OPM.528/63 No. 860

MEMORANDUM TO CABINET BY M.T.I.A.

GOZO WATER SUPPLY

As Honourable Ministers may recall, a decision had been taken in Cabinet on the 28th August, 1965, to proceed with the installation of an independent desalination plant in Gozo and to continue the contract tanker service for the transportation of freshwater from Malta to Comino so long as the cost remains below that involved in the provision of an independent distiller in Comino.

2. Subsequently, Messrs Preece, Cardew and Rider were appointed as Consultants to the project and were assigned, as a first step, the task of preparing a feasibility report incorporating

i) a re-assessment of the water demand growth in Gozo and the determination of the most economic size and type of seawater desalination plant to meet the demand;

ii) the design, preparation of contract documents, assessment of tenders received and supervision of all works for the installation of the single-purpose seawater desalination plant complete with screening facilities, de-aerators, ajectors, pumping plant instrumentation, boiler plant, pipeline from sea to plant and other ancillary plant.

L-ARKIVJI NAZZJONALI TA' MALTA

3. The Consultants submitted their report on April 24, 1967 - copy enclosed - from which the main conclusion is that initially two desalination units, each of about 250,000 gallons per day, should be installed without delay to meet the short-term increase in the water demand in Gozo. The report has been analyzed and the Ministry is in general agreement.

4. The total cost of the proposed desalination plant which will not combine the generation of electricity - in this regard the Ministry had ascertained from the Malta Electricity Board that the electrical energy demand in Gozo can be met from their Station in Malta via the submarine cable linking Malta to Gozo - including civil engineering works is estimated at £1,003,800. The money provision available as grant-in-aid for the development of the Water Supply in Gozo under the 1964/69 Development Plan is only £313,077 and was included on the basis of a report by a different firm of consultants, Messrs Italconsult, who had in 1964 reported on the "Water Supply Schemes for the Islands of Gozo and Comino" and had costed a 500,000-gallons-a-day desalination plant at £420,000.

/2.....

5. The cost estimates for a single-purpose desalination plant of an overall output of about 500,000-gallons-a-day by the two firms of consultants differ by £583,000. The difference is due to:

a) the distillers and other ancillary plant proposed by Italconsult were considered to be installed in the open and without any major building enclosure. Messrs Preece, Cardew and Rider, on the other hand, have included a sum of £93,500 to cover civil engineering costs to instal the proposed plant underground at Mgarr ix-Xini. This was the result of discussions held with the Public Works Department who understandably held the view that this plant should be hidden from sight if the natural touristic potential in the area is to be retained;

b) Preece, Cardew and Rider have considered, with security of supply very much in mind, the installation of two distillate units nominally rated at ½ million gallons daily, instead of one unit of ½ million gallons daily. Also they have sought to incorporate the latest proven techniques and knowledge to provide margins of capability to meet peak demands and plant of long life. These factors, particular duplication of units, have an appreciable affect on the capital expenditure involved and reflect the cost of reliability which is an essential requirement of water supply. Preece, Cardew and Rider have also considered in detail all the ancillary equipment required for the project and costed the entire project on recent contract prices for similar plant;

c) since 1964 when Italconsult submitted their report prices have been escalating by about 7½% overall;

d) it is now evident that certain essential items involving both capital and operating expenditure (buildings, roads, adequate oil and chemical storage, extension of electricity mains, pumping, dosing etc) were not included in estimates prepared by Italconsult for comparison purposes of possible alternative means of supplying water to Gozo;

e) differences in the forecast demand of water and therefore in plant capacities and phasing.

6. In summary form, the capital investment required in the alternative shemes to supplement the existing natural water resources at Gozo, and the cost per 1,000 gallons of distillate, can be shown as follows:

3/.....

L-ARKIVJI NAZZJONALI TA' MALTA

(a) Scheme I. Provision of independent desalination plant at Gozo producing under Phase I (up to 1973-74) a maximum of 500,000 gallons of distillate a day (2 units each of 250,000 gallons a day) and extending under Phase II (up to 1978-79) to 750,000 gallons a day and capable of further future units extensions;

(b) Scheme II. Production of distillate in Malta under current project of power generation/seawater distillation with transfer of distillate by land and submarine pipeline Malta-Comino-Gozo;

(c) Scheme III. Production of distillate in Malta as under Scheme II but with construction of steel bridge across Malta-Comino-Gozo, which would avoid the provision of a submarine pipeline with its inherent problems.

7. SCHEME I

The water costs under Scheme I for a desalination plant installed below ground are given in some detail at Appendix A to this memorandum.

