



**Report on the current status of transport logistics for
MISA's Phosphate Project at Sukulu, Uganda**

Making Regional Cooperation a Reality

August 2003

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Section I

Transport Logistics Overview



1. Sukulu Phosphate Project Overview

Transport for One Million Tonnes

In 1998, the Government of Uganda entered in a Memorandum of Understanding for the development of the Sukulu Phosphate project in eastern Uganda with Madhvani International, SA "MISA" and Rhodia Chimie, a French chemicals giant formed as a result of the chemicals/pharmaceuticals divide of Rhone Poulenc, the French Conglomerate (the pharmaceuticals division has become known as Aventis). It was agreed that the project should produce in excess of one million tonnes of value-added phosphate products, including rock concentrate, for export. Since then, MISA has spent over US \$1,500,000 in carrying out studies, metallurgical tests and feasibility work. This cost includes sampling. The feasibility work is ongoing and within 6 months, MISA is about to embark upon commercial-scale pilot plant trials as part of the bankable feasibility study (BFS). Since the project is designed for the export of 1,000,000 tonnes per annum, the logistics of transport costs between Tororo and Mombasa is critical for the project's viability. A company, Nilefos Minerals Ltd., has since been formed as a subsidiary of MISA. Please see attached Annex I on the background of the Sukulu phosphate project.

Capacity Constraints

Presently, neither KRC nor the Uganda Railways Corporation can handle Nilefos' volume of cargo. MISA is, therefore, working on ways to minimise these costs and has held extensive discussions since 1999 with the Uganda Railways Corporation and the Ministry of Works, Transport and Communications. With the support of the Government of Uganda, MISA has also held detailed discussions with the Kenya Railways Corporation "KRC" and the Ministry of Transport and Communications in Kenya. MISA had commissioned a preliminary report on the logistics of transport (see Annex II). According to the report, 20-30 locomotives and 800-1200 dedicated wagons are required. This is dependent on the turnaround times of the trains and needs more detailed feasibility studies.

Target Cost of Transportation

A central platform of Uganda's export policy is to establish and maintain export competitiveness. The current cost of transport from Mombasa to Kampala is over US \$80 per tonne. 2,000,000 tonnes travel by road and 900,000 tonnes travel by rail per annum. It is therefore imperative to reduce transport costs between Uganda and the sea. Improved railway infrastructure would benefit Uganda by reducing damage to roads, and lowering transport costs overall and Nilefos proposes to transport its cargo by rail to Mombasa at a cost of no more than US \$10 per tonne.

2. Meetings with KRC

Several meetings with KRC have been held, both in Kenya and Uganda, details of which are provided in Annex III.

List of meetings held with KRC (dates; places; persons attended; outcomes; minutes) attached as Annex III

At the last meeting (see Annex III), it was agreed that Nilefos Minerals would make a presentation to the board and management of KRC to give a clear understanding of the project. In the meantime, Nilefos and KRC have drafted a Memorandum of Understanding (see Annex IV for the current version). It is necessary now to execute the MoU and proceed with detailed feasibility studies/analyses.

3. Meetings with the Kenya Ports Authority

As with rail transport, adequate facilities at Mombasa are a pre-condition for this project. Several discussions with the Kenya Ports Authority "KPA" were held with Nilefos between 2000 and 2003. KPA has visited Nilefos in Uganda in 2002 and 2003. Several options have been discussed and KPA have been supportive by indicating a willingness to permit Nilefos to operate its own facility. On 7th March 2003, The Managing Director of KPA visited the Sukulu Project site together with a land-planning committee from Mombasa. A Memorandum of Understanding between Nilefos and KPA has been proposed (see Annex V) to such an extent that a proposed location of dockside facilities in Mombasa has been visited. Several alternative locations have also been identified. It is, therefore, necessary for the MoU to be executed so that feasibility work can be completed.

4. Investment Cost

It is estimated that US \$90,000,000 is required for the railway and US \$30,000,000 is required for the ports. Neither KPA nor KRC have facilities to handle this volume of cargo (1,000,000 tonnes per annum) so therefore Nilefos is to invest in locomotives, rolling stock and port facilities. In return, Nilefos would obtain rights to use the track to Mombasa and a dockside plot from KPA.

5. Privatisation

Both KRC and the Uganda Railways Corporation are being considered for privatisation. The World Bank and the Governments of Kenya and Uganda are discussing a timetable and scope.

MISA believes this will take some years before privatisation can successfully take place and in the meantime – and for the project to be 'Bankable' – Nilefos needs the rights to operate trains between Tororo and Mombasa. Otherwise the project cannot be financed. Therefore, the project depends on securing the rights to use the track to and from Mombasa, and MISA seeks an intervention from the Government of Uganda with the Kenyan authorities to conclude these arrangements.

There is also no conflict of interest between what Nilefos requires (ie: the right to operate its own trains) and privatisation. Nilefos would have a positive impact on the KRC privatisation because of the track charges it will pay the Government of Kenya/KRC in addition to the investment it will make in dedicated wagons and locomotives. This will substantially add value to the railway network.

6. Access to the Sea for Uganda's Exports

It is vital to consider Uganda's position as a landlocked and heavily agriculturally-based African economy. Because of this, Uganda has to be competitive in its exports, and since the country has a potential to produce food and minerals as exports, these are vital to strengthening its economy. The cost of transportation, therefore, is vital.

This project will transform the cost of transportation and will enable Uganda to compete globally on a scale which will increase incomes of Ugandan citizens, and thus allow the country to further develop. Support from the Government of Uganda is therefore requested to convene a meeting with KRC respectively KPA as a matter of urgency in order to conclude the proposed arrangements.

Section II

Annex I

**Background to the
Sukulu Phosphate Mining Project**



Background to the Sukulu Phosphate Mining Project

MISA plans to establish an industrial complex based on a large deposit of Phosphate rock at Sukulu hills, Tororo, Uganda. The phosphate bearing soils have resulted from the weathering of a volcanic intrusion and the deposit is estimated to be in excess of 200 million tonnes.

History:

Mackay and Schnellman initially calculated the phosphate reserves in the 1950's. A mine and processing plant were operated at the site between 1960 and early 1970. The operation stopped during the Idi Amin era. Proper records of earlier studies are also reported to have been lost. The Sukulu hills location is thus a well-known spot on the world register for its significant deposits of this type of phosphates. It may be noted that the only other rock of similar quality in the world is mined only in Russia.

Study funded by the World Bank:

During the early 1980's the World Bank funded a comprehensive feasibility study, which was undertaken by Beardon-Potter. This study also confirmed the earlier estimates of reserves and technology that can be employed for producing a high grade concentrate. The work of Beardon-Potter continued into the early 1990's and this was further reviewed and updated on behalf of Gujarat State Fertilizer of India shortly after.

Selection of MISA:

Under President Yoweri Museveni, there has been renewed interest in developing the phosphate project. In 1998, the Government of Uganda examined industry proposals from a handful of companies and chose MISA and its partners. To begin with, Rhodia Chimie was MISA's partner and when they withdrew for their internal reasons due to acquisition and restructuring, Foskor came in for pursuing the project. Subsequently, they also withdrew. MISA believes that this is a valuable project for exploiting the natural wealth of Uganda and is convinced about its technical and financial viability. It will also improve the economic

activity of the whole region and is in full compliance with the Government policy of poverty alleviation. MISA has since pursued the project alone and obtained an exclusive prospecting license through its wholly owned subsidiary Nilefos Minerals Ltd.

Rail Transport at Economic cost up to Mombasa of finished products and import of raw materials:

It is vital to note that Uganda is a landlocked country and therefore a critical factor for the project's success is the economic cost of transportation. MISA had commissioned a preliminary report on the logistics of transport (see Annex II). According to the report, 20 to 30 locomotives and 800 to 1200 dedicated wagons are required for the Project. The current cost of transport from Mombasa to Kampala is between US \$50 and 80. For traditional crops like coffee the agreed rate is around US \$28. Nilefos has held several discussions with KRC and negotiated an MoU for co-operating in finding ways to achieve a target rate of US\$10 or less per tonne per trip for the in and out bound movement of up to one million ton per annum each way.

Nilefos is also reaching an agreement with a technical and financial partner for the transport project and expects to conclude the agreements very shortly.

A technical evaluation committee has been formed by KRC and MISA and has had a few deliberations. It appears that one single operator is ideal for trips both ways so as to achieve an optimum turnaround time for the trains. This will ensure minimum investment in rolling stock (locomotives & wagons). Please see annex III for details of discussions and meetings held between MISA/Nilefos and KRC.

MISA needs co-operation and approval from Uganda Railways Corporation "URC" and the Government of Uganda, to achieve the above objective because although the majority of track lies within Kenya meaning that KRC would be the ideal sole operator, the Sukulu site is just 30km inside Uganda and therefore requires URC approval. MISA is also looking to approach KRC and the Government of Kenya jointly with URC and the Government of Uganda to help conclude an arrangement as smoothly as possible.

In our last discussion, it was agreed that MISA would make a presentation to the board and management of KRC and KPA to give a clear understanding of the Project. MISA is negotiating a Memorandum of Understanding with KRC (see Annex IV for the current version after several discussions). Furthermore, the MoU needs to be signed as soon as possible in order for the stakeholders to commence a Bankable Feasibility Study.

