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For advice on 21 November 2016

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

Port Shelter Sewerage Stage 3 – Sewerage Works at Po Toi O

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report for the proposed sewerage works at Po Toi O (hereafter known as "the Project") submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-244/2016). The Drainage Services Department (DSD) (the Applicant) and their 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. Po Toi O is located in the southern part of Sai Kung District, next to Clear Water Bay. As presented in the EIA Report, there is no public sewerage system in

Po Toi O village. Sewage and wastewater generated by local restaurants and residents are treated and disposed of by means of private septic tanks and soakaway systems (STS). The Applicant has proposed a centralized public sewage treatment facility and public sewers under the Port Shelter Sewerage Master Plan Stage 3, with a view to improving environmental hygiene in the Po Toi O area. The Applicant conducted a public engagement exercise to collate views from local communities, mariculturists and fishermen, Sai Kung District Council and green groups during the course of the EIA study, and has incorporated the public feedback and views into the EIA study where applicable.

4. The Applicant submitted the EIA report for 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

5. Provision of proper sewerage systems to unsewered villages subject to resources permit is a general government policy. The proposed sewerage works is an environmental enhancement project that aims to improve local hygiene conditions and remove odour nuisances associated with regular desludging the STS by villagers. It is also a preventive measure to avoid potential environmental problems arising from ineffective treatment or overflow of sewage due to insufficient desludging or structural defect of the STS.

DESCRIPTION OF THE PROJECT

6. The Project is to construct and operate a public sewerage system comprising a local sewage treatment plant, gravity sewers, rising mains, and a submarine outfall for discharge of treated effluent. The location and general layout of the Project is shown in **Figure 1**. The key components of the Project are as follows:

(i) Construction of a local sewage treatment plant with a design capacity of about 139m^3/day at average dry weather flow;
(ii) Construction of gravity sewers of about 800m in length and rising mains of about 400m in length in the Po Toi O area; and

(iii) Construction of a submarine outfall of about 385m in length.

7. The Project covers the following elements that are Designated Project (DP) under Part I, Schedule 2 of the EIAO:

(i) Item C.12(a)(v) and (vii) – A dredging operation which is less than 500m from the nearest boundary of an existing or planned :
- fish culture zone
- coastal protection area

(ii) Item F.6 – A submarine sewage outfall; and

(iii) Item Q.1 – A project including a sewage treatment plant and a portion of new sewers in a conservation area.

ENVIRONMENTAL BENEFITS

8. According to the EIA report, the Project will bring about the following benefits upon its completion:

(i) Centralized sewage treatment equipped with odour removal system can improve environmental hygiene in the Po Toi O area, and avoid potential environmental problems of the existing STS.

(ii) Green measures and advanced technologies can be adopted for the proposed sewerage system to enhance reliability of the sewage treatment and disposal process.

CONSIDERATION OF ALTERNATIVE OPTIONS

9. The EIA report has considered alternative options for the development of the Project, including site locations, plant designs, construction methodologies and programme, in order to avoid and minimize environmental impacts. The environmental benefits and dis-benefits of the options have been evaluated. The recommended options of various project items have taken into account environmental considerations, site constraints, other factors such as operational requirements, engineering considerations, and comments received from the public engagement exercise during the course of the EIA study. Some of the key approaches that have been adopted by the Applicant to avoid or minimize environmental impacts are summarized below:

Avoidance of Impacts

(i) Avoidance of destruction of coral-lined rocky shore by adopting a submarine outfall 100 m away from the shore rather than an above-ground discharge pipe along the coast.

(ii) Avoidance of direct impact on the amphioxus habitat (fish species of conservation importance) by shifting the treated effluent discharge location of the submarine outfall over 100 m away from the habitat.

(iii) Avoidance of emergency discharge of untreated sewage during equipment or power failure by providing standby pump and screen, dual power supply, emergency storage, and tankers for continuous removal of untreated sewage to other sewage treatment plants (STP) for proper treatment and disposal.

Minimization of Impacts

(iv) Selection of the preferred site at a cut slope of the disturbed shrubland for locating the STP, adopting a compact sewage treatment technology to reduce the footprint of the STP, and laying mains/sewers along the existing footpaths to minimize loss of ecological sensitive habitats.

(v) Actively responding to public views received during public engagement exercise by locating the submarine outfall in the outer bay area with about 10 m water depth for better dispersion and dilution of treated effluent, and over 300 m away from the nearest fish culture zone.

(vi) Minimizing potential impact on water quality, marine ecological and fisheries by adopting horizontal directional drilling (HDD) below seabed for construction of the submarine outfall to avoid using the conventional method of open dredging.

