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Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report

Improvement Dredging
for Lamma Power Station Navigation Channel

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report for Improvement Dredging for Lamma Power Station (LPS) Navigation Channel (hereafter known as “the Project”) submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-251/2017). The Hong Kong Electric Company Ltd (HKE) (the Applicant) and its consultants will present the EIA report at the meeting of the EIA Subcommittee.

ADVICE SOUGHT

2. Members’ views are sought on the findings and recommendations of the EIA report. The Environmental Protection Department (EPD) will take into account comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under Section 8(3) of the EIAO.

BACKGROUND

3. The LPS Navigation Channel (the Channel) was formed in 1981 to facilitate delivery of coal to the LPS by ocean going vessels. As the LPS is mainly a coal-fired power station that relies on coal-fired units for base load operations, there is a need to ensure safe access for ocean going coal-carrying vessels to the LPS in order to ensure the continuity of electricity supply to Lamma and Hong Kong Island.

HKE is responsible for maintaining sufficient water depth of the Channel, and thus needs to carry out dredging operations whenever the required minimum channel depth is approached as a result of natural siltation. The first improvement dredging was carried out in 1990. Since then, several other dredging operations had been carried out to ensure vessel navigation safety.

4. In 2008, the Marine Department (MD) stipulated the current requirement for HKE to maintain a minimum channel depth of -15.65mPD. In order to meet the requirement, there is a need to re-profile and maintain the Channel to an optimal depth lower than the specified minimum as a longer term solution. Consequently, HKE conducted the environmental impact assessment to study the environmental impact relating to future proposed dredging works.

5. With respect to the Applicant's submission of the EIA report of the Project for approval, the EPD in conjunction with the relevant authorities, considered that the EIA report met the requirements of the EIA Study Brief and the Technical Memorandum on EIA Process (TM), for the purpose of exhibiting the report for public inspection, under Section 7(4) of the EIAO.

NEED FOR THE PROJECT

6. LPS is the only power station supplying Hong Kong and Lamma Islands with electricity. As coal forms part of the fuel mix and is delivered to LPS via the marine route, there is a need to maintain the Channel to a minimum depth of -15.65mPD as specified by MD to ensure safe passage for ocean going vessels for delivering coal supplies to LPS. To address high natural siltation in the Channel, HKE proposes to carry out maintenance dredging of sediment from the seabed along the gazetted Channel to a depth of -16.5mPD, taking into account of MD's latest requirement.

DESCRIPTION OF THE PROJECT

7. The Project is to provide and maintain safe clearance for ocean going marine vessels for delivering coal shipments to LPS via the Channel, through the dredging of naturally accumulated sediment from the seabed. The Project area is about 262ha in size, and covers the part of the Channel anticipated to be affected by siltation as well as its immediate area. The location of the Project is shown in **Figure 1**. The key components of the Project include :

- (i) Initial dredging and re-profiling of the Channel down to a depth of -16.5mPD with an estimated dredged sediment quantity up to 3.2Million (M)m³, while maintaining the slope of the existing Channel boundaries;
- (ii) Recurrent dredging of selected localized high spots of the Channel caused by natural siltation about once every four years, with dredging quantity up to 0.9Mm³; and

- (iii) Recurrent re-profiling dredging of the Channel about once every 10 years to the depth of -16.5mPD, with estimated dredging quantity up to 2.9Mm³.

8. The Project is classified as a designated project under Item C.12 of Part I Schedule 2 of the EIAO, i.e. a dredging operation exceeding 500 000m³.

CONSIDERATION OF ALTERNATIVE DREDGING OPTIONS

9. The EIA report has considered various alternative options for the Project, including channel alignments, dredging methods, dredging depth with associated dredging quantity & frequency and sizes of coal vessel. The recommended dredging option has been chosen with a view to avoiding or minimizing environmental impacts where practicable. Some of the key approaches that have been adopted by the Applicant to avoid or minimize environmental impacts are summarized below :

Avoidance and Minimization of Impacts

- (i) The options of using original dredged Channel alignment and a dredging depth of -16.5mPD to match the existing slopes around the Channel are selected to avoid the need for widening of slopes and hence minimizing dredged sediment quantity; and
- (ii) Use of selected high spot dredging about once every four years to reduce the frequency of full re-profiling dredging to about once every 10 years.