Port Handling facilities:

As with rail transport, adequate facilities at Mombasa Port are a pre-condition for this Project. Nilefos has had several detailed discussions with Kenya Ports Authority (KPA). MISA visited KPA in 2000 and held discussions to date. KPA has also visited the Sukulu mining site with its Land development committee on 7th April 2003. Several appropriate dockside locations have been identified with the help of KPA.

Investment:

The total investment in the project is US \$535 million. Uganda Investment authority has granted an investment licence for the same in December 2002. It is estimated that an investment of US \$90 million is required for the railway and US \$30 million is required for a port facility. MISA is ready to invest in locomotives, rolling stock and port facilities. The BFS is expected to cost approximately US \$5 million.

Railway Privatisation:

There is precedent in this region and elsewhere in the world that the Project and privatisation of the impacted project companies have gone on parallel tracks. Both KRC and URC are being considered for privatisation. The World Bank and governments of Kenya and Uganda are discussing a timetable and scope for this. MISA believes that this will take some time before privatisation can successfully take place and in the meantime Nilefos needs rights to operate trains between Tororo and Mombasa. The success of the project depends on transport. Help and intervention is needed from the Government of Uganda with Kenyan authorities to conclude agreements with KRC and KPA. This Project will add value to the railway network, to the privatisation process and will help to develop the whole East African region.

Section III

Annex II

Preliminary Report on the logistics of transport
Section 6.0 – Land and Sea Transport



6.0 Land and Sea Transportation

6.1 Overview

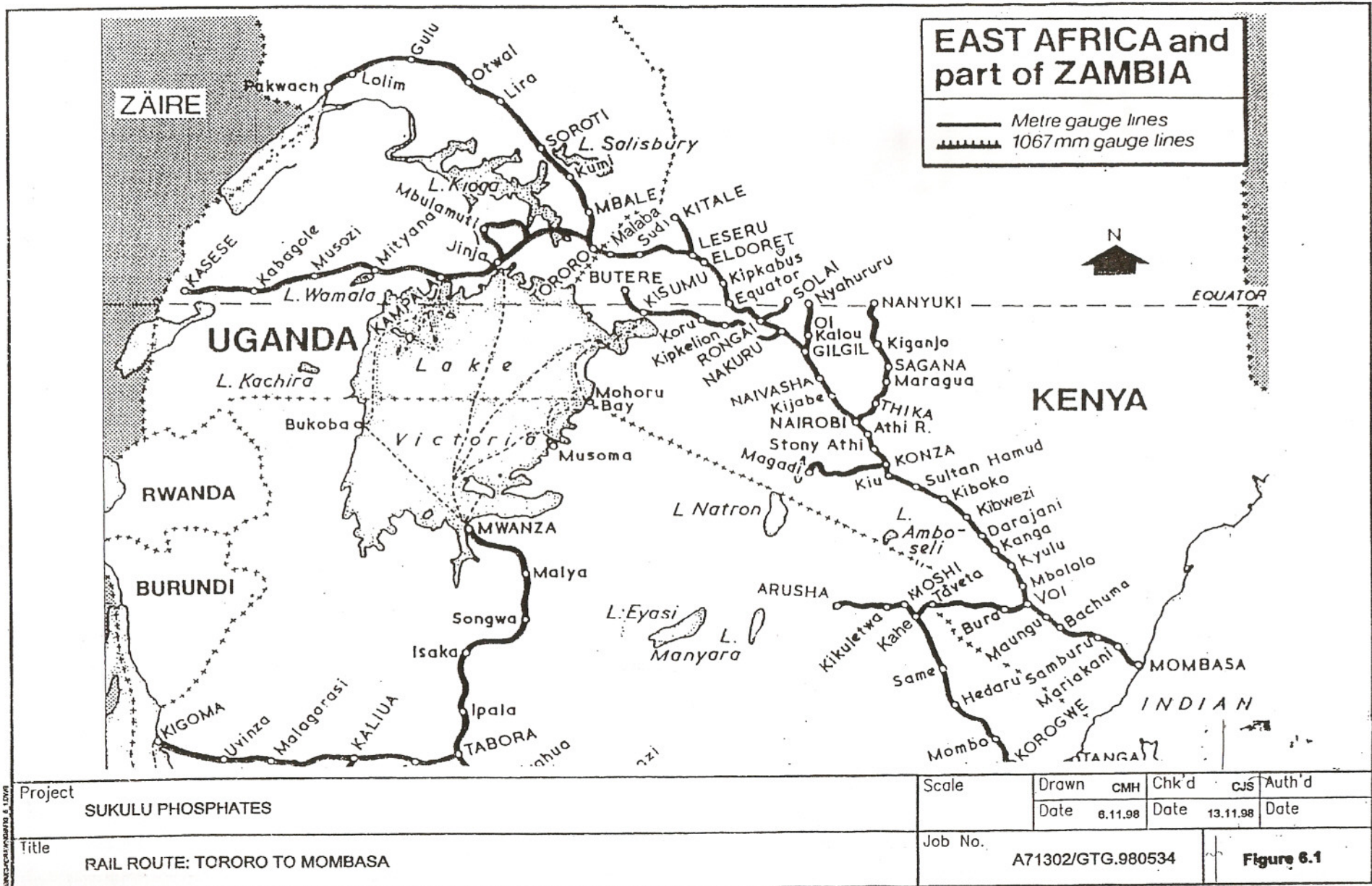
It will be necessary to minimise transportation costs; this will require efficient use of the components of the transport system. The initial concept for the project envisaged transporting one million tonnes to the coast, however with the change in emphasis, the amount of material to be transported will be significantly reduced and will diminish as a greater market for other added value products are developed.

The change of scope from that initial concept does not however reduce the project's dependence on the railway and the efficient transport of material to and from the coast. The project will require the movement of material in both directions and the quantities will be substantial. The need to streamline customs formalities will require a bonded storage area at Mombasa port with rail facilities, the original project required sulphur and other bulk materials to be imported, the new concept will increase the tonnages of the same materials to be imported and will add additional material such as Urea. This would indicate that bonded warehousing will be required.

The analysis below is included to detail the aspects of rail transport within the area, as although rock concentrate may be reduced in quantity the problems of moving finished products will have much in common with those of moving rock concentrate.

Transporting the concentrate and some of the final products to the coast will be a major logistical exercise. The rail route distance to Mombasa is some 1100-km. The line is a metre gauge single line with passing loops at each station. Figure 5.1 shows the rail route with all the stations and passing loops.

The project could transport three to four hundred thousand tonnes of material to Mombasa with a considerable tonnage of material (about 200000 tonnes) of return material that will be required by the mine and process plants being brought from the coast. As much of the concentrate produced will be used to produce Fertilisers and High Value products the actual tonnage of material



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available to be shipped to the coast will be significantly reduced, possibly to half this amount, the BFS will define the actual tonnage available for sale. There will be a requirement to utilise this return capacity to reduce costs to an acceptable level.

At the port the material will need to be loaded into ships that must be of a size that will keep the ocean freight charges to a reasonable level. It will also be necessary to load the ships quickly to reduce demurrage charges.

As the current system is operated it is unlikely that it could operate at a level of cost and efficiency that this project requires. It will be necessary to invest in rail rolling stock, locomotives and loading equipment at the port.

The project would seek to manage and operate its own locomotives and rolling stock over the existing Uganda and Kenya rail track and pay a track charge for doing so.

6.2 General Operating Parameters (Rail)

If a minimum of 300 operating days is assumed for the rail link and the production level of the phosphate complex taken at one million tonnes per annum then 3300 tonnes per day will need to be moved. If this figure is reduced by a half, which is not an unreasonable supposition, then the daily tonnage reduces commensurately.

The 300-day operating year estimate is justified by the expected loss of time due to operational problems. The plant is designed to accommodate the worst-case scenario of low concentrate feed grade and a 10:1 feed to concentrate ratio. This means that on occasion the plant will produce more concentrate than the basic design. To avoid build-up of stock this material will need to be moved to the coast. The extra operating days will accommodate this.

The axle load limit on the line has been honoured and it has been assumed that standard pattern four axle wagons have been used with standard couplers. The length of passing places of 600m has been used.

The cycle time between Tororo-Mombasa-Tororo is a critical parameter. It will necessary to reduce this to the shortest time possible. At all times turn-around times at the terminals will need to be minimised.

The traffic proposed is one way. There is presently no real bulk haulage from Mombasa hence if back haul is to be carried it must be possible to haul the type of traffic that generally moves between Mombasa and Kampala, i.e. Containers.

Methods of handling bulk materials and containers have been looked at, and several ideas have been put forward. They will need to be looked into further in the BFS before a definitive proposal is made.

6.3 Rail Transit and Cycle Times

The cycle time will be dictated by the state of the track, motive power available, ruling gradients, passing loop location and length, the time taken to load a train at the mine and the time taken to unload the train at the port. Signalling and congestion on the line will also play their part.

Minimising cycle time is critical to the project. The project will need to dispatch about three trains a day so every day added to the cycle time adds sufficient locomotives and wagons to haul three thousand three hundred tonnes.

