

For discussion
On 25 June 2007

**Legislative Council
Panel on Environmental Affairs**

**Provision of sewerage facilities at Yung Shue Wan and
Sok Kwu Wan on Lamma Island and Tseng Tau Chung Tsuen in Tuen Mun**

PURPOSE

This paper seeks Members' support for the Administration's proposal to upgrade the following three projects to Category A prior to submission to the Public Works Subcommittee for consideration with a view to seeking Finance Committee's funding approval:

- (a) **230DS** – Outlying Islands Sewerage Stage 1 Phase 1 Part 2 - Yung Shue Wan Sewerage, Sewage Treatment Works and Outfall at an estimated cost of about \$286 million in money-of-the-day (MOD) prices to provide sewerage and sewage treatment facilities to Yung Shue Wan;
- (b) **234DS** – Outlying Islands Sewerage Stage 1 Phase 2 - Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities at an estimated cost of about \$257 million in money-of-the-day (MOD) prices to provide sewerage and sewage treatment facilities to Sok Kwu Wan;
- (c) **346DS** – Upgrading of Tuen Mun Sewerage, Phase 1 (part) at an estimated cost of about \$31 million in money-of-the-day (MOD) prices to provide sewerage to Tseng Tau Chung Tsuen in Tuen Mun.

PROPOSAL AND JUSTIFICATION

230DS – Outlying Islands Sewerage Stage 1 Phase 1 Part 2 - Yung Shue Wan Sewerage, Sewage Treatment Works and Outfall and

234DS – Outlying Islands Sewerage Stage 1 Phase 2 - Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities

2. At present, Lamma Island is unsewered and sewage arising from village houses is discharged into nearby water bodies after treatment by private treatment facilities, such as septic tanks and soakaway systems. These private treatment facilities in general are not effective in removing pollutants due to their close

proximity to watercourses¹ and inadequate maintenance². Their discharge is a source of pollution of nearby watercourses and receiving waters.

3. Projects **230DS** and **234DS** will provide proper sewage collection, treatment and disposal facilities capable of handling sewage from an estimated population of 5 300 at Yung Shue Wan (YSW) and 2 100 at Sok Kwu Wan (SKW), together with flow from commercial activities and visitors. Under the proposed projects, sewage from central YSW, SKW and Chung Mei will be collected by sewers to the proposed sewage treatment works (STWs) at YSW and SKW for secondary treatment and nutrient removal before disposal. On completion of the proposed projects in mid 2010, the water quality of the nearby watercourses and receiving waters of Lamma Island will be improved.

4. For efficiency, the two proposed projects will be implemented together under two contracts: one for the village sewerage works and the other for the STWs, outfalls and pumping stations. Two site plans showing the locations of the proposed works at YSW and SKW respectively are at **Enclosure 1**.

5. The works for the village sewerage will be implemented under a Design-Bid-Build (DBB) contract comprising the following:

- (a) Construction of about 5 kilometres (km) of sewers in eight villages of YSW and SKW, namely Po Wah Yuen, Sha Po New Village, Tai Yuen New Village, Kam Shan Terrace, Sha Po Old Village, Ko Long, Chung Mei and Sok Kwu Wan; and
- (b) Associated geotechnical works along the proposed sewer alignments.

Construction is scheduled to commence in early 2008 for completion in mid 2010.

6. The works for the STWs, the outfalls and pumping stations will be implemented under a Design-Build-Operate (DBO) contract comprising the following:

- (a) Design, construction and operation of two STWs providing secondary treatment at YSW and SKW with capacities of 2 850 and 1 430 m³/day respectively, together with the associated sludge treatment and odour control facilities;

¹ Soakaway systems operate by allowing the effluent to percolate through the gravel so that pollutants would be removed in a natural manner. However, if a system is located in an area where the underground water table is high such as an area in close proximity to watercourses, it cannot function properly.

² Inadequate maintenance of septic tanks or soakaway systems would affect the pollutant removal efficiency of a system and may even lead to an overflow of effluent.

