

## ITEM FOR FINANCE COMMITTEE

### HEAD 43 - CIVIL ENGINEERING DEPARTMENT Subhead 700 General other non-recurrent

Members are invited to approve a new commitment of \$29.2 million in money-of-the-day prices for the monitoring of three new uncontaminated mud disposal sites at the seafloors south of Tsing Yi, north of Lantau and east of Tung Lung Chau.

#### PROBLEM

We need to make available new sites to meet the demand for the disposal of uncontaminated mud<sup>1</sup>.

#### PROPOSAL

2. The Director of Civil Engineering (DCE), with the support of the Secretary for Works, proposes to create a new commitment at an estimated cost of \$29.2 million in money-of-the-day (MOD) prices for the monitoring of three new uncontaminated mud disposal sites.

#### JUSTIFICATION

3. Since 1992, the Civil Engineering Department (CED) has been managing two open seafloor multi-user disposal areas south of Cheung Chau and east of Ninepins for uncontaminated mud from all public works projects. Mud generated from private projects is also disposed at these sites but this contributes

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<sup>1</sup> Uncontaminated mud refers to dredged materials suitable for open sea disposal without the requirement of capping.

Encl. 1 to less than 1% of the total quantity. CED estimates that the available capacity of the two areas will be exhausted by the end of 1999. At the same time, he projects that the yearly uncontaminated mud disposal requirement will stay at above 30 million cubic metres in the next few years. (Details of the projections are at Enclosure 1.) Hence there is a need to identify new sites for the disposal of uncontaminated mud.

Encl. 2 4. CED has identified three new disposal sites at the seafloors south of Tsing Yi, north of Lantau and east of Tung Lung Chau as shown in Enclosure 2. They are previous marine sand borrow pits left empty following sand extraction. The three sites together with the remaining capacity in the existing sites south of Cheung Chau and east of Ninepins would be able to meet the projected demand for uncontaminated mud disposal up to about March 2004.

5. However, to allow mud disposal at the three new sites, the Director of Environmental Protection requires that a monitoring scheme be put in place for regular water quality, bathymetric and ecological monitoring<sup>2</sup> in accordance with the environmental monitoring and audit programme recommended by the Environmental Impact Assessment (EIA) studies. This is to ensure that the new international standards for managing mud disposal facilities adopted by the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, to which Hong Kong through China is a signatory, will be met.

6. If the three disposal sites are not available in time, this would lead to unbearable consequences on the delivery of public works projects. In particular, the regular maintenance dredging of ports and navigational fairways for maritime activities will be adversely affected if there is insufficient capacity to dispose of the uncontaminated mud. DCE therefore proposes to set up a system in accordance with the monitoring and audit programme recommended by the EIA study for monitoring the use of the three sites starting from April 1999 for five years until their capacities have been exhausted.

7. DCE has considered using in-house staff resources for undertaking the monitoring work. He concludes that this is not possible because all his staff have been fully engaged. Furthermore, the department lacks expertise in

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<sup>2</sup> Bathymetric surveys measure backfilling levels to ensure that mud is evenly spread and that no high spots are formed inside the pits. Ecological monitoring refers to the study of the number and variety of marine organisms. This monitoring is designed to detect any ecological impact resulting from disposal operations and to determine whether operational modifications are necessary.

interpreting ecological field monitoring. Entrusting the work to contractors and consultants is considered the most appropriate approach especially given the time-limited nature of the work.

**FINANCIAL IMPLICATIONS**

8. We estimate the total cost of the project to be \$29.2 million in MOD prices, made up as follows -

		<b>\$ million</b>	
(a)	Water quality monitoring	11.1	
(b)	Bathymetric monitoring	4.4	
(c)	Ecological monitoring	9.0	
(i)	field monitoring	4.5	
(ii)	consultants' fees	4.5	
	<b>Sub-total</b>	<b>24.5</b>	(at October 1998 prices)
(d)	Inflation allowance	4.7	
	<b>Total</b>	<b>29.2</b>	(at MOD prices)

9. As regards paragraph 8(a), the cost of \$11.1 million is for engaging contractors to conduct water quality monitoring of all three sites, each for two days per month.

10. As regards paragraph 8(b), the cost of \$4.4 million is for engaging contractors to conduct bathymetric monitoring to ensure that mud is evenly spread and that no high spots are formed inside the pits. At each site, bathymetric survey will be carried out twice per year.

11. As regards paragraph 8(c), the cost of \$9 million is composed of two elements. An estimated \$4.5 million is for engaging contractors to conduct ecological monitoring by taking regular samples of marine organisms from the

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mud sites and analysing the results. Another estimated \$4.5 million is for hiring consultants to independently interpret the ecological monitoring results produced by the contractor and to assess the seabed recovery. This monitoring approach will ensure that we can detect any ecological impact resulting from disposal operations and determine whether operational modifications are necessary.

12. As regards paragraph 8(d), the cost of \$4.7 million is an inflation allowance. We shall tender the monitoring work under standard remeasurement contracts with provision for inflation adjustment because the duration of the contract period will be longer than 21 months. The cost of monitoring is independent of the actual amount of mud intake. We shall award the consultancy on a lump-sum basis with provision for inflation adjustment as the contract will be longer than 12 months.

Encl. 3  
Encl. 4

13. A detailed breakdown of the costs is at Enclosure 3. A breakdown of the consultants' fees is at Enclosure 4.

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

Year	\$ million (October 1998)	Price adjustment factor	\$ million (MOD)
1999-2000	4.9	1.05833	5.2
2000-2001	4.9	1.12183	5.5
2001-2002	4.9	1.18914	5.8
2002-2003	4.9	1.26049	6.2
2003-2004	4.9	1.33612	6.5
Total	<u>24.5</u>		<u>29.2</u>

15. The proposed project will not give rise to any recurrent expenditure.

**ENVIRONMENTAL IMPLICATIONS**

16. We have completed EIA studies for the three new sites, which were funded under Public Works Item 5454CL "Fill Management Study, Phase VI - investigation for further fill resources, seabed reinstatement, dredging and marine disposal, environmental and physical studies". The EIA studies concluded that disposal of uncontaminated mud at the three sites would be environmentally acceptable, and recommended environmental monitoring and audit programme for the operation of the disposal sites. The Advisory Council on the Environment endorsed the EIA for the sites south of Tsing Yi and north of Lantau on 9 February 1996 and the EIA for the site east of Tung Lung Chau on 23 March 1998.

**BACKGROUND INFORMATION**

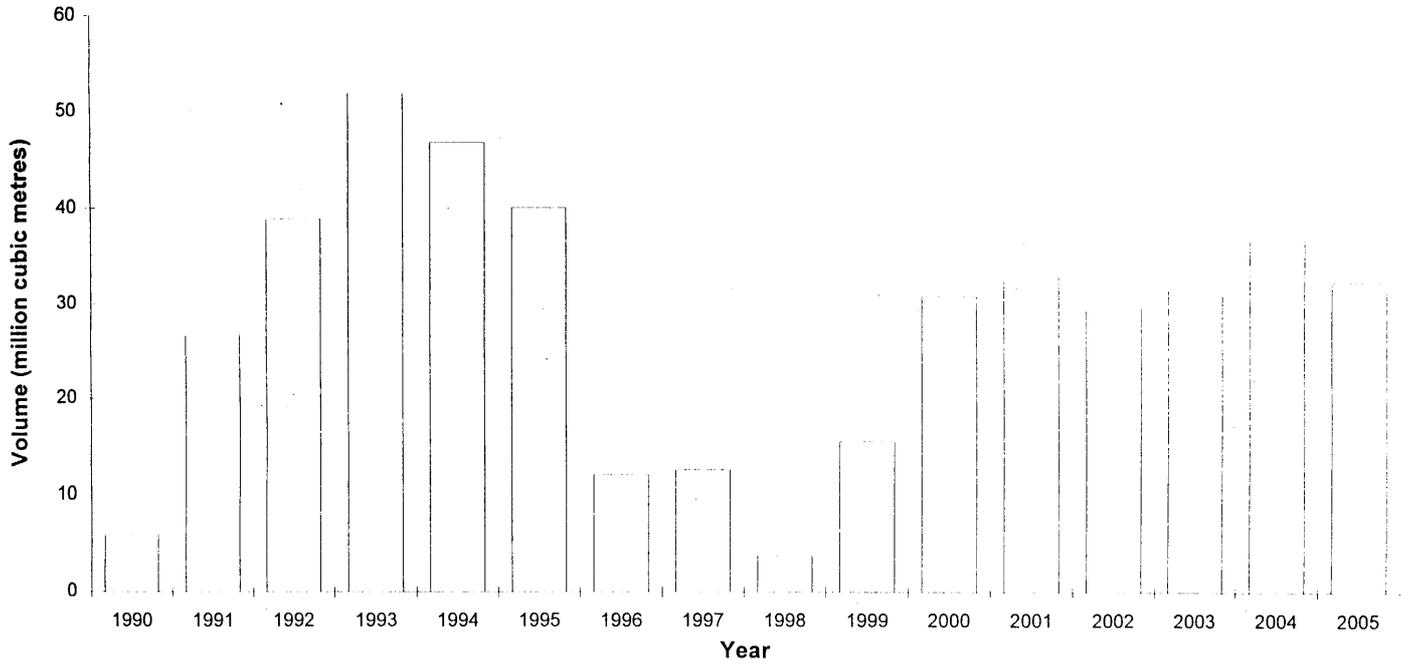
17. The south of Tsing Yi and north of Lantau sites are ready to receive uncontaminated mud. The east of Tung Lung Chau site will be ready to receive mud in early 1999 on completion of the baseline survey funded under Public Works Item 5454CL.

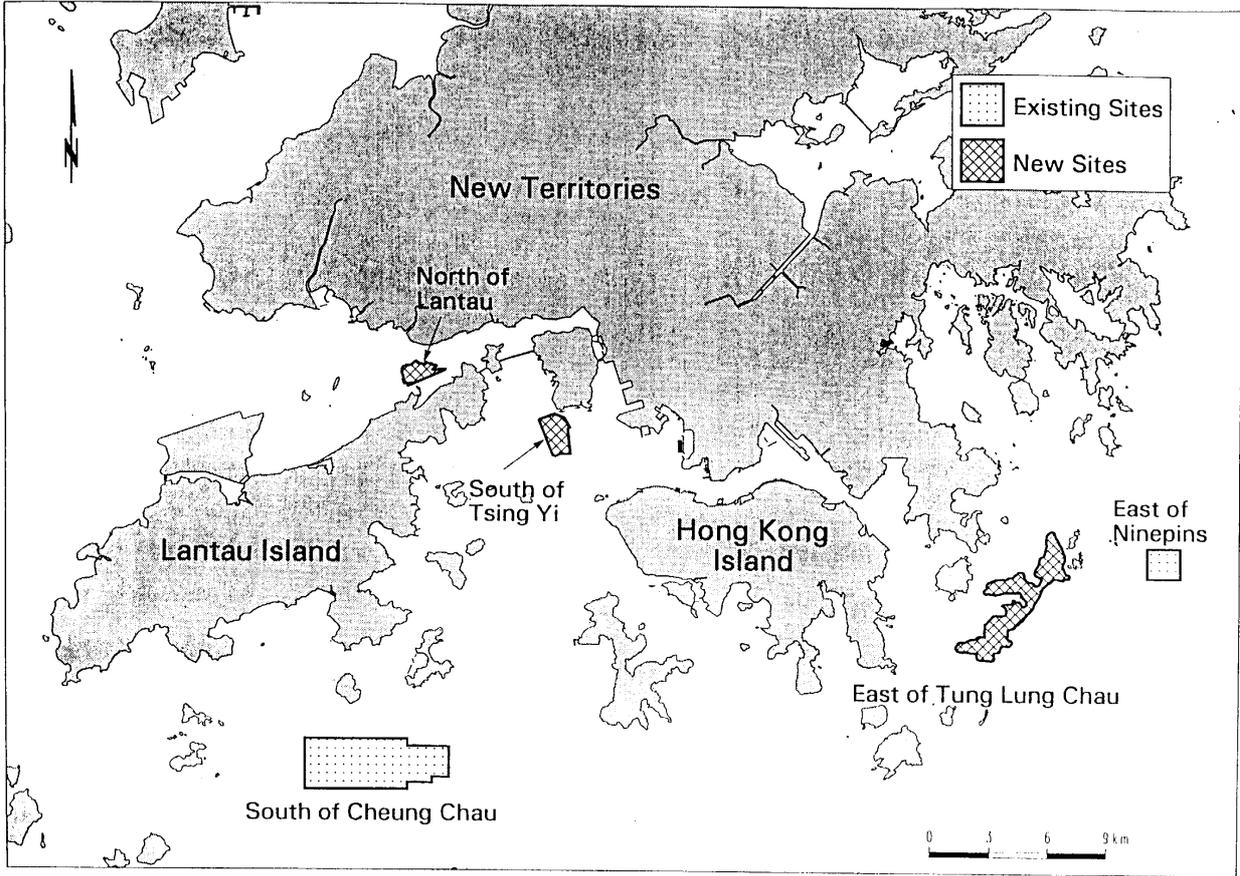
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Works Bureau  
January 1999



