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Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report
Development of Integrated Waste Management Facilities Phase 1

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report for the proposed Integrated Waste Management Facilities (IWMF) (hereafter known as “the Project”) submitted under section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-193/2011). The Nature Conservation and Infrastructure Planning Division of the Environmental Protection Department of the HKSAR Government (the applicant) and their consultants will present the report at the meeting of EIA Subcommittee if necessary.

ADVICE SOUGHT

2. Members’ views are sought on the findings and recommendations of the EIA report.

NEED FOR THE PROJECT

3. The Project is to provide the facilities to reduce the bulk size of municipal solid waste (MSW) requiring landfill disposal and to recover energy from the MSW.

The Project would help save up the precious space of the existing landfills which are anticipated to reach their maximum capacities in early to mid 2018 and it would also provide electricity for use in Hong Kong.

DESCRIPTION OF THE PROJECT

4. The proposed Project will be located at the Middle Tsang Tsui Ash Lagoon (TTAL) in Tuen Mun (**Figure 1**) and/or an artificial island near Shek Kwu Chau (SKC) (**Figure 2**) with a size of about 11 hectares (ha). Incineration technology will be adopted for the treatment of MSW. The Project will mainly comprise a thermal incineration plant with a design capacity of 3,000 tonnes per day (tpd) and a mechanical sorting and recycling plant with a design capacity of 200 tpd.

5. For the proposed Middle TTAL site, the Project will also include the decommissioning of a part of the lagoon previously used for disposal of pulverized fuel ash (PFA).

6. For the proposed SKC site, reclamation will be needed to form land for accommodating the Project.

7. The Project constitutes a Designated Project (DP) by virtue of the following items in Schedule 2 of the EIAO:

In respect of TTAL & SKC sites

- (i) Item G.3, Part I - An incinerator with an installed capacity of more than 50 tonnes per day;
- (ii) Item G.4, Part I - A waste disposal facility for refuse;
- (iii) Item D.1, Part I - Public utility electricity power plant;
- (iv) Item G.6, Part I - A waste disposal facility for pulverized fuel ash or furnace bottom ash;
- (v) Item F.4, Part I - Reuse of treated sewage effluent from on-site wastewater treatment plant;

In respect of TTAL site

- (vi) Item 8, Part II - Decommissioning Project: A waste disposal facility for pulverized fuel ash or furnace bottom ash;

In respect of SKC site

- (vii) Item C.1, Part 1 - Reclamation works (including associated dredging works) of more than 5 ha in size; and

- (viii) Item C.12, Part 1 - A dredging operation exceeding 500,000 m³.

VIEWS OF THE DIRECTOR AND RELEVANT AUTHORITIES

8. The Director of Environmental Protection (DEP), in conjunction with the relevant authorities, considers that the EIA report meets the requirements of the EIA Study Brief and the Technical Memorandum on EIA Process (TM). Comments from the public and the Advisory Council on the Environment will be taken into account by DEP in deciding whether or not to approve the EIA report under the EIAO.

CONSIDERATION OF ALTERNATIVE OPTIONS

9. The project proponent has identified a number of potential sites for the IWMF, including Tseung Kwan O Area 137, Ex-Lamma Quarry, Ha Mei Wan in Lamma Island, Tuen Mun Area 38, Middle TTAL and an artificial island near SKC. Considering various factors which include remoteness from major population clusters, planning and land use constraints, potential ecological and visual impacts, the proposed sites in Middle TTAL and an artificial island near SKC are assessed to be more suitable for the IWMF.

10. The EIA study has also evaluated the latest incineration technologies for MSW treatment, including fluidized-bed, rotary kiln, eco-co-combustion, gasification, plasma gasification and pyrolysis. The study indicates that moving grate incineration is the most preferable option, mainly in view of its capability and reliability in treating the required 3,000 tpd of MSW.

ENVIRONMENTAL ASPECTS TO HIGHLIGHT

11. Based on the two proposed sites at TTAL and SKC respectively, the EIA study has assessed the potential environmental impacts of locating the Project at either one of these sites or at both sites at the same time.

Air Quality Impacts

12. Given the nature of the proposed IWMF, air quality impact during operation is a key issue to be considered. The EIA study has recommended the latest air pollution control system, including selective catalytic reduction for Nitrogen Oxides (NO_x) removal and activated carbon for dioxins removal, be adopted. The EIA study has also recommended the adoption of a daily average NO_x emission limit of 100 mg/m³, which is more stringent than that stipulated in Hong Kong and European Commission for waste incineration. Besides, with the IWMF chimney height of 150 m above ground level, cumulative air quality impacts of concerned parameters, including Nitrogen Dioxide and Respirable Suspended Particulates, have been modeled and assessed. The results reflect that, even with development of the IWMF concurrently at both TTAL and SKC sites, the impacts to the existing and planned air sensitive receivers will meet the relevant standards and criteria in all areas that may be impacted by the IWMF emissions, including Tuen Mun, Tung Chung and Kwai Tsing.

13. With respect to the odour issue, the on-site wastewater treatment plant, waste reception halls and waste storage areas of the IWMF will be fully enclosed and the potential odour emissions associated with the operation of the IWMF will be collected and eliminated by the incineration process or ventilated to deodorizer before discharging to the atmosphere. Furthermore, an air pollution control and stack monitoring system will be installed for the IWMF to ensure the emissions will meet the stringent target emission limits as designed.

Health Impacts

14. The highest cancer risk arising from the IWMF is below the screening level adopted by the United States Environmental Protection Agency. Therefore, the EIA report concludes that the Project would not give rise to unacceptable cancer risk. In addition, cumulative acute and long term non-carcinogenic health impacts arising from the IWMF are also found to be insignificant.

Water Quality Impacts: Sewerage

15. During operation of the IWWMF, all generated wastewater will be discharged to the on-site wastewater treatment plant for treatment. The treated effluent from the wastewater treatment plant will be fully reused in the incineration plant for cleansing and landscape irrigation within the Project site.

Water Quality Impacts at SKC site: Dredging and Reclamation

16. To minimize dredging and filling activities and the associated environmental impacts, cellular cofferdam approach instead of sloping seawall is proposed for the reclaimed land to reduce the total dredging volume to 27,300 m³. The cofferdam enclosing the reclamation area would be constructed prior to the reclamation filling. Other mitigation measures, including the employment of silt curtains and control of dredging and filling rates, have been proposed to ensure no unacceptable water quality impact from dredging and filling works. The dredged marine sediments belong to Category L material (i.e. sediments with little or no contamination) with reference to Works Branch Technical Circular No. 34/20002 (i.e. Management of Dredged/Excavated Sediment) and will be properly disposed of at designated marine dumping areas.

Waste Management

17. All fly ash and air pollution control (APC) residues from the incineration process will be treated by cement solidification or chemical stabilization for compliance with the proposed Incineration Residue Pollution Control Limits and leachability criteria prior to disposal to the West New Territories Landfill. With this mitigation measure in place, the residual impact arising from the disposal of fly ash and APC residues is considered to be minimal and acceptable.

Noise Impacts and Landfill Gas Hazards

18. The EIA report also covers assessments of the potential impacts arising from noise and landfill gas hazards. With appropriate mitigation measures in place to minimize those impacts, the expected impacts are considered acceptable in terms of meeting the relevant requirements of the EIA Study Brief and TM.

Ecological Impacts at TTAL site

19. The EIA study indicates that the IWMF would affect the existing PFA ash lagoons which are of low to moderate ecological values. There would be a total loss of 1.98 ha breeding ground of Little Grebe in the Middle lagoon as a result of the proposed IWMF development. To compensate for the loss, 1.2 ha of pond habitat will be created in the western side of the Project site and 4.5 ha of wetland habitat at the unoccupied Middle lagoon will be enhanced as Little Grebe habitat. The loss of Little Grebe habitats at the ash lagoons has been taken into account in an earlier EIA study for the West New Territories (WENT) Landfill Extensions project approved in 2009. The approval has required the creation of at least 8 ha of freshwater ponds in the WENT Landfill site no later than the first year of the commencement of construction of the WENT Landfill Extensions project. Nevertheless, the project proponent will maintain the 4.5 ha of enhanced habitats until the area is occupied by the WENT Landfill Extensions Project; while the 1.2 ha of created pond habitat will be maintained permanently. Monitoring of Little Grebe and other avifauna will be carried out during the construction and operation of the Project.

Ecological Impacts at SKC site

Finless Porpoise

20. Developing the Project at SKC site would affect area identified as important habitat for Finless Porpoise. To mitigate the permanent loss of 31 ha of habitat for Finless Porpoise as a result of the proposed reclamation works and breakwater construction, the project proponent has made a firm commitment to seek to designate a marine park of about 700 ha in size in the waters between SKC and Soko Islands, in accordance with the statutory process stipulated in the Marine Parks Ordinance. The project proponent would seek to complete the designation of the marine park before the operation of the Project at SKC. Details of the marine park will be formulated in a future study. Other mitigation measures will also be adopted to minimize disturbance to Finless Porpoise, such as scheduling acoustically-disturbing construction works outside the months with peak Finless Porpoise occurrence (i.e. December to May). With the mitigation measures in place, residual impacts on Finless Porpoise would be acceptable. A monitoring programme will also be carried out to verify the impact evaluation and assess the effectiveness of the recommended mitigation measures for Finless Porpoise during construction and operation of the Project.

Coral

21. The proposed reclamation works would affect subtidal hard bottom habitat with 198 coral colonies of small sizes and low total coverage (less than 1% of total coral coverage within the study area), evaluated as of low to moderate ecological value. As all the corals to be directly affected are found on boulders that could be relocated, coral translocation has been recommended to avoid any direct loss. Water quality control measures are also proposed to reduce potential elevation in marine water suspended solid levels that might indirectly affect the corals. With these mitigation measures in place, unacceptable impacts on corals are not anticipated. A monitoring programme will also be carried out to verify the impact evaluation and assess the effectiveness of the recommended mitigation measures for coral colonies during construction and operation of the Project.

White-bellied Sea Eagle

22. Since White-bellied Sea Eagle (WBSE) is a highly mobile species and similar habitat for WBSE is available in the vicinity, the EIA study confirms that the impacts on WBSE arising from the IWMF Project would be low to moderate. Potential impacts on WBSE during the construction and operation stages would be mitigated through avoidance of noisy works during the breeding season of WBSE from December to May, adoption of quieter construction methods and plants, restriction of vessel access near the nest of WBSE and avoidance of unnecessary lighting and provision of shielding for lights to minimize glare disturbance. With these mitigation measures in place, potential impacts on the WBSE would be acceptable. A monitoring programme will be carried out to confirm no adverse impacts to the breeding activities of the WBSE during construction and operation of the Project.

Visual and Landscape Impacts at TTAL site

23. With the architectural and landscape design of the IWMF being coherent with the adjacent proposed Sludge Treatment Facilities (STF), the development of these two facilities would be integrated and blend well with the surrounding environment. The EIA report further concludes that these two facilities would form a harmonic view. With mitigation measures in place, potential landscape and visual impacts arising from the IWMF would be acceptable.

Visual and Landscape Impacts at SKC site

24. The EIA study has also assessed the potential visual impacts caused by the proposed IWMF and has recommended a series of measures to minimize the impacts, including rooftop and vertical greening along the building façade, adoption of natural materials with recessive colour and provision of sky gardens between the stacks. Furthermore, to maximize visual compatibility between the existing natural shoreline of SKC and the IWMF site, natural rocks with similar colour as the SKC rocky shore will be adopted for the construction of breakwater and artificial shoreline. The EIA report further concludes that the visual impacts are acceptable with mitigation measures in place.

ENVIRONMENTAL MONITORING AND AUDIT

25. The EIA report includes an Environmental Monitoring and Audit (EM&A) Manual which recommends an EM&A programme during the construction and operation phases of the Project. Key recommended EM&A requirements include stack and odour monitoring, marine water quality monitoring during reclamation as well as ecological monitoring of Little Grebe, Finless Porpoise, corals and WBSE.

PUBLIC CONSULTATION

26. The applicant has made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 17 February 2011 to 18 March 2011. Members will be informed of any public comments received by the Environmental Protection Department.

March 2011
Environmental Assessment Division
Environmental Protection Department



Project Title : Integrated Waste Management Facilities (IWMF) – Phase 1

Figure 1 Location of the IWMF at the Tsang Tsui Ash Lagoons Site

(Reproduced from Figure ES1 of the Executive Summary of the EIA Report)





Project Title : Integrated Waste Management Facilities (IWMF) – Phase 1

Figure 2 Location of the IWMF at the Artificial Island near Shek Kwu Chau

(Reproduced from Figure ES2 of the Executive Summary of the EIA Report)

