## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

#### Head 704 – DRAINAGE Environmental Protection – Sewerage and sewage treatment 274DS – Yuen Long and Kam Tin sewerage, stage 3

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of 274DS, entitled
   "Yuen Long and Kam Tin sewerage, stage 3
   package 2", to Category A at an estimated cost
   of \$213.4 million in money-of-the-day prices;
   and
- (b) the retention of the remainder of **274DS** in Category B.

#### PROBLEM

Sewage from unsewered areas in Yuen Long is a source of pollution to nearby watercourses and the receiving waters of Deep Bay.

### PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade part of **274DS** to Category A at an estimated cost of \$213.4 million in money-of-the-day (MOD) prices for implementing sewerage works in six unsewered areas in Yuen Long.

/**PROJECT** .....

## PROJECT SCOPE AND NATURE

3. The part of **274DS** that we propose to upgrade to Category A comprises the construction of –

- (a) about 6.5 kilometres (km) of sewers ranging from 300 millimetres (mm) to 450 mm in diameter for six unsewered areas, namely Nam Pin Wai, Sai Pin Wai, Tai Tong Tsuen, Tsoi Uk Tsuen, Wong Uk Tsuen and Ying Lung Wai;
- (b) about 3.6 km of gravity trunk sewers ranging from 300 mm to 450 mm in diameter in the vicinity of the areas mentioned in (a) above; and
- (c) ancillary works.

— A site plan showing the proposed works is at Enclosure 1.

4. Subject to the funding approval of the Finance Committee, we plan to commence the proposed works in August 2012 for completion in August 2016.

5. We will retain the remainder of **274DS** in Category B, which involves the construction of about 16 km of sewers for 19 other unsewered areas in Yuen Long and Kam Tin. Planning and design of the relevant works are in progress. Funding for the remainder of **274DS** will be sought at a later stage after completion of the planning and design works.

## JUSTIFICATION

6. At present, sewage from unsewered areas in Yuen Long is often treated and disposed of by means of private on-site treatment facilities (such as septic tanks and soakaway (STS) systems). These facilities are however ineffective in removing pollutants due to their proximity to watercourses<sup>1</sup> or inadequate maintenance<sup>2</sup>. Sewage from these unsewered areas has therefore been identified as a source of water pollution to nearby watercourses and the receiving waters of Deep Bay.

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<sup>&</sup>lt;sup>1</sup> STS systems operate by allowing the effluent to percolate through gravels whereby pollutants are removed in a natural manner. However, if a STS system is located in an area where the ground water table is high, such as an area in proximity to watercourses, it will not function properly due to ineffective percolation.

<sup>&</sup>lt;sup>2</sup> Inadequate maintenance of STS systems would affect their pollutant removal efficiency and might even lead to overflow of effluent.

7. The aforesaid situation will persist unless sewerage infrastructure is made available to collect and treat sewage from these areas properly. As a long-term measure to address water pollution problems, we have formulated a programme under the Yuen Long and Kam Tin Sewerage Master Plan to expand the public sewerage in Yuen Long in phases. The proposed works aim to construct a sewerage system at the six unsewered areas in Yuen Long mentioned in paragraph 3(a) above, such that the sewage collected will be conveyed to the Yuen Long sewage treatment works and San Wai preliminary treatment works for treatment before discharge. This will minimise the release of pollutants into the environment and bring about sustainable improvement to the water quality of nearby watercourses and Deep Bay.

8. Based on the village properties survey results and the potential village house development information within the six unsewered areas obtained in June 2011 and January 2012 respectively, the proposed sewerage facilities for the six unsewered areas mentioned in paragraph 3 above will be able to serve some 1 300 village houses comprising about 1 035 existing houses, five planned houses and 260 potential houses<sup>3</sup>.

## FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be \$213.4 million in MOD prices (please see paragraph 10 below), broken down as follows –

		\$ million
(a)	Construction of sewers within villages	47.5
(b)	Construction of gravity trunk sewers	81.2
(c)	Ancillary works	1.0
(d)	Environmental mitigation measures	6.3

/(e) .....

<sup>&</sup>lt;sup>3</sup> The 260 potential village houses are houses that may be developed on the vacant lands which are adjacent to the proposed sewer alignment. There is currently no development programme for these houses, which is subject to landowners' will and Lands Department's approval. In the event that some of these potential houses are not built, the abortive cost is not expected to be significant because, according to the designed sewer alignment, the proposed sewers will in any case need to pass by the vacant lands to serve the existing and planned houses.

					\$ million	
(e)	Con	sultants' fees	for		1.9	
	(i)	contract administration	on	0.3		
	(ii)	managemen resident site	t of staff	1.6		
(f)	Remuneration of resident site staff				26.1	
(g)	Con	tingencies			14.3	
		S	ub-total		178.3	(in Sep 2011 prices)
(h)	Provision for price			35.1		
	aujusunent	Total		213.4	(in MOD prices)	

A breakdown of the estimates for the consultants' fees and resident site staff costs by man-months is at Enclosure 2.

