Sea export terminals. One of these also feeds the country’s two refineries. The third pipeline links other inland oilfields to the Khartoum Refinery. The fourth, a relatively short one, links outlying oilfields to the main pipeline.

The main line is the 1610km *Greater Nile Petroleum Operating Company (GNPOC)* pipeline, commissioned in mid-1999. As noted above in **Section 3.2**, this carries crude oil from the main oilfields in Blocks 1, 2 and 4 to the El Obeid Refinery and the Khartoum Refinery, with the balance destined for export as Nile Blend. The second pipeline is the 1400km *Petrodar* pipeline, largely completed in 2005 but only recently commissioned. This runs from Blocks 3 and 7 direct to the coast. A third 730km crude oil pipeline, completed in late 2004, connects *Al Foula* in **Block 6**, west the GNPOC fields, to the Khartoum Refinery. The final crude pipeline, *White Nile Petroleum Company’s* 174km line, links production from Block A into the GNPOC pipelines servicing the fields in Blocks 1, 2 and 4.

These pipelines will favourably affect the economics of further oil discoveries further. Operators of the new oilfields should be able to negotiate use of the pipelines instead of building their own.

(b)  **Sudan - Refined Product Pipelines:**

There are two major refined product pipelines operational in Sudan, both of 12” diameter and both running from Port Sudan to Khartoum. The first was built in the 1970s to carry imported fuel products from Port Sudan to the capital before Sudan had its own refining capacity. In later years, it was reversed to allow the export of gasoline produced in Khartoum. In 2005, it was reversed again during the Khartoum Refinery maintenance shutdown to allow transport of imported fuels – including but not limited to gasoline – to Khartoum. After the refinery reopened, it was reversed again to its usual export state.

The second refined products pipeline was completed in 2005 by India’s Oil and Natural Gas Corporation. It runs from the Khartoum Refinery to Port Sudan and carries export gasoline produced by additional processing capacity installed at the refinery over the past two years.

(c)  **Sudan Ports - Export and Import:**

Sudan has two main oil export terminals on the Red Sea, Bashair-1 and Bashair-2, both south of Port Sudan. The first serves GNPOC exports from Blocks 1, 2 and 4 together with production from Block 5A and probably some from Block 6. The second serves Petrodar production from Blocks 3 and 7.

The export terminals are understood to have storage capacity for 3.2 million barrels of crude oil (or about one week’s current exports). This storage cannot be used for refined fuel products which are catered for at the products import/export terminal and LPG terminal at Port Suakin.

Of particular interest to the humanitarian community, availability of refined product storage to serve imports at Port Sudan is generally good with further storage for both crude oil and refined products available at an old disused refinery in the town. There are also a number of private company facilities in the immediate vicinity of the port. These storage installations are understood to be connected by pipeline and together may exceed several hundred million litres.

The accompanying table outlines the volume, in cubic metres (thousands of litres) and ownership, by product, of storage capacity at Port Sudan.

The volume is in cubic metres (thousands of litres) and ownership, by product, of storage capacity at Port Sudan.

<table>
<thead>
<tr>
<th>Company</th>
<th>LPG</th>
<th>Naphtha</th>
<th>Mogas</th>
<th>Jet A1</th>
<th>Diesel</th>
<th>Fuel Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petronas</td>
<td>-</td>
<td>23,100</td>
<td>1,150</td>
<td>10,900</td>
<td>8,900</td>
<td>18,300</td>
</tr>
<tr>
<td>Nile</td>
<td>54</td>
<td>-</td>
<td>900</td>
<td>-</td>
<td>5,500</td>
<td>4,700</td>
</tr>
<tr>
<td>Gapco</td>
<td>89</td>
<td>-</td>
<td>2,300</td>
<td>-</td>
<td>11,000</td>
<td>2,100</td>
</tr>
<tr>
<td>Aman</td>
<td>2,500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Iran Gas</td>
<td>1,960</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Abbarci gas</td>
<td>440</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SPC</td>
<td>950</td>
<td>-</td>
<td>82,000</td>
<td>-</td>
<td>41,000</td>
<td>-</td>
</tr>
<tr>
<td>PSR</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>38,000</td>
</tr>
<tr>
<td>Total</td>
<td>5,993</td>
<td>23,100</td>
<td>86,350</td>
<td>11,100</td>
<td>66,400</td>
<td>63,100</td>
</tr>
</tbody>
</table>

We noted that Shell, previously a major player in the country, has now withdrawn from import and export activities at Port Sudan and its facilities have been taken over by Petronas.
3. Industry Background (cont’d)

3.3 Pipelines and Ports (cont’d)

(d) Mombasa Port:

Mombasa Port is the gateway to East Africa and, absent strong logistical links between North and South Sudan, will continue to be the key point of entry into the region for the product imports on which Southern Sudan depends. We are increasingly concerned that this is not only an expensive source of imports but a less reliable one.

With strong population and economic growth in Kenya, Uganda, Rwanda and Burundi, fuels have become a key factor in the development of these countries, yet the capacity of the port at Mombasa has not expanded to accommodate this. At the time of our original South Sudan fuel survey in early 2004, there was little or no issue with fuel storage capacity at Mombasa. In the two years since then, the situation has become much more finely balanced. This has been demonstrated on a several occasions when importers were forced to pay demurrage in the region of US$20mn for four ships delayed up to three weeks for offloading. The reasons were a combination of increased demand and lack of storage, the latter as a result of an error by the Kenya Pipeline Company and the Kenya Port Authority (see sidebar at right).

Undoubtedly these episodes have served as a warning to the market, highlighting the growing pressure on the Mombasa corridor and how finely balanced the storage and pipeline routes through Kenya are.

Fuel imports into Kenya are covered by a process known as the “Industrial Tender” whereby the government compiles total requirements of registered operating companies and then tenders that on the international market. The government then issues the fuel delivered under the terms of the tender. This is, in effect, a method of price control.

Importation of fuel products through Kenya is a complex and costly affair for the marketers who then pass on these costs to consumers. Typical charges are detailed below. Rationalisation is clearly required. It also suggests that implementing supply routes to Southern Sudan from the north, to reduce or even eliminate reliance on Mombasa, should be a priority.

### The Mombasa Ullage Debacle

Problems arose in recent months at Mombasa Port with the manipulation of ullage (storage) at the Kipevu Oil Storage facility in favour of selected oil marketers. This allowed certain importers more free storage than they should have been entitled to and caused other importers to incur demurrage as their vessels could not unload.

Objections by the major importers eventually caused the government to free up additional storage at the Kenya Petroleum Refinery jetty at Shimanzi and to order the Kenya Pipeline Company to identify publicly the offending company and require it to vacate the excess storage it has been holding in Kipevu.

Additional conflict arose with ships offloading greater volumes than allowed as part of the industrial contract. Accordingly, the government will now impose fines on shippers and companies who fail to evacuate their products within the allocated 30 days. The surcharges are said to be US$10 per cubic metre for up to 45 days and US$20 for 46 to 60 days.

What is remarkable is that the offending marketer holds only 4 percent of the market and was still able to dominate imports, suggesting that the market and storage balance is very fine.

<table>
<thead>
<tr>
<th>Charge type</th>
<th>US$ per metric tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya Ports Authority wharfage</td>
<td>2.50</td>
</tr>
<tr>
<td>North Corridor Transit</td>
<td>0.12</td>
</tr>
<tr>
<td>Inspection charges</td>
<td>0.80</td>
</tr>
<tr>
<td>Product analysis, recertification</td>
<td>0.07</td>
</tr>
</tbody>
</table>

| Other costs include:                     |                      |
| KPC pipeline storage loss (0.5% of landed cost); loss rate at loading depot (0.5% in tank cost per product); storage charges after 30 days; export bond charges, Customs overtime, supervision fees and dead stock/pipefill financing. |
3. Industry Background (cont’d)

3.3 Pipelines and Ports (cont’d)

(e) The Kenya Pipeline:

The Kenya product pipeline is a key link in the fuels supply chain to Southern Sudan. Technically, all imported product destined for re-export is routed through the pipeline to Nairobi and then to a terminal at Kisumu for Uganda and Rwanda and Eldoret for Southern Sudan respectively. The system was tightened by the Kenya Revenue Board in 2005 after abuses were found with tax-exempt re-export fuel diverted for local use in Kenya.

First constructed in the 1950’s, the pipeline has seen little improvement or upgrades over its life other than patch and repair. It has increased its throughput from 880,000 cubic metres in 1978 to over 3.5 million cubic metres now. It is expected to rise again to 3.7 million cubic metres this year. Current plans call for four new pumping stations\(^7\) to increase the flow from the current 440,000 litres per hour to a declared and probably very optimistic 880,000 litres per hour by May 2007. These pumps cannot be used to increase the pressure as the pipeline integrity is too fragile for this.

The pipeline system and its associated storage remains a vulnerable supply route, one that might collapse with little notice, cutting off supplies beyond Kenya, including Southern Sudan.

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\(^7\) These pumping stations will be at Samburu, Manyani, Makindu and Konza. At time of writing, three consortia had been prequalified and shortlisted for the tender.
3. **Industry Background** *(cont’d)*

3.4 **Refineries**

(a) **Overview**

Sudan depends in part for fuel supplies on three regional refineries: its own major refinery at Gaili, about 30 kilometres north of Khartoum, a second much smaller refinery with a more limited product slate at El Obeid, and, to a very limited extent, the Kenya Refinery Company refinery at Mombasa. The Khartoum Gaili Refinery produces the full range of fuel products, with the exception of specialised lubricants. Mombasa produces most products but not aviation fuel. A fourth refinery is under construction at Port Sudan but is not expected to be operational until 2009.

