

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 - DRAINAGE

Environmental Protection - Sewerage and sewage treatment 61DR – Northeast New Territories village sewerage, phase 2

Members are invited to recommend to Finance Committee to increase the approved project estimate of **61DR** from \$107.0 million by \$38.0 million to \$145.0 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **61DR** is insufficient to cover the costs of the works under the project.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to increase the APE of **61DR** from \$107.0 million by \$38.0 million to \$145.0 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In April 2002, we upgraded **61DR** to Category A at an estimated cost of \$107.0 million in MOD prices for implementing the Northeast New Territories (NENT) village sewerage phase 2 works. The approved scope of works under **61DR** comprises the construction of –

/(a)

- (a) about 13 kilometres (km) of sewers, ranging from 225 millimetres (mm) to 500 mm in diameter, for 16 unsewered areas in the NENT, namely Heung Yuen Wai, Ha Heung Yuen, Tsung Yuen Ha, Chuk Yuen North, Chuk Yuen South, Kaw Liu, Ta Kwu Ling, Kan Tau Wai, Tong Fong, Ping Yeung, Tai Po Tin, Ping Che, Pak Hok Shan, Tai Tong Wu, Leng Tsai and Hung Leng;
- (b) seven sewage pumping stations with associated rising mains (three in Ping Yeung, and one each in Chuk Yuen North, Hung Leng, Leng Tsai and Tai Tong Wu);
- (c) five communal septic tanks and absorption fields¹ (one set each in Heung Yuen Wai, Ha Heung Yuen, Tsung Yuen Ha, Chuk Yuen North and Chuk Yuen South); and
- (d) an aqua-privy with associated septic tank and absorption field in Fung Wong Wu.

———— A layout plan of the project is at Enclosure 1.

4. We started the construction works in January 2003 and planned to complete the works in February 2006. Owing to the time taken for carrying out the additional works arising from house connection works and addressing villagers' concerns in various aspects, the works are now expected to complete in early 2007.

JUSTIFICATION

5. It is necessary to increase the APE of **61DR** by \$38.0 million to cover the cost due to additional works arising from house connection works, disruption to the progress of works due to local villagers' concerns and requests during construction, higher-than-expected tendered price, and inflation over the past few years.

Additional works arising from house connection

6. The NENT Landfill was developed in the late 1980s. The development plan included construction of a trunk sewer which would convey pre-treated leachate from the NENT Landfill to the Shek Wu Hui Sewage

/Treatment

¹ An absorption field provides the requisite surface area for proper treatment of septic tank effluent.

Treatment Works, and which would also serve nearby villages. During the consultation on implementation of the NENT Landfill project and the sewerage system, the Government agreed to complete the house connection works (i.e. installing sewer pipes to connect individual village houses to the public sewers) for those houses that already existed before the operation of the landfill in mid 1995 and the owners of which could be contacted.

7. During the planning and design stage, we carried out a survey and issued letters to the villagers requesting them to give consent to the Government contractor to carry out the house connection works within their premises and that the villagers would take up the subsequent maintenance of the completed works. Based on the feedback from the villagers and further discussions with the village representatives, we estimated that there were 880 village houses the house connections of which would be carried out by the Government. During construction, more local villagers who had not given consent for the Government to do the works during the survey requested such house connection, and provided information to substantiate that their village houses existed before mid 1995. After reviewing our records and the information provided, the number of houses that required house connection works under this project increased from about 880 to 1 150. Since these houses meet the basic criterion of being in existence before the operation of the landfill in mid 1995, we do not consider it reasonable or equitable to refuse to provide connections for them simply because the requests from the owners have come late. Furthermore, it would be environmentally unacceptable to allow the sewage generated from these houses to continue to pollute the environment for an unduly long period of time without the necessary house connections.

8. During construction, we found many of the houses to be connected are equipped with multiple wastewater outlets. As a result, more pits and longer sewers than expected were required to suit the internal drainage layout of the individual houses. Additional works arising from house connections are estimated to cost about \$7.2 million, which had not been allowed for in the original estimate.

Variations to address villagers' concerns and requests during construction

9. We consulted the relevant District Council, Rural Committee and Village Representatives on the implementation of the village sewerage works under this project before formal gazettal of the works under the Water Pollution Control (Sewerage) Regulation. We then gazetted the sewerage works in 1999 and 2001 and subsequently obtained authorisation of the works without receiving any objections. However, since the commencement of works in January 2003, there

/have

have been many occasions when local people have objected to various aspects of the works, for various reasons. The major objections concerned the proposed sewage pumping stations in Tai Tong Wu and Ping Yeung. The objectors strongly resisted the presence of these sewage facilities in the vicinity of their houses because of their perception of possible adverse effects on “Fung Shui” and hygiene arising from these facilities. Some worried about the integrity of their houses being adversely affected during the construction of the sewers along the narrow alleys and requested sewer realignment.

