

**For discussion
on 31 March 2003**

**Legislative Council
Panel on Environmental Affairs**

**208DS - Outlying Islands sewerage, stage 1 phase 1 part 1
Ngong Ping sewerage, sewage treatment and disposal**

Purpose

This paper seeks Members' views on the Administration's proposal of submitting PWP Item **208DS** "Outlying Islands sewerage, stage 1 phase 1 part 1 - Ngong Ping sewerage, sewage treatment and disposal" to the Public Works Subcommittee for consideration for part upgrading to Category A at an estimated cost of \$250.4 million in money-of-the-day (MOD) prices for the construction of a tertiary sewage treatment plant, public sewers, and an effluent export pipeline at Ngong Ping, Lantau Island.

Background

2. To meet the development needs and to improve water quality in coastal waters, the Administration completed in 1994 the Outlying Islands Sewerage Master Plan (SMP) Study which recommended to upgrade the sewerage, sewage treatment and disposal facilities at six areas including Ngong Ping. We subsequently included all these proposed works under **208DS** "Outlying Island sewerage, stage 1, phase 1" in Category B of the PWP in 1995. In 1996, Finance Committee approved the upgrading of part of 208DS as 209DS for engaging consultants to carry out impact assessment, investigation, and detailed sewerage design at Ngong Ping amongst other areas. The preliminary investigation works were completed in early 1998.

3. At present, there are neither public sewers nor sewage treatment works at Ngong Ping. Sewage generated from Ngong Ping is either tankered away or disposed of through the privately owned septic tank and soakaway systems¹. Under the 1994 SMP Study, the Ngong Ping sewerage scheme was planned to cater for about 12,000 visitors per day and 500 residents in Ngong Ping. Following the Administration's decision to develop a cable car system linking Ngong Ping and Tung Chung for tourism promotion, the Environmental Protection Department

¹ Septic tank and soakaway systems operate by utilizing the microorganisms in the septic tank to degrade the suspended solids originated from the wastewater. Effluent leaving the septic tank would then percolate through the gravel in the soakaway pit where the organic pollutants and pathogens will be further degraded and removed by the microorganisms in a natural manner. Sludge generated in the septic tank has to be tankered away periodically.

completed a review of the Ngong Ping sewerage scheme in 2001. The review concluded that the Ngong Ping sewerage scheme should be expanded to cater for around 47,000 visitors and the related developments. In June 2001, the Finance Committee approved additional funding for the relevant consultancy study to cover the costs of impact assessments, investigation, and design work for the revised Ngong Ping sewerage scheme.

Proposal

4. To cope with the substantial increase in sewage flow upon the commissioning of the cable car project and its related developments, and to protect water quality in the water gathering ground for the Shek Pik reservoir and in other receiving water bodies, we propose to construct public sewers, a tertiary² sewage treatment plant with disinfection at Ngong Ping – the Ngong Ping sewage treatment works (NPSTW) - to collect and treat the sewage, and an effluent export pipeline to convey and discharge the effluent into the Southern Marine Waters at Tung Wan. As a pilot scheme for effluent reuse in Hong Kong, part of the effluent from the NPSTW will be fed into a separate “flushing and other non-potable” reclaimed water supply system³ for reuse at the public toilets at Ngong Ping and potentially the cable car terminal and the related developments. The reuse of reclaimed water is also expected to reduce the volume of effluent to be discharged at Tung Wan. A site plan showing the location of the proposed works is at **Enclosure 1**.

5. We propose to upgrade part of **208DS** “Outlying Islands sewerage, stage 1 phase 1 part 1- Ngong Ping sewerage, sewage treatment and disposal” to Category A for implementation of the Ngong Ping sewerage scheme. The scope of the proposed works comprises –

- (a) the laying of about 0.65 km of trunk and branch sewers (with diameters ranging from 250mm to 500mm) in Ngong Ping;
- (b) the construction of NPSTW and associated electrical and mechanical equipment and installations; and
- (c) the laying of about 5.7 km of twin 200mm effluent export

² With tertiary treatment, sewage from Ngong Ping is treated by physical, biological and UV-irradiation processes to reduce the level of organic pollutants, suspended solids, nitrogen (a nutrient) and pathogenic organisms to protect the sensitive receiving waters.

³ The construction of the flushing and other non-potable reclaimed water supply system will be funded under **Head 709 - 323WF** which was approved by Finance Committee on 21 February 2003. The supply system will be entrusted to Drainage Services Department for construction in conjunction with the Ngong Ping sewerage scheme.

pipeline from the proposed NPSTW to Tung Wan⁴.