OTHER SPECIFIC ENVIRONMENTAL ASPECTS

Water Quality Impact

10. Impacts on sensitive receivers during construction and operation have been assessed in the EIA study. Key sensitive receivers identified include Fish Culture Zones, bathing beaches, corals, seawater intakes, Finless Porpoise and Green Turtle habitats, Sham Wan SSSI and potential Marine Park. Locations of sensitive receivers are shown in **Figure 2**.

11. Release of suspended solids (SS) is the key concern on water quality impact associated with the Project. The assessment has shown that with mitigation measures such as capping the maximum allowable dredging rate through limiting the number of dredgers operating within a certain area at any particular instance, restricting speed of construction vessels to 10 knots, and use of cage-type silt curtains to surround the closed grab dredgers, the release of SS into the surrounding marine environment during dredging operations will be reduced to level that complies with the criteria at all Water Sensitive Receivers.

12. The EIA report concludes that there will be no adverse water quality impact arising from the construction and operation of the Project.

Marine Ecological and Fisheries Impact

13. Based on the EIA study, the proposed dredging works will only cause a temporary loss of limited fishing ground (maximum 20ha at any instance) and short term disruption of fisheries operation for construction and operation phases. HKE will conduct stakeholders' engagement activities prior to the improvement dredging to foster the understanding of relevant fishermen and mariculturists on the Project.

14. The findings of the EIA study indicate that the Project will unlikely cause long-term disturbance on cetaceans (i.e. Finless Porpoise) and inter-nesting habitats of Green Turtle. The potential disturbance or collision impacts of proposed dredging works on Finless Porpoise are considered as minor according to the experience from past dredging works. Nevertheless, precautionary measures including prohibition of dredging at the southern portion of the Project Area during the sensitive calving season for Finless Porpoise between the months of February and April has been recommended. In addition, barges carrying sediments operating outside the Project Area will avoid Finless Porpoise habitat area in southwest and east Lamma to minimize the potential disturbance on the cetaceans.

15. Mitigation measures during construction and operation for minimizing water quality impact (e.g. adoption of cage-type silt curtains and closed grab dredgers) and adoption of recommended maximum allowable dredging rate will also minimize potential impact on marine ecology and fisheries.

16. The EIA report concludes that there will be no unacceptable adverse impact on marine ecology and fisheries during both the construction and operation phases.

Waste Management

17. Based on the review of the sediment quality data in the Project area, the marine sediment to be dredged is classified as Category L sediment suitable for Type 1 Open Sea Disposal. The estimated upper limit dredged sediment volume for the initial re-profiling stage, recurrent selected localized high spots dredging and re-profiling are up to respectively 3.2Mm³, 0.9Mm³ and 2.9Mm³.

18. The EIA report recommends that the Project should carry out sediment sampling at the actual dredging area prior to dredging operation to confirm the classification of sediment, and to comply with the Dumping at Sea Ordinance (DASO) permitting requirements and Marine Fill Committee's (MFC) approval on disposal allocation. With implementation of the recommended mitigation measures and management procedures in construction and operation phases, the EIA report concludes that no adverse environmental impact is expected.

Other Environmental Impacts

19. Other environmental impacts including hazard to life and noise have also been assessed in the EIA report and no adverse impact is expected. With the implementation of recommended mitigation measures, the EIA report concludes that the Project will comply with the relevant requirements under the TM.

ENVIRONMENTAL MONITORING AND AUDIT

20. The EM&A Manual included in the EIA report recommends an EM&A programme for both the construction and operation phases of the Project. Key recommended EM&A requirements cover water quality, hazard to life and waste management.