10. We have revised the location and design of the pumping stations and amended the sewer layout. These variations resulted in a number of site problems and hence additional construction time and costs. For instance, we had to construct a pumping station adjacent to a slope resulting in additional costly slope works. We also relocated a section of sewer to run along the heavily trafficked Sha Tau Kok Road and constructed it by the more expensive trenchless method so as to minimize traffic impact.

11. We have revised our working sequence and construction method in many cases to meet the demands of individual villagers, such as to avoid affecting the access to their houses, and work had to be done in small sections and in a piecemeal manner. This was further complicated by the presence of uncharted utilities and space is often limited for utility diversion in those narrow alleys between village houses.

12. All the additional works and variations are estimated to cost about \$14.3 million, and delayed the completion of the proposed sewerage works under **61DR** by about a year. As the contractor for **61DR** was not responsible for the delay, the prolongation costs of about \$3.0 million have to be borne by the Government under the terms of the contract.

Additional site supervision and liaison

13. The proposed house connection works involve the design and construction of sewer connections to all existing sewage and sullage outlets from the village houses. Since each village house has its own internal sewage pipe arrangement, we have had to tailor the arrangement of house connection works for each of the village houses separately, through extensive liaison with the house owners.

14. Although no objection was received when the sewerage works were gazetted in 1999 and 2001, we encountered objections from local villagers on land resumption arrangements just before we invited tenders. Taking into account the likelihood of further objections and the considerable efforts in liaising with local villagers on acceptable house connection arrangements with least disruption to them, we decided to enhance the site supervisory team to deal with such time-consuming and labour-intensive liaison work. The total additional cost for additional site supervision and liaison is estimated to be \$10.7 million.

Higher-than-expected tendered price

15. The contract works were procured through a competitive tendering process, and we subsequently accepted the lowest tender. The overall tendered sum was about 5% higher than the corresponding sum allocated in the APE. In particular, the successful contractor included relatively high unit rates for constructing and connecting sewers in his bid, and these rates were 28% higher than those anticipated in the original estimate. The contractor might have expected more resources to be required for carrying out sewerage works in remote restricted areas and in private premises. The contract is a remeasurement contract with payment made to the contractor based on the tendered unit rate and quantity of sewerage actually carried out. While the sewerage works are substantially increased as mentioned in the above paragraphs, the higher-than-expected unit rates for sewerage works have also contributed a major portion of the increase in project cost. The net additional cost is estimated to be \$4.1 million.

Inflation allowance

16. The works under this project are subject to contract price fluctuation adjustment determined based on the “Index Numbers of the Costs of Labour and Materials used in Public Sector Construction Projects” tailored by applying the tendered weighting factors under the terms of Contract. As a result of the inflation in costs of labour and materials, the average contract price fluctuation adjustment for the period from 2003 to 2006 is about 2.6% per annum which is higher than that allowed in the APE by \$5.8 million.

17. Following a review of the financial position of the project, we consider it necessary to increase the APE of **61DR** from \$107.0 million by \$38.0 million to \$145.0 million in MOD prices in order to cover the total costs of the works under the project. A summary of the proposed increase of \$38.0 million is as follows –

/(a)

Factor		Increase/ (Decrease) in MOD prices (\$ million)	%
(a)	Additional cost of works	21.5	56.6
	(i) additional works arising from house connection	7.2	
	(ii) variations to address villagers' concern	14.3	
(b)	Contractor's prolongation costs	3.0	7.9
(c)	Increase in site staff costs	10.7	28.1
(d)	Higher than expected tendered price	4.1	10.8
(e)	Inflation allowance	5.8	15.3
(f)	Contingencies	(7.1)	(18.7)
Total		38.0	100.0

_____ A comparison of the cost breakdown of the APE and the revised project estimate is at Enclosure 2.

FINANCIAL IMPLICATIONS

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

Year	\$ million (MOD)
Up to 31 March 2006	101.8
2006 – 2007	24.4
2007 – 2008	10.0
2008 – 2009	5.8
2009 – 2010	3.0
	145.0

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19. The proposed increase in the APE will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

20. We have been keeping the local community informed of the latest development of this project. On 16 March 2006, the Chairman of the Ta Kwu Ling District Rural Committee wrote to us reiterating his support for the project and urging the Government to seek additional funds for completing the project so as to fully discharge the Government's previous commitment to provide house connections to the villagers affected by the NENT Landfill project.