There are several other small “skimmer” units within Sudan meeting local needs for some ground fuels, particularly in the oilfields themselves for upstream operations. None of these contribute to aviation fuel production and their capacity is immaterial to the overall situation.

In the early years of this decade, Sudan’s two refineries could generally meet the country’s needs. However, from 2003, the commissioning of gas turbine power stations to meet the rapid increase in Khartoum’s need for electricity meant that demand for diesel outstripped the capacity of the refineries. The heavy aviation fuel needs of the humanitarian community, particularly WFP-HAS from 2004 and into 2005, also exceeded the capacity of the refining industry. Although WFP’s needs have now significantly reduced, the demands of international airlines (often taking advantage of the cheap subsidised aviation fuel in Sudan) and to a lesser extent UNMIS have continued to place pressure on aviation fuel production.

(b) **Khartoum’s Gaili Refinery**

First commissioned in mid-2000 with a capacity of about 50,000bpd, this refinery was built and is operated by China National Petroleum Company (CNPC). It produces a full range of refined products and is the only refinery in the country to produce Jet A-1 aviation fuel. Until late 2005, it used as feedstock relatively light, low-sulphur crude from the Heglieg and Unity fields in Blocks 1 and 2 but now much of the crude it processes is heavier, more difficult crude from Block 6.

The capacity of the refinery was increased to about 60,000bpd in 2004 and to about 90,000bpd in 2005. A new cracker unit that would further increase processing capacity to about 120,000bpd was due to be commissioned in November 2005 but this has been delayed until about June 2006. The cracker will also allow the refinery to produce a greater proportion of higher value fuels.

The refinery produces an excess of gasoline above Sudan’s needs, which it exports through a new product pipeline to Port Sudan, commissioned in 2005.

(c) **The El Obeid Refinery**

Compared to Gaili, the El Obeid refinery is a relatively low technology distillation plant with a modest but useful processing capacity of around 10,000bpd. It is fed by light crude from the Heglieg and Unity fields and produces diesel, fuel oil and gasoline as well as limited LPG.

We are unaware of any plans to upgrade either the product slate or the capacity of the refinery.
3. Industry Background (cont’d)

3.4 Refineries (cont’d)

(d) The Kenya Refinery

Of the three operational refineries, the Kenyan refinery at Mombasa is probably of the least relevance, given that its primary function is to service the needs of Kenya itself. By law, Kenyan fuel marketing companies are required to take 70% of their requirements from the refinery for internal consumption, thus maintaining, somewhat artificially, the viability of the refinery. An old unit first commissioned in 1954 with a relatively small capacity of about 60,000bpd, the refinery will need a major upgrade if it is to meet the growing needs of the regional economies. It processes crude from the Arabian Gulf in quantities as noted in the table above. Production for 2005, according to Kenya Petroleum Refineries Ltd, is shown in the table at the right.

Shareholdings in the refinery have changed over the past two years as the multinational oil companies relinquish relatively small refining operations to concentrate on their core upstream business. Although the Kenya Government continues to hold a 50% share in the refinery, the private sector shareholders who, between them, hold the other 50%, are changing. The latest has been BP who is selling its 17.1% interest. Shell, the refinery operator, is also withdrawing. The new buyer is expected to be one of the newer downstream companies who are starting to dominate product marketing in Kenya. These are Triton, IOU of India, Addex and Oilcom, and smaller companies such as Dalbit, Engen of South Africa (a Petronas subsidiary). The two leading product companies in Kenya continue to be Caltex and TOTAL.

(e) The Port Sudan Refinery

This refinery is presently under construction and is expected to be commissioned in 2009. It is being built by and will be operated by Petronas with an eventual processing capacity of about 150,000bpd. Being located on the Red Sea, well away from the main fuels markets of Sudan, it is intended as a value added unit, to refine crude oil that would otherwise be exported into exportable refined products.

Significantly, the refinery will be able to process the sour crude that will be more available then. In Sudan, the main producing fields at Heglieg and Unity produce what is known as “Nile Blend”. This is a light crude, highly prized for refining into more valuable products and lubricants. As such, Nile Blend attracts a premium for export whereas sour crude attracts a discount. It is therefore more advantageous on an overall basis nationally to process the sour crude for domestic use (as is being done presently in the Gaili Refinery at Khartoum) and export the lighter crude, and to convert the lower value heavy crude into higher value products in a value added refinery.

Given that this plant will not be operational for at least another three years, with its output being exported, it does not form a relevant part of the Sudan fuels equation for the time being.

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8 “Sour” is an industry term for crude oil with a high sulphur content. This needs to be removed in the refining process.
9 The crude from Heglieg and Unity is between 33 and 41 degrees API (American Petroleum Institute, an industry measure of density or “lightness” of crude oil) with a low 0.5% sulphur content. However, it is waxy and therefore requires heating to maintain pipeline flow rates.
4. Fuel Supply

4.1 Overview

Sudan refines all types of fuels required for domestic consumption. However, for certain products, especially diesel and aviation fuel, regular imports have been necessary to meet the demand generated by Sudan’s burgeoning national economic growth, combined with the large needs of the UN and humanitarian community.

Since Sudan has become an oil producer, its refining industry has generally responded adequately to the country’s increased fuel needs in the late 1990’s and into the early years of this decade. However, industry capacity has now fallen well behind demand. The situation is further exacerbated by the failure to bring online on schedule in late 2005 Khartoum Refinery’s new cracker unit. This would have allowed a significant increase in much-needed diesel output, increasing national refining capacity by about a third, or 30,000bpd.

To bridge the supply gap, the Sudan Petroleum Corporation (SPC) has been obliged to import both diesel and Jet A-1 aviation fuel, as well as furnace oil. Imports have risen steadily since 2002 from 308,187 metric tonnes to 368,347 metric tonnes in 2005.

Although Sudan may be producing up to one million bpd of crude oil by 2007, it will continue to have difficulty meeting domestic fuel needs. The only major new addition to the national refining industry for the remainder of the decade will be the new Port Sudan Refinery, due online in 2009.

4.2 Diesel

Diesel remains the main fuel used by both the transportation industry and the UN community. Estimates of future demand and the resultant surpluses or supply gaps are difficult but the commissioning of Khartoum Refinery’s new cracker unit in June 2006 should significantly improve the supply side of the equation. However, this is unlikely to produce an immediate surplus given the demands of the power generation sector and the planned refinery closure for major maintenance in early 2007. Beyond this, the new Merowe River Nile hydroelectric scheme should be online late 2007, thus reducing reliance on diesel-fired power stations. With construction of the distribution system ahead of schedule and the switch to hydroelectric power for base loads, diesel should be more available for the transportation and humanitarian markets. This should persist for a year to 18 months until demand from continued economic growth again places further pressure on local supply.

Sudan’s refinery system is not expected to be capable of exporting diesel fuel until the 130,000bpd Port Sudan refinery comes is operational in 2009 but should be able to meet local needs in 2007.

Our earlier 2004 report on North Sudan used estimates for diesel fuels requirements provided by UNMIS and members the Humanitarian Community. The UNMIS figures proved to be seriously over-estimated. The ramifications of this are more fully covered in Section 10 of this report covering the short-term (interim) fuels contract and the long-term fuels contract.
4. Fuel Supply (cont’d)

4.3 Jet A-1 Aviation Fuel

Given the vast size of Sudan, the limited Nile barge capacity and river port infrastructure (and slowness of this form of transport), and the lack of roads between the north and south, aircraft will continue to form an integral part of the country’s transport system. The commercial growth in Jet A-1 use is expected to continue unabated. Internal and international air transport is experiencing significant growth, with new routes between the north and south and greater traffic on existing routes.

The main users of Jet A-1 in the UN are: (a) UNHAS, with actual 2005 monthly usage of approximately 10 million litres and estimated 2006 monthly usage of 500,000 litres; and (b) UNMIS with actual 2005 monthly consumption of about 2 million litres, estimated 2006 consumption of 3 million litres. The large fall in WFP usage is due largely to a reduced reliance on airlift and airdrops for food delivery as part of WFP’s logistics strategy. They have used the peace dividend to open up roads and use more economical overland deliveries of food aid. The expected increase in UNMIS consumption is based on a higher level of deployment as more UN troops and observers are available.

The impact of UN operations on the Jet A-1 market has not been as great as expected, mainly because:

- UNMIS, in 2004, seriously overestimated its 2005 aviation fuels usage;
- As part of a conscious effort to avoid distorting the local market, as recommended in our earlier report on North Sudan, UNMIS import their fuels and are therefore independent of domestic market forces; and
- As noted above, WFP have replaced much of the air transport of food with ground transport.

Whereas UNMIS imports all their fuel requirements through Port Sudan, the humanitarian community - of which WFP is the biggest consumer - draw from local supplies largely through Matthew Petroleum and Petronas. The local market is cheaper than imports but is subject to supply disruptions during the periodic one month refinery closure. The humanitarian community experienced significant aviation fuels shortages in late summer 2005, with costs being incurred for idle aircraft that were on time charter contract.

UNMIS have taken the precautions of holding reserve stocks on most operational sites and also of building a strategic reserve as a buffer to major supply interruptions. Although humanitarian agencies do have stocks, they are more limited. When the refinery closes, they are forced to limit their operations accordingly.

Fortunately, the next refinery closure is programmed for January 2007, in the dry season when there is generally a lesser need for aviation. Furthermore, the soon-to-be-completed improvements in Khartoum’s Gaili Refinery will increase supply of Jet A-1 to the market. However there will still be a need to import this fuel.

One cause for concern is the apparent absence of an air refuelers’ licensing system in Sudan. In effect, this those who may not be suitably qualified can fuel aircraft. We also noted inconsistencies in standards in a number of depots and sites around the country, (including sites used by UN agencies) but noted that WFP carried out a professional site survey in its only temporary fuel storage base in Rumbek.