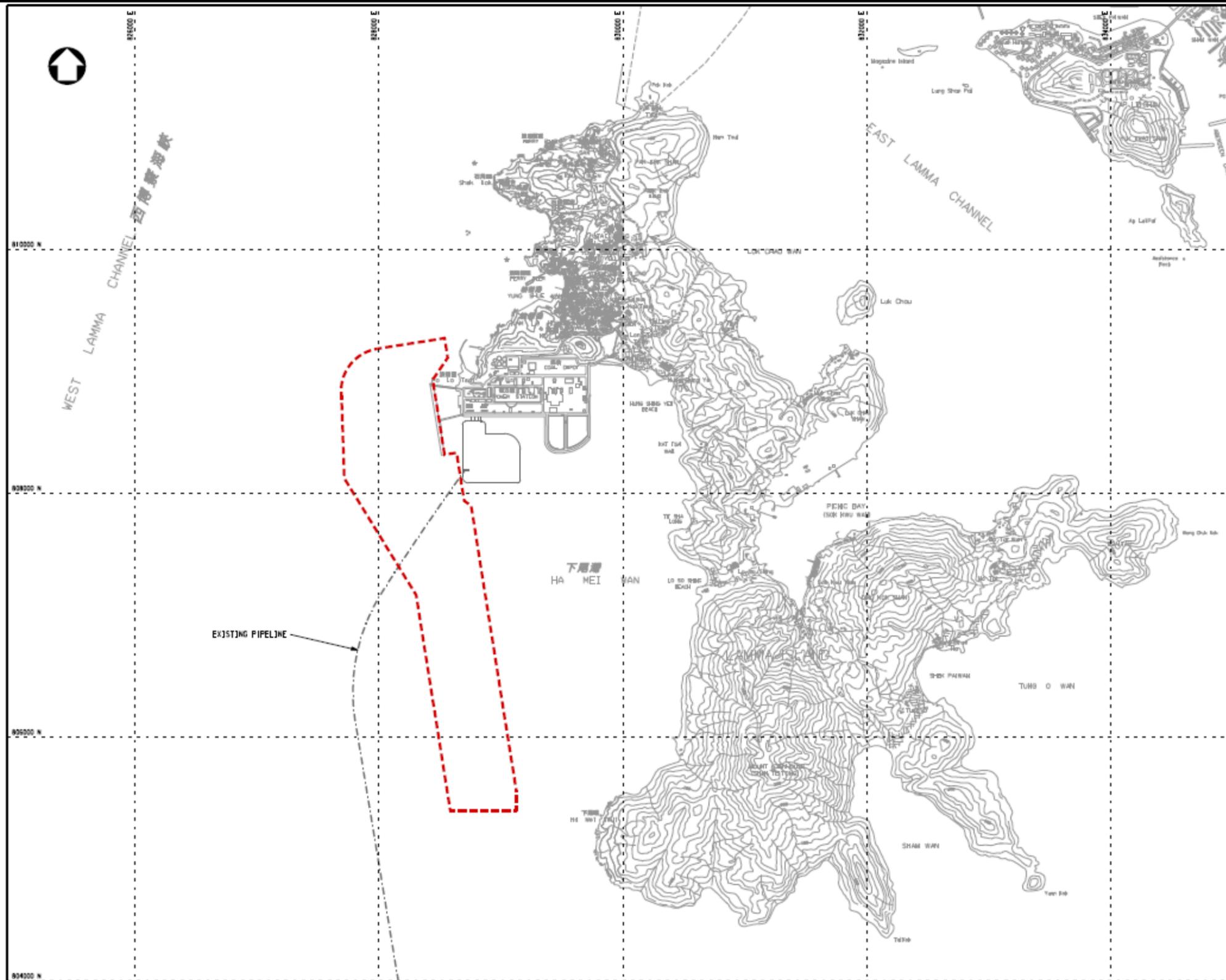
PUBLIC CONSULTATION

21. The Applicant made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 9 June 2017 to 8 July 2017. During this inspection period, four sets of public comments were received by the EPD. The main concerns raised by the public are on fisheries and marine ecology. The public comments will be summarized in a gist to be provided to the ACE before the meeting.

