

For discussion
on 25 November 2002

**Legislative Council
Panel on Environmental Affairs**

Environmental Improvement of Shing Mun River

PURPOSE

This paper seeks to advise Members of the progress of Stage 1 works of the project “Environmental Improvement of Shing Mun River (the River)”, approved by the Finance Committee on 12 January 2001, and the current environmental conditions of the River. In addition, Members’ support is sought for the Administration’s proposal to submit the remaining environmental improvement works (i.e. the Stage 2 works) of the River to the Public Works Subcommittee for consideration.

BACKGROUND

2. The 5.5 kilometres long River, constructed in 1970s for flood prevention purposes, became heavily polluted in the 1980s due to rapid increase in population in Sha Tin and indiscriminate discharges from industrial, commercial, livestock and domestic sources. Following the declaration of the Tolo Harbour and Channel Water Control Zone under the Water Pollution Control Ordinance in 1987, the implementation of the revised Livestock Waste Control Scheme in 1994, and the phased provision of a sewerage network for the unsewered villages in the River catchment under the Tolo Harbour Stage 1 sewerage scheme, the pollution load discharging into the River has been sharply reduced by 94% in 2001 as compared with 1987.

3. However, the accumulation of sediments at the riverbed over the past few decades continues to adversely affect the water quality. It also releases obnoxious odour at times, and suppresses the development of a balanced ecology within the River system. To improve the situation, it is necessary to maintain the sewerage connection programme and, at the same time, carry out improvement works to remove the pollutants at the riverbed.

STAGE 1 IMPROVEMENT WORKS ON THE SEDIMENTS

4. In 1996, the Environmental Protection Department (EPD) commissioned a study to formulate the most cost-effective and environmentally acceptable methods in tackling the odour arising from the sediments at the River. The study concluded that a combined strategy of in-situ bioremediation¹, dredging, and minor engineering works would provide a long-term solution to the problem.

5. Subsequent to the detailed design of the improvement works, we divided the project – **51DP** “Environmental Improvement of Shing Mun River”- into two stages as illustrated in Annex. With Members’ support, the Finance Committee approved an estimated cost of \$70 million (in money-of-the-day prices) in January 2001 for the Stage 1 works. These works, which focuses on the most polluted sections of the River, commenced in May 2001. We improved the River channel lining at the upstream by August 2001 and then proceeded with the year-long dredging works and bioremediation treatments in the most critical sections of the River from Man Lai Court to the Heritage Museum and the main River channel near Ravana Garden. So far, about 18 hectares of the riverbed have undergone the in-situ bioremediation treatments and 160 000 cubic metres (m³) of sediments have been dredged. The remaining Stage 1 works in the middle and upper stream of the River will be completed by the end of 2002.

6. Although the Stage 1 works have not been fully completed, the sediment samples collected at treated sections of the riverbed showed that the odour problem has largely been relieved after treatment. Sediments therein have turned from blackish and colloidal to brown in colour with the texture of sand grains. The level of Acid Volatile Sulphide (AVS), which is the source of obnoxious odour, in treated sediments have dropped by over 99% after application of bioremediation. The Reduction Oxidation Potential (Redox) of the sediments has gone up significantly above the threshold level of –200mV, thereby preventing the future generation of the odour (i.e. hydrogen sulphide gas). The quality of the sediments has also improved to such an extent which would allow a more prosperous growth of bacteria for further aerobic decomposition of organic polluting contents. In the light of our recent testing results, we expect that the improvements should be able to sustain over time, provided that the Government and the community can continue to jointly prevent the discharge of new pollutants into the River. Subject to approval of

¹ The in-situ bioremediation process involves the injection of chemicals (i.e. specially designed oxidants) into the sediments at the riverbed in two treatment applications. Micro-organisms in the River will then utilize the chemicals to convert organic matter within the sediments into harmless natural materials such as carbon dioxide and water.

the Finance Committee for the remaining works at the River proposed below, we plan to continue to monitor the sediment quality of the riverbed as part of the Stage 2 works.