6. As a minor part of the proposed sewerage pipe laying works at Ngong Ping falls within the works boundary of the cable car project to be implemented by the Mass Transit Railways Corporation Limited (MTRCL), the Administration will entrust the design and construction of the concerned pipe laying works to the MTRCL so as to avoid interface problems during construction and minimise public inconvenience arising from road openings. The Administration will however engage its own consultants and contractor to implement the remainder of the sewerage works in the usual manner.

7. We plan to start the construction of the proposed NPSTW, public sewers, and the effluent export pipeline in August 2003 for completion in July 2005, in order to meet the target commissioning date of August 2005 for the Cable Car System.

Financial Implications

8. We estimate the capital cost of the proposed works to be \$250.4 million in MOD prices, made up as follows -

	Estimate (\$million)
(a) (i) About 0.65 km of Trunk and branch sewers	7.4
(ii) Ngong Ping Sewage treatment works	153.0
- civil works	96
- electrical and mechanical works	57
(iii) About 5.7 km twin effluent export pipeline	35.6
(b) Consultants' fees for	29.0
- contract administration	1.0

⁴ Our original proposed scheme was to convey the effluent from the NPSTW to Tai O for discharge, which had been confirmed by the Environmental Impact Assessment (EIA) conducted for this project as the best option from environmental perspective. However, this proposal was strongly objected by some members of the Islands District Council, the Tai O Rural Committee and Tai O residents. In response to these objections, the Drainage Services Department conducted an additional EIA study to evaluate the acceptability of discharging the effluent at Tung Wan. The additional EIA study, endorsed by the Advisory Council on the Environment, confirmed that the Tung Wan discharge option was environmentally acceptable.

- site supervision	28.0	
(c) On-cost payable to MTRCL	0.8	
(d) Environmental mitigation measures	4.5	
(e) Contingencies	22.0	
	Sub-total	<u>252.3</u> (Sep 2002 prices)
(f) Provision for price adjustment	(-1.9)	
	Total	<u>250.4</u> (MOD prices)

9. We estimate the annual recurrent expenditure arising from this project to be about \$5.3 million. Based on the current level of expenditure on operation and maintenance of sewerage facilities, the proposed works by themselves would lead to an increase in the recurrent cost of providing sewage services by about 0.36%.

10. We estimate that the projects would create some 150 new jobs, including 25 professional/technical staff and 125 labourers, during the construction of the above proposed works.

Public Consultation

11. We consulted the Islands District Council (IDC) and Tai O Rural Committee (TORC) in December 2002 and January 2003 respectively on the proposed works. Both IDC and TORC supported the proposed works.

Environmental Implications

12. We have completed Environmental Impact Assessment (EIA) studies for the proposed works⁵. In general, the studies concluded that all the proposed construction works will not give rise to insurmountable environmental impacts with the implementation of mitigation measures. For short term impacts during construction, we will control noise, dust and site run-off within established standards and guidelines through implementation of environmental mitigation measures, such as the use of temporary noise barriers and silenced construction plant to reduce noise generation, and water-spraying to reduce emission of dust.

⁵ The main EIA study for the project incorporating the Tai O discharge option was approved by the Environmental Protection Department (EPD) in November 2002. The supplementary EIA study for the Tung Wan discharge option was approved by EPD in January 2003.