21. We consulted the Legislative Council Panel on Environmental Affairs on 24 April 2006 and presented the factors accounting for the increase in the project estimate. Members had no objection to the Administration submitting the proposal for consideration at the PWSC meeting on 10 May 2006.

ENVIRONMENTAL IMPLICATIONS

22. The proposed increase in the APE does not have any environmental implications.

LAND ACQUISITION

23. The proposed increase in APE does not require any land acquisition.

BACKGROUND INFORMATION

24. In April 1990, we included **61DR** into Category B for implementation of the proposed leachate treatment facilities for the NENT Landfill and the village sewerage works for 16 unsewered areas.

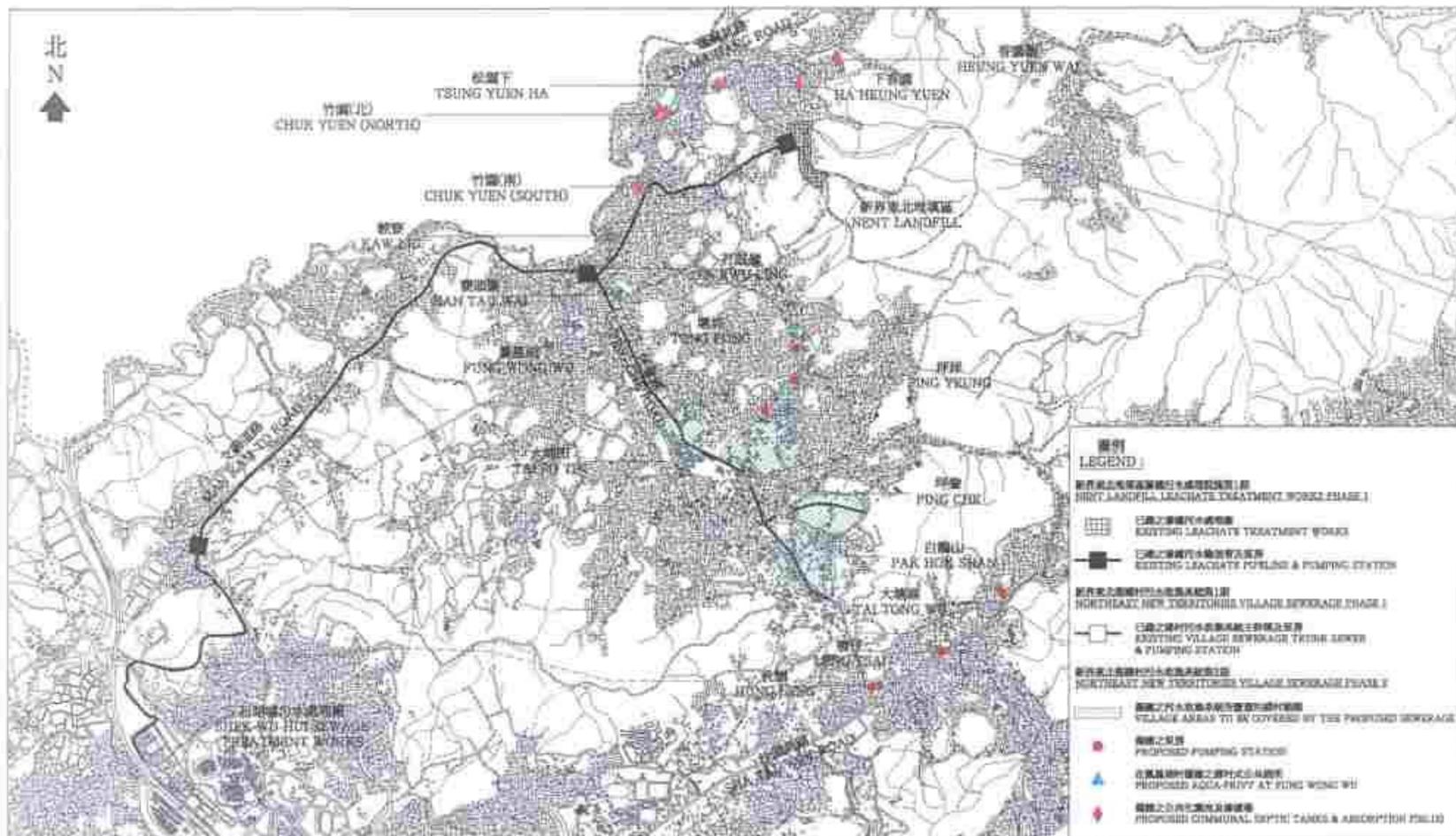
25. In April 1990, we upgraded part of **61DR** to Category A as **62DR** "NENT landfill leachate treatment phase 1 and village sewerage – consultants' fees and investigation" for carrying out the site investigation and detailed design for the whole project.