The ruling gradients on the line are as follows:

Section	Through Distance (km)	Ruling Gradient (%)
Tororo – Eldoret	177	Up 1.0 Dn 1.0
Eldoret – Nakuru	204	Up 1.5 Dn 1.0
Nakuru – Nairobi	181	Up 1.5 Dn 1.18
Nairobi – Mombasa	531	Up 1.5 Dn 1.18

The Kenya Railways working timetable gives the following typical transit times for freight traffic:

Section	Transit Times
Mombasa to Nakuru	18.5 Hours
Return Journey	17.5 Hours
Nairobi to Nakuru	8.0 Hours
Return Journey	7.0 Hours
Nakuru to Eldoret	8.0 Hours
Return Journey	10.0 Hours
Eldoret to Malaba	5.0 Hours
Return Journey	5.0 Hours
Tororo to Malaba	11.0 Hours #
Return Journey	11.0 Hours #
Waiting time at passing places	36.0 Hours
4.5.4 Total Up and Down	4.5.5 137 Hours

(# includes waiting time for customs formalities)

In addition to running times 36 hours needs to be added for delays at the passing places at Eldoret/Nakuru & Nairobi. This results in a turn around time of 137 hours or 5.78 days. Adding initially one day for loading and another for unloading we get 7.7 days or 8 days.

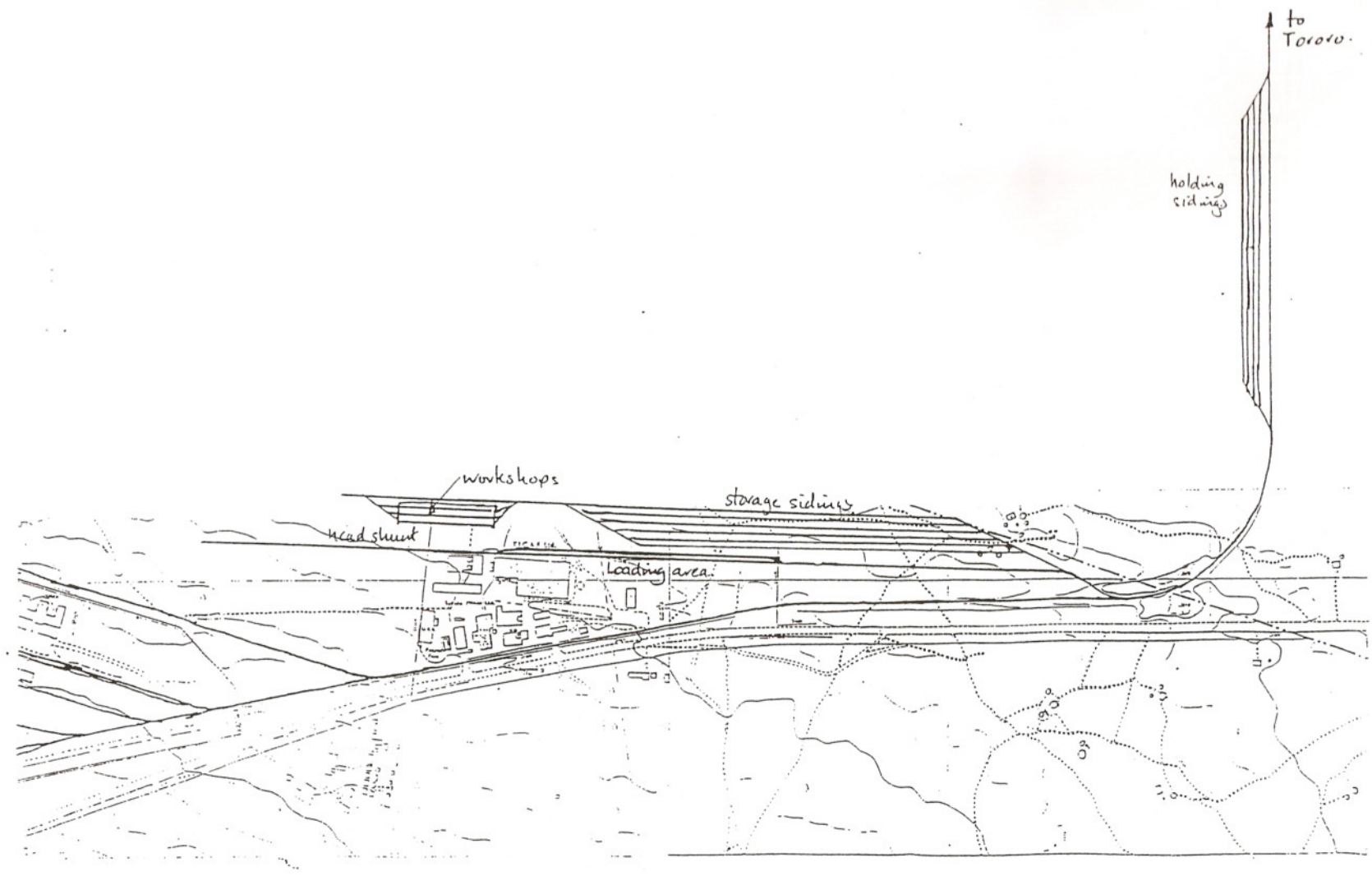
The figures that stand out are the waiting times at the crossing stations and the Tororo-Malaba section. Tororo-Malaba is a very short section that adds an additional day to the cycle time. Speeding up customs formalities needs to be a priority, and three trains a day will almost certainly result in this delay time increasing if another system is not put in place. The co-operation of the Governments of Uganda and Kenya will be solicited to expedite this process.

The passing times of 36 hours will need to be looked into to see if it is possible to shorten this. The loading and unloading times at the mine and port will be minimised, but these fall into the sphere of influence of the project. How this might be achieved will be described later.

For the purposes of this study an average cycle time of eight days has been assumed which is a little more than we would hope to achieve but will accommodate the occasional long travel time.

NOTES:

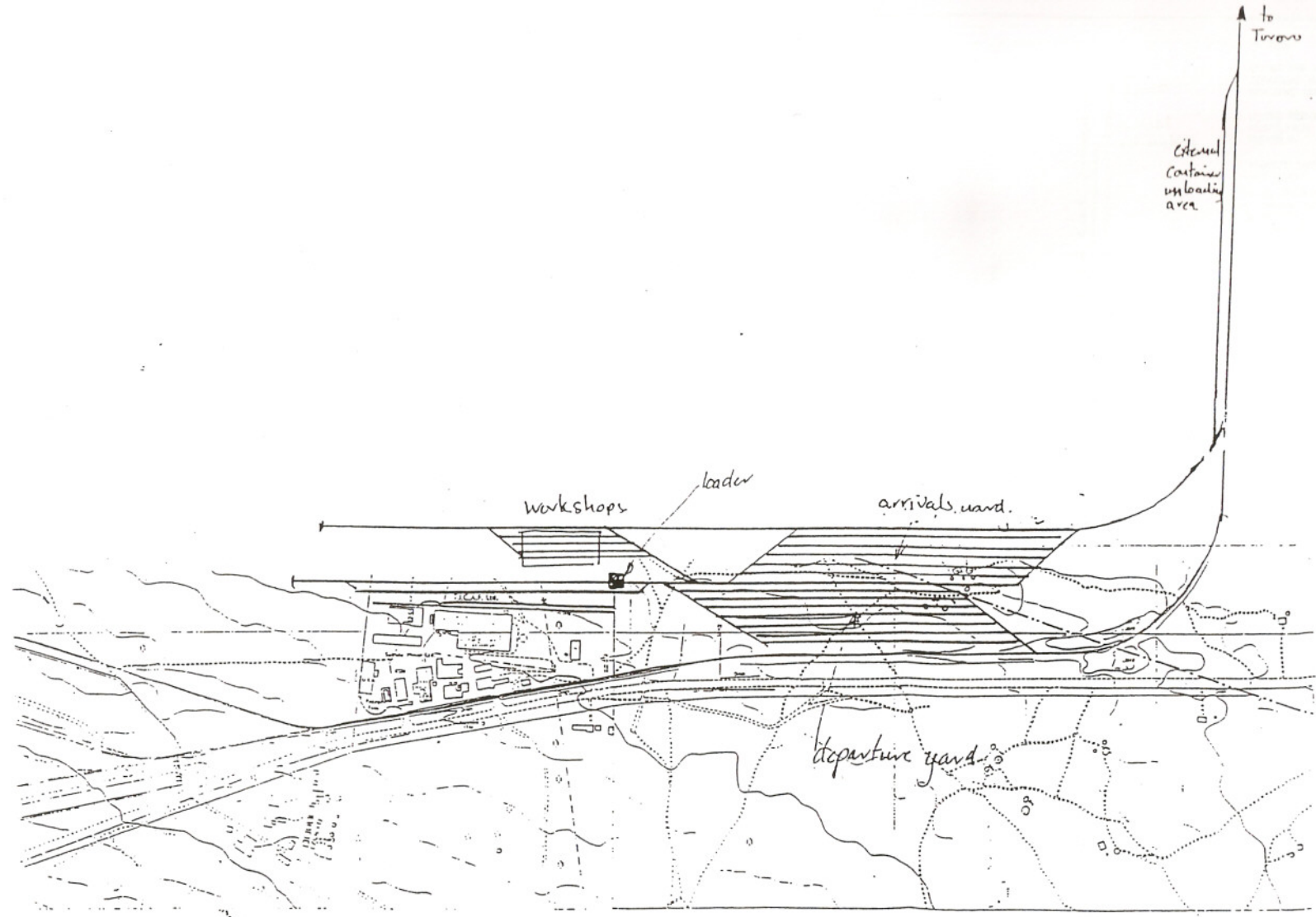
1. HOLDING SIDINGS USED TO UNLOAD BACK TRAFFIC CONTAINERS AND HOLD LOADED TRAINS AWAITING PATH.
2. AFTER UNLOADING, TRAINS DRAWN FORWARD TO STORAGE SIDINGS TO AWAIT LOADING.
3. TRAINS PULLED OUT OF STORAGE SIDING AND BACKED INTO LOADING AREA.
4. LOADED TRAINS MOVED TO HOLDING SIDINGS.
5. NUMBER OF SIDINGS IS INDICATIVE ONLY.



