13. Summary of Environmental Outcomes

13.1 General

The following Section presents a summary of Environmental Outcomes for each impact assessment described in this EIA Report.

13.2 Air Quality Impact

13.2.1 Construction Phase

With the implementation of the recommended mitigation measures as well as the relevant control requirements as stipulated in the *Air Pollution Control (Construction Dust) Regulation*, it has been assessed that there would be no exceedance of the hourly, daily or annual TSP criteria at any of the ASRs.

13.2.2 Operation Phase

During the operation phase, all the assessed ASRs would be in compliance with the relevant current AQOs and other relevant criteria for all emissions modelled in this EIA. It is recommended that emission control equipment should be installed to reduce any potential effects on the local residents and sensitive receivers.

The recommended mitigation measures include gas cleaning equipment and stack for the CHP and odour treatment unit. This odour treatment assessment is based on the application of a UV-C and ozone treatment system with second stage active carbon filters recommended in the preliminary design. For the CHP, the preliminary design incorporates a combination of thermal and catalytic treatment processes to remove pollutants from the exhaust gasses from the CHP. Both the odour treatment unit and the CHP emissions are suggested to be directed to a flue to aid the dispersion and minimise effects on ASRs.

RCV's travelling to and from the OWTF2 site must be clean and the waste transfer compartment sealed during transport to avoid odour impacts. Deliveries will be scheduled to minimise / avoid queuing of vehicles[1]. In parallel, OWTF2 operator will not wish to accumulate waste materials at the site and will facilitate prompt processing.

Waste deliveries may comprise either conventional Refuse Collection Vehicles (RCV) or vehicles transporting purpose built containers that enclose the loose or bagged organic waste. The containment unit (RCV or container) must be designed to prevent ingress of rainwater (reducing leachate generation) and leakage of leachate. The container unit must be robust and made of a corrosion resistant material (stainless steel or high density / hard wearing plastic are preferred). These container units will be sealable to ensure a water and air tight seal that prevents ingress of water or any escape of odour. Following discharge at the OWTF2 the waste transfer vehicles will pass through a cleaning process before leaving the facility to remove potential for odour impact on the public highway. In view of this, odour emission from the waste collection vehicles during transportation of organic waste is therefore not anticipated.

[1] It is not in waste collection operators commercial interests to have vehicles queuing to discharge loads at OWTF2 as this is non-productive time, Operators will arrange their schedules to minimise queue times at OWTF2.

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13.3 Hazard to Life

A hazard assessment has been carried out to evaluate the biogas risk to existing, committed and planned off-site population due to the generation, transfer, storage and use of biogas due to operation of the Project.

Hazardous scenarios associated with the operations of the Project have been identified and assessed. A quantitative risk assessment has been conducted to determine the impact of the identified hazardous scenarios on the surrounding existing and proposed populations during the operation phase of the Project in terms of individual and societal risks. The maximum individual risk remains below $1x10^{-5}$ per year at the site boundary and hence meets the HKRG requirements. For the societal risk, the potential loss of life (PLL) for the 2017 scenario and the 2017 scenario with proposed developments are 5.16×10^{-6} per year and 6.25×10^{-6} per year respectively. It can be seen that the societal risk for both scenarios are low and within the acceptable region as per HK EIAO Societal Risk Guideline. Therefore, the assessment has concluded that the risks due to operation of the Project are acceptable under the individual and societal risk criteria set out in Annex 4 of the Environmental Impact Assessment Ordinance Technical Memorandum (EIAO-TM).

13.4 Noise Impact

13.4.1 Construction Phase

The potential source of noise impact during the construction phase of the Project is from the use of Powered Mechanical Equipment (PME) for various construction activities, including demolition and removal of the existing above ground structures of the Sha Ling Livestock Waste Composting Plant and construction of proposed superstructure. PME likely to be used at the Project site include breakers, cranes, lorries and other vehicles, air compressors and generators. A total of four representative noise sensitive receivers (NSRs) were identified for the construction phase assessment. The prediction results indicate that the noise impact of unmitigated construction activities from the project would cause exceedance of the relevant daytime construction noise criterion of 75 dB(A) at most of the NSRs. Mitigation measures are therefore required to alleviate the noise impacts generated during the construction phase. Recommended mitigation measures include good site practise to limit noise emissions at source, selection of quieter plant, use of movable noise barrier, enclosure and noise insulating fabric.

With the implementation of the mitigation measures, the construction noise levels at all representative NSRs are predicted to between 63 dB(A) and 75 dB (A), which comply with the noise standards stipulated in the EIAO-TM. Significant and residual construction noise impacts are therefore not anticipated from this Project.

13.4.2 Operation Phase

During operation phase of the Project, potential noise impact is from the operation of proposed fixed plant including shredders, screw pumps, mixers, power supply systems, etc. are anticipated. Noise impact from planned fixed plant can be effectively mitigated by implementing noise control measure at source during the detailed design stage. In this study, quantitative impact assessment has concluded that with the adoption of the proposed maximum permissible Sound Power Levels in a range of 84 to 90 dB(A) during

day-time period, 80 to 84 dB(A) during evening period and 79 to 81 dB(A) during night-time period at the proposed ventilation openings, the fixed plant noise levels at all selected NSRs comply with the relevant noise criteria. Therefore, significant fixed plant noise impact to the existing and planned NSRs is not anticipated.