(vii) Adopting a basement design for the STP, enclosing all odour sources and placing the noisy equipment underground to minimize odour and noise nuisance.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

Water Quality Impact

10. A non-dredged HDD method has been selected for construction of the submarine outfall to minimize water quality impact. For installation of the outfall diffuser, confined dredging and backfilling within a fully enclosed cofferdam will be carried out to minimize the potential water quality impact arising from marine-based works. Silt curtain will also be provided during installing and dismantling of the cofferdam.

11. With the provision of a centralized public STP and public sewers to replace the private STS, sewage will be collected and treated to secondary level followed by discharge of the treated effluent through a submarine outfall with diffuser located more than 300m from shores; the EIA report predicts that near shore water quality will be improved as a result.

12. The EIA report concludes that there will not be adverse water quality impact during both construction and operational phases.

Terrestrial Ecological Impact

13. During the construction period, small areas of secondary woodland (350 m^2) and rocky shore above high tide level (750 m^2) will be affected to provide temporary works area for the submarine outfall. No species of conservation importance has been identified within these areas and they will be reinstated after works completion. Bright colour fencing will be erected along the boundary of the undisturbed region of the shrubland and woodland and around the identified *Diospyros vaccinioides,* a plant species of conservation importance, near the works boundary to remind workers not to trespass the area.

14. The STP will be located on a small area of shrubland on a cut slope. The permanently affected area is around 900 m^2 and is not of high ecological value as identified in the ecological field surveys. For the *Gnetum luofuense,* an identified plant species of conservation importance, only the part which entangles with existing vegetation within the works area will be cleared. The loss is considered insignificant due to its commonness in the Po Toi O area and in other parts of Hong Kong.

15. The EIA report concludes that there will not be adverse impact on terrestrial ecology during both construction and operational phases.

Marine Ecological and Fisheries Impact

16. During construction, mitigation measures for minimizing water quality impact (e.g. HDD for submarine outfall, and confined dredging and backfilling within a fully enclosed cofferdam for diffuser installation) will minimize potential impact on marine ecology and fisheries.

17. To avoid encroachment to the coral-lined rocky shore and a major amphioxus habitat identified in the field surveys, the outfall diffuser will be located over 100 m away from the shore. Only a small area of muddy seabed (5 m^2) will be lost permanently due to the diffuser installation, where no species of conservation importance was identified. There will be no direct impact on the existing fish culture zones which are over 300 m away from the outfall diffuser.

18. No anti-fouling agent will be used as diffuser ports will be designed to achieve self-cleansing flow velocity to prevent growth of marine organisms. The outfall diffuser will be made of material (e.g. high-density polyethylene) that allows cleaning of marine organisms by divers easily.

19. The EIA report concludes that there will not be adverse impact on marine ecology and fisheries during both construction and operational phases.

Noise Impact

20. With the adoption of good site practices, quiet construction equipment, the use of noise barriers and proper scheduling of works, construction noise will be mitigated to within the respective noise criteria.

21. Operational noise impact will be limited and contained in view that most plant equipment will be placed underground and enclosed within the STP.

22. The EIA report concludes that there will be no adverse noise impact during both the construction and operational phases.

Air Quality Impact

23. During construction, good site practices including dust control measures such as water spraying and covering dusty stockpiled materials, the dust levels at representative air sensitive receivers (ASRs) would comply with the established criteria for Total Suspended Particulates and Respirable Suspended Particulates.

24. The sewage treatment units will be placed in the basement of the STP. During operation of the STP, the exhaust air will pass through an odour removal system at a minimum of 99.5% efficiency in the STP before discharging to the environment. The predicted odour levels at all ASRs are well below the odour criterion (5 odour units based on an averaging time of 5 seconds) stipulated in the TM.

25. The EIA report concludes that there will be no adverse air quality impact during both the construction and operational phases.

Landscape and Visual Impact

26. Measures that include embedding the STP into existing cut slope, provision of appropriate façade treatment, compensatory tree planting and vertical greening will be adopted in the design stage to maintain the visual entity with surrounding undisturbed landscape.

Other Environmental Impacts

27. Other environmental impacts including waste management, land contamination and built heritage are relatively minor and have also been addressed in the EIA report. With the implementation of recommended mitigation measures, the EIA report concludes that the Project will comply with the relevant requirements under the TM.