It should be further noted that imported aviation fuel – as with diesel fuel - is subsidised. This has led to international airlines taking advantage of this by filling up beyond their fuel needs to return to their port of origin. In effect, Sudan is subsidising foreign airlines, creating an external drain on the economy. This is unsustainable in the long term.
4. Fuel Supply (cont’d)

4.4 Liquid Petroleum Gas

The use of LPG as a cooking fuel is growing in Sudan. Supply is plentiful both from upstream operations (where gas is produced and separated out as crude oil is extracted) and as a by-product in the refining process.

LPG use in urban areas is now well-established with adequate numbers of gas bottles in circulation and filling plant infrastructure. However, its use should be strongly encouraged in IDP camps and rural areas to help prevent deforestation. Use of wood and charcoal is unsustainable with an increasing population and an arid environment. The effect of reliance on these traditional fuel sources is already evident with desertification in numerous areas. Schemes in other countries where the UN, government and oil industry have joined forces to provide LPG canisters and cookers to rural families have proved very successful in arresting environmental damage and improving quality of life.

Sudan has been a net exporter of LPG since the turn of the century, following the commissioning of the Khartoum Refinery. This source alone – excluding direct field production and the El Obeid Refinery - produced about **223,000 metric tonnes** in 2005. Refinery expansion has increased current production capacity to **343,000 metric tonnes**. Additional capacity will be achieved firstly when the new Khartoum Refinery cracker unit comes onstream, and again in 2009 when Port Sudan refinery is commissioned. Negotiations are currently under way with Indian companies to develop the domestic LPG market, with most of the gas bottles in circulation provided from there.

On the demand side, national consumption for 2005 was about **102,000 metric tonnes** with the household sector accounting for about 90% of total consumption. The increase has been remarkable over the past two decades. Total national consumption in 1985 was only **8,000 metric tonnes**. This almost doubled by 1995 to **15,000 metric tonnes** and further jumped to **98,000 metric tonnes** in 2002, a level that has remained largely constant. Much of this increase is attributed to the advent of local oil production in the Sudan in the late 1990’s and the parallel production of LPG. As this local production far exceeded local demand, LPG prices were reduced by about 40% and investment and income tax concessions introduced to encourage LPG usage.

Potential household demand is estimated at about **554,000 metric tonnes**, based on anticipated household sector growth. Thus, current consumption represents only about 18% of the potential countrywide. Clearly, there is room for expansion in this market.

Potential demand and developments in the power, industrial, commercial and automobile sectors were difficult to quantify as it was not practicable to obtain reliable data. However, indications suggest that these sectors will move at least some way towards substituting current energy sources with LPG. Garri Power Station, commissioned in June 2003, has already converted to LPG from gasoil (diesel) with the SPC advising that the station will consume all the current LPG surplus. Nevertheless, several factors will limit growth in other areas. These include the specifications of locally produced LPG, which contains unsaturated carbohydrates (olefins) at levels which render it unsuitable for efficient use in industrial and automotive applications.
4. **Fuel Supply** (cont’d)

4.4 **Liquid Petroleum Gas** (cont’d)

Expansion of LPG use will depend greatly on the available LPG logistics. Excluding SPC, the industry’s nationwide storage capacity is 7065 metric tonnes. About 60% of this is dedicated to export operations in Port Sudan and Suakin. A further 22% is located at the primary supply and distribution terminals at Gaili in Khartoum, with a further 8% at Shagara where most filling operations are conducted. The remaining 10% is spread between Jazeera state, which is the second largest consumer after Khartoum, and elsewhere across the north of the country. There is little, if any storage capacity in the south.

In addition to storage, other important elements in the LPG logistic chain are circulating cylinders, transportation trucks and filling plants. The most commonly-used household cylinder is the 12.5kg size, mostly used in cities. For economic reasons, smaller packages are used in rural areas but are important to consider as this is a major growth area. Industrial and commercial consumers such as hospitals, student dormitories, restaurants, bakeries and brickworks use bigger fixed tanks usually supplied by the marketers.

Whist current storage is sufficient to support today’s consumption, further growth will require expansion of both logistics and geographic coverage, particularly to provide LPG access to regions in the south and west.

We were unable to ascertain any definitive licensing requirements for operating in the local LPG market but verbal indications from officials and marketers suggest that there no specific requirements exist and a company already licensed to operate in the refined products market is not required to obtain a separate license to work with LPG.

5. **The Drums Shortage**

Drums are a vital part of the supply chain for some of the more remote locations served by the humanitarian community, particularly where the fuel quantities required are not large. They may be readily transported in pick-ups and regular trucks - and even aircraft - for any liquid fuels.

We noted that WFP’s contractor for Southern Sudan is struggling to find sufficient quantities of drums in Kenya. This is apparently a result of the Kenya Revenue Board cracking down on illicit practices involving drums and the export trade whereby they are used to smuggle tax-exempt fuel destined for export back into the Kenyan market, thus depriving the Kenyan treasury of taxes due to it. It is understood that the situation may have been further exacerbated by the only manufacturer of drums in the country ceasing trading. At the time of writing, only 127 drums were reported available in Kenya. There are sufficient drums in Northern Sudan with a manufacturer in Port Sudan so orders will eventually be met, in time. However, the southern drums shortage increases the fragility of the already difficult southern supply chain.

The real cost of drums should be considered. Although a flexible supply element of the supply chain, they are expensive. At 200 litres each, the fuel in a drum can cost in the region of US$200, generally less, but the cost of the steel drum is often US$30 to $40, adding at least 20% to the cost of the fuel. Although manufacturers will usually take drums back and refund a small part of their cost, it is often impracticable for users in remote areas to ship these back to source. Also, given the circular shape of drums, there is often a great deal of “dead space” on trucks carrying them that might otherwise be filled with fuel if a bulk cargo were carried. Furthermore, it is seldom possible to use all the 200 litres in a drum because of dregs and particles in the bottom. This is particularly so for aviation fuel. The real cost of each usable litre of drummed fuel is therefore much higher than generally assumed. There is a premium for convenience.

Any agency considering using drums should consider reusable rubber models. There are two types of these: one that uses the same fuel all the time and more flexible ones where a disposable inner “bag” is fitted before use and disposed of afterwards. This means the drum can be used for water, diesel and Jet A-1. When transporting empty, the drums can be collapsed in size using a simple vacuum pump connected to a vehicle. This allows the volume taken up by empty drums to be reduced by a factor of eight to ten, thus saving on transport.

In general, with fixed installations with a reasonable throughput of fuels, it is usually more economical to move away from drums to a small bulk fuel installation as soon as possible, if bulk resupply is possible.
6. Distribution: Fuel Corridors

6.1 The Northern Corridor

The most economical fuels in Sudan are available from the refineries at either El Obeid or the Khartoum Gaili Refinery. These, plus imports, supply North Sudan and the Darfurs, with some supply to Southern Sudan, through the logistical routes illustrated in Annex B.

Contracting Arrangements: UNMIS

UNMIS presently have two contracts, one relatively small with Petronas covering the Darfurs and a larger one supporting the peace process in the south and north of Sudan. During this year, UNMIS will operate a total of three fuels contracts. The Petronas Darfurs contract is the first; the other two are what have become known respectively as the “short-term” and “long-term” fuel contracts, both providing fuels for operations in the north and south. The former has been in operation for about a year with SkyLink Logistics and is likely to continue until September or October 2006, when the long-term contract will take over. The latter (which had not yet been awarded at the time of writing) is being renamed the “unified fuel contract” to reflect the fact that it may serve all UN missions in Sudan. However, it may be unified in name only as it is by no means certain that the humanitarian agencies will join with UNMIS in this contract.

The Petronas Darfurs contract includes bases in El Geneina, Nyala, El Fasher (the state capitals of West Darfur, South Darfur and North Darfur respectively) and El Obeid. It is understood that this contract will be integrated with the long-term (unified) contract. Both of these contracts are important to the humanitarian community. We have therefore addressed these separately in Section 10, exploring what is feasible and at what cost.

To their credit, UNMIS have adopted a socially responsible position by importing all its fuel requirements through Port Sudan so as to not adversely affect the local market. At the time the decision to do this was taken, UNMIS had expected to use substantially more aviation fuel than it actually has in the past year. Had this usage eventuated and been drawn from the local market, it would have placed greater strains on the local economy.

The fuel imported by UNMIS (whether for the Darfurs or under the short-term contract) is brought in tax-free and is generally of excellent quality. However, it is more expensive than the subsidised local fuels. The importation process starts with an application by UNMIS to the Minister of Finance for tax-free importation. The UNMIS contractor then buys the fuel on the spot market or by prior arrangement with a foreign refinery or shipper and arranges importation through SPC and a major handler in Port Sudan. When the vessel arrives at Port Sudan, a standard quality assurance procedure is carried out to ensure it meets the required specifications. If so, the fuel is unloaded and the UNMIS contractor draws the fuel and trucks it by tanker to the required destinations. If specifications are not met (and there have been cases of this occurring) it remains on the vessel until a rectification process is agreed with the testing authority. Costs in such circumstances are borne by the seller.

Under the short-term contract, UNMIS is currently flying fuels to many locations in the South. This cost is not factored into overall price and is an expensive but at times necessary means of distribution.

Contracting Arrangements: The Humanitarian Community and African Union

In contrast to UNMIS, the humanitarian community has been drawing its fuel requirements from the local market in Sudan and relying on imports from the south. Although local fuels cost less than imports, quality is less assured and supply less certain. The supply issue was most clearly illustrated by major problems encountered in the third quarter of 2005 when the Khartoum Gaili Refinery closed for planned maintenance. This prompted debate on the merits of this approach and calls in some quarters for a unified fuel contract with UNMIS.

In addition to the fuels needs of the humanitarian community, the African Union (AU) peacekeeping mission in the Darfurs is served by PAE, with supplies sourced locally. However, the relatively modest volumes required, mainly of diesel, do not seem to have placed much strain on the market or the supply chain into the Darfurs.

It should be noted that both the humanitarian community and the AU is benefiting from the de facto subsidy being applied by the Government of Sudan to fuels. It is understood that these subsidies amounted to around US$1 billion in 2005. Both the World Bank and IMF are challenging the appropriateness and legality of such subsidies under the terms of wealth sharing agreement. It is reasonable to expect that these subsidies will be either reduced or removed entirely in the next three to five years, thus significantly increasing the per litre price of local fuels. We have addressed this separately in Section 7.
6. Distribution: Fuel Corridors (cont’d)

6.2 Nile Barges: The North-South Route

At present, the River Nile is the only north-south route open year round, at least in theory. The key to the fast and cheap supply of fuels to the south is thus Nile barges. There has been much discussion of these over the past two years but little progress on improving the ageing and largely decrepit fleet. Most Nile barges are operated by the River Transport Company, with the route running south from Kosti. Barge traffic between Khartoum and Kosti is possible but very costly because the Jebel Aulia dam on the river requires offloading, transhipment by truck around the dam, and reloading onto barges further south. RTC continues to be underfinanced. Without investment, it cannot hope to provide an adequate service.

The key advantages of barges is that they can carry large loads, between 200 and 500 metrics tonnes, or the equivalent of between 10 and tanker 25 trucks and the route exists and is free of the effects of the rainy season. However, the lack of barges, the poor state of the pushers and the inadequacy of the river ports will continue to severely limit the capacity of this corridor for agencies. The volume of cargo to be moved is substantial and places further strain on the system.

Nevertheless, the RTC have plans to improve their facilities under a contract with the Sea Port Authority. These investments will include a Customs house to enable bonded goods to be transferred to Southern Sudan more efficiently. International investors are also beginning to enter the market. We understand that Damen Shipyards of the Netherlands have contracted with RTC to construct a new yard and a total of 46 barges. These would include flat top, cargo hold, petrol and diesel, Jet A-1 and oil-carrying vessels. We further understand that Damen have been in contact with WFP about building two pusher tugs and eight barges in Kosti for food transport. UNMIS are also buying barges and pushers. The Malaysian Transport Company (MTC) of Malaysia are said to be considering importing and building barges from China but this project is still very much in the planning stage and therefore at least one year away, if it eventuates. Proposals by Egyptian barge builders with a track history in the region seem to be the most promising. In any event, it will take many months, if not several years, to build up a suitable barge fleet.

The area of perhaps greatest long-term concern is fuels barge unloading in Southern Sudanese river ports. Without suitable facilities allowing quick turnaround, barge traffic will not develop.

As an example of the challenges facing barge transport, offloading operations in Juba, the most important port in the south, are very basic. The vessels tie up to mango trees and rely entirely on manual labour with no security around the offloading point. To fully offload a barge can take several weeks. For fuels deliveries to Juba, the cargo must be pumped into the few small tanker trucks available for a shuttle service to the severely limited suitable storage available. A company by the name of Royal has been using barges to deliver fuels but concede that this is extremely difficult without a proper port and that there are huge pollution and thus environmental risks. A Kuwaiti-Sudanese company had announced plans to construct a new port, with an investment of US$70mn, over a period of two years, on the site of the old port. It is further understood that this may have fallen through, thus further delaying infrastructure improvements.

It is imperative that the Government of Southern Sudan be actively engaged in the issue of river ports as land ownership and land access issues transcend the technical considerations. For Juba, it was suggested to the Minister of Industry and Minerals that the most expedient solution, once land issues are resolved, might be a pumping station at the port, connected overland by a pipeline to a tank farm inland and jointly owned by the private sector and Government ownership. To address the Government’s budgetary constraints, the project could be funded by the private sector with 80% of operating revenues accruing to the private sector until such time as the capital costs are recouped, reversing then to 20% to the private sector and 80% to the Government.

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10 The company also intended to rebuild the Juba Hotel into a 5-star facility, with a US$40mn investment. It is unclear whether this project will proceed. Kuwait has been a major development donor to Southern Sudan over the years, building the Al-Sabah children’s hospital at Juba and other facilities and being one of the few Arab countries to maintain any sort of continuous presence in Juba.
6. Distribution: Fuel Corridors (cont’d)

6.2 Nile Barges: The North-South Route (cont’d)

Kosti: The main base for all north/south barge operations. The site consists of fuel loading facilities, barge workshops, dry docks, general cargo loading area and repair yard. In addition, new construction of additional facilities, almost duplicating many of the existing facilities, is being completed by the Sea Port Authority. The duplication is because of the siting of current facilities and bridges which limit barge traffic.

Khartoum: The base of the River Transport Company (RTC) including dry docks and workshops. Facilities support only local transport and tourist vessels due to the Jebel Aulia dam between Khartoum and Kosti limiting traffic on this stretch of the river.

Malakal: An increasingly important town. Almost completely supplied by the river in rainy season. Fuel storage is old and in need of repair but is being used by the local oil companies. Off-loading is via jetty and works well. A new jetty is under construction and will improve the capability and capacity to discharge loads.

Shambe: In the near future, after the current 2006 rainy season, Shambe may become an important fuel offloading point that will allow the Nile traffic to supply cheaper fuels to the South by road through Yirilo to Rumbek and Wau. This will require investment in both offloading facilities and roads but the town is very well sited for this role.

Bor: The capital of the region and traditionally served by the river. The road from Juba was recently improved and now serves as the main supply route. There are no fuel stations in Bor but two oil exploration companies are operating on Blocks BA & BB. Both are shipping in fuel to cover the rainy season and we would expect a commercial station to open later in 2006. There is no dedicated fuel barge offloading point in Bor.

Juba: The capital of the GoSS. Juba now have 4 fuel stations by May and some storage but very poor barge offloading facilities. Investment will take place but it will be at least two years before a dedicated port is built or reclaimed. In the meantime, fuel will be driven in from the South. Jet A-1 may also be flown in from the North. Fuel barge offloading is a huge problem as the new port is on private land in the town. A solution of a pumping station and a government-owned main storage facility has been proposed by UNJLC to the relevant Minister but no decision had been made at time of writing.

KEY POINTS ON RIVER NILE LOGISTIC ROUTE

- Khartoum: The base of the River Transport Company (RTC) including dry docks and workshops. Facilities support only local transport and tourist vessels due to the Jebel Aulia dam between Khartoum and Kosti limiting traffic on this stretch of the river.
- Malakal: An increasingly important town. Almost completely supplied by the river in rainy season. Fuel storage is old and in need of repair but is being used by the local oil companies. Off-loading is via jetty and works well. A new jetty is under construction and will improve the capability and capacity to discharge loads.
- Shambe: In the near future, after the current 2006 rainy season, Shambe may become an important fuel offloading point that will allow the Nile traffic to supply cheaper fuels to the South by road through Yirilo to Rumbek and Wau. This will require investment in both offloading facilities and roads but the town is very well sited for this role.
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Nile River barges at Juba. The port facilities are very rudimentary with barges tying up to trees.
6. Distribution: Fuel Corridors (cont’d)

6.3 The Southern Corridor

Fuel from the south into Southern Sudan originates from the point of importation at Mombasa’s Kipevu Oil Terminal in Kenya, then generally passes through the Kenya Pipeline Company’s product pipeline to either Eldoret or Kisumu in western Kenya. It is then moved by road tanker via Lokichoggio in northern Kenya, and then through Kapoeta and Torit in southeast Sudan into Juba, or road tanker though Kaya in northern Uganda to Yei in southwestern Sudan. From Yei, it goes by road tanker either northeast to Juba or northwest to Rumbek, from where it may go on further to Wau.

Fuel travelling from Kenya and then through Uganda is dispatched from Eldoret in Kenya under escorted customs convoys to the Ugandan border and then similarly on into South Sudan. Although the fuel (as a transit commodity in both Kenya and Uganda, and destined for UN use in Sudan) is exempt from taxes, it has become common practice to pay the local “Gabana tax” which equates to around 5% of the value of the load at Eldoret. This seems to help ensure less delay than would otherwise be experienced at the Kenya/Uganda border.

Another logistical factor to be taken into consideration is the axle and weight limits currently enforced in Kenya and Uganda. The legal restriction means that the maximum cargo for fuel tankers is 42,000 litres.

Fuel delivered through the southern corridor will be critical in the coming rainy season. It is likely, in our opinion, that the UN will face shortages in Wau and Bor and the surrounding areas unless fuels are stockpiled or other contractual arrangements made. A number of contractors are willing to install temporary systems; others have containerised systems which may be either rented or operated free to the user if a specified minimum monthly throughput – generally 30,000 to 60,000 litres – is maintained.

Yei-Rumbek: This is the most well-established route and supports members of the humanitarian community who have been operating in the western part of Southern Sudan. Wau may be supplied from Rumbek for part of the year. Fuel supplies were a major issue two years ago but since a WFP road-building programme and installation of bulk fuel installations allowed the replacement of inefficient and costly drummed fuels with bulk fuels, others have followed suit and established containerised stations in the area. Fuel prices remain high with the long supply route but these are expected to fall as competition intensifies and larger infrastructure with economies of scale is built. Large tanks which may be completed during the rainy season are already under construction in Wau. The buffer stocks which these can hold should help alleviate current shortages. We also expect that fuel stations will be built in Wau in the latter part of the year, and more and better roads will improve access to the area.

UNMIS is presently flying its fuel into Wau but once prices drop and stocks from the south are built up, it may no longer be possible to justify this.

Yei-Juba: This will be a key route in the rainy season. It is expected to be closed periodically after particularly heavy rains but should be accessible to 6x6 tankers most of the time. It is essential that the momentum in fuel supply built up in Juba prior to the rainy season is maintained. This will require a substantial effort from contractors to keep fuel flowing particularly as Juba does not yet have sufficient storage to last the rainy season. It is understood, however, that the new UNMIS fuel contractor will build a new tank farm to ensure that the mission is not hampered by a lack of fuel when the rains block deliveries. This should help to maintain security of supply but it is unlikely to be ready this rainy season.

Lokichoggio-Torit-Juba: This road, the eastern approach to Juba from Kenya, was partly rehabilitated this year by German NGO GTZ and has been well used by the commercial sector (but not the UN). However, it is doubtful whether it will remain open throughout the rainy season and the road from Kitale to Lokichoggio within Kenya remains problematic.

Juba-Bor: This north-south route on the east bank of the Nile has been well-used this year and forms part of a growing road infrastructure. As yet, there is no fuels station in Bor but the fuels supplier to White Nile Exploration Company Ltd, which bases its operations out of the town, may open a small station in the near future.

Fuel deliveries in Southern Sudan will improve but agencies should make serious arrangements now for the coming rainy season as there is insufficient fuel currently available in many southern locations.
7. The Fuel Subsidies: A Hidden Cost to Sudan

Curiously, the Government of Sudan is continuing to subsidise fuel prices by setting the national price of fuels at less than the price of fuels imported by SPC.

In effect, low-cost locally-produced fuel is being pooled with more costly imports with one price being applied to the pool. The low cost of local fuel is offsetting the higher cost of imported fuel and the price of local fuel is being set below the international market rates. This situation which will become more unsustainable as the ratio of imported to local fuel increases and as international fuel prices rise.

The Sudan Consortium, which groups The World Bank, the United Nations and the International Monetary Fund, estimates the extent of these subsidies in 2005 at US$1 billion per annum, referring to them as “onerous fuel subsidies applied in North Sudan”. If these subsidies are withdrawn (although this may be politically difficult) we should expect a significant price increase in the cost of fuels and transport. Our best estimate of the probable increase in the price of fuels is about 25%. This will be felt particularly by the humanitarian agencies which draw fuel from the local economy. The UNMIS peacekeeping mission, on the other hand, import their fuel directly, bearing the market price, and will thus be unaffected.

Illustrating the effect of the subsidies and the drain on the Sudanese economy, Khartoum International Airport is the cheapest airport for refuelling in the Horn of Africa and East Africa regions. This in turn exacerbates the problem as international airlines opt to fill up at Khartoum, thus further increasing demand and the cost of the subsidy. The building of the new Khartoum Airport and other developments over the next three years will add to the pressure on fuel supplies.

8. Quality Issues: Sudan’s “Coca-Cola” Fuel

In the past year, with production from China National Oil Corporation’s Muglad Basin’s Block 6 coming onstream, Khartoum’s Gaili Refinery has switched in part from using the lighter Heglieg and Unity crude as feedstock to heavier, sour crude from Muglad’s Al-Foula field. This is causing frustration and additional cost to users as the refining process has yet to be fully adjusted to deal adequately with the characteristics of this oil. The resultant diesel is below the quality that the market is used to. It contains a high level of impurities and particles which eventually affect engines if not filtered out, places additional pressure on fuel filters, decreases the interval between vehicle and generator services, and can significantly increase maintenance costs. The effect is felt particularly in more remote areas such as the Darfurs where stocks of spare parts have to be increased in order to maintain fleet and generator availability.

With its dark colour, uncharacteristic of diesel, it is known popularly as “Coca-Cola fuel”.

It is, however, expected that problems with the refining process will be solved within the next three to four months at time of writing. Once the refinery’s new cracker unit is fully operational. In the meantime, it is recommended that those in receipt of the sub-standard diesel pre-filter it when filling vehicles or generator tanks. With appropriate filters, the effect of the particles and impurities in the fuel can be largely reduced.

It is suggested that coarse and fine filters are fitted progressively in line where fuel enters agency premises, and then in fill lines. These filters would require cleaning with clean spirit of fuel weekly or more frequently when daily intakes occur. Where fuel is intended for vehicles with sophisticated computerised fuel and ignition controls, where particle matter from the diesel will increase the need for maintenance or reduce service intervals, a fitted system should be installed with the same throughput as the fuel pump on the inlet side of all receipts.

This solution was discussed with local fuel delivery companies who were very helpful. Most have contacts with local companies who will supply and fit the equipment. Such equipment is only available in Khartoum or El Obeid. It is recommended that either Matthew Petroleum or Petronas are contacted directly at their headquarters in Khartoum with a request for assistance.

An alternate to using this sub-standard fuel is to instead use Jet A-1 in vehicle and generator diesel engines. There would be a slight loss in power at low revolutions but this practice is widely used elsewhere in field applications.

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9. **The Darfurs**

9.1 **Overview**

The Darfurs fuel supply chain has developed considerably over the past two years since the first major UN humanitarian operations in the region began in 2004. It has further adapted to meet the additional requirements of the limited UNMIS deployment (without peacekeepers or military observers for now), increased humanitarian operations, limited but growing oil exploration activity and the relatively modest needs of the widely-dispersed African Union Force.

The fuels supply business into the Darfurs has attracted considerable investment from key companies such as Petronas and Matthew Petroleum but also from a number of smaller firms who fill niche roles. Construction of additional storage has ensured a good level of availability. The supply chain is capable of absorbing seasonal variations in demand and predictable local development increases. However, it may struggle in the event that a peacekeeping element of UNMIS is deployed to replace or support AU forces and if associated air assets arrive at short notice. None of the current operators are likely to speculate on this and construct further storage. To do so would risk overcapitalising their investment as their assets currently in place are generally viable even if the UN presence diminishes.

Insecurity continues to be a cause for concern for the safety of fuel convoys. Thus, without a comprehensive peace agreement between the participating fractions in the Darfurs, it is inevitable that prices will remain above average due to the high insurance costs associated with transporting product and with the cost of delays as convoys are assembled. Whilst it is generally seen as the African Union’s function to provide security, these forces are rather stretched and labour under operational and resource limitations, with very poor communications. Ideally, they should provide escorts but this seldom eventuates.

A convoy system does, however, exist for UN and commercial companies supporting humanitarian operations but many transporters carrying fuel are still reluctant to join it as it can cost them time waiting for convoys to be formed.

9.2 **The Darfur Fuel Supply Chain**

The Darfur fuel supply chain, as illustrated below, is now well established tried and tested under trying conditions. It is far from perfect but has matured and is flexible.
9. **The Darfurs (cont’d)**

9.2 **The Darfur Fuel Supply Chain (cont’d)**

The AU draw fuel through their own designated contractor (PAE) in an operation presently monitored by the Canadian Government. It appears adequate to meet the AU’s needs and does not effect the commercial or humanitarian community.

The **Chad** corridor is virtually closed for fuels because of both cost and insecurity. It is actually cheaper to fly fuel to El Geneina from El Obeid than to source it through Chad. The political and security environment in western Sudan and Chad rule out this corridor for the time being.

The **Libya** corridor remains a possibility in the dry season. The northern areas of Darfur in particular may benefit from this but we do not believe it to be commercially viable for elsewhere in the region.

Recently commenced seismic work being carried out in **Block 12A** in North Darfur has had little effect on the economy as much of its requirements are being imported through Libya. If exploration is successful and oilfields are developed, it is likely that the oil may be exported through Libya or by way of a new pipeline to Port Sudan, or to join one of the existing crude oil pipelines. In any event, given the early stage of the exploration work, this is not likely to have a major effect on the Darfur fuels equation for some time.

9.3 **Future Events**

**UN Forces in Darfur:** The possible – even probable - rebadging of AU troops to UN command and control plus the associated increase in air assets will test and perhaps initially stretch the Darfur fuel supply chain. However, given political considerations and the need to source troops, few of these forces would arrive before the end of 2006, even later into 2007. If the deployment coincides with the early 2007 maintenance closure of the Khartoum Gaili Refinery, this will severely test the UNMIS strategic reserves and fuels logistics. As UNMIS imports its fuels needs, the extra requirements would place little pressure on locally-produced supplies. They would, however, place extra demand on storage and transport, both of which will affect humanitarian operations. The increased costs would undoubtedly affected the humanitarian community with a temporary price hike before the supply chain adjusts to the new demands.

It is understood that the UN may form a separate mission to cover the administration and deployment of any UN Darfur peacekeeping force. It is unclear how this may affect fuels contracting but it is recommended the this mission remain as part of the unified contract (as discussed further in **Section 10**) rather than establishing yet another separate supply chain.

**Oil Exploration:** The search for oil will continue in the area and may eventually affect the market for the 6x6 trucks required to get fuels through to the more difficult areas, making transport more expensive. This may be exacerbated when drilling rigs are deployed in South and North Darfur. However, we do not see any significant changes to the roads infrastructure and demand until firm discoveries are made. Given the early stage exploration efforts are at, this will not be until 2008 or even 2009 at the earliest.

**IDPs and Returnees:** A peace agreement in the Darfurs by mid-year and an improvement in the security situation may prompt longer-term voluntary and assisted returns in some parts of the region. Of the estimated 1.8 million IDPs, the UN estimates that as many as 300,000 could return to their homes in over 600 villages within the first months, with a potential further 300,000 in a second wave, and the remainder staying in camps and settlements.