# YEARLY UNCONTAMINATED MUD DISPOSAL REQUIREMENTS





Uncontaminated Mud Disposal Areas

**Enclosure 3 to FCR(98-99)64**

**Breakdown of costs  
for monitoring three new uncontaminated mud disposal sites  
south of Tsing Yi, north of Lantau and east of Tung Lung Chau**

The estimated cost is as follows -

	<b>Area km<sup>2</sup></b>	<b>Bathymetry (\$ million)</b>	<b>Water quality (\$ million)</b>	<b>Ecology (\$ million)</b>	<b>Total (\$ million)</b>
<b>South of Tsing Yi</b>	8	0.24	0.74	0.6	1.6
<b>North of Lantau</b>	3	0.09	0.74	0.6	1.4
<b>East of Tung Lung Chau</b>	18	0.54	0.74	0.6	1.9
Cost per year					4.9
Total cost for five years					24.5
Inflation allowance					4.7
Total					29.2 (at money-of- the-day prices)

Notes :

- The cost of monitoring is independent of the actual disposal volume.
- Bathymetric monitoring cost is calculated based on similar types of survey for which the average cost was \$15,000 per square kilometres. At each site, bathymetric survey will be carried out twice per year.
- Water quality monitoring cost per disposal site is calculated based on an existing term contract at \$28,000 per day plus 10% (for price adjustment), for two days per month per site.
- Ecological monitoring and consultancy costs are calculated based on a similar existing contract of \$4.5 million for eight sites. The pro-rata charge for doing similar types of work at each site is about \$0.6 million.

**Enclosure 4 to FCR(98-99)64**

**Breakdown of Consultants' Fees**

Breakdown of estimates for consultants' fees (at October 1998 prices) -

		<b>Estimated man- months</b>	<b>Average MPS salary point</b>	<b>Multiplier factor</b>	<b>Estimated fee (\$ million)</b>	
(a)	Assess ecological monitoring results	Professional	22.5	40	2.4	3.390
		Technical	7.5	16	2.4	0.378
(b)	Assess seabed recovery	Professional	3.5	40	2.4	0.527
		Technical	3.5	16	2.4	0.176
Total consultants' fees					4.471	

Notes :

A multiplier factor of 2.4 is applied to the average Master Pay Scale (MPS) to arrive at the full staff costs including the consultants' overheads and profit, as the staff will be employed in the consultants' offices.

(At 1 April 1998, MPS point 40 = \$62,780 per month and MPS point 16 = \$21,010 per month.)