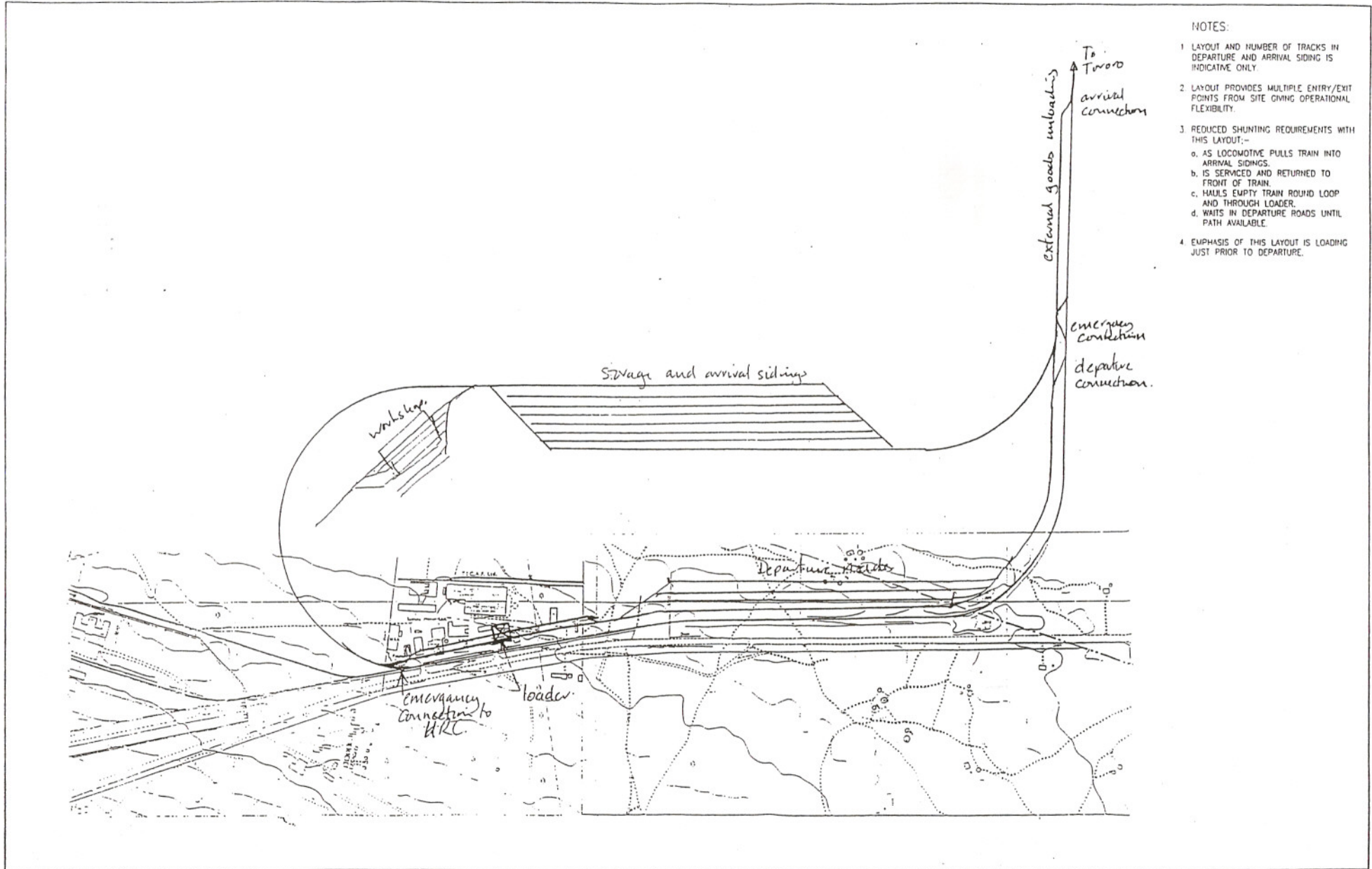
Project	SUKULU PHOSPHATES	Scale	Drawn CMH	Chk'd CJS	Auth'd
			Date 6.11.98	Date 13.11.98	Date
Title	POSSIBLE LAYOUT AT MINE - OPTION A	Job No.	Figure 6.2		
		A71302/GTG.980534			

NOTES:

1. TRAINS WITH ... IN TRAFFIC UNLOADED IN ... AREA O. PERIMETER FENCE OF PHOSPHATE FACILITY.
2. NUMBER AND LAYOUT OF TRACKS IN ARRIVALS/DEPARTURE AREAS IS INDICATIVE ONLY.



Project	SUKULU PHOSPHATES	Scale	Drawn CMH	Chk'd CJS	Auth'd
			Date 6.11.98	Date 13.11.98	Date
Title	POSSIBLE LAYOUT AT MINE - OPTION B	Job No.		Figure 6.3	
		A71302/GTG.980534			



NOTES:

- 1 LAYOUT AND NUMBER OF TRACKS IN DEPARTURE AND ARRIVAL SIDING IS INDICATIVE ONLY.
- 2 LAYOUT PROVIDES MULTIPLE ENTRY/EXIT POINTS FROM SITE GIVING OPERATIONAL FLEXIBILITY.
- 3 REDUCED SHUNTING REQUIREMENTS WITH THIS LAYOUT:-
 - a. AS LOCOMOTIVE PULLS TRAIN INTO ARRIVAL SIDINGS.
 - b. IS SERVICED AND RETURNED TO FRONT OF TRAIN.
 - c. HAULS EMPTY TRAIN ROUND LOOP AND THROUGH LOADER.
 - d. WAITS IN DEPARTURE ROADS UNTIL PATH AVAILABLE.
- 4 EMPHASIS OF THIS LAYOUT IS LOADING JUST PRIOR TO DEPARTURE.

Project	SUKULU PHOSPHATES				Scale	Drawn	CMH	Chk'd	CJS	Auth'd
	Date	6.11.98	Date	13.11.98		Date				
Title						Job No.				

Figure 6.4

6.4 Rolling Stock

The project requires moving both bulk material and containers on the same rolling stock. These tasks are fundamentally incompatible and any system will need to be a hybrid. Phosphoric tankers will also be required

For the type of material to be hauled, which is free flowing, dry and non-abrasive, hopper wagons are the logical choice. However this precludes the use of containers on the same vehicles. The second option would be to use open box wagons, but this also would preclude the use of containers on the back haul unless the box wagons were to be made over large so that they could accommodate a container inside the box. This is far from ideal and the overall length of the wagon would be longer than the standard wagon so this would be a special and hence expensive.

Using containers is also not ideal. There are load limits on a 40-foot container of 29.125 tonnes, and for a 20-foot container 21.72 tonnes. If the axle loading is limited to 18 tonnes then the gross weight of a wagon could be 72 tonnes and assuming that the tare weight of a container flat is 20 tonnes then the potential payload (including the container box) is 52 tonnes.

A fully loaded 40-foot container will not utilise the full capacity of the flat. Two 20-foot containers are more efficient the payload possible is 24 tonnes for each, giving a payload of 48 tonnes for each flat.

The system proposed is developed from this. A 20-foot container has a volumetric capacity of 33 cubic metres. If the container were to be cut in half then the capacity would be 16.5 cubic metres. Assuming that the density of phosphate rock is assumed to be 1.6 tonnes/ cubic metre then the potential capacity of this half height container would be 53 tonnes, the weight limit is 24 tonnes or just over 14 cubic metres. A half height container could accommodate the tonnage easily.

The proposal is that second hand 20-foot containers be purchased, cut in half and have the door opening replaced with a fixed panel. Stacking lugs would be added so that the half height containers can be stacked as ordinary containers.

These modified containers could be strengthened to take 24 tonnes and so that they could be handled with forklift trucks.

These half height containers would be filled with phosphate and hauled to the coast, they could then be stacked four to a container flat for the return, thus freeing up half the flats for hauling full containers back to Tororo.

There would also be a requirement to haul empty containers to the coast. These could be loaded onto flats. It would be wrong to send them back empty. Phosphate could be loaded into concentrate bags, put onto pallets and loaded into the closed containers, alternatively a barrier could be put into the container and then it could be pneumatically loaded. This would not utilise the potential full capacity of the flat but for every four containers utilised in this way an additional flat could be added with the two half height containers on so that all up weight of the train can be utilised.

With this configuration and allowing for the 8-day transit time the number of wagons that will be required will be 555 wagons for 9 days it would be 625 wagons.

There are two options for the purchasing the wagons, Kenya Railways have had quotation for new flats for US\$36000. The cost of refurbishing old wagons has been estimated at US\$10000 each. Assuming the cost of purchasing and modifying two 20 foot containers is \$8000 the cost of a new wagon with containers is \$US44000 and refurbished wagons \$18000.

This gives the cost of these wagons between US\$24.4M and US\$9.9M for the 8-day cycle, or US\$27.5 and US\$11.23M.