STAGE 2 IMPROVEMENT WORKS

7. Stage 1 works focus on the most polluted sections of the River. The less-polluted sections remain untreated. To improve these remaining sections, we now propose to upgrade the remaining part of **51DP**, entitled “Environmental improvement of Shing Mun River – Stage 2”, to Category A at an estimated cost of \$27.9 million² in money-of-the-day prices. The Civil Engineering Department plans to start the works in March 2003 for completion in June 2006. The scope of the proposed improvement works together with the cost breakdown is as follows -

<u>Works</u>	<u>\$ million</u>
(a) bioremediation of the remaining polluted riverbed of about 19 hectares	9.9
(b) dredging of about 110 000 m ³ of riverbed sediments	6.6
(c) improvements to a small portion of the River channel lining and other minor engineering works	2.9
(d) environmental mitigation measures and implementation of environmental monitoring and audit programme for works mentioned in items (a) to (c) above	2.4
(e) monitoring of the sediment and water quality after bioremediation	3.4
(f) contingencies	2.7
Total	<u>27.9</u>

8. We consulted the Health and Environment Committee of the Sha Tin District Council on 7 November 2002 on the proposed Stage 2 works and obtained the Committee’s support.

9. We completed an environmental review of the project in 1998. The

² This is the latest estimate. We would finalise the project cost when submitting the proposal to the Public Works Subcommittee for consideration.

review concluded and EPD agreed that the proposed works, with implementation of the mitigation measures, would not have long-term adverse environmental impacts. The sediments dredged would be classified in accordance with the established management framework and disposed of properly in the assigned disposal sites as appropriate.

10. We anticipate that upon completion of the Stage 2 works, the odour problem at the River will be further reduced. The sediments after bioremediation treatments will improve in quality and form a protective layer to prevent new sediments from turning anaerobic and becoming new sources of the odour problem. These improvements will lead to a healthier ecological system in the River and provide a better environment for local residents as well as visitors when they take part in various water sports, such as rowing and boating.

CONTROL AND EDUCATION







11. To sustain the impact of the environmental improvement works on the River, we would need to continue to control pollution at source and take stringent enforcement actions against illegal discharges. In this regard, the Food and Environmental Hygiene Department will continue its street-cleaning programme to prevent rubbish and pollutants from being carried into the River and will employ contractors to collect the floating refuse. EPD will continue to step up enforcement actions to guard against illegal discharges into the River catchment area. Apart from the efforts made by Government departments, we need to count on the cooperation of the local community to protect the water quality of the River. We will continue to promote public awareness in preserving the improved environment in the River in partnership with the Sha Tin District Council through activities like carnivals and school visits. We will show the public the present improvement of the River and educate them on the importance of maintaining a clean and ecologically sustainable River.