The total cost of distilled water gives a range of from 23/4 to 17/1d per 1,000 gallons in regard to a plant of 8:1 G.O.R. (8 lbs of distillate for every 1 lb of steam) and represents capital charges on the additional capital (£1,003,800/1,365,000 less £313,077), required to be borrowed, and running costs. In a 6:1 G.O.R. plant the cost range on a similar basis of computation is one of from 22/1d to 17/2d per 1,000 gallons. The lower cost range is explained by the fact that a 6:1 G.O.R. plant costs less in capital investment than an 8:1 G.O.R. plant of the same output. In fact, the estimates are £877,300/1,200,000 (6:1 G.O.R.) and £1,003,800/1,365/000 (8:1 G.O.R.). The advantage of an 8:1 G.O.R. plant lies in a more efficient unit and a consequent cheaper operating cost. It would, without doubt, be recommendable to instal an 8:1 G.O.R. plant if grant-in-aid money can be made available to finance the project "in toto". In fact, on the assumption that the total capital investment required for an 8:1 G.O.R. plant (£1,003,800) would come from grant-in-aid sources, the cost range would come down to 17/5 to 12/5 per 1,000 gallons with a 4% per annum depreciation.

8. SCHEME II

Originally Italconsult had estimated that the total cost of water distilled at Malta and transferred to Gozo under this Scheme would be 10/1 per 1,000 gallons (i.e. 7/- production

4/.....

L-ARKIVJI NAZZJONALI TA' MALTA

cost at Malta and 3/1 conveyance cost). Their estimates, however, excluded the cost of land transfer mains and booster stations from the Power/Water Station at Marsa to Mellieha and from Mgarr to Ta' Cenċ Reservoir in Gozo which, when calculated, takes the distributed cost up to 16/5 per 1,000 gallons.

The capital cost of this project has been re-estimated at £1,488,000 i e. £288,000 more than the cost of 3 x 250,000 gallons-a-day distillers mainly due to the fact that Italconsult's pipeline costing (£420,000) concerned only the submarine stretch and was under-estimated (mainly on the basis of the known seabed conditions at the time).

This project presupposes the provision of another distillating unit at the Malta Power/Water Station over and above the planned distillers programme for the Malta needs and necessitates accelerating the phasing of the installation of the distillers at Malta and bringing forward the date for the construction of a second distillation station. It would also have the effect of a further imbalance of power and water requirements (due to matching of steam demands) with a distinct possibility that the water production costs of the entire output would escalate.

It should be stressed that uncertainty exists in regard to the capital costs of a submarine pipeline - these could vary significantly depending in the main on the method of laying, the seabed conditions and the pipe material. It is also necessary to emphasize that, notwithstanding any commercial guarantee that may be given, the security of the water supply via a submarine pipeline is considered less than a land-based distiller. Besides, the aspect of maintenance, and possible breakdown and repair, of an undersea pipeline poses problems financial and other.

The project has undoubtedly the attraction of solving Comino's water problem in that the money currently spent under the current contract tanker service to transport freshwater from Malta to Comino (£9,000 a year) would be saved. However, Comino's water supply problem could equally be solved through a much shorter length of pipeline Gozo-Comino linked with the Gozo land-based distillation plant.

L-ARKIVJI NAZZJONALI TA' MALTA

SCHEME III

9. At first sight, this project appears to deserve deep and serious consideration since it would combine Gozo's and Comino's needs not only in regard to the supply of water but of other public utilities apart from other economic advantages the project could generate.

Tentative cost estimates for the construction of a forty (40) feet carriageway linking Malta to Comino and Gozo range between £4.5m. to £7.7m. depending on the type and system of construction and clearances. These estimates were obtained from Messrs. Pauling & Co. Ltd. and from Freeman Fox and Partners both of London respectively.

Preliminary investigations showed that the project is justified on a long term basis in view of the major tourist and other development works contemplated for Gozo and Comino. Both these Islands will become easily accessible to Malta resulting no doubt in an accentuation of the tempo of tourist development and in the attraction of industry to the sister Island. The project could also save Government the need of improving the Mgarr Harbour, would make the Ghajnsielem Trough available for storage of water from Malta without the need of installing a submarine pipeline, and might even render unnecessary the provision of separate distillers for Gozo as both Comino and Gozo could be fed from the distiller to be installed in Malta at a lower capital and running cost than it would be the case should these installations be set up in Gozo. It would also open to them the employment opportunities being created in Malta without the need of separating themselves from their families as at present. It will save Government the cost of maintaining the electricity and telephone submarine cables and might lead to reduction in administration costs.

Tolls over a period of years might not only cover maintenance cost but could contribute substantially towards the capital costs.

The economic justification of the project should however be gone into deeply with a view to ascertaining its viability before definite commitments are entered into.

/6.....

L-ARKIVJI NAZZJONALI TA' MALTA

As this study might take some months and even if positive it will take some time before plans are finalized and tenders issued, it would seem to be advisable to proceed at least with one of the proposed distillers.