6.5 Locomotive Requirements

Trailing load will dictate the number of locomotives that will be required. Two assumptions have been made. Using the type of locomotives currently in use a 900 tonne train could be accommodated.

If the two modified 20-foot container system was to be used then each wagon would be 72 tonnes and each train would be 17 wagons and the train

weight would be 864 tonnes. If it is assumed that locomotives can be turned around faster than the wagons i.e. as a train arrives the locomotive is uncoupled, re-fuelled, serviced and coupled to a train waiting to depart, adding more than six hours to the locomotive running time available every trip.

Allowing a 25% allowance for heavy-duty operation then the number of locomotives would be of the order of 25 at a cost of approximately \$2M each.

6.6 Loading Trains

Again assuming the two twenty foot container system were adopted the loading of the trains would be achieved by a continuous belt loader, The trains would pass under a loading chute. A measured 24 tonnes would be put into each container. The loading of each wagon would take about 8 minutes so a train could be fully loaded in 2.5 hours. Additional time would be required for re-distributing the half height containers and if any 40-foot containers were to be loaded this would be a possibility. A turn around time of six hours should be sufficient but 24 hours has been allowed for.

Drawings 6.2 to 6.4 show a potential layouts for the sidings at Tororo, these are designed for a capacity of one million tonnes per annum and for handling containers.

Space has been allowed for the handling full containers at Tororo. It is envisaged that the containers coming up from the coast will be unloaded onto road trucks for despatched to Jinja and Kampala.

Full containers destined for the coast, and returned empties would be delivered to the terminal and put on the next available trains. Empty containers would be filled with concentrate in bags.

There is the possibility that an inland port could be developed at Tororo. This would require the co-operation of both the Ugandan and Kenyan Customs authorities. At the Mombasa any containers destined for Uganda would have seals attached by the Kenyan authorities prior to dispatch. The entire train would then be customs cleared and would not be required to stop at Malaba. A Kenyan customs officer would check and remove the seals at Tororo. Ugandan customs

would then take over. The containers would be moved to a secure area for customs clearance and then dispatch by road or rail. This could be developed outside the project but the project could provide a catalyst for its introduction.

Figures 6.2, 6.3 and 6.4 show possible layouts for the rail system for the mine, if the inland port option were to be pursued then option C (fig 6.4) could be the basis for further development

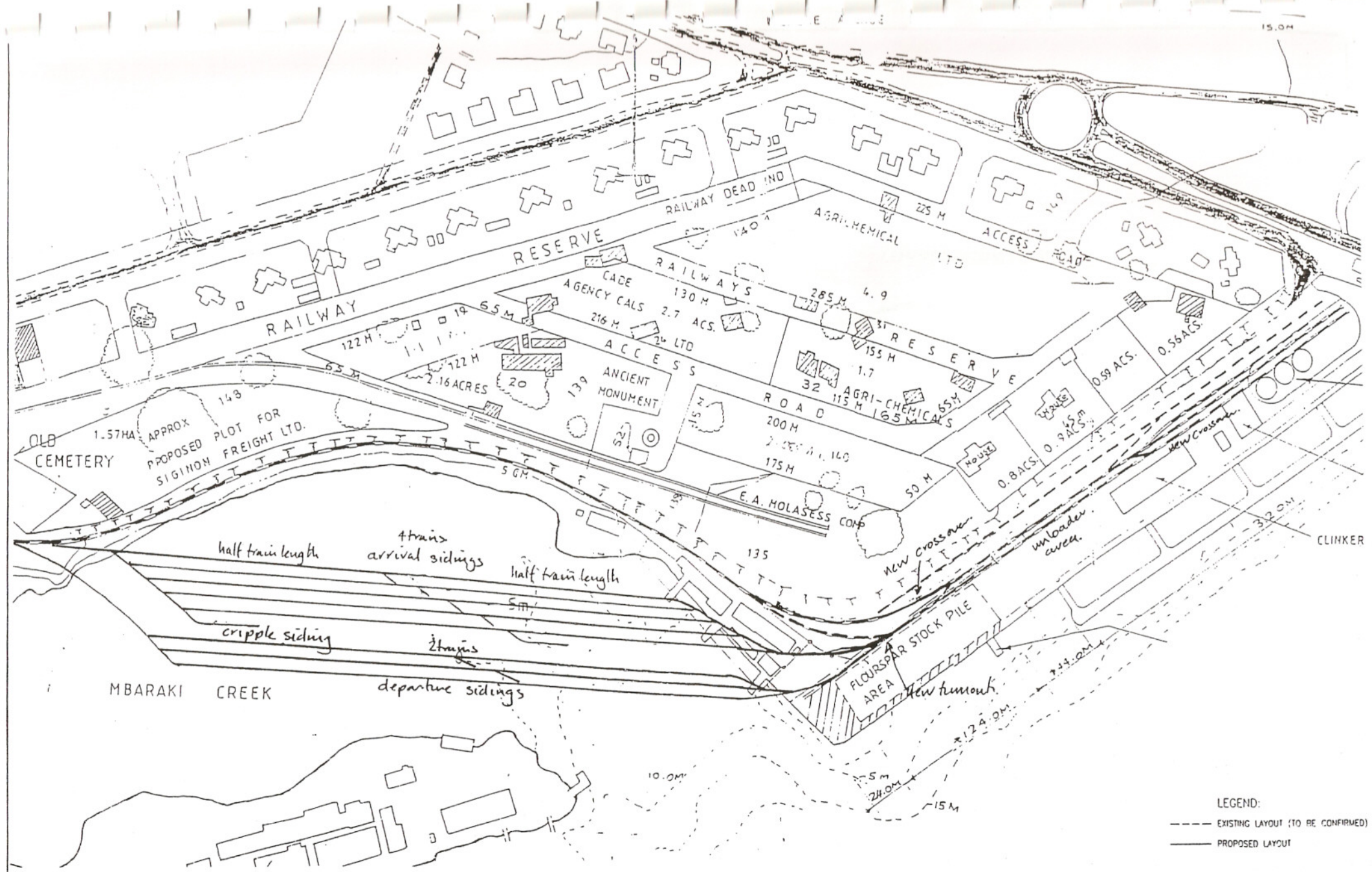
6.7 Unloading Trains

This will be more difficult as the space around the loading terminal at Bamburi Cements loading dock is limited. Figure 5.5 shows a possible layout that utilises the only spare area around the Bamburi dock for sidings, it shows how congested the area is. To implement this an area of shallow water would need to be reclaimed. There is an alternative that utilises the ports existing marshalling area but this area is already busy and might not have sufficient spare capacity in the future. When the trains arrive at Mombasa it will be necessary to put them into a marshalling area, probably close to the present oil terminal and container terminal. The wagons would then be shunted a few at a time to the unloading terminal. If an alternative site close to the oil terminal were to be chosen for the ship-loader then the system would be simpler.

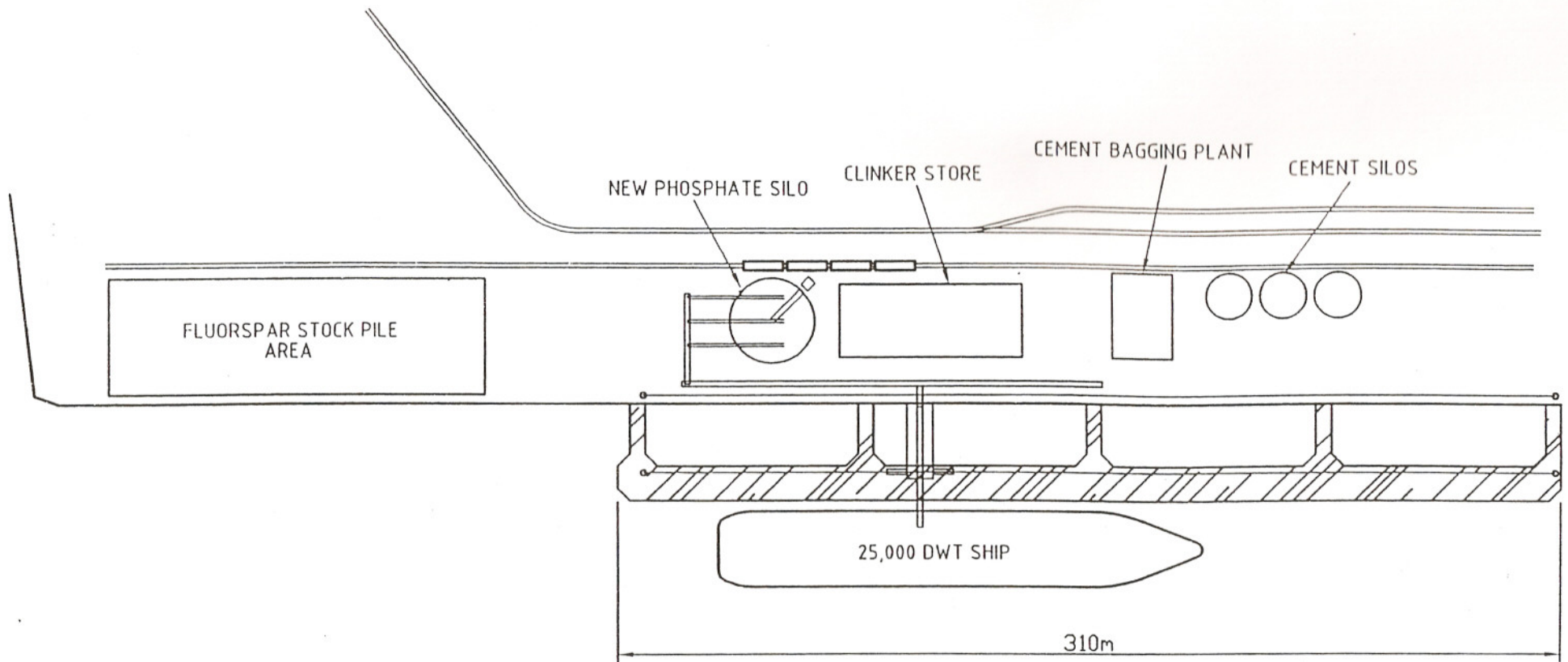
This marshalling area is where empty trains, will be loaded with containers and other goods destined for Tororo.