- (b) Design, construction and operation of two submarine outfalls of lengths 500m and 750m at YSW and SKW respectively;
- (c) Slope stabilization works for the two STW sites and the associated maintenance works during the operation period; and
- (d) Design, construction and operation of two pumping stations and two twin rising mains with total length of about 1 km at SKW.

We plan to start construction in early 2008 for completion in mid 2010.

346DS – Upgrading of Tuen Mun Sewerage, Phase 1

7. At present, domestic sewage from unsewered areas in Tuen Mun is discharged into nearby watercourses after treatment by private treatment facilities. Most of these private treatment facilities are septic tanks and soakaway systems in village houses. The facilities in these areas are often ineffective in removing pollutants due to their close proximity to watercourses and inadequate maintenance. Sewage discharged from these unsewered areas is a source of pollution to the existing watercourses and the receiving waters in Tuen Mun Nullah and Castle Peak Bay. Moreover, the existing trunk sewerage in Tuen Mun does not have adequate capacity to handle the increasing sewage flow generated in the catchment areas.

8. In September 1993, the EPD completed the study “Tuen Mun Sewerage Master Plan” to establish a long-term sewerage improvement plan for Tuen Mun. We have been implementing the scheme in phases on a priority basis.

9. In January 2003 the EPD completed the study “Review of Tuen Mun and Tsing Yi Sewerage Master Plans” which assessed the adequacy of the existing sewerage system in Tuen Mun for meeting the future demand. It recommended, among other things, the following sewerage works under **346DS**:

- (a) Construction of about 6.8 km of trunk sewer (“the Western Interceptor Sewer”, WIS) and the associated Tuen Mun North sewage pumping station and WIS sewage pumping station in Tuen Mun;
- (b) Provision of pumping stations and village sewerage to collect and convey sewage from 21 unsewered villages/areas in Tuen Mun; and
- (c) Extension of the existing village sewerage in Sun Fung Wai, Nai Wai, Lam Tei, Tai Lam Chung Tsuen, Luen On San Tsuen, Wong Uk and Wu Uk.

10. Tseng Tau Chung Tsuen is one of the 21 unsewered villages under item 9(b) above. The hygiene problem in Tseng Tau Chung Tsuen is compounded by the fact that the domestic sewage is discharged directly into open drainage channels without any treatment. The situation of this village is even worse than the other villages where sewage is carried by underground conduits. To bring about early improvement to the adverse hygiene and environmental conditions in Tseng Tau Chung Tsuen, we will implement the Tseng Tau Chung Tsuen sewerage, which does not require any private land acquisition, as the first phase of **346DS**. Sewerage for other villages that may require acquisition of private land will be carried out under the subsequent phases. This implementation strategy is in line with the expectation of the Tuen Mun District Council.

11. We propose to upgrade part of **346DS**, called **Phase 1A**, to Category A for constructing the Tseng Tau Chung Tsuen sewerage. This comprises construction of about 4 km of sewers. A site plan showing the location of the proposed sewerage works is at **Enclosure 2**.

12. We plan to commence construction of the proposed works under Phase 1A in January 2008 for completion in October 2010. We will continue with the planning and design of the remaining works under **346DS** and target to complete their construction in December 2013.

FINANCIAL IMPLICATIONS

13. We estimate the capital cost³ of the proposed projects to be about \$574 million in MOD price made up as follows -

	\$ million (MOD)
(a) 230DS - Outlying Islands Sewerage Stage 1 Phase 1 Part 2 - Yung Shue Wan Sewerage, Sewage Treatment Works and Outfall	286
(b) 234DS - Outlying Islands Sewerage Stage 1 Phase 2 - Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities	257
(c) 346DS - Upgrading of Tuen Mun Sewerage, Phase 1	31
	<hr/>
Total	<hr/> 574 <hr/>

³ These are the latest estimates of the capital costs and new job opportunities. We will finalize the project costs and new job opportunities, and include the cost breakdown, prior to submitting the proposals to the PWSC for consideration.

14. There will also be recurrent cost implications estimated to be in the order of \$11 million per annum. This estimate is yet to be confirmed, and the final figure will be included in the PWSC paper in due course.