July 2017

Environmental Assessment Division

Environmental Protection Department



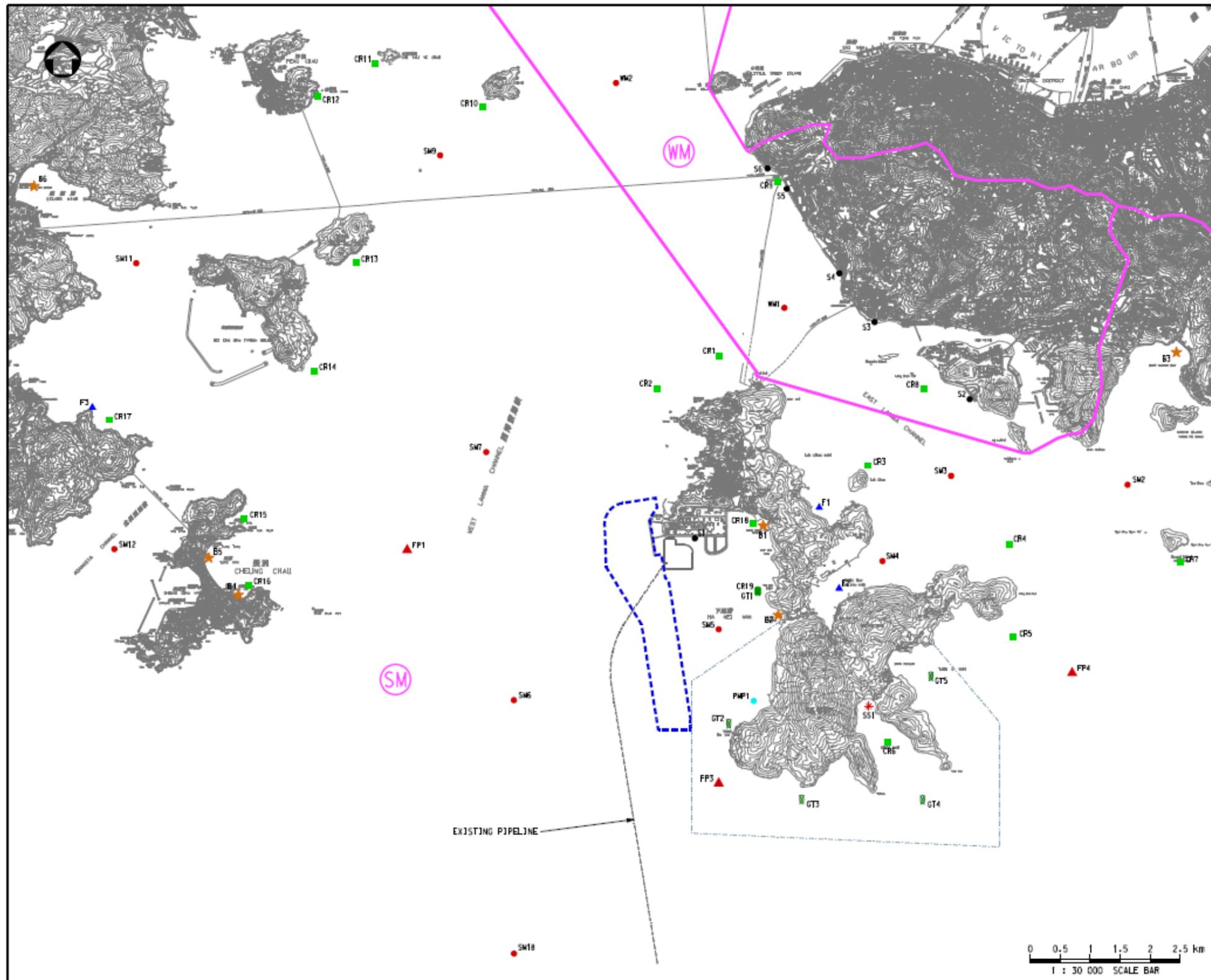
Key to symbols

--- PROJECT BOUNDARY



**Project Title: Improvement Dredging for Lamma Power Station
Navigation Channel**
Figure 1: Project Location Plan

Application No. : EIA-251/2017
[Note: This figure is extracted from the EIA Report
– Figure 1.1]