It is envisaged that a special unloader will be installed. It will pick up a loaded half container and dump it directly into a hopper and return it to the wagon. Each half container should not take more than three to four minutes. The unloaded material is then stored in a 30,000 tonne capacity silo for later loading into ships.

Unloading 40-foot containers that have phosphate in bags will need to be handled separately. These can be emptied into road trucks or empty modified 20 foot containers for transport to a hopper close to the ship-loading silo.

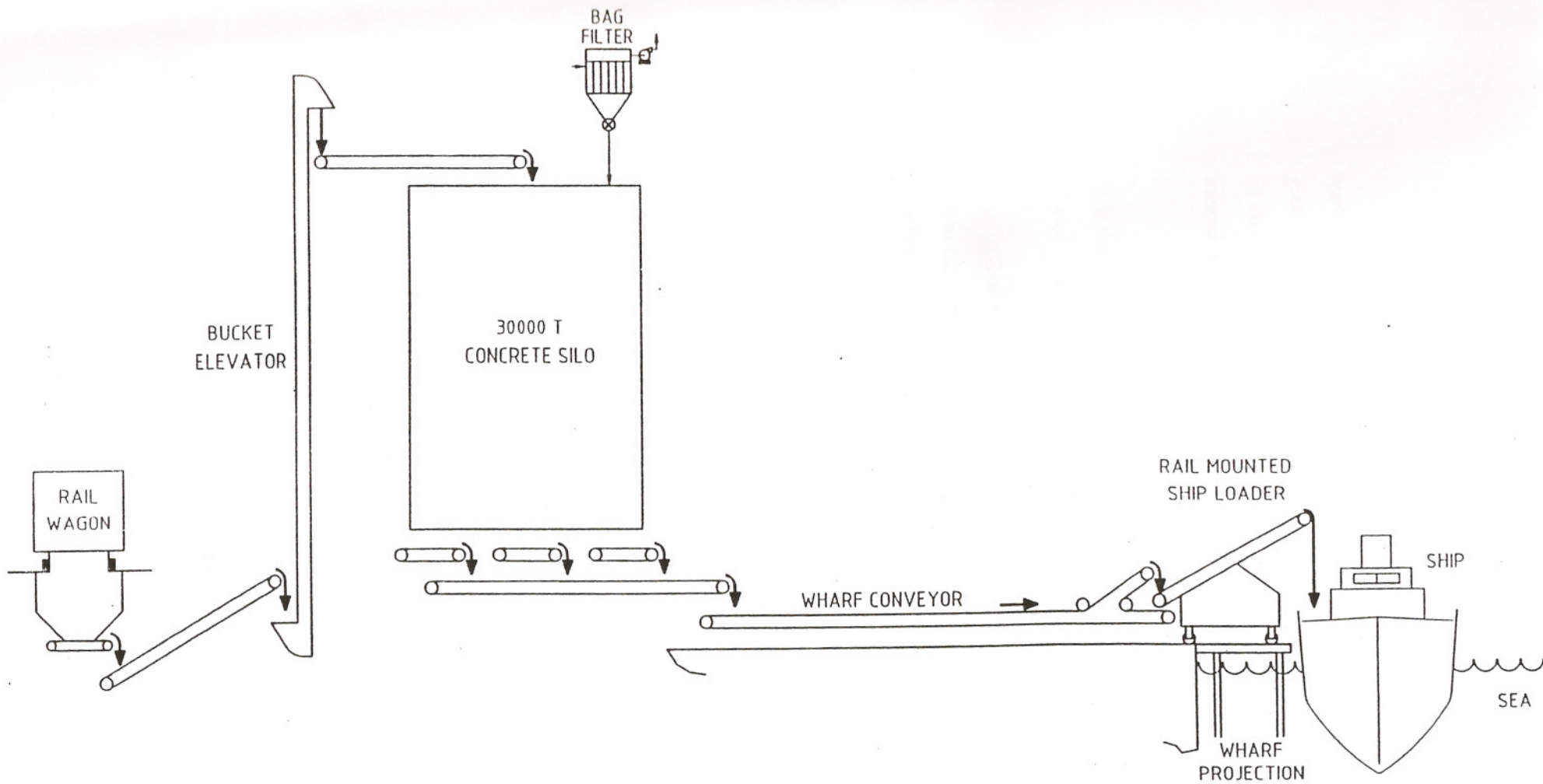


Project	SUKULU PHOSPHATES			Scale	Drawn CMH	Chk'd CJS	Auth'd
					Date 6.11.98	Date 13.11.98	Date
Title	POTENTIAL USE OF MBAVAKI CREEK			Job No.	A71302/GTG.980534		Figure 6.5



C:\WORK\KAMP\PHOSPHATE\FIG. 6.6.DWG

Project SUKULU PHOSPHATES	Scale	Drawn	CMH	Chk'd	CJS	Auth'd
		Date	6.11.98	Date	13.11.98	Date
Title FLOW SHEET: PROPOSED PHOSPHATE SAND HANDLING, STORAGE AND SHIP LOADING FACILITY PORT OF MOMBASA, KENYA	Job No.	A71302/GTG.980534				Figure 6.6



Project	SUKULU PHOSPHATES	Scale	Drawn CMH	Chk'd CJS	Auth'd
		Date 6.11.98	Date 13.11.98	Date	
Title	FLOW SHEET: PROPOSED PHOSPHATE SAND HANDLING, STORAGE AND SHIP LOADING FACILITY PORT OF MOMBASA, KENYA		Job No.	A71302/GTG.980534	
			Figure 6.7		

G:\SUKULU\PHOSPHATE\FIG 5.7.DWG

6.8 Ship Loading

Two options are available to us. Bamburi Cement has a berth and ship-loader that could be utilised. The ship-loader is very old and has not been used a great deal. It is a combination of loader and unloader. It can load ships at a rate of about 500 t/h. It can move along the berth on tracks but cannot slew or extend. Its ability to load vessels larger than 10000 tonnes is very restricted.

The berth is over 300m long and can be extended if required. It appears that the current configuration can accommodate 25000 DWT carriers even though they cannot be loaded.

The ship-loader and all the associated conveyor belts would need to be replaced to increase the capacity. The current ship-loader would have difficulty loading phosphate rock as it is a free flowing material that will run backwards down steep conveyor belts. An additional storage silo will need to be constructed. There is an existing storage facility that was used previously for the storage of cement clinker. This appears to be a relatively simple building and its capacity is not known. It could be used for overflow storage but not as a principal storage area.

The capacity of the ship-loader would need to be of the order of at least 1000t /h. In order to reduce costs the bulk carriers will need to be turned around as quickly as possible to reduce demurrage charges.

The area around Bamburi's facility is very constricted. There is little or no possibility of expanding the facility. There is a small storage area currently used for fluorspar that could provide some space. There is also a creek, a small bay nearby that could be filled in and used as a storage area or rail siding. The port authority are keen to have a bulk-handling terminal and if they are willing to cooperate, they might give permission for the area to be reclaimed.

Figure 6.6 gives a conceptual layout showing how the additional facilities might be accommodated at the Bamburi Wharf. Figure 6.7 is a schematic of the ship-loading facility.

The second option would be to construct a completely new facility alongside the present oil terminal/container port. This has the distinct advantage that it will not be necessary to go into the main port. The disadvantage is that the water off the coast at this point is not sufficiently deep to accommodate 25000 DWT ships, There is deep water nearby, close to the oil terminal and although some dredging would be required it would not be too serious. This would avoid the wagons having to enter the port. It would also appear that the cost of constructing this terminal would not be dissimilar from modernising the Bamburi facility.

Section IV

Annex III

Meetings with Kenya Railways Corporation



L P S



LAKE PRODUCTS & SERVICES LTD.

21 February 2002

Attention: Mr. Andrew Wanyandeh
Managing Director, Kenya Railways

**AGENDA FOR MEETING ON 22ND FEBRUARY 2002 IN NAIROBI AT 3.00 PM
IN KENYA RAILWAYS OFFICE**

RE: PHOSPHATE TRAINS FROM TORORO TO MOMBASA

- 1) Introduction by Mr. Nalin Desai, Vice President - MISA
- 2) Capacity Requirement & Rolling Stock
- 3) Investment Requirements and Ownership Issues
- 4) Funding of the project
- 5) Track rights and related issues
- 6) Technical co-operation
- 7) Track maintenance, other maintenance issues and Guarantees
- 8) Issue of Railway Operator for the project
- 9) Legal formalities, Documentation and Agreements
- 10) Proposed date of the next meeting and the place
- 11) A. O. B.