15. We estimate that the proposed projects will create some 108 jobs³ comprising 43 professional/technical staff and 65 labourers, providing a total employment of 3 622 man-months.

PUBLIC CONSULTATION

230DS – Outlying Islands Sewerage Stage 1 Phase 1 Part 2 - Yung Shue Wan Sewerage, Sewage Treatment Works and Outfall and 234DS – Outlying Islands Sewerage Stage 1 Phase 2 - Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities

16. We consulted the Islands District Council on 24 April 2006, and the Lamma Island (South) Rural Committee and the Lamma Island (North) Rural Committee on 22 June 2006 and 15 September 2006 respectively. They all supported the implementation of the projects.

17. The Lamma Area Committee, and the mariculturists' and fishermen's groups were also consulted on 22 February 2006 and 17 August 2006 respectively. We obtained their support together with constructive comments. We have taken due consideration of their comments in the implementation of the projects.

346DS – Upgrading of Tuen Mun Sewerage, Phase 1

18. We consulted the Tuen Mun District Council on 14 July 2006 on the proposed sewerage works for the villages in Tuen Mun. The District Council supported the implementation of the proposed works. We also consulted the Village Representatives of Tseng Tau Tsuen, San Wai Tsai and Leung Tin Tsuen on 27 April 2007 on the proposed sewerage works for Tseng Tau Chung Tsuen. They supported the implementation of the proposed works.

ENVIRONMENTAL IMPLICATIONS

19. Both projects **230DS** and **234DS** are designated projects under the Environmental Impact Assessment (EIA) Ordinance. We will apply for environmental permits under the Ordinance for their construction and operation. The EIA reports concluded that with proper mitigation measures, good site practices and appropriate phasing, the proposed works would not have any environmental impact.

20. **346DS** is not a designated project. We completed the Preliminary Environmental Review (PER) for the Review of Tuen Mun and Tsing Yi Sewerage

Master Plans in 2003. The PER concluded that environmental impacts brought about by the proposed works will mainly be short term effects during construction.

21. We will control noise, dust and site run-off to levels within established standards and guidelines through implementation of mitigation measures, such as quieter construction plant to reduce noise generation, water-spraying to reduce dust emission, and strict control on diversion of site run-off. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices are properly implemented.

22. At the planning and design stages, we have given due consideration to the need to minimize the generation of construction and demolition (C&D) materials. We will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse, and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will require the contractor to separate public fill from C&D waste before disposal at designated public filling reception facilities⁴ and landfills respectively. We will also control the disposal of public fill and C&D waste at these facilities by a trip-ticket system. We will record the disposal, reuse, and recycling of C&D materials for monitoring purposes.

23. We estimate that the proposed projects will generate a total of about 52 100 tonnes of C&D materials. Of these, we will reuse about 10 800 tonnes (21%) on site, deliver 33 400 tonnes (64%) to public fill reception facilities for subsequent reuse, and dispose of 7 900 tonnes (15%) at landfills. In addition, there will be 64 800 tonnes of dredged marine materials associated with the outfall construction at YSW and SKW, which will be disposed of at the Cheung Chau South Disposal Facility. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about \$1.9 million for these projects (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne⁵ at landfills; there is no charge for the disposal of dredged marine material at the Cheung Chau South facility).

ADVICE SOUGHT

24. Members are invited to support the Administration's proposal to upgrade the following three projects to Category A for consideration by the Public Works Subcommittee, with a view to seeking funding approval by the Finance Committee.

⁴ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of public fill in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