Current plans for the non-food items (NFIs) which these people need encompass the requirements of 470,500 households covering these 1.8 million beneficiaries. This includes supporting returnees, vulnerable people, and IDPs who are unable to return home, and responding to new displacements arising from fresh militia attacks. As such, there remains a pressing need to ensure well-coordinated NFI distributions and effective pipeline and logistics management for an adequate response. Additionally, returns of IDPs to their villages will require an expanded aid distribution network in the areas of return. Inevitably, this will lead to further pressure on fuel supplies and the supply chain, with perhaps even the need to place additional storage in key outlying locations.
10. Integration: Unified Fuel Contracting

10.1 Overview

UNMIS is expected to contract with an as yet unannounced fuels supplier consortium before mid-year to provide fuels for its own operations throughout Sudan in the long term. UN humanitarian agencies and their implementing partners will have the option of participating in this contract, through a Memorandum of Understanding (MoU) with UNMIS or other suitable mechanism, so that they may draw from the same supplies. However, given the time required for contracting and mobilisation, this long-term fuel contract (as it is generally known) is unlikely to come into effect until late in the year. In the meantime, UNMIS will continue to be served (as it has been since 2005) by what is known as the short-term fuel contract with SkyLink Logistics. UNMIS has negotiated to extend this contract through to 25th July 2006, with the option (which it may have little choice but to exercise) to extend further up to 25th October 2006.

10.2 Interim Contractual Arrangements

At present, UN humanitarian agencies have an opportunity to take advantage of this interim SkyLink contract by entering into an MoU with UNMIS. At time of writing, terms of the MoU were still being negotiated. However, there are several non-negotiable elements in the UNMIS draft of the MoU which agencies should be aware of:

- A 12% service charge, payable to UNMIS, based on the net price of the fuel. Several UN agencies consider this to be excessive;

- The contract includes a fixed charge, payable by UNMIS to SkyLink, of US$2.3mn per month, ostensibly for operations and maintenance. UNMIS wants to recover this by pro-rating it in arrears (i.e. making the calculation after consumption) across the volumes consumed by each party to the MoU. Thus, the higher the consumption, the lower the per litre charge. In practice, consumption is low so the per litre charge is high. The charge is understood to relate solely or largely to UNMIS consumption prior to the present day. Recent discussions at the time of finalisation of this report suggests that UNMIS may be prepared to take a more pragmatic approach to this by applying a flat percentage, agreed in advance;

- UNMIS requires that agencies who are party to an MoU with it pay for their fuel in advance, based on estimated fuels usage for the coming three months. Thus, the agencies would have to pay for fuels up to three months in advance. This places a further financial cost on the agencies.

As an indication, the estimated total cost per litre for Juba, as determined under the terms of the draft of the MoU as of mid-April and plotted against the current commercial market price in Juba of US$1.20, is as follows:

![Net Cost to Agencies, US$ per litre of Diesel at Juba, based on terms of draft MoU, mid-April 2006](chart)

- At low volumes, the price is prohibitively expensive.
- The price only matches the commercial retail price at very high total volumes.
10. Integration: Unified Fuel Contracting (cont’d)

10.2 Interim Contractual Arrangements (cont’d)

Clearly, the cost of fuels under this MoU only matches the commercial market price at total volumes in excess of 6 million litres per month. In practice, the total volumes are likely to be substantially less than this. Furthermore, with actual volumes not being known until after the end of each three-month accounting period, the pro-rata amount per litre will be similarly unknown until then. Thus, given that this element (shown in cross-hatched green above) is a major part of the cost of fuel, especially at low volumes, the agencies would have no way of knowing in advance the exact price of their fuels. In effect, they would be buying blind, without knowing the price.

This interim contract and the terms under which humanitarian agencies may be able to draw supplies from it may be useful for organisations with relatively small requirements in remote areas of Southern Sudan not yet served by the commercial fuels industry. Prices in these circumstances may be of little concern. This is particularly so for those agencies with little or no organic logistics capability. One must also consider the overhead administrative cost of setting up and managing fuel supply arrangements; sometimes it is cheaper to pay a higher pay-as-you-go rate. However, larger agencies that have generally been able to put their own arrangements in place with commercial suppliers will find the price available through this MoU too high.

10.3 The Unified Long-Term Fuel Contract

Opportunities and Principles: Co-operation and Co-ordination

The Unified Long Term Fuel Contract is, in the team’s opinion, a unique opportunity for the UN to demonstrate to donors and member states that the peacekeeping, political and humanitarian elements of the UN can work together using a common service to the mutual benefit of all, whilst delivering good value for money. Unified fuel contracting has the potential to save on tendering costs, provides purchasing power through combining quantities (something particularly relevant in the fuels industry which relies heavily on economies of scale), and can eliminate the duplication of independent supply chains in the respective agencies and implementing partners. Such co-operation can also eliminate competition between agencies, which inevitably (as experience has shown in other missions that have failed to adopt a truly unified approach) drives up costs.

The Special Representative of the UN Secretary General in Sudan has declared that one of his key aims was to, where possible, take a unified approach to common services and facilities. A unified approach makes good commercial sense and is of particular benefit to the smaller and medium-sized agencies and NGOs to whom setting up an administrative mechanism is often disproportionately expensive in relation to the value of the goods or services delivered.

The following statement, as extracted from the Statement of Works for the long-term fuel contract, embodies the spirit of the agreement and the intention, in principle, to co-operate, co-ordinate and use a unified approach:

The United Nations has established a peace operation in Sudan, namely, the United Nations Mission in Sudan (UNMIS) with a mandate to support the implementation of the recent Comprehensive Peace Agreement. As part of the Mission’s support programme, it is intended to enter into an arrangement with a fuel supplier (or suppliers) for the provision of fuel, oils and lubricants as an outsourced turnkey fuel contract. This arrangement will require the strategic and operational supply, storage, distribution and dispensing of fuel in support UNMIS and UN agencies, programmes and funds (hereafter referred to as other UN Agencies).

As a final principle, when selecting a contractor or contractors, due consideration should be given to national infrastructure and development so that the host country also benefits. This may be as simple as the construction of service stations or storage which will be accessible to the public or commercial interests, so as to encourage economic development such as agricultural activities, extractive industries or commerce in an area.
10. Integration: Unified Fuel Contracting (cont’d)

10.3 The Unified Long-Term Fuel Contract (cont’d)

About the Contract

As is appropriate before a contract is negotiated commercially, the team has not had sight of the draft contract. However, based on the Scope of Works publicly available for tendering purposes, we have ascertained the following as the broad requirements for the contract.

- **Aim:** The aim of the contract is to have the supplier(s) provide reliable fuel support and ancillary services to satisfy UNMIS’s requirements and those of the humanitarian agencies in a timely manner.

- **Fuel Support Concept:** The concept of fuel support is for the UN to outsource petrol, oil and lubricants (POL) and associated support services with a turnkey fuel contract. The contractor must have the capacity to provide fuel from a source independent of domestic suppliers (i.e. it must import fuels) and must be responsible to manage the complete fuel supply chain for UNMIS, including:
  - the import of fuel;
  - distribution of fuel throughout Sudan by various modes of transportation;
  - establishment, operation and maintenance of bulk fuel storage facilities;
  - establishment and maintenance of fuel stocks including local reserves, operating stocks, and a Mission Strategic Fuel Reserve (SFR); and
  - dispensing fuel to end users and accounting for fuel transactions.

- **Start-up and Mobilisation:** The contract is expected to start up in late July 2006 with the build up of the strategic reserve and concurrent take over of existing sites from the current short-term contractor, SkyLink. Given the size of the country, this transition process should take around three to four months. A further factor which elongates the transition is that at each fuel site, a UN fuel team member must be present to check the figures of the balance of fuel transferred. Most fuel on the short-term contract is held in bladders and accounting for fuel in such storage in the challenging and remote operating environments in Sudan is difficult.

- **Strategic and Other Reserves:** A strategic reserve of 30 days mission supply, owned by the UN but held and operated by the contractor, is to be held in a triangle between Khartoum, Kosti and El Obeid. This is to ensure supply during refinery maintenance closures and protect the UN mission against strikes, port blockades, government seizure of suppliers’ stocks and the effects of civil unrest. The strategic reserve is to be split into Jet A-1 and Diesel stocks.

Local reserve stocks are to be held at each location based on the re-supply lead time. Whilst these reserves are operational, the contract may not envisage holding strategic or tactical reserves for security reasons in those locations that are volatile, isolated and with large numbers on UN humanitarian workers.

- **Ownership:** Under the terms of the contract, the UN will own all fuel held for strategic and local reserves. The UN will not own operating stocks until the fuel is transferred for use into UN-owned and/or authorised equipment (i.e. a vehicle, generator, aircraft) or authorised fuel containers.

An appreciation of these key requirements of the contract is necessary before any analysis of the appropriateness of the arrangements or recommendations can be made. The supply chain is illustrated overleaf.
10. Integration: Unified Fuel Contracting (cont’d)

10.3 The Unified Long-Term Fuel Contract (cont’d)

**Note:** Once the river port at Shambe on the Nile is restored, and road connections re-established to Rumbek, fuel from the North can be supplied to Rumbek by barge. From there, it can be supplied to Wau on existing roads.
10. Integration: Unified Fuel Contracting (cont’d)

10.3 The Unified Long-Term Fuel Contract (cont’d)

Obstacles to Co-operation

Although there is almost universal agreement that a unified fuel contract is the preferred course of action, there are several key practical issues to be overcome before principle can become reality. The short-term fuel contract as discussed above (Section 10.2) has had its own unique issues which renders interagency co-operation difficult. This has, however, highlighted a number of aspects where agencies will have to be flexible and adapt their own systems and approaches if progress is to be achieved.

The costs of co-operation are outlined below:

- **Inter Agency Administrative Charges:** Each agency has a different rate for charging for services it provides. In this case, UNMIS would levy a 12% administration fee, based on the value of fuels provided. The principle of such fees is generally considered fair, even necessary. However, most agencies view a 12% rate as very high. In order to secure full interagency co-operation and in view of the large monetary values involved, it may be advisable for UNMIS to reduce this rate, even on a one-off basis solely for the fuels contract.