Secretary

**MINUTES OF THE MEETING HELD AT KENYA RAILWAYS HEAD
QUARTERS IN NAIROBI ON 22ND FEBRUARY 2002 AT 3 PM.**

Present:

Mr. John O. Nyerere	-	G. M. (Commercial), KRC, Chairman
Mr. Andrew Wanyandeh	-	Managing Director, KRC, Part Time
Mr. J. Kinara	-	Chief Traffic Manager, KRC
Engineer S. Ouna	-	Consultant, KRC
Mr. Nalin Desai	-	Vice President, MISA
Mr. Godfrey Wandera	-	Ministry of Works
Mr. Hrishikesa Madhvani	-	Representing the President, MISA
Mr. Nilesh Kanabar	-	Consultant, LPS

The meeting started at 3.10 p.m. with the apology from Chairman on behalf of MD, KRC for not being able to attend on account of need to attend another more important meeting. The Chairman welcomed the LPS/MISA members and other participants.

Introduction:

Each team members gave self-introduction. Mr. Desai in his introductory comment made the following points:

- Uganda has these natural resources of Phosphate mineral, which can be commercially exploited.
- Phosphate is a dirt-cheap commodity. At present the international price of 40% concentrated rock is US\$ 50/ton delivered to destination port.
- In natural form it is available 10% concentration so it has to be mined, beneficiated and exported for commercial purposes.
- Unlike precious metals & precious stones it is required in huge quantity. We will need to transport 1.0 M tonnes/annum concentrated rock and finished products to Mombasa and bring back haul cargo of 400,000/500,000 tonnes/annum will be for mines and process plant to be installed and balance would be for others?
- We believe that KRC/URC can not offer an acceptable freight rate as the project is financially viable only if the freight per tonne per one way trip is not more than US\$ 10/-.
- A preliminary study made by us indicated that if we owned the rolling stock and operated our own train it is possible to achieve this but need to use the existing tracks and track charges should not be more than US\$ 1.5 per tonne per one way trip.
- As the plant will be only 30 kms. From the Kenyan border and the distance to Mombasa port is 110 kms co-operation of KRC is sought by us to help us make this project viable.

- Apart from the income of US\$ 3.0M/year from the track charges Kenya will get income in the form of port charges for 30 years.
- All this income is additional income and can come only if the project is implemented.
- Besides, at present Kenya imports fertilisers to the tune of 150,000 tonnes/annum and we can meet this demand at economic cost.

Comments from the Chairman:

The chairman said that they want to concentrate on the fundamental issues like track rights, privatisation of Kenya Railways, Investments, and Funding of the project, back haul traffic and transportation cost per tonne.

Capacity Requirements:

Mr. Desai explained that we need to transport one million tonnes of Phosphate to Mombasa & export it and back haul approximately 500,000 tonnes to Uganda for the plant and same amount of others cargo. The project has to invest in acquiring 25 locomotives and about 550 to 600 special wagons if the turnaround time is 5/6 days. We will have to run 3 trains per day of 40 wagons each.

Mr. Andrew Wanyandeh, MD, KRC entered the meeting at this stage and apologised for not reaching on time due to other unavoidable meeting. Mr. Desai once again explained the introductory comments to him. He confirmed that KRC couldn't and wouldn't want to go into the issue of track rights due to the privatisation process, which will take place within 2 to 3 years. Mr. Desai commented that it can take as much as 8/10 years. Mr. Andrew than insisted that KRC wants to resolve the fundamental issues and doesn't want to get involved in price war or price-cutting. He explains that the rate of US \$ 24.34 was quoted on the assumption that the wagons will come back empty and there will be no back hauling from Mombasa. He has given the assurance that KRC will review the rates after taking into consideration that you want to back haul minimum of 500,000 tonnes from Mombasa for yourself and same amount for the others.

Ownership Issues:

Mr. Hrishikesa Madhvani proposed that we can invest in locomotives, wagons and track maintenance provided we are given track right to haul 1 million tonnes of plant products to Mombasa and back haul of full available capacity. Mr. Desai mentioned that for the 250MW Bujagali Hydro project in Uganda where privatisation of Power sector was undergoing we were allowed to move ahead with the project pending privatisation. A parallel track approach will enable us to implement the project faster and generate additional business and revenue for KRC/Kenya. Mr. Andrew suggested that we should process the raw material in Uganda and then transport only the finished products to Mombasa. Mr. Desai explained that considerable quantity would be processed at site but some rock concentrates have to be exported as we are living in market driven world we have to produce & supply what is demanded/dictated by the market. He also explained the cost involved in processing the products in Uganda. KRC accepted that the costing of US\$ 24.34 was done considering only one way full load. Mr. Desai reassured that we are not trying to take away any current business

from KRC but will generate additional business that will make use of currently under utilised railway tracks. Mr. Andrew explained that they could provide locomotives for the trains as they have the capacity. He explained that they don't want to give track rights because after the project investments of approximately US\$ 100 million in locomotives and wagons, if the private operator doesn't agree with the same conditions then it will be difficult for both the parties to remain in the business. Mr. Desai explained the financial implications of the project informing that over the period of 30 years KRC will receive a revenue of approximately US\$ 90 million for the track rights alone and will help the whole region in increasing business activity.

Funding of the project:

Mr. Desai made it clear that we don't want any subsidised rates. We choose all the projects on their own merits and not on the basis of subsidies. He welcomed the idea of KRC leasing the locomotives to us. They are waiting for the reply for the quotations from India. As soon as the quotes are received KRC will forward the rates for leasing the locomotives to us. Mr. Desai explained that the current estimated investment required in locomotives, wagons & facilities at port are approximately US\$ 100 million. Mr. Desai said we can only invest this money in case of following:

- (1) If the track rights are granted at a per tonne rate of US\$ 1.50 per one-way trip.
- (2) Alternatively, KRC should invest the money and offer the rate per tonne per one-way trip of not more than US\$ 10.

This project cannot come in absence of one of the above.

Before abandoning the project we may have to evaluate/explore the cost of using facilities of Tanzania Railways & Dar es salam port.

KRC informed the meeting that at present only six trains per day were operated and immediate goal for them is to increase them to at least twenty four/day. Mr. Desai said that our project will help you achieve your goal by adding three trains/day and our aims and goals are compatible.

After deliberating this and other proposals on the table it was concluded that the project has to proceed as it was in the interest of Uganda, Kenya and the whole region.

KRC side suggested and both the parties agreed to form a committee that will have members from the following stakeholders:

- (1) Representative from Kenya Railways
- (2) Representative from Uganda Railways
- (3) Representative from Ministry of Transportation & Works of Kenya
- (4) Representative from Ministry of Transportation & Works of Uganda
- (5) Consultants from KRC
- (6) Consultants from LPS/MISA
- (7) All other interested parties.

KRC proposed that the working committee should meet periodically at regular intervals and discuss and exchange their views and in between the meetings use e-mails, fax and phones to remain in touch. LPS/MISA agreed to send terms of reference (T.O.R) for the committee to KRC within one week of the meeting. Broadly the committee should discuss following issues and come out with their findings & recommendations in three months for making it possible for the project to proceed.

- 1) Reducing the cost of transportation at the acceptable level & to the satisfaction of both the parties.
- 2) Back haul of goods to Uganda.
- 3) Turnaround time.
- 4) Technical requirements, operation & maintenance.
- 5) Track and other maintenance issues.
- 6) Loading & offloading of trains at the Port and Port handling operation in Mombasa
- 7) Agreements and Guarantees.
- 8) Legal formalities.
- 9) Co-operation in the great lake region.
- 10) Interest of Kenya, Uganda and whole region.

The committee will make suggestions on ways & means to make the project viable in the interest of Kenya, Uganda and Great Lake region. KRC and LPS both agreed on 90 days time period.

The meeting ended at 5 pm with a vote of thanks to the chairman and the hosts KRC..

Secretary
LPS

MINUTES OF THE WORKING COMMITTEE MEETING HELD AT KENYA RAILWAYS HEAD QUARTERS IN NAIROBI ON 15TH APRIL 2002 AT 11.30 A.M.

Present:

Mr. John O. Nyerere	-	G. M. (Commercial), KRC, Chairman
Engineer Okuku	-	Chief Mechanical Engineer, KRC
Mr. J. Kinara	-	Chief Traffic Manager, KRC
Mr. Nyalwal	-	Marketing Manager, KRC Mombasa
Mr. J. G. Nyambare	-	Operations Manager, KRC
Mr. Nalin Desai	-	Vice President, MISA
Mr. Ben Dramadri	-	Nilefos
Mr. Nilesh Kanabar	-	Consultant, LPS

The meeting started at 11.40 a.m. The Chairman welcomed the Nilefos members and other participants. The minutes of the meeting held on 22nd February 2002 is approved.

Introduction:

Each team members gave self-introduction. Mr. Dramadri in his introductory remarks made the following points.

- He thanked KRC, URC, and Government of Kenya and Government of Uganda for the support shown so far to the project and commended their active interest in making efforts to get economic transport cost for the project. Without achieving this target cost of transport this project is a non-starter.
- This is a huge investment as transportation component alone will need approximately US\$ 100 million in rolling stock, port facilities and loading & offloading facilities at both the ends. Apart from the developers own fund a sizeable amount will have to be borrowed and lenders would insist for suitable guarantees from KRC / Government of Kenya regarding the availability, suitability and maintenance of the track and operation of the trains as well as the port facilities.
- The project life is expected to be 30 years from the commencement of commercial production. Nilefos Minerals would consider to hand over the rolling stock ownership to KRC at mutually agreeable terms at the end of the project life.
- KRC is veering round to the view that privatisation process for KRC and URC may take longer then expected time and project of such a magnitude and importance should not be delayed on account of this.
- As Nilefos will be required to invest in the rolling stock and related facilities the ownership of the equipments has to be with them. They will need operator for the railways and the port. Legally and commercially

acceptable arrangement suitable to both the parties can be worked out once the principle is accepted.