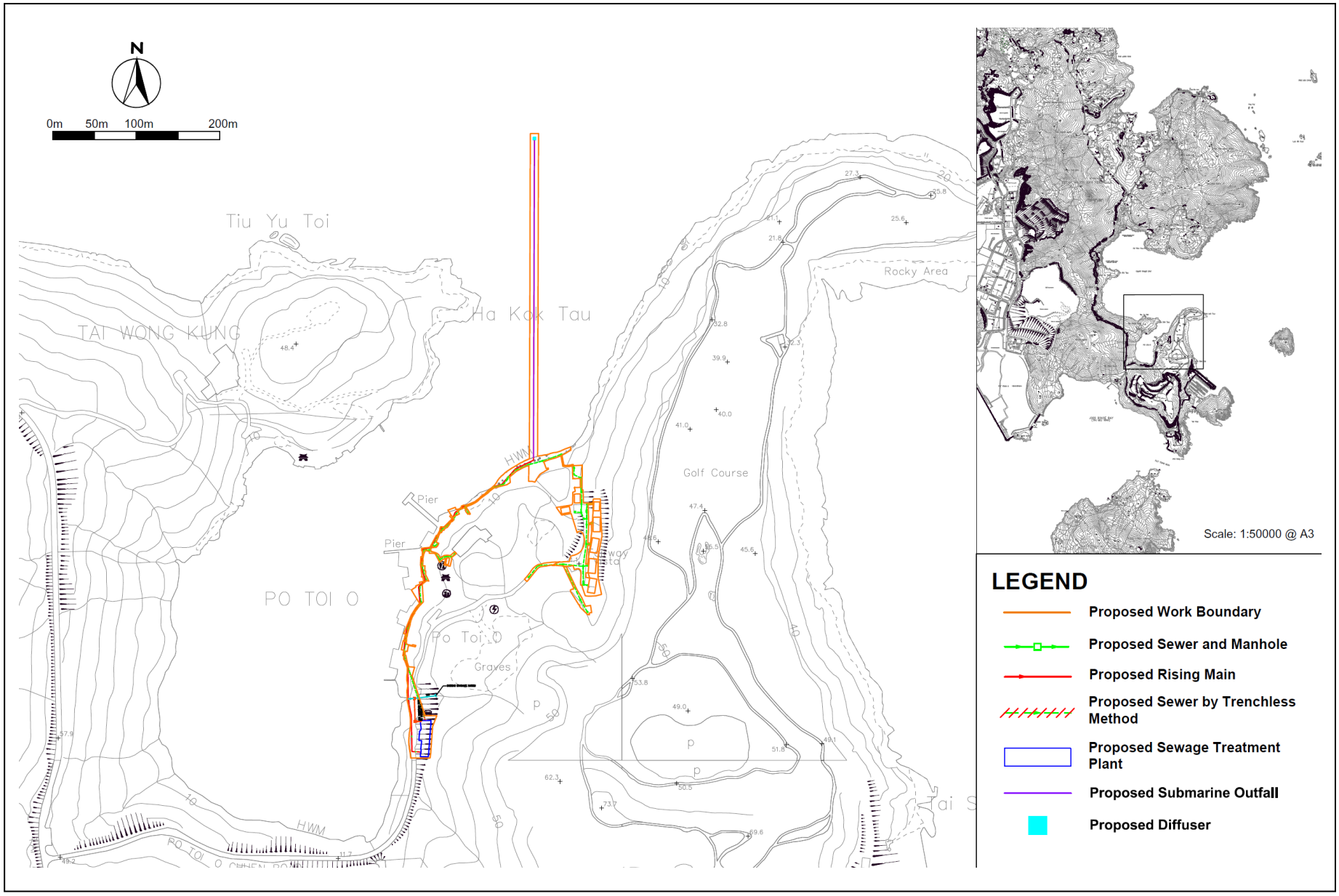
ENVIRONMENTAL MONITORING AND AUDIT

28. The EIA report includes an Environmental Monitoring and Audit (EM&A) Manual which recommends an EM&A programme for the construction and operation phases of the Project. Key recommended EM&A requirements cover air quality, noise, water quality and terrestrial ecology.

PUBLIC CONSULTATION

29. The Applicant made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 15 September 2016 to 14 October 2016. During this inspection period, four sets of public comments were received by the EPD. The main concerns raised by the public are on ecology and fisheries. The public comments will be summarized in a gist to be provided to ACE members separately.

November 2016
Environmental Assessment Division
Environmental Protection Department



Project Title: Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O

Figure 1: Project Location Plan

Application No. : EIA-244/2016

[Note: This figure is extracted from the EIA Report - ES (Figure 1A)]