10. Subject to approval, we will phase the expenditure as follows -

Year	\$ million (Sept 2011)	Price adjustment factor	\$ million (MOD)
2012 - 2013	14.1	1.05325	14.9
2013 - 2014	40.8	1.11118	45.3
2014 - 2015	41.0	1.17229	48.1
2015 - 2016	40.5	1.23677	50.1
2016 - 2017	37.1	1.30479	48.4
2017 - 2018	4.8	1.37656	6.6
	178.3		213.4
2012 - 2013 $2013 - 2014$ $2014 - 2015$ $2015 - 2016$ $2016 - 2017$ $2017 - 2018$	$ \begin{array}{r} 14.1 \\ 40.8 \\ 41.0 \\ 40.5 \\ 37.1 \\ \underline{4.8} \\ 178.3 \\ \end{array} $	1.05325 1.11118 1.17229 1.23677 1.30479 1.37656	14.9 45.3 48.1 50.1 48.4 <u>6.6</u> 213.4

/11. .....

11. We have derived the MOD estimate on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2012 to 2018. We will deliver the works under a re-measurement contract because of the uncertain underground conditions that may affect the alignments of the sewers. The contract will provide for price adjustments.

12. We estimate the additional annual recurrent expenditure arising from the proposed works to be \$1.1 million. The recurrent expenditure attributable to sewage charges has been taken into account in determining the sewage charges for the years 2008-09 to 2017-18 stipulated in the Sewage Services (Sewage Charge) Regulation (Cap. 463A) and the recurrent expenditure attributable to trade effluent surcharges will be taken into account in reviewing the trade effluent surcharge rates in future.

## PUBLIC CONSULTATION

13. We consulted the Shap Pat Heung Rural Committee on 8 December 2006. Members were supportive of the proposed works and suggested that more villages should be covered. We consulted the Environmental Improvement Committee of the Yuen Long District Council on 19 May 2008 and 14 March 2011. Members supported the proposed works.

14. We gazetted the proposed works in accordance with the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) under three schemes between December 2010 and July 2011. No objection was received and all the three schemes were subsequently authorised by the Director of Environmental Protection between May 2011 and December 2011.

15. We consulted the Legislative Council Panel on Environmental Affairs on 28 May 2012 on the proposed works. Members raised no objection to the proposed works.

## ENVIRONMENTAL IMPLICATIONS

16. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We completed a Preliminary Environmental Review (PER) in July 2008, which concluded that the proposed sewerage works will not cause long-term adverse environmental impacts. 17. For short-term environmental impacts during construction, we will control noise, dust and site run-off to levels within the established standards and guidelines through implementation of environmental mitigation measures, such as the use of silenced construction equipment and noise barrier to reduce noise, water-spraying to reduce emission of fugitive dust, and proper treatment of site run-off before discharge. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices are properly implemented on site. We have included in paragraph 9(d) above a sum of \$6.3 million (in September 2011 prices) in the project estimate for implementing environmental mitigation measures.

18. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. For example, in addition to the need for meeting hydraulic and traffic requirements, we have designed the alignment of the proposed sewers in such a manner that excavation and demolition of existing structures will be minimised. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise the disposal of inert construction waste at public fill reception facilities<sup>4</sup>. We will encourage the contractor to maximise the use of recycled / recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

19. At the construction stage, we will require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste at public fill reception facilities and landfills respectively through a trip-ticket system.

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<sup>&</sup>lt;sup>4</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

20. We estimate that the project will generate in total about 10 350 tonnes of construction waste. Of these, we will reuse about 5 990 tonnes (57.9%) of inert construction waste on site and deliver 4 200 tonnes (40.6%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 160 tonnes (1.5%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$0.13 million for the proposed works (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne<sup>5</sup> at landfills).

## HERITAGE IMPLICATIONS

21. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office. In the PER for the proposed works, assessment on the heritage impact has been conducted. We will carry out mitigation measures on built heritage in the vicinity of the proposed works and conduct an archaeological watching brief during excavation in archaeological potential locations in accordance with the recommendations of the PER.

## LAND ACQUISITION

22. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume a total of 69 private agricultural lots (about 1 932 square metres  $(m^2)$ ) for carrying out the proposed works. The land resumption and clearance will not affect any households or domestic structures. We will charge the cost of land resumption and clearance estimated at \$14.63 million to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3.

/BACKGROUND .....

<sup>&</sup>lt;sup>5</sup> This 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 per m<sup>3</sup>), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

## **BACKGROUND INFORMATION**

23. In March 1992, we completed a sewerage master plan for Yuen Long and Kam Tin under **112DS** "Yuen Long and Kam Tin sewerage master plan study – consultants' fees and investigations". In December 1992, we included **157DS** "Yuen Long and Kam Tin sewerage" into Category B for implementation of sewerage works recommended under the sewerage master plan.

24. In May 1993, we upgraded part of **157DS** to Category A as **164DS** "Yuen Long and Kam Tin sewerage, stage 1" at an approved project estimate (APE) of \$32.0 million in MOD prices. The construction works commenced in October 1993 and were completed in February 1996.