- **Operation and Maintenance (O&M) Charge:** As illustrated above (chart, Section 10.2), the manner in which UNMIS hopes to recover this cost has caused a huge distortion in the total per litre cost of fuel under the short-term contract; the value rises and falls in direct relationship to the total fuel demands each month. We do not believe that such a charge will apply to the same extent in long-term contract, but there will most likely be fixed O&M charges by location, to be recovered by pro-rating volumes consumed each month by agency. This charge will be incurred by UNMIS regardless of whether or not any other agency participates in the contract. It would probably be a fixed monthly cost, regardless of volumes passing through the location’s facility.

It is recommended that this cost be factored into the per litre unit price as a fixed cost. If left undefined until the end of an accounting period, it can significantly distort the price. Furthermore, agencies have no way of knowing the price of fuel before purchase. The financial and audit regulations of most agencies may, quite reasonably, prevent them from purchasing fuels under such arrangements.

It may even be better for UNMIS to bear the full cost themselves and dispense with trying to recharge part of it to agencies. This would significantly reduce the administrative burden for UNMIS and may even lead to greater volumes of fuel being drawn through the contract by the agencies, with UNMIS benefiting from a higher level of administrative charges.

- **Payment in Advance:** This is generally acceptable but should be phased more conveniently for the agencies. At present, it appears that agencies may have to pay for fuels up to three months in advance. Apart from it being difficult to forecast consumption this far ahead, it imposes a financing cost on the agencies. A month-by-month payment in advance may be more appropriate.

- **No Guarantee of Supply:** When supplies are short, the needs of UNMIS may take precedence over those of the humanitarian operations. This is clearly unacceptable to the agencies because it may affect delivery of much-needed relief items to populations in Southern Sudan.

- **Charge for share in Strategic Fuel Reserve:** UNMIS may want the humanitarian community to share in the costs of ownership, operations and maintenance of the strategic fuel reserve.

A final key issue is the basic cost of fuel. As noted earlier, UNMIS imports all its fuel (and will do so for the long-term contract) whereas the humanitarian agencies draw from the local market. Given that local fuels are subsidised, imports are more expensive but quality is assured (especially for diesel, refer to Section 8 above) and there is more assuredness of supply during periods such as refinery maintenance shutdowns or local emergencies. In effect, the humanitarian agencies have been trading off lower prices for quality and for certainty of supply and justifying their reluctance to join with UNMIS on cost grounds, without giving consideration to distorting effect their demands may have on the local market.

However, when the subsidies are removed (see Section 7 above), the price of local product will be similar to imported product. Thus, if the humanitarian agencies are not at that point in time participating in the unified long-term fuel contract, they may be paying international prices for lower quality, less available fuels. The benefit of the trade-off will have disappeared without the compensating cost savings.
A Better Alternative Contract Structure

Given the broad requirements that the contract is required to fulfil and the challenges of overcoming the obstacles to effective unified fuels contracting as identified above, we suggest an alternative contracting structure to the traditional form of fuels contracting. This would involve an overarching UN contract with a series of subsidiary arrangements directly between the respective agencies and the supplier. We believe that this structure would deliver the best commercial pricing and availability, reduce or eliminate unnecessary interagency costs and protect against any change in pricing policy by the Government of Sudan in the form of the removal of subsidies. The structure is as illustrated below:

The overarching contract would set the prices across the board for all agencies and establishing the terms, conditions, specifications and technical aspects. It will also need to separately address the requirements of the major fuel-consuming agencies that have the capacity to deal direct with the contractor, thus maintaining their independence, as they wish. In effect, this concerns only DPKO (UNMIS) and WFP. The separate arrangements would allow WFP to avoid having to deal with the contractor through UNMIS, thus avoiding the administrative charge. Although WFP may incur additional staff costs in doing so, these should be less than the 12% administration charge.

For those agencies with a small to medium fuels usage (including the requirements of their implementing partners), the administrative burden and hence administration costs could be reduced by arranging with the contractor to operate a ticket or voucher scheme. This would require agencies to prepay for vouchers from the DPKO contractor. These vouchers would be valid for use at a designated number of locations or stations. The system is simple, easy to administer and has no significant costs implications. It would also help the contractor to forecast stock levels and thus improve availability based on the level of vouchers purchased.

We believe it will be simple to extend the voucher scheme to OCHA-registered NGO’s in Southern Sudan but a number of issues may have to be addressed in North Sudan before it can be offered to all NGO’s, not least the fact that they are not recognised by the Government of Sudan as UN implementing partners under the Status of Mission Agreement and are thus, under Sudanese law, not entitled to tax exemption on fuels used in their operations.
10. Integration: Unified Fuel Contracting (cont’d)

10.3 The Unified Long-Term Fuel Contract (cont’d)

Miscellaneous Issues

Two further issues should be considered:

- **Estimated demand figures**: The fuel demand figures as provided by UNMIS in the Request For Proposal document available to bidders appear higher than we estimate they should be. This is of some concern considering the earlier gross underestimates by UNMIS of their fuel requirements and the consequences of this. As such, the inclusion of the humanitarian community’s figures in the amounts quoted for in the contract may assist DPKO in meeting its estimates.

  We also noted the disclaimer in DPKO’s document regarding the accuracy of those estimates and in effect abrogating responsibility should the consumption figures not be achieved. This is a complicated area of contract law where it may not be possible to contract away such aspects. The disclaimer may not be valid. Contractors will bid in good faith based on estimates provided to them. They will calculate their required investment, operating expenditure and profits accordingly. If those figures are not achieved in a material sense, DPKO may expose itself to legal challenges for commercial compensation.

- **Strategic Fuel Reserve**: It is unclear what cost-sharing arrangements, if any, will apply to the financing of the strategic fuel reserve, especially as the agencies may benefit from this. As noted above, this fuel is purchased and is the property of UNMIS. There is thus a purchase cost, even though the fuel will be eventually rolled over into operations, and a financial cost from tying up cash in the stocks. UNMIS could either absorb all the cost, request the agencies to share the cost on a pro-rata basis or charge a fixed entrance or access fee to the reserve to agencies who benefit from it when shortages occur. If any cost is to be charged, it will have to be determined fairly and transparently.

**The Bottom Line: The Elements of Price**

Overall per litre costs under the unified long-term fuels contract are difficult to ascertain at present as the team, quite correctly, was not privy to the tender process. However, we believe that the contract offers an excellent opportunity for the UN family to demonstrate to donors and member states that costs can be driven down by astute contracting and co-operation.

Based on publicly available documents, the basic price of fuel is derived from the formula: **Platts + variable cost + fixed cost**, as described further below:

- **Platts** will vary each time a new shipment of fuel arrives in Port Sudan. This, on average, is likely to be every three to five months as the contractor is not using duty free fuel to deliver the fuels;

- **Variable Cost** is the rise or fall from the Platts baseline as a result of changes in international crude oil and fuel price. It was unusual that this element did not include a small factor, expressed as a percentage, for transport costs as the change in fuel prices in turn affect the cost of transport; and

- **Fixed Costs** represents the cost of transportation, handling, the contractor’s profit, administration and operational elements. It would have been preferable that the operations and maintenance costs be included in this as a fixed cost per litre instead of pro-rated in arrears based on volumes used.

The final cost of fuel will comprise the following:

- Basic price, as calculated above;
- Pro-rated Operation and Maintenance (O & M) cost; and
- Pro-rated or assessed cost of the Strategic Reserve, which may be a one-off fixed fee.
10. Integration: Unified Fuel Contracting (cont’d)

10.3 The Unified Long-Term Fuel Contract (cont’d)

Final Arguments for Unified Fuels Contracting.

The most compelling reason for unified fuels contracting, whether through the interim short-term fuels contract or the long-term contract presently under negotiation, is to achieve better value for money overall to the donors and member states who, in the end, fund both the UNMIS mission and the humanitarian agencies. Any cost reduction represents not only good stewardship but may also allow more funds to be available for core activities.

Unified fuels contracting may mean that one area of UN operations (i.e. the humanitarian agencies) may appear to benefit from the removal of some charges such as the fixed operations and maintenance cost. A more pragmatic view would argue that these charges would be paid anyway by UNMIS and that it simply causes the humanitarian agencies to incur more costs if they are not allowed to benefit from these fixed costs or are asked to contribute to subsidise them for DPKO. Obliging each of the agencies to establish similar parallel operations wastes valuable money, time and manpower and results in different parts of the same family competing for the same limited resources. It simply increases the overall costs beyond what they otherwise need to be.

The issues that prevent most humanitarian agencies from participating in the UNMIS short-term contract arise through bureaucratic considerations, without due importance being given, on a practical basis, to overall mission costs. It is well understood that the passing on of certain costs involved in this contract cannot and should not be waived without justification and agencies must be accountable internally. It is, however, more difficult to understand why such waivers cannot be granted when it is clear that they would add value to the overall operation, save costs in other areas, and not add any costs that would not otherwise be borne by the lead agency.

UNMIS will continue to import quality fuels into Sudan – both under the short-term contract for much of the remainder of this year and under the long-term one that will succeed it - regardless of whether or not the humanitarian community does so. The humanitarian community will, at least for the time being, continue to use the subsidised fuel available in the north, despite the diesel being of very poor quality. In the short-term, given the extra costs incurred in vehicle and generator maintenance and the opportunity cost of asset downtime, together with the effect on operations during fuel shortages whilst the Khartoum Gaili Refinery is closed for maintenance, the real cost savings of the humanitarian community’s approach must be questioned. In the medium to long term, the price difference between the imported and local fuel is likely to reduce or even disappear as the Government subsidy is withdrawn, perhaps increasing local prices by around 25%. In this case, given assured supplies and assured quality, participation in the UNMIS contracts becomes even more attractive.