26. In May 1992, we upgraded part of **61DR** to Category A as **84DR** “NENT leachate treatment works, phase 1” to undertake the construction of the NENT leachate treatment facilities. We started the works in November 1992 and completed them in November 1995.

27. In January 1993, we upgraded another part of **61DR** to Category A as **86DR** “NENT landfill village sewerage, phase 1” to undertake the construction of the public sewerage along Ping Che Road. We started the works in May 1993 and completed them in May 1996.

28. In April 2002, we upgraded the remainder of **61DR** to Category A at an estimated cost of \$107 million in MOD prices for implementing the NENT village sewerage phase 2 works. We started the construction works in January 2003 and expected it be completed in early 2007.

Environment, Transport and Works Bureau
May 2006



圖則名稱 Drawing title

新界東北區鄉村污水收集系統第2期
NORTHEAST NEW TERRITORIES VILLAGE SEWERAGE, PHASE 2

繪圖 drawn	ORIGINAL SIGNED	C.W. CRAN	日期 date	27-04-2006
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部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION			

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附件 1 ENCLOSURE 1

61DR - Northeast New Territories village sewerage, phase 2

A comparison of the approved project estimate and revised project estimate in MOD price is as follows –

	(A)	(B)	(C)	(C) – (A)
	Approved project estimate \$ million	Revised project estimate² \$ million	Further revised project estimate \$ million	Difference \$ million
(a) Sewers (including house connection works)	49.3	63.0	86.3	37.0
(b) Sewage Pumping Stations	20.8	13.0	20.0	(0.8)
(i) civil works	7.1	6.3	11.0	3.9
(ii) electrical and mechanical works	13.7	6.7	9.0	(4.7)
(c) Communal septic tanks and absorption fields	5.1	4.4	4.4	(0.7)
(d) Aqua-privy	0.9	0.9	0.9	0.0
(e) Environmental mitigation measures	2.6	1.5	1.5	(1.1)
(f) Consultant's fees for	18.2	22.9	28.9	10.7
(i) contract administration	3.9	3.9	3.9	0.0
(ii) site supervision	14.3	19.0	25.0	10.7
(g) Contingencies	10.1	1.3	3.0	(7.1)
Total	107.0	107.0	145.0	38.0

² Revised estimate after the contract award

2. As regards (a) (Sewers including house connection works), the total increase of \$37.0 million includes –

- (i) \$13.7 million due to the higher-than-expected unit rates for the sewerage and house connection works under the awarded contract;
- (ii) \$7.2 million for the costs arising from an additional number of about 270 houses with their late requests for house connection made after commencement of the works;
- (iii) \$7.3 million for the costs arising from variations to address villagers concerns and requests during construction and additional works to overcome unforeseen site constraints;
- (iv) \$3.0 million for the contractor's prolongation cost due to extended contract period; and
- (v) \$5.8 million for the costs arising from inflation.

3. As regards (b) (i) (Civil works for sewage pumping stations), the total increase of \$3.9 million includes –

- (i) the increase of \$4.7 million for the costs arising from the additional works to resolve local objections;
- (ii) the decrease of \$0.8 million due to lower than expected unit rates for these civil works under the awarded contract.

4. As regards (b) (ii) (Electrical and mechanical works for sewage pumping stations), the total decrease of \$4.7 million includes –

- (i) the increase of \$2.3 million for the costs arising from the additional electrical and mechanical works to suit the revised layout of the pumping stations; and
- (ii) the decrease of \$7.0 million due to lower than expected unit rates for the electrical and mechanical works under the awarded contract.

5. As regards (c) (Communal septic tanks and absorption fields), the decrease of \$0.7 million is due to lower than expected unit rates for these works under the awarded contract.

6. **As regards (e) (Environmental mitigation measures)**, the decrease of \$1.1 million is due to lower than expected unit rates for the environmental mitigation measures under the awarded contract.

7. **As regards (f) (ii) (Site supervision), the total increase of \$10.7 million includes –**

- (i) \$6.0 million to cover additional site staff cost due to the extended contract period of the project; and
- (ii) \$4.7 million to cover additional site staff cost to enhance the site supervision team to deal with the time-consuming and labour intensive liaison work.

8. **As regards (g) (Contingencies)**, we retain \$3.0 million as the contingencies for future incidental additional works, for settlement of the final accounts and resolution of possible claims from the contractor.