25. In May 1995, we upgraded part of **157DS** to Category A as **194DS** "Yuen Long and Kam Tin sewerage, stage 2 phase 1 – modification works at Ping Shun Street pumping station, rising mains to Ha Tsuen pumping station and sewers in Tong Yan San Tsuen" at an APE of \$225.4 million in MOD prices. The construction works commenced in August 1995 and were completed in October 1998.

26. In October 1995, we divided **157DS** into **157DS** "Yuen Long and Kam Tin sewerage, stage 2" and **274DS** "Yuen Long and Kam Tin sewerage, stage 3".

27. In June 2002, we upgraded part of **274DS** to Category A as **335DS** "Yuen Long and Kam Tin sewerage, stage 3 phase 1" at an APE of \$59.9 million in MOD prices. The construction works commenced in January 2003 and were completed in May 2006.

28. In June 2009, we upgraded part of **274DS** to Category A as **370DS** "Village Sewerage at Wang Chau of Yuen Long" at an APE of \$219.2 million in MOD prices. The construction works commenced in July 2009 for completion in June 2013.

29. In June 2010, we engaged consultants to carry out detailed design, site investigation, traffic and environmental impact assessment for the proposed sewerage works of the remaining 25 unsewered areas under **274DS** at an estimated cost of \$8.3 million in MOD prices. We charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". We have substantially completed the detailed design of the proposed works mentioned in paragraph 3 above. The consultants are working on the design of the remaining works under **274DS**.

30. The proposed sewerage works will not involve any tree removal or planting proposals.

31. We estimate that the proposed works will create about 59 jobs (48 for labourers and another 11 for professional/technical staff) providing a total employment of 2 580 man-months.

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Environment Bureau June 2012

#### 附件 1 ENCLOSURE 1



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#### Enclosure 2 to PWSC(2012-13)33

#### 274DS – Yuen Long and Kam Tin sewerage, stage 3

# Breakdown of estimate for consultants' fees and resident site staff costs (in September 2011 prices)

			Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)	
(a)	Consultants' fees for contract administration (Note 2)	Professional Technical	-	-	-	0.1 0.2	
					Sub-total	0.3	
(b)	Resident site staff costs	Professional Technical	78 587	38 14	1.6 1.6	7.8 19.9	
	(Note 3)				Sub-total	27.7	
	Comprising –						
	<ul> <li>(i) Consultants' fees for management of resident site staff</li> </ul>				1.6		
	(ii) Remuneration of resident site staff				26.1		
					Total	28.0	

\* MPS = Master Pay Scale

#### Notes

- 1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of resident site staff supplied by the consultants. (As at now, MPS salary point 38 =\$62,410 per month and MPS salary point 14 =\$21,175 per month.)
- 2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade part of **274DS** to Category A.
- 3. The actual man-months and actual costs will only be known after completion of the construction works.

#### Enclosure 3 to PWSC(2012-13)33

## 274DS – Yuen Long and Kam Tin sewerage, stage 3

#### Breakdown of the land resumption and clearance costs

		\$ million	
(I)	Estimated land resumption cost		13.13
(a)	Agricultural land ex-gratia compensation (Zone A)	10.84	
	44 agricultural lots (with a total area of $1 \ 281.2 \ m^2$ ) will be resumed		
	1 281.2 m <sup>2</sup> x \$8,460 per m <sup>2</sup> (see Notes 1 and 2)		
(b)	Agricultural land ex-gratia compensation (Zone C)	2.29	
	25 agricultural lots (with a total area of $650.8 \text{ m}^2$ ) will be resumed		
	650.8 m <sup>2</sup> x \$3,525 per m <sup>2</sup> (see Notes 1 and 2)		
<b>(II</b> )	Estimated clearance cost		0.17
(a)	Ex-gratia allowance of crop compensation	0.03	
(b)	Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farms	0.02	
(c)	Ex-gratia allowance for "Tun Fu"	0.12	
(III)	Contingency payment		1.33
(a)	Contingency on the above costs	1.33	

Total costs

14.63

#### Notes

1. There are four ex-gratia compensation zones, namely Zones A, B, C and D, for land resumption in the New Territories as approved by the Executive Council in 1985 and 1996. The boundaries of these zones are shown on the Zonal Plan for Calculation of Compensation Rates. 1 281.2 m<sup>2</sup> and 650.8 m<sup>2</sup> of the land to be resumed in the project **274DS** is agricultural land currently within Zone A and Zone C respectively.

2. In accordance with G.N. 2128 dated 16 March 2012 on the revised ex-gratia compensation rates for resumed land, the ex-gratia compensation rate of agricultural land for Zone A and Zone C is 120% and 50% respectively of the Basic Rate at \$655 per square foot (or \$7,050 per m<sup>2</sup>). Hence the ex-gratia compensation rate used for estimating the resumption cost of the 44 lots (Zone A) and 25 lots (Zone C) affected by **274DS** is \$8,460 per m<sup>2</sup> and \$3,525 per m<sup>2</sup> respectively.