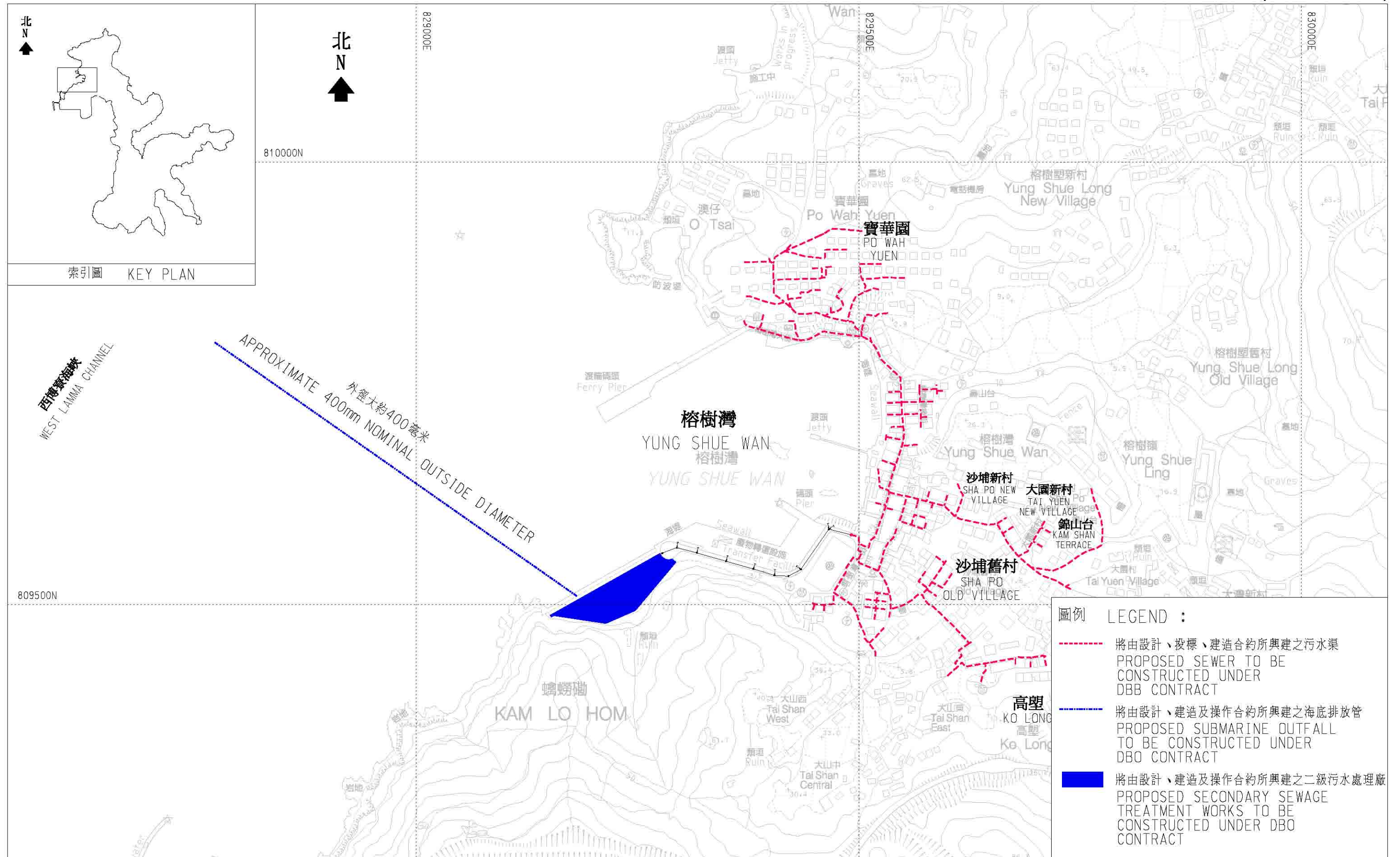
⁵ The estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

