

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 709 -WATERWORKS

#### Water Supplies – Fresh water supplies

#### 100WF – Sheung Shui/Fanling water supply – Ping Che fresh water service reservoir

Members are invited to recommend to Finance Committee the upgrading of the remainder of **100WF** to Category A at an estimated cost of \$117.2 million in money-of-the-day prices for the construction of the Ping Che fresh water service reservoir.

### PROBLEM

There will be inadequate storage capacity of fresh water service reservoirs in the Sheung Shui/Fanling areas.

### PROPOSAL

2. The Director of Water Supplies (DWS), with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **100WF** to Category A at an estimated cost of \$117.2 million in money-of-the-day (MOD) prices for the construction of the Ping Che fresh water service reservoir.

### PROJECT SCOPE AND NATURE

3. The scope of works under **100WF** comprises –

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- (a) construction of Ping Che fresh water service reservoir with a capacity of 20 000 cubic metres (m<sup>3</sup>) ;
- (b) construction of a one kilometre (km) access road and associated drainage works;
- (c) laying of about three km of fresh water mains of diameters ranging from 600 millimetres (mm) to 700 mm; and
- (d) landscaping and geotechnical works.

4. We plan to start construction in November 2004 for completion in October 2007. A site plan showing the scope of works under **100WF** is at Enclosure 1. A perspective diagram of the proposed works is shown at Enclosure 2.

## JUSTIFICATION

5. With the planned developments in Area 36 and Burma Line in the Sheung Shui/Fanling areas, the water demand for drinking and flushing uses is on the increase. We project that the total mean daily water demand will increase from 122 700 m<sup>3</sup> for a population of 304 000 in 2003 to 134 000 m<sup>3</sup> for a population of 342 000 in 2011. As the existing fresh water service reservoirs in Sheung Shui/Fanling areas, including the Table Hill, Kwu Tung and Tong Hang fresh water service reservoirs, can only cope with a mean daily demand of 112 000 m<sup>3</sup>, we consider that a new service reservoir of storage capacity<sup>1</sup> of 20 000 m<sup>3</sup> is required to meet the projected shortfall.

6. The existing water supply system is already overloaded and prolonged operation of the pumps in the pumping station is required. This operation arrangement increases the risk of system breakdown and interruption of water supply. The situation will get worse upon the completion of the planned developments in the areas. As the storage capacity of the existing reservoirs is lower than normal, the reliability of water supply is low and will be further reduced in an emergency situation, such as mainburst, electricity failure or pump breakdown. Under such circumstances, there will be prolonged interruption of water supply.

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<sup>1</sup> Since the shortfall in mean daily demand is 22 000m<sup>3</sup> and the planned capacity of fresh water service reservoirs is set as 85% of mean daily demand, the required storage capacity of Ping Che fresh water service reservoir = 18 700m<sup>3</sup> (22 000m<sup>3</sup> x 85%) + about 7% contingency for future demand = 20 000 m<sup>3</sup>.

7. To improve the reliability of the existing water supply system and to meet the future water demand in Sheung Shui/Fanling areas, the proposed Ping Che fresh water service reservoir should be commissioned as soon as possible.

## FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the proposed works to be \$117.2 million in MOD prices (see paragraph 9 below), made up as follows –

	<b>\$ million</b>	
(a) Site formation	25.5	
(b) Fresh water service reservoir	35.5	
(c) Ancillary works for	46.4	
(i) access road and drainage works	13.4	
(ii) fresh water mains	24.1	
(iii) landscaping works	1.1	
(iv) geotechnical works	7.8	
(d) Electrical and mechanical works	1.6	
(e) Environmental mitigation measures	2.1	
(f) Contingencies	11.2	
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Sub-total	122.3	(in September 2003 prices)
(g) Provision for price adjustment	(5.1)	
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Total	117.2	(in MOD prices)
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9. Subject to approval, we will phase the expenditure as follows –

<b>Year</b>	<b>\$ million (Sept 2003)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2004 – 2005	7.3	0.97150	7.1
2005 – 2006	49.8	0.95450	47.5
2006 – 2007	40.7	0.95450	38.8
2007 – 2008	18.5	0.96643	17.9
2008 – 2009	6.0	0.98455	5.9
	122.3		117.2

10. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2004 to 2009. We will tender the works on a remeasurement basis because the works involve extensive underground works, the quantities of which are subject to variation during construction to suit the actual site conditions. Since the contract period will exceed 21 months, we will provide for price adjustments in the contract.

11. The annual recurrent expenditure arising from this project is about \$310,000.

12. The project by itself will lead to an increase in production cost of water by 0.05% in real terms by 2009<sup>2</sup>.

## **PUBLIC CONSULTATION**

13. We have consulted the villagers on the proposed works since the  
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<sup>2</sup> The increase in production cost of water is calculated on the assumption that the demand remains static during the period from 2004 to 2009 and the amount of government subsidy to the waterworks operations is to be contained at the present level.

early planning stage, and have taken their suggestions in arriving at the present layout of the access road. We consulted the District Development and Environmental Improvement Committee of the North District Council in March 2002. The Committee supported the project.

14. We gazetted the proposed access road of the project under the Roads (Works, Use and Compensation) Ordinance (Chapter 370) on 22 November 2002. We received no objection and gazetted the notice of authorisation on 14 February 2003.