10. Hon. Ministers are asked to either (a) to approve that three distillate units be installed in Gozo at an estimated overall expense of £1.4m. even though the price per 1,000 gallons after taking into account interest and depreciation will range from 23s. 4d. to 17s. 1d. (plus 1s. 3d. for distribution) and will involve an increase in the annual subsidy on water (excess of distributed water costs on charges for water) of £212,000 to £220,000 or 22s. 6d. to 16s. 3d. per 1,000 gallons. A sum of £313,077 is already available in the Development Plan for this purpose. This sum will have to be increased by £1.1m.

or (b) to approve the carrying out of a feasibility study for the construction of a bridge linking Malta to Comino and Gozo and to proceed with the provision of a distiller for Gozo at an estimated expense of some £470,000 of which £313,077 are available in the Development Plan. The provision of two further distillers to be deferred until the economics of the bridge project is determined.

2nd September, 1967.

L-ARKIVJI NAZZJONALI TA' MALTA

APPENDIX A

The estimates of product costs per 1,000 gallons for a desalination plant installed below ground are:

PHASE I — 2 X 250,000 gallons per day units

G.O.R.	3:1	6:1
Total Capital Cost	£1,003,300	£877,300
"Grant-in-aid"	313,077	313,077
Actual Expenditure subject to amortization	691,000	565,000
Annual amortization (6% interest, 4% depreciation)	69,100	56,500

YEARS 1969-70

Annual distillate production - 90 X 10^6 gallons		
Operating cost per 1,000 gallons	98d	114d
Amortization per 1,000 gallons	182	151
Total	280 (23s 4d)	265 (22s 1d)

YEARS 1973/74

Annual distillate production - 136 X 10^6 gallons		
Operating cost per 1,000 gallons	102d	118d
Amortization per 1,000 gallons	120	98
Total	222	216

PHASE II (1974-75/1978-79) 3 x 250,000 gallons per day units

Total Capital Cost	£1,365,000	£1,200,000
"Grant-in-aid"	313,077	313,077
Actual Expenditure subject to amortization	1,052,000	887,000
Annual amortization (6% interest, 4% depreciation)	105,200	88,700

YEARS 1978/79

Annual distillate production - 210 X 10^6 gallons		
Operating cost per 1,000 gallons	95.5d	114.5d
Amortization per 1,000 gallons	110	92
	205.5 (17s 1d)	206.5 (17s 2½d)

L-ARKIVJI NAZZJONALI TA' MALTA

L-ARKIVJI NAZZJONALI TA' MALTA

REMARKS BY PRINCIPAL ASSISTANT SECRETARY (ECONOMIC PLANNING) ON MEMORANDUM NO. 860 (GOZO WATER SUPPLY)

Consultants and the Ministry of Trade, Industry and Agriculture are in agreement that if grant monies are available for this project then it is advisable to purchase an 8:1 G.O.R. installation which is more efficient and cheaper to run. If the project is financed out of loan monies, interest charges appear to tip the balance in favour of a 6:1 G.O.R. installation.

2. Grant monies up to £313,077 are available for the next two years to be spent on this project. It has been ascertained that if tenders are published immediately about £296,000 would be required up to March, 1969 (vide para. 10 of red 3). It is very likely that this project would continue to attract British grant monies during the next quinquennium and the limiting factor will be the grant/loan allocation which will be decided upon. All told, the probability that this scheme will be entirely financed from grant money is high and as such I would recommend the 8:1 G.O.R. installation.

3. The total cost of the 8:1 unit is slightly over £1 million. This figure includes some £94,000 for excavation works to hide the installation below ground. The Public Works Department argue that esthetically the installation is an eyesore if sited above ground. The Consultants (vide para 11-20 of red 4B) state that "whether or not the additional expenditure is justified is a matter for serious consideration by the authorities.....". To my mind this is a significant sum of money which can be put to better use on other projects. I would suggest that Ministry of Trade, Industry and Agriculture and Public Works Department should study ways and means of effecting this saving.

4. The Cabinet memo has linked this project with a decision on building a bridge linking Malta-Comino-Gozo. The problem of water supply in Gozo is acute and requires an immediate decision, while it is highly unlikely that a properly worked out feasibility study would be ready in time to enable a cabinet decision without retarding tourist development in Gozo for lack of water. Prima facie the scheme appears to be a white elephant. Recent data obtained since the cabinet memo was written indicate that such a bridge would cost about £9.2 million. If this is financed out of a loan, interest and maintenance charges are estimated at nearly £2,000 per day and slightly less than double this figure if amortisation is taken into account. Though I am not in a position to talk about availability of funds during the course of the next quinquennium before the next plan is drawn up and priorities are decided upon, it is not probable that sums between £9 and £10 million can be found for such a scheme.

5. I would suggest that an early decision be sought for the purchase of a 8:1 G.O.R. installation.