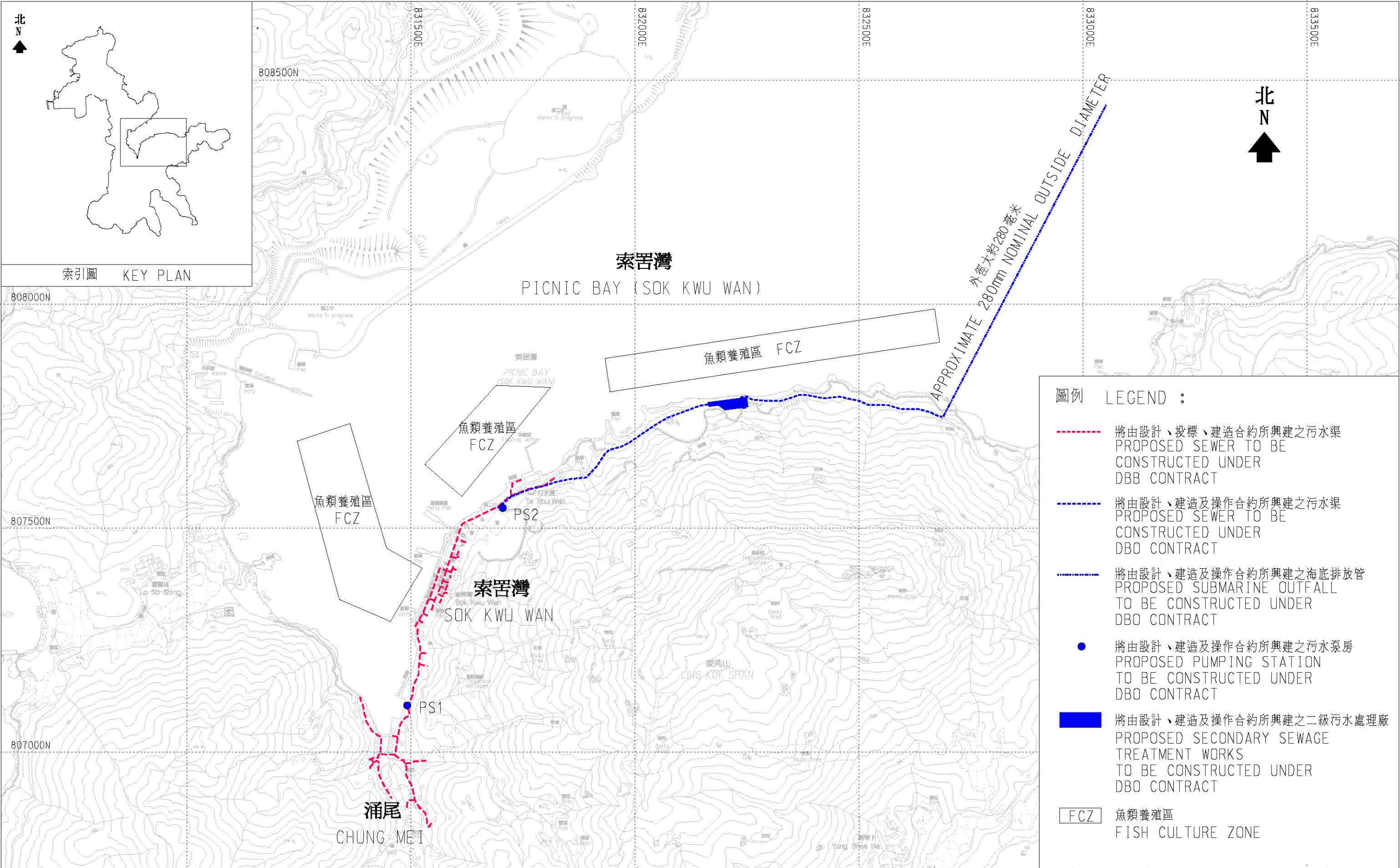
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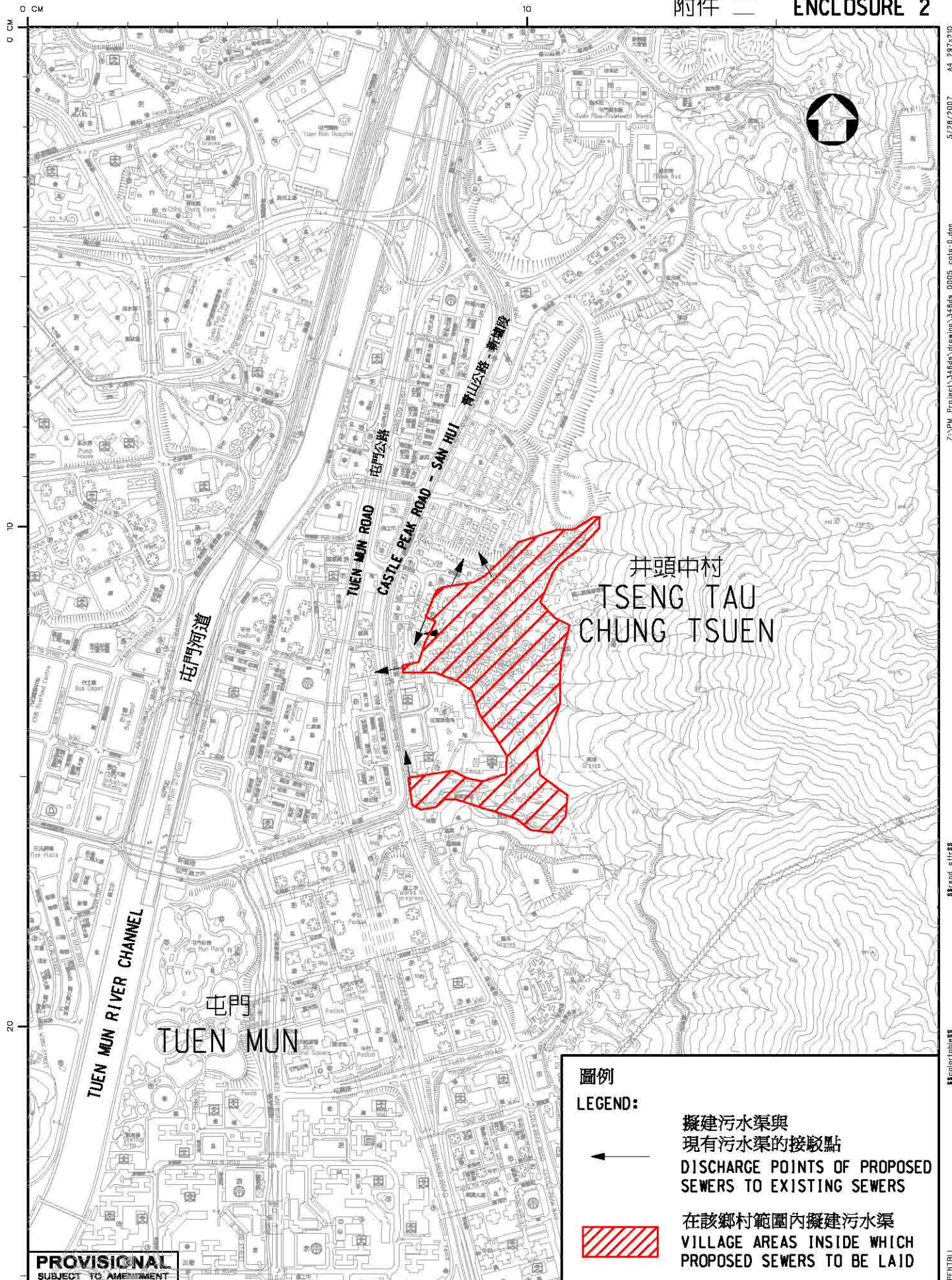
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(c) **346DS** – Upgrading of Tuen Mun Sewerage, Phase 1(part) at an estimated cost of about \$31 million in money-of-the-day (MOD) prices to provide sewerage to Tseng Tau Chung Tsuen in Tuen Mun.

Environmental Protection Department
June 2007







圖例

LEGEND:



擬建污水渠與
現有污水渠的接駁點
DISCHARGE POINTS OF PROPOSED
SEWERS TO EXISTING SEWERS



在該鄉村範圍內擬建污水渠
VILLAGE AREAS INSIDE WHICH
PROPOSED SEWERS TO BE LAID

PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title
工務計劃項目4346DS
屯門污水收集系統改善計劃第一期甲
井頭中村
PWP ITEM 4346DS
UPGRADING OF TUEN MUN SEWERAGE, PHASE 1A
VILLAGE SEWERAGE AT TSENG TAU CHUNG
TSUEN

繪圖 drawn	SIGNED C.K.LAM	日期 date	19.04.07
核對 checked	SIGNED W.H.CHO	日期 date	28.05.07
批核 approved	SIGNED K.C.LO	日期 date	28.05.07
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no.	比例 scale
DPM/346DS/0005	N.T.S.
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