It is unclear whether humanitarian agencies will be able to join in with the UNMIS contract at a later stage but it is clear that if they are to be able to under the recommended structure, then the structure needs to be set now.

Concerning charges such as the operations and maintenance cost and any charge for the cost of the strategic reserve (being issues that are most likely to emerge as dealbreakers for the agencies), a pragmatic overview of the whole mission could perhaps be taken by Senior Management up to the level of the SRSG and recovery of these charges from the humanitarian community waived. In support of this, it could be argued that the agencies do not receive a full service from the UNMIS contractor so should pay less. For example, under the short-term contract, UNMIS have their generators filled so there is a manpower saving; the humanitarian agencies enjoy no such service. Similarly, the humanitarian agencies enjoy no guarantee of supply, being second priority after UNMIS when shortages occur. They are thus receiving a second tier service.

There may well be room for manoeuvre within these areas, especially as the scale of the humanitarian operation is so much smaller than that of UNMIS. Total monthly diesel requirements for the humanitarian community are not expected to exceed 500,000 litres for diesel and 500,000 litres of Jet A-1 per month compared to the UNMIS projected requirement of around 8 million litres per month for all fuels.

Owing the scale of the UNMIS operation and the general goodwill towards the unified long term fuel contract, the contract is the ideal vehicle to forge a truly transparent framework for a unified mission fuel support system that could be a model for other and future missions.

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12 Although in theory UNMIS should be using only imported fuels, it has come to our attention that they are concerned about the locally-produced “Coca-Cola” diesel in Sudan. See Section 7. Thus, despite being supposedly independent of this problem, UNMIS does appear to be using some local fuels. We have been unable to obtain a satisfactory explanation for this.
Annex A

Exploration and Production Blocks, Sudan

Source: Oil Exploration and Production Authority, Sudan Ministry of Energy and Mining\(^\text{13}\), March 2006, and industry sources.

- **Blocks 1, 2 and 4 – Oil producing since 1999**

  In Mугlad Basin, near towns of Bentiu and Heglieg, with Unity, Heglieg and other oilfields. Combined area 50,000 sq-km.

  Operated by **Greater Nile Petroleum Operating Company or GNPOC (www.gnpoconline.com)**, comprising China National Petroleum Corporation or CNPC (40%), Petronas (30%), OVL, a subsidiary of India’s Oil and Natural Gas Corporation (25%) and Sudapet (5%). Oil had been discovered in 1993, after on-off exploration over more than a decade. Brought onstream 1996 with first exports 1999.

  Arakis’s interest was purchased in October 1998 by another Canadian independent, **Talisman**. In October 2002 Talisman sold its Sudan oil assets to ONGC Videsh Limited (OVL).

  Sudan’s main producing oilfields, providing most of the exports through a 1610km 28” pipeline to the Bashair-1 export terminal near Port Sudan, with a capacity of 350,000bpd. About 40% of the country’s wells have been drilled in these properties.

  Currently produces about **285,000 to 300,000 bpd**. In addition to the main Heglieg (Block 1) and Unity (Block 2) fields, **Block 1 and 2 include the El Toor, Toma, Toma South, El Nar, Talih Munga and Umm Sagura fields. The adjacent Block 4 includes the Kaikang, Timsa and Bamboo fields.**

- **Blocks 3 and 7 – Oil producing from April 2006**

  East of the GNOP area in the states of White Nile and Upper Nile, in Melut Basin. Split into 3D (140 sq-km), 3E (10,361 sq-km) and 7E (61,918 sq-km), totalling about 72,419 sq-km.

  The **Petrodar** consortium comprises, as for the GNOP consortium, China National Petroleum Corporation (41%), Malaysia’s Petronas (40%), and Sudapet (8%). Other members are two small Arabian Gulf companies, GOP and Al-Thani. The consortium is pursuing the **Melut Basin Oil Development Project**, centred on the Adar-Yale field, discovered 1981, and the Palouge field. Bulk production came onstream in April 2006 with about **170,000 bpd** and is expected to increase production to 300,000bpd by 2007.

  Exports are through a 1400km 32” pipeline from Aljabaleen to the Bashair-2 export terminal near Port Sudan, with a present capacity of 250,000 bpd. It may be practicable to link any eventual production from Block B (see overleaf) to this pipeline. About a third of the country’s wells have been drilled in these two blocks. Reports suggest that the consortium may have discovered other fields in the area with reserves at least equal to those that are now producing.

- **Blocks 5A and 5B – Oil producing from Block 5A from early 2006. Still exploring in Block 5B**

  Contiguous with and south of the GNOP concessions in Blocks 1, 2 and 4.

  Block 5A (29,885 sq-km) is being developed by Petronas (68.875%) and India’s OVL (24.125%), with Sudapet holding a 7% interest through the **White Nile Petroleum Operating Company or WNPOC** (not to be confused with White Nile Ltd., a British company attempting to operate in Southern Sudan’s Block B). The main interest is Block 5A’s **Thar Jath** field. Exploration concession granted 1997. Production now about **80,000 bpd** from early 2006.

  Block 5B (20,199 sq-km) also operated by WNPOC but with different interests, Petronas (41%), OVL of India (24.5%), IPC (24.5%), Sudapet (10%). Exploration and Production Sharing Agreement signed in 2001.

  Exports through a 174km 24” tie-in pipeline to GNPOC’s Heglieg to Port Sudan pipeline (see above), Blocks 1, 2 and 4.

- **Block 6 – Oil producing since 2004**

  Largely in Southern Darfur, north-west of the GNOP area, centred on **Al Foula**. Covers 38,468 sq-km. About 20% of the country’s wells have been drilled in this block.

  Held by **China National Petroleum Company International Sudan** or CNPCIS (95%) and Sudapet (5%). Exploration and Production Sharing Agreement signed in 1995.

  First major production in late 2004. Presently thought to be producing about 40,000bpd, expected to increase eventually to 170,000 bpd in coming years. Presently supplying much of the feedstock to the Khartoum Refinery through a 723km 24” 200,000bpd capacity pipeline.

\(^{13}\) Oil Exploration and Production Authority, P.O. Box 2986, Khartoum, SUDAN. Ph: +249-193-778869 and 776684; Fax: 778979
Annex A
Page 2 of 2

Exploration and Production Blocks, Sudan (cont’d)

- **Block 8 – Exploration only**
  
  As for Blocks 5A and 5B, operated by White Nile Petroleum Operating Company, with shareholders Petronas (77%), Sudapet (15%) and Hi Tech (8%). Covers 65,856 sq-km.

- **Blocks 9 and 11 – Exploration only**
  
  Block 9 (126,090 sq-km) surrounds Khartoum. Block 11 (119,124 sq-km) lies contiguous to the western edge of Block 9, and to the southeastern edge of it.
  
  Operated by Sudapak Operating Company with shareholders Zaver Petroleum of Pakistan (85%) and Sudapet 15%. An Exploration and Production Sharing Agreement had previously been signed for Block 9 with Russia’s Slavneft in 2002 but this was terminated before the agreement with Zaver in 2003.
  
  Significantly, this Blocks 9 and 11 represent the first time that major oil exploration concessions were granted in North Sudan since Sun Oil had drilled six dry wells in 1982. Prior to this, all exploration has been in the centre or south, and all production has come from the centre. The first well in these blocks, drilled in 2005, was dry.

- **Block 10 – Not yet let**
  
  In the east of the country along the Eritrean and Ethiopian borders. Area (57,604 sq-km). Under processing for evaluation.

- **Block 12 – Not yet let**
  
  Covering much of North and West Darfur, along the Chad and Libya borders and split into Block 12A (the northernmost part) and 12B (the larger part, straddling all three Darfur states). At time of writing, it is understood that concessions had not been granted on these blocks but that Japanese and Chinese interests may have shown particular interest in them, and that Block 12A is being evaluated.

- **Block 13, 15 and 16 - Various**
  
  All relatively small blocks on the Red Sea coast and offshore. Block 13 is understood to be under processing. Block 15 is understood to be operated by the Red Sea Petroleum Operating Company, held 35% each by CNPC and Petronas, 15% by Sudapet, 10% by Express and 5% by Hi Tech.

- **Block 14 – Pre-exploration only**
  
  North and west of Block 12A and stretching from Sudan’s western border with Libya, across most of the northern border with Egypt. It is understood that at time of writing, PetroSA of South Africa and Sudapet are conducting a joint study over the block, started in 2005. With encouraging results, an Exploration and Production Sharing Agreement may be signed shortly.

- **Block A – Exploration only**
  
  In Southern Sudan, between Blocks 5A and 5B (to the southwest) and Block 7 (to the northeast). As for Blocks 9 and 11, operated by Sudapak.

- **Block B – First explored 1980’s, Exploration resuming now**
  
  In Southern Sudan, centred on Bor. Now divided into Block BA and Block BB.
  
  Held by TOTAL of France (32.5%), Marathon Petroleum (32.5%), Kuwait Foreign Petroleum Exploration Company (25%) and Sudapet (10%) under a concession first let in 1981. Not yet producing oil.

- **Block C**
  
  The northern part of this block is in South Darfur. It then extends further into Southern Sudan along the southern edges of Blocks 6 and 4.
  
  The concession was let in 2003 to the Advanced Petroleum Company (APCO) consortium, comprising Swiss interests, Cliveden (37%), the State of Khartoum (10%), and Sudanese companies Sudapet (17%), Hi-Tech Petroleum (28%) and Heglieg Petroleum (8%).
Annex B

Sudan: Major Fuels Logistics Routes