## **ENVIRONMENTAL IMPLICATIONS**

15. The Director of Environmental Protection carried out an Environmental Review of the project in 1995, which concluded that no Environmental Impact Assessment was necessary. The project would not have adverse long-term environmental impact and the short-term construction impacts could be mitigated through implementation of standard pollution control measures. We have included \$2.1 million (in September 2003 prices) in the project estimate to implement these mitigation measures and will incorporate these requirements into the works contracts for implementation.

16. We will require the contractor to submit waste management plans (WMP) with appropriate mitigation measures, including the allocation of areas for waste segregation on site to facilitate reuse or recycling of construction and demolition (C&D) materials, for approval. The contractor will be required to carry out on-site sorting of C&D materials to recover reusable/recyclable C&D waste so as to minimise the C&D waste disposed of at landfills. We will ensure that the day-to-day operations on site comply with the approved WMP. We will implement a trip-ticket system to control the proper disposal of C&D materials and will record the reuse, recycling and disposal of C&D materials for monitoring purposes.

17. We have taken due consideration of the need to minimise the generation of C&D materials when planning and designing the layout of the service reservoir platform, the slopes and alignments of the proposed water mains. To further minimise the generation of C&D materials, we will encourage the contractor to use steel instead of timber in formwork and temporary works. We estimate that the project will generate about 80 000 m<sup>3</sup> of C&D materials. Of these, we will reuse about 7 000 m<sup>3</sup> (8.8%) on site, 32 000 m<sup>3</sup> (40%) as waste cover at West New Territories (WENT) Landfill as required by Environmental Protection Department, 40 000 m<sup>3</sup> (50%) as fill at other filling areas and dispose

of 1 000 m<sup>3</sup> (1.2%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$125,000 for this project (based on a notional unit cost<sup>3</sup> of \$125/m<sup>3</sup>).

## LAND ACQUISITION

18. We will resume about 2 230m<sup>2</sup> of agricultural land for the proposed works. No building land or household is involved, except about 10 temporary structures are to be cleared. We will charge the cost of land acquisition and clearance, estimated at \$4.7 million to **Head 701 – Land Acquisition**.

## BACKGROUND INFORMATION

19. The project **100WF** was originally included under **Head 707 – New Towns and Urban Area Development** for improvements to the water supply to Sheung Shui/Fanling New Town. We upgraded Stage I of the project to Category A as **10WF** “Sheung Shui/Fanling Water Supply” in 1977 and completed the works in 1983. The remainder of **100WF**, comprising the Kwu Tung fresh water service reservoir and Ping Che fresh water service reservoir systems, and the associated mainlaying works was retained in Category B.

20. In June 1993, we upgraded part of **100WF** to Category A as **195WF** “Sheung Shui/Fanling Water Supply – Stage II” for the construction of the Kwu Tung fresh water service reservoir, associated mainlaying works and part of the inlet main for the Ping Che fresh water service reservoir. The works were completed in 2001. In August 2003, the Secretary for Financial Services and the Treasury approved the transfer of the remainder of **100WF** from **Head 707** to **Head 709 – Waterworks** on the consideration that Ping Che fresh water service reservoir was to serve areas outside the Sheung Shui/Fanling New Town.

21. We have substantially completed the detailed design for the proposed works using in-house resources.

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<sup>3</sup> The estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m<sup>3</sup>), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

22. The proposed construction works will involve removal of 62 trees including 60 trees to be felled and two trees to be transplanted within the project site. All trees to be removed are not important trees<sup>4</sup>. We have adjusted the original alignment of the access road to keep the felling of trees to a minimum. We will incorporate planting proposals as part of the project, including estimated quantities of 200 trees, 18 000 shrubs and 300 m<sup>2</sup> of grassed area.

23. We estimate that the proposed works will create about 90 jobs (75 for labourers and another 15 for professional/technical staff) providing a total employment of 2 300 man-months.

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Environment, Transport and Works Bureau  
May 2004

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<sup>4</sup> Important trees include trees on the Register of Old and Valuable Trees, and any other trees which meet one or more of the following criteria:

- (a) trees over 100 years old;
- (b) trees of cultural, historical or memorable significance;
- (c) trees of precious or rare species;
- (d) trees of outstanding form; or
- (e) trees with trunk diameter exceeding one metre (measured at one metre above ground level).



圖例 LEGEND :

- 擬敷設的食水管道  
PROPOSED FRESH WATER MAINS
- 擬建道路  
PROPOSED ACCESS ROAD

核准 APPROVED:  
  
總工程師/總計 (S / DS)

315 / 2004

(甲類工程)  
(CAT 'A' Subscheme)

工務計劃項目第 100WF 號 — 上水 / 粉嶺供水計劃 - 坪壘食水配水庫

PWP NO. 100WF — SHEUNG SHUI / FANLING WATER SUPPLY -  
PING CHE FRESH WATER SERVICE RESERVOIR

比例尺 SCALE 1 : 50 000

水務署  
WATER SUPPLIES DEPT.

草圖編號 SK 62003 / 085  
SKETCH NO.


附件 1 ENCLOSURE 1





遠觀圖  
PERSPECTIVE VIEW

附件 2 ENCLOSURE 2

核准 APPROVED  
  
 核准/擬定 CE/Des

11 / 5 / 2004

(甲級工程)  
(CAT 'A' Submission)

工務計劃項目第 100WF 號 — 上水 / 粉嶺供水計劃 - 坪壘食水配水庫

PWP NO. 100WF — SHEUNG SHUI / FANLING WATER SUPPLY -  
 PING CHE FRESH WATER SERVICE RESERVOIR



水務署  
WATER SUPPLIES DEPT.

草圖編號  
SKETCH NO. SK 62003 / 087