- Institutions like the World bank and IFC can be requested to get involved at appropriate stage to accept the parallel track approach for the privatisation of KRC and agreements reach between KRC and Nilefos can be made binding to the would be private operator.

COMMENTS FROM THE CHAIRMAN:

- The chairman commented that privatisation will be done in vertical layers meaning there will not be multiple operators on the track.
- It was noted that earlier costing was done on the assumptions that there will not be any back haul of cargo.
- In the previous meeting it became apparent that Nilefos was not seeking any subsidy but was striving to keep the transport cost as low as possible (in the range of US\$ 10 or less per tonne per trip). The back haul permission was required for achieving these goals.
- It was reiterated that important project with outlays of over US\$ 500 million can be implemented only if the transport cost is within the above-mentioned limits.
- To avoid having multiple operators it was proposed by Nilefos and accepted by KRC that initially KRC should be the operator for the trains and the new private sector entity that will take over KRC will honour the commitment and operate the phosphate trains under the same terms and conditions.

Modalities of Operation:

- KRC proposed that the train from Sukulu to Mombasa and back should be operated by one operator only so as to achieve economies and respect the practical aspects. Efforts will have to be made to get this approved by URC. This arrangement is expected to result in reducing the turn around time for the train.
- URC will be required to grant the track rights for approximately 30 kms. Distance between Malaba border and the plant site.
- KRC technical team had done their homework well and confirmed the following:
 - (a) 35-wagon train hauled by 2 locomotives will be ideal for this operation.
 - (b) Two trains per day with 340 working days per year would help in transporting approximately one million tonne each way (952,000 tonnes per annum).
 - (c) Each wagon can carry gross weight of 60 tonnes.
 - (d) Payload per wagon would be 40 tonnes.

- (e) On the outbound journey from the plant to Mombasa, modified half container will carry 20 tonne each and loaded two half containers per wagon.
 - (f) On the inbound journey from Mombasa to the plant, these half containers will be staked one above the other and carry total 20 tonne cargo.
 - (g) Over and above that in the space created by staking half container one above the other one full loaded container will be carried.
 - (h) Nilefos will assure KRC that the backhaul cargo to and from Mombasa would be additional business generated solely by their effort and will not encroach on their present cargo-offering clients.
 - (i) KRC confirmed that this would result in taking away cargo handled by the truck operators. Infact they would like this trend to be encouraged.
- The turnaround time has to be minimum so as to have the number of wagons needed to be minimum. This depends on the running time and loading and offloading time at both the ends. Besides, time needed at the border crossing for custom clearance.
 - A suggestion was made that GOU and GOK should be requested jointly by KRC and Nilefos to clear the block trains at the starting point, i.e. Mombasa and plant site by deploying the custom authorities offices of respective government of the place.
 - Nilefos will invest in designing and implementing a wagon loading and offloading procedures and equipments to minimise the time required. KRC offered to let us have their advice and experience available.
 - Nilefos will engage engineers and consultants who will design the loading and offloading equipments and procedures so that a target of loading and offloading the entire train in half a day is possible.
 - Nilefos will need assurances and written legally binding commitments from KRC regarding the reliability, suitability, availability and maintenance of the tracks so as to achieve the targets, haulage of cargo in both the directions.
 - Nilefos informed that they had discussions with Kenya port authority for a suitable site to have a terminal for receiving and dispatching cargo from and to the plant site and also for loading and offloading out going and in coming cargo from/on to the ship. Any help KRC can give in securing the appropriate area and facilities from Kenya Port authority will be welcomed. KRC confirmed that they would help to the extent necessary.
 - KRC was requested to advise on the repair and maintenance of rolling stock.
 - KRC was also requested to advise on the source for procuring the wagons and cost thereof. The design of the wagon will be from the suppliers but specifications will be from KRC.
 - KRC advised that it would be cost effective to lease the locomotives rather than buying.
 - KRC has obtained quotations from India for wet leasing the locomotives.
 - At both ends we may have to provide shunting engines, one each. When the shunting engine is under repair we can get temporary help from URC/KRC and hire for a few days their shunting engine, thereby saving investment/lease charges for 2 spare shunting engines.

- It is possible to run train with 22 wagons with one engine or 35 wagons with 2 engines. KRC recommended that for operational and other considerations it would be better for us to select 35 wagon train with 2 engines as the rail lines are single track and considerable time is lost at each passing point.
- As the train running time is 72 hours a special boogie (kabooza) with living facilities for the operating crew who will rotate duty every 8 hours will have to be provided.
- Fuelling of engine would be economical at Mombasa, Nairobi and Eldoret.

Running Time: (Details discussed)

- KRC explained that running time from Mombasa to Malaba border is approximately 72 hours including refuelling.
- Customs clearance at Malaba border usually takes approximately one hour.
- The total number of working days per annum is assumed at 340 days for calculation purposes.
- KRC proposed that Nilefos could think of Inland container depot or Dry port in Tororo. We can have meeting with Ministry of Transportation for this issue. KRC and Nilefos can negotiate to exchange some business in future if this facility is available.
- It is proposed that Nilefos should talk to the Customs and Revenue department with the help of KRC, such that customs clearing should be done at factory site in Tororo and at the offloading site at Mombasa which will allow economies in turn around time.
- KRC suggested that we need multiple crew on the train and should have Kabooza (accommodation for the crew) on the train.
- KRC said that fuelling facility is available at all the major points like Nairobi and Eldoret.
- KRC stipulated that the gross weight of each wagon should not be more than 60 tonnes as the tracks are designed for carrying that capacity. There is weighbridge check and compliance on weight stipulation is very essential.

Type of Locomotives, Equipments and Tracks:

- KRC accepted to give the specifications for locomotives and will send us the quotations received from different suppliers from countries like India.
- KRC proposed that rather than buying the locomotives Nilefos should lease of the locomotives from company like General Electrical.
- We also need to look at the capacity of the fuel tank of locomotives, KRC said that the maximum capacity is 4,600 lts. The train will use approximately 4,000 lts. fuel on uphill for travelling 530 kms from Mombasa to Nairobi and on the return it is less.
- Shunting engines are required at both the ends that is at Tororo and also at Mombasa port.
- Overhead cranes and front loader is also required at Mombasa port.

- Nilefos should also think of the cost of laying the sidings at both the sites. KRC will help in designing & laying at a cost.
- KRC recommended that the tracks at both the ends should be designed in such away that loading and offloading could be faster at both the ends.
- KRC will provide the specifications and cost for shunting engines.

Maintenance of rolling stock and locomotives:

- The maintenance cover is one rack of train, which means 35 wagons.
- Nilefos proposed that they will give half of the maintenance to URC and half to KRC.
- KRC said that maintenance is a continuous process. Every time the train is leaving from either Tororo or Mombasa there will be a general inspection for 30 minutes for each train. There are three types of maintenance. (1) Light maintenance and (2) Heavy maintenance and (3) Very heavy maintenance.
- Light maintenance is done quarterly and half yearly. Where every quarter greasing and oiling, etc. is done. Half-yearly maintenance comprises of inspection of brakes, linings, etc. Heavy maintenance is done every year and very heavy maintenance is done after 7 to 8 years. KRC will give recommendations on how to carry out the maintenance.

Terminal Issue:

Nilefos needs support from KRC to negotiate with Kenya port authority because allocation of terminal at Mombasa port is also vital issue. KRC agreed to help Nilefos on the terminal issue.

A.O.B.:

- KRC has agreed to provide the necessary guarantees that would be needed by the lenders and reliability of the services that will be provided by them.
- KRC recommended that Eldoret and Mombasa depot needs to be revived and will need help from Nilefos, which Nilefos agreed to consider.
- At appropriate stage KRC and Nilefos commitments will be formalised.
- Nilefos will come up with draft agreements from the financiers of the project, which KRC agreed to look into.
- Parameters of the contract will be discussed at a later stage when negotiations reach final stages.
- Mr. Desai raised a question that if KRC and Nilefos don't come to an agreement after all this negotiations than what is the next step forward? To which chairman gave a very positive reply that KRC thinks that US\$ 10 per tonne is achievable target. Nilefos appreciated the co-operation from KRC.
- KRC will need to invest and upgrade signalling and communication system. KRC informed that they are already in the process of putting fibre optics from Mombasa to Kampala and negotiations are underway for other

facilities. They need help in financing this. It is expected to be of the order of US\$ 1 to 3 million. Nilefos agreed to consider this as legitimate requirement.

- KRC doesn't have any preferred supplier of rolling stock but they would insist that they meet the specification.
- Nilefos reminded KRC that the contract would be for 30 years as the life of the project is 30 years. KRC agreed to build it in the mechanism of the terms of contract.
- KRC proposed that the next working committee meeting should be after three weeks in Jinja, Uganda, which Nilefos accepted.

The meeting ended at 1.30 p.m. with a vote of thanks to the chairman and the hosts KRC.

Secretary
LPS