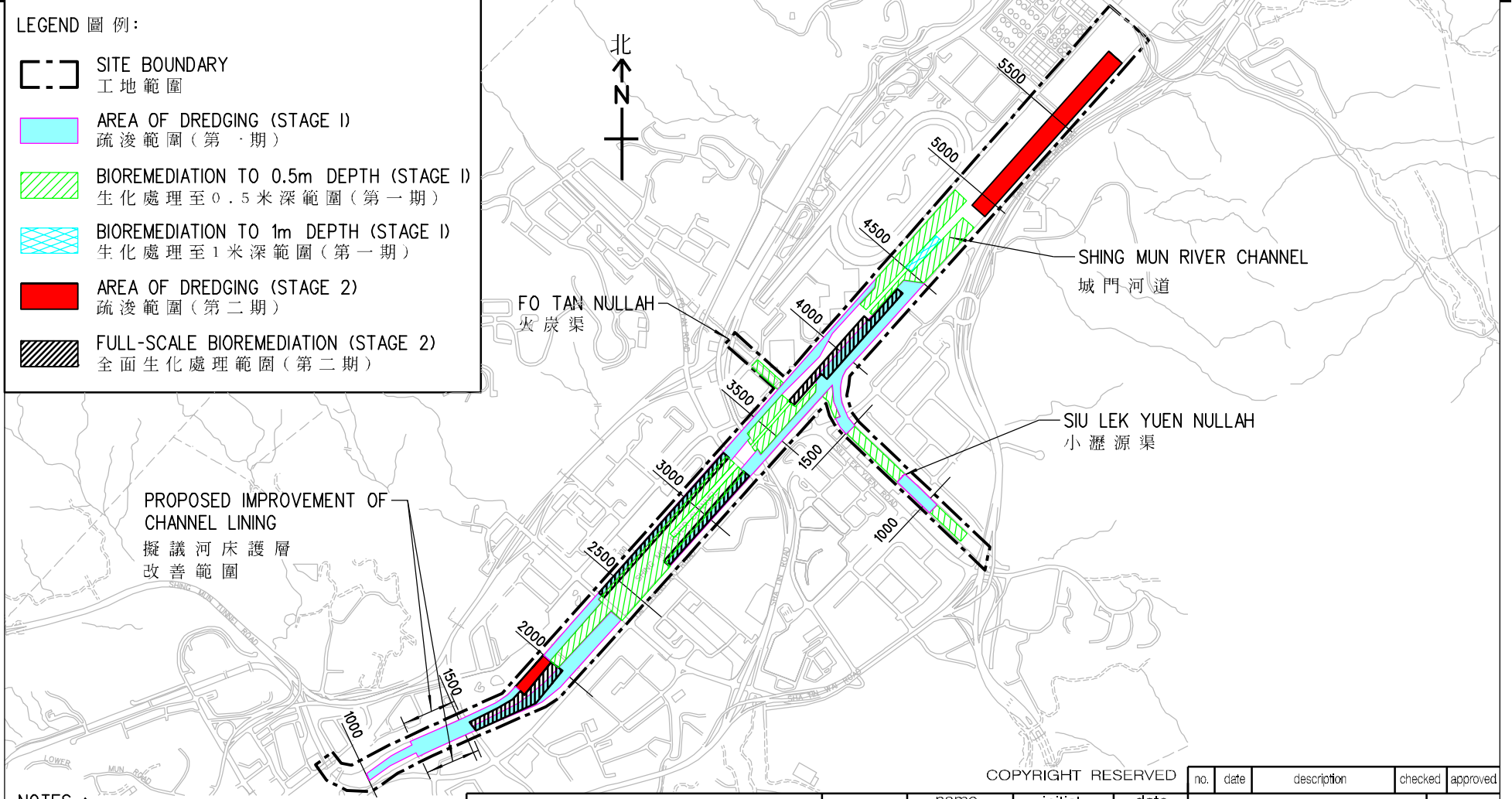
CONCLUSION

12. Members are invited to -
- (a) note the improvement in the River under the Stage 1 improvement works (paragraph 6); and
 - (b) give views and support the Administration in seeking the Public Works Subcommittee to recommend to the Finance Committee the funding proposal for the remaining part of **51DP** “Environmental improvement of Shing Mun River – Stage 2” (paragraphs 7-10).

Environment, Transport and Works Bureau
November 2002

LEGEND 圖例:

-  SITE BOUNDARY
工地範圍
-  AREA OF DREDGING (STAGE 1)
疏浚範圍 (第一期)
-  BIOREMEDIATION TO 0.5m DEPTH (STAGE 1)
生化處理至 0.5 米深範圍 (第一期)
-  BIOREMEDIATION TO 1m DEPTH (STAGE 1)
生化處理至 1 米深範圍 (第一期)
-  AREA OF DREDGING (STAGE 2)
疏浚範圍 (第二期)
-  FULL-SCALE BIOREMEDIATION (STAGE 2)
全面生化處理範圍 (第二期)




- NOTES :**
- APART FROM THE AREA SHOWN FOR DREDGING, DREDGING SHALL ALSO BE CARRIED OUT AT OTHER AREAS DESIGNATED BY ENGINEER PARTICULARLY AT OUTFALLS.
 - ADDITIONAL BIOREMEDIATION, MAINLY SUPPLEMENTARY, SHALL ALSO BE CARRIED OUT AT AREAS DESIGNATED BY ENGINEER AS FROM TIME TO TIME.

title 名稱
PWP ITEM No. 051DP
ENVIRONMENTAL IMPROVEMENT OF SHING MUN RIVER STAGE 2 - IMPROVEMENT REQUIREMENTS
 工務計劃項目第 051DP 號
 城門河環境改善工程第 2 期 - 改善範圍

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