Key to symbols

- PROJECT BOUNDARY
- PRELIMINARY BOUNDARY OF THE POTENTIAL MARINE PARK IN SOUTH LAMMA
- SEAWATER INTAKE
 - S1 - HEC POWER STATION INTAKE
 - S2 - WSD SEAWATER INTAKE AT AP LEI CHAU
 - S3 - WAH FU ESTATE
 - S4 - CYBER PORT
 - S5 - QUEEN MARY HOSPITAL
 - S6 - SHA WAN DRIVE
- CORALS

CR1 - PAK KOK	CR10 - KAU YI CHAU
CR2 - SHEK KOK TSUI	CR11 - SIU KAU YI CHAU
CR3 - LUK CHAU	CR12 - PENG CHAU
CR4 - WONG CHUK KOK (NORTH)	CR13 - SUNSHINE ISLAND
CR5 - WONG CHUK KOK (SOUTH)	CR14 - HEI LING CHAU
CR6 - SHAM WAN	CR15 - CHEUNG CHAU (NORTH)
CR7 - ROUND ISLAND	CR16 - CHEUNG CHAU (SOUTH)
CR8 - AP LEI CHAU	CR17 - CHI MA WAN PENINSULA
CR9 - SANDY BAY	CR18 - NORTHERN HUNG SHING YE
	CR19 - HA MEI WAN (NORTH)
- ★ GAZETTED BEACHES
 - B1 - HUNG SHING YEH
 - B2 - LO SD SHING
 - B3 - DEEP WATER BAY
 - B4 - TUNG WAN, CHEUNG CHAU
 - B5 - KUN YAM WAN
 - B6 - SILVERMINE BAY
- MARINE WATER QUALITY MONITORING STATIONS (IN SOUTHERN AND WESTERN BUFFER WATER CONTROL ZONE)

WM1 - HONG KONG ISLAND (WEST)	SM6 - WEST LAMMA CHANNEL
WM2 - HONG KONG ISLAND (WEST)	SM7 - WEST LAMMA CHANNEL
SM2 - HONG KONG ISLAND (SOUTH)	SM9 - WEST LAMMA CHANNEL
SM3 - EAST LAMMA CHANNEL	SM11 - LANTAU ISLAND (EAST)
SM4 - EAST LAMMA CHANNEL	SM12 - LANTAU ISLAND (SOUTH)
SM5 - WEST LAMMA CHANNEL	SM18 - WEST LAMMA CHANNEL
- * SITE OF SPECIAL SCIENTIFIC INTERESTS
 - SS1 - SHAM WAN (NESTING OF GREEN TURTLE)
- ⊗ GREEN TURTLE INTER-NESTING HABITAT
 - GT1 - HA MEI WAN (NORTH)
 - GT2 - HA MEI WAN (SOUTH)
 - GT3 - SOUTH LAMMA
 - GT4 - SOUTHEAST LAMMA
 - GT5 - TUNG O WAN
- POTENTIAL MARINE PARK
 - PMP1 - SOUTH LAMMA
- ▲ FINLESS PORPOISES
 - FP1 - EAST OF CHEUNG CHAU
 - FP3 - SOUTHWEST OF LAMMA
 - FP4 - EAST OF LAMMA
- ▲ FISH CULTURE ZONE
 - F1 - LO TIK WAN
 - F2 - SOK KWU WAN
 - F3 - CHEUNG SHA WAN

WATER CONTROL ZONES:

SM SOUTHERN WM WESTERN BUFFER



Project Title: Improvement Dredging for Lamma Power Station Navigation Channel
Figure 2: Location of Water Sensitive Receivers

Application No. : EIA-251/2017
 [Note: This figure is extracted from the EIA Report – Figure 3.1]