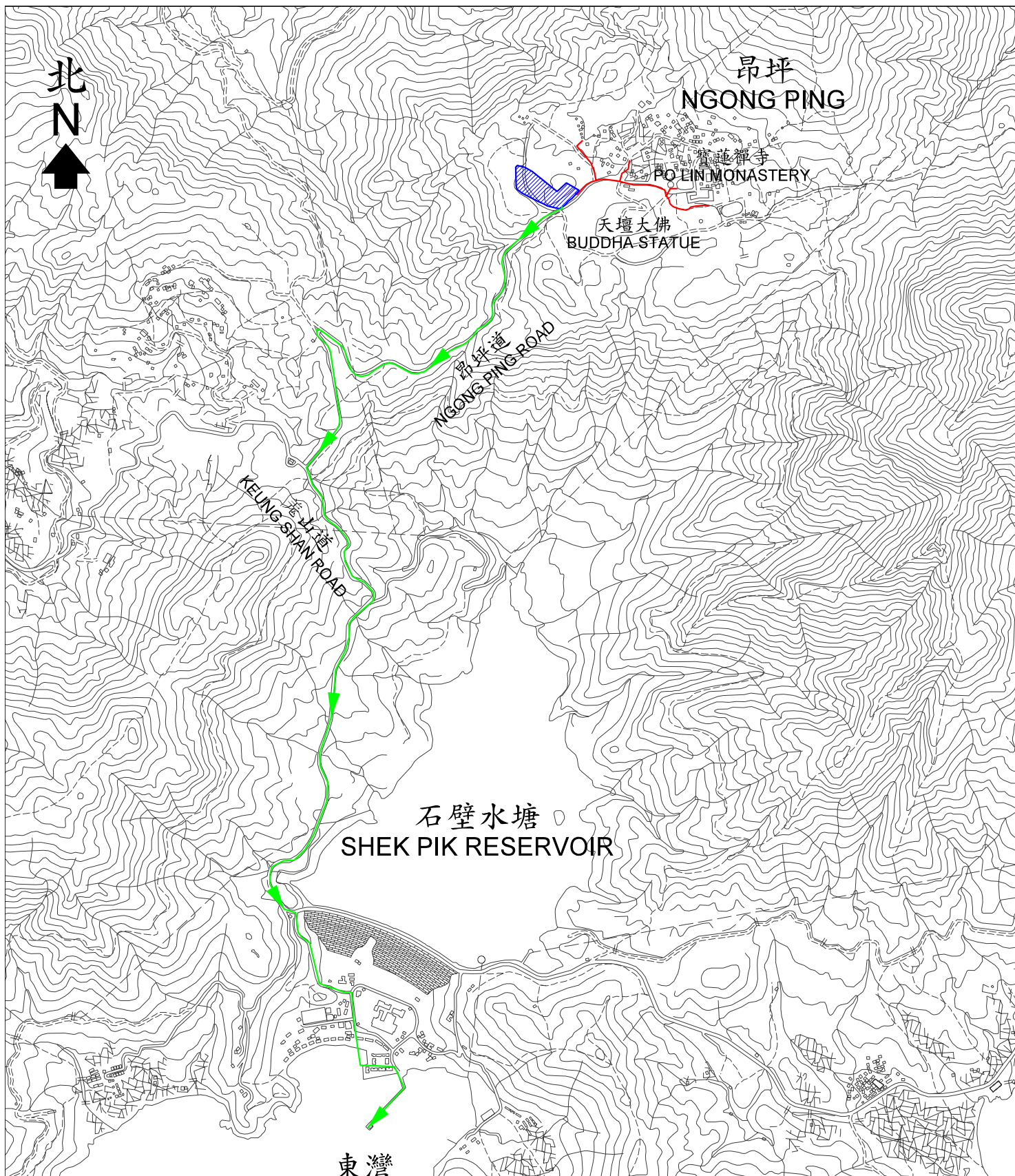
We estimate the cost of implementing the environmental mitigation measures to be \$4.5 million in MOD prices which has been included in the project estimate.

13. We have given due consideration to the need to minimise the generation of construction and demolition (C&D) materials in designing the levels and layout of the sewage treatment plant and the levels and alignments of the proposed pipeline. To further minimise the generation of C&D materials, we will encourage the contractors to use steel instead of timber in formwork and temporary works. We estimate that about 82,000 cubic metre (m³) of construction and demolition (C&D) materials will be generated by the project. About 23,000 m³ (28%) will be reused on site, 58,000 m³ (71%) will be reused as fill in public filling areas and 1,000 m³ (1%) will be disposed of at landfills.

Advice Sought


14. Members are invited to support our proposal of upgrading part of **208DS** for consideration by the Public Works Subcommittee in April 2003 with a view to seeking the funding approval of Finance Committee in May 2003.

Environment, Transport and Works Bureau
Drainage Services Department
March 2003



圖例 LEGEND	
	擬建之三級污水處理廠的位置 PROPOSED TERTIARY SEWAGE TREATMENT PLANT SITE
	擬建經處理污水雙排放管道 PROPOSED TWIN EFFLUENT EXPORT PIPELINE
	擬建之污水渠 PROPOSED SEWERS

工程計劃項目第208DS/B號
PWP ITEM No. 208DS/B

圖則名稱 drawing title 離島污水收集系統第1階段 第1期第一部份 - 昂坪污水 收集系統、污水處理及排放設施 OUTLYING ISLANDS SEWERAGE, STAGE 1, PHASE 1 PART 1 - NGONG PING SEWERAGE, SEWAGE TREATMENT AND DISPOSAL	繪畫 drawn C.W. CHAN	日期 date 11-02-2003	圖則編號 drawing no. DCM/2003/007	比例 scale N.T.S.
	核對 checked H.S. FONG	日期 date 11-02-2003		
	批核 approved K.W. MAK	日期 date 11-02-2003	保留版權 COPYRIGHT RESERVED	
	部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION		