Food Waste/Sewage Sludge Anaerobic Co-digestion Pilot Trial -
To Set Up a Food Waste Pre-treatment Facilities at
Existing Shuen Wan Leachate Pre-treatment Plant

1. PURPOSE

1.1. This paper briefs Members on the proposed food waste pre-treatment
facilities for the food waste/sewage sludge anaerobic co-digestion pilot trial
to be built at the existing Shuen Wan leachate pre-treatment plant in Tai Po.

2. BACKGROUND

2.1. The Government has set out in the Food Waste & Yard Waste Plan for Hong
Kong (the Food Waste Plan) unveiled in February 2014 that Hong Kong
needs to build a network of around five to six organic waste treatment
facilities (OWTFs) with a total recycling capacity of about 1,300 to 1,500
tonnes per day to recycle food waste to energy.

2.2. Apart from constructing new facilities, we are exploring the use of existing
sewage treatment facilities for food waste/sewage sludge anaerobic co-
digestion as an additional part of the network of OWTFs to help raise Hong
Kong's food waste treatment capability.

2.3. As a new environmental protection initiative in the 2016 Policy Address and
Policy Agenda, we will commence a food waste/sewage sludge anaerobic co-
digestion pilot trial to confirm the feasibility of food waste/sewage sludge
anaerobic co-digestion and determine the technical requirements for using
such technology to convert food waste to energy. Results of the trial will
provide the basis for our formulation of medium to long-term development
roadmaps and action plans.

2.4. The pilot trial will be jointly carried out by the Drainage Service Department
(DSD) and Environmental Protection Department (EPD). A food waste
pretreatment facilities will be set up at the existing Shuen Wan leachate pre-treatment plant site to provide up to 50 tonnes per day of pre-treated food waste to the existing sewage sludge anaerobic digestion systems at the Tai Po Sewage Treatment Works (STW) for co-digestion. For the site location, please refer to Appendix 1.

2.5. EPD will be responsible for the food waste sourcing, pre-treatment facilities construction and conveying the pre-treated food waste to a designated anaerobic digester at the Tai Po STW for co-digestion.

2.6. The pilot trial will last for about 6 years.

3. **FOOD WASTE PRE-TREATMENT FACILITIES**

3.1. The Investigation, Design and Construction (IDC) consultancy for the food waste treatment facilities commenced on 14th October 2015. The consultant has completed the engineering feasibility study, environmental review and reference design, and is preparing the tender for the Design, Build and Operate (DBO) contract. The consultant will also carry out site supervision and project management, and undertake performance monitoring and review during the commissioning phase.

3.2. The food waste pre-treatment facilities (FWPF) will consist of the following major components:
- Reception area;
- Shredder and impurity separation system; and
- Deodourisation system.

3.3. The FWPF will be implemented through a DBO contract arrangement. The design and construction works will commence in the first half of 2017 for completion and commissioning in the first half of 2018. The pilot trial will last for 6 years until 2024.

3.4. During the first 2 to 3 years of operation, the amount of food waste to be treated would be about 20-30 tonnes per day on average to test for the mixing ratio of food waste and sewage sludge as well as various operation parameters; and gradually built up to a maximum of about 40-50 tonnes per day in the later stage of the pilot trial.
4. **KEY FINDINGS OF THE ENVIRONMENTAL REVIEW**

4.1. The Consultant has completed the environmental review and ascertained the likely nature and extent of environmental impacts on air quality, water quality, landfill gas hazard, noise, landscape & visual arising from the FWPF. Where necessary, the environmental review has recommended mitigation and control measures to reduce the environmental impacts to acceptable levels.

4.2. Upon implementation of the recommended mitigation measures, the FWPF would be environmentally acceptable and no unacceptable residual impacts are anticipated. Regular monitoring of landfill gas concentration within the boundary of the FWPF site has also been specified in Environmental Monitoring & Audit (EM&A) section in the report.

**Air Quality Impacts**

4.3. Potential air pollution sources during construction phase arise mainly from dust emissions from the demolition and construction activities. With the implementation of the mitigation measures as stipulated under the Air Pollution Control (Construction Dust) Regulation, no adverse construction dust impact is anticipated.

4.4. During the operational phase, completely sealed bulk collection vehicles will be used for food waste collection, which can prevent fugitive odour and leachate leakage on the delivery route to the FWPF. No adverse air quality impact from the induced traffic for food waste collection and delivery is anticipated.

4.5. Moreover, at-source mitigation measures will be implemented to minimize the potential odour impact from the proposed facilities during operation to environmentally acceptable level. The mitigation measures include:
- Enclosing all potential odour sources for extraction;
- Maintaining negative pressure within the facilities to avoid odour escape;
- Installation of deodouriser to control odour emission via ventilation exhaust;
- Directing exhaust of deodouriser vertically upwards to avoid direct discharge towards sensitive receivers; and
• Regular inspection and maintenance of deodouriser.

**Noise Impact**

4.6. No representative noise sensitive receivers are identified within 300m of the FWPF boundary. The closest sensitive receiver identified is at least 400 m away from the project area. Potential noise impacts from both construction and operational phase are not anticipated.

**Water Quality Impact**

4.7. During the construction phase, construction site runoff and sewage from site workforce are identified as potential water pollution sources. Mitigation measures including covering excavated materials, providing proper drainage systems and providing sedimentation tanks onsite, etc. have been recommended to mitigate any potentially adverse temporary water quality impacts.

4.8. During the operational phase, wastewater generated during the food waste pre-treatment process including equipment cleansing and floor cleansing will be diverted to the Tai Po STW for proper treatment. Therefore, no adverse water quality impacts are anticipated.

**Landscape and Visual**

4.9. According to the Outline Zoning Plan of the project site, the maximum building height of the FWPF is limited to 2 storeys. The outlook design of the FWPF will blend with and be compatible with the surrounding environment. The residual landscape and visual impacts are expected to be insubstantial.

5.  **TRAFFIC IMPACT ASSESSMENT**

5.1. During the construction phase, a maximum of 12 round trips of truck traffic are expected to be generated per day and there should be no adverse impacts to the existing traffic.

5.2. In the early stage of operation, food waste will be collected from within the Tai Po Industrial Estate and the collection will gradually be extended to the
wet markets in Tai Po District. The food waste collection vehicles will enter the Shuen Wan leachate pre-treatment plant via Dai Li Street next to the Tai Po STW.

5.3. Most of the food waste will be collected by sealed bulk collection vehicles in order to minimize odour impact and leachate leakage. A small amount of food waste will be collected in 240L transit skips/bins and delivered by heavy goods vehicles to the FWPF. Capacity per bulk collection vehicle is approximately 8 to 10 tonnes and about 10 to 14 round trips are required to deliver 50 tonnes of food waste to the FWPF. On the other hand, each heavy goods vehicles with 240L bins is able to handle 2-3 tonnes of food waste, about 34 to 50 round trips are required to deliver 50 tonnes of food waste.

5.4. Assessment of future traffic condition in the study area during construction and after commencement of operation of the facilities in Years 2018 and 2021 has been undertaken. All assessed junctions would be operating satisfactorily with ample capacity during both morning and evening peaks. In addition, it is likely that the peak food waste delivery to the FWPF would be during off-peak hours of commuter traffic. Therefore, the traffic impact induced by the FWPF will be insignificant.

6. **WORKS PROGRAMME**

6.1. We plan to invite tenders for the DBO contract for the FWPF in Q3 2016 and commence the construction works in early 2017 for commissioning the co-digestion pilot trial in early 2018.

6.2. We will apply for revising the permitted land use of the subject site under the section 16 planning application of the Town Planning Ordinance (Cap.131) from “Leachate Pre-treatment Works” to “Leachate Pre-treatment Works cum Food Waste Pre-treatment Facilities” in end 2016 to allow co-use of the site for both leachate and food waste treatment.

7. **ADVICE SOUGHT**

7.1. Members are invited to provide comments on it.

Environmental Protection Department
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Appendix 1
Site boundary of the proposed food waste pre-treatment facilities