13.5 Water Quality Impact

Water quality impact assessment has been carried out for areas within 500m of the Project site boundary and other areas in the vicinity that might be impacted by the Project. Four fish ponds and two watercourses were identified as inland water sensitive receivers.

The Project is located within the Deep Bay Water Control Zone. Effluent treatment is required prior to discharge into the water courses in the Deep Bay Area, in order to meet the criteria of "no net increase in pollution load requirement".

During the construction phase, potential water quality impact could be generated from site run-off, sewage from workforce, and discharge of wastewater from various construction activities. With the implementation of the mitigation measures, no adverse water quality impact on the water sensitive receivers from the construction works for the Project is anticipated.

Sewage effluent from operation of the Project would be discharged to the Shek Wu Hui Sewage Treatment Works via a new sewer connection to the existing NENT sewerage network. Adverse water quality impact on the water sensitive receivers is therefore not expected.

Wastewater generated from the dewatering of digestate from the digesters during operation of the Project is expected to be in a normal flow of 229.18 m^3/day and a peak flow of 5.31 L/s. Wastewater would be treated in an on-site wastewater treatment plant prior to discharge to the public sewerage system. Therefore, no adverse water quality impact is anticipated.

13.6 Waste Management Implications

Waste types likely to be generated during the construction phase of the Project could include excavated materials (from site formation and foundation works), C&D materials (from mixture of topsoil and dead vegetative material and surplus concrete or grouting mixes), chemical waste (from maintenance of construction plant and equipment) and general refuse (from the construction workforce). Provided that waste is handled, transported and disposed of using approved methods and that the good site practices are followed, adverse environmental impacts would not be expected during the construction phase.

During the operation phase of the Project, waste types to be generated could include wastes generated from pre-treatment processes (from pre-treatment sorting of organic waste feedstock), chemical wastes (from maintenance of mechanical equipment) and general refuse (from visitors and on-site staff). Provided that waste is handled, transported and disposed of using approved methods and that the good site practices are followed, adverse environmental impacts would not be anticipated during the operation phase.

Potential sources of land contamination in the operation phase have been reviewed. It is estimated that a limited amount of chemicals would be used or chemical wastes generated during the operation. Good practices and response procedures for contamination prevention have been identified. With the

implementation of recommended practices and procedures, the potential for contamination due to operation of the Project is expected to be minimal.

13.7 Ecological Impact

The Project Area comprises an existing developed concrete platform and plantation habitat adjacent to some village development. In general, the area is not ecologically significant owing to the relatively low ecological value of the habitats. The ecological impact of loss of a very small area of plantation habitat within the Project Area is therefore considered as minor.

Indirect impact on off-site habitat is also not considered to be significant due to lack of important ecological resources. No ecological impact has been identified from the operation of the Project as all potential air quality, noise and water quality impacts will be controlled to environmentally acceptable levels.

No specific ecological mitigation measures are considered necessary, except the precautionary measures for the existing plantation areas where trees and vegetation will be retained within the Project Area.

13.8 Fisheries Impact

A review and ground truthing exercise was conducted for fisheries impact and identified no commercial fish culture resources or activities within the immediate area. With the recommended water quality control measures and good site practice in place, the Project is unlikely to have any direct or indirect impacts on existing ponds or related activities within the immediate area. Therefore, no fisheries impact arising from construction and operation of the Project is anticipated and no fisheries-specific mitigation measures are required.

13.9 Landscape and Visual Impact

13.9.1 Potential Impact on Existing Trees

There are approximately 458 trees within or in close proximity of the Project. None of the trees are registered as Old and Valuable Tree (OVT). Approximately 441 trees are proposed to be retained in-situ; approximately 14 are proposed to be felled due to unavoidable conflict with the proposed works and transplantation is considered unsuitable; the remaining 3 trees are dead and in conflict with the proposed works and are therefore proposed to be removed. Tree planting to compensate for the loss of existing trees in terms of both quality and quantity as stipulated in ETWB TC(Works) No. 3/2006 is proposed and incorporated into the landscape design within the Project site. The overall potential impact on trees is considered negligible.

13.9.2 Landscape and Visual Impact

Sources of landscape and visual impacts will arise from removal of vegetation and demolition and construction work associated with the proposed Project. With the implementation of mitigation measures, the anticipated landscape and visual impacts are generally insubstantial, with slight negative impact expected for some landscape resources, landscape character areas and visual sensitive receivers. However, since the duration of the impact is only limited to the construction phase with a small area, such residual impact is therefore considered acceptable. Overall, in terms of Annex 10, Clause 1.1 (c) of the EIAO-TM, the landscape and visual impacts are acceptable with mitigation measures.

13.10 Cultural Heritage Impact

13.10.1 Archaeology

A desk-based review identified that the proposed site area has no archaeological potential. Some archaeological potential exists in the wider assessment area, but these areas with archaeological potential would not be impacted by the proposed Project. If associated works are proposed within identified potential area of archaeological interest within the AA in the detailed design phase, an archaeological investigation would be required prior to commencement of works. The scope and methodology of archaeological investigation are recommended but need to be agreed with the Antiquities and Monuments Office (AMO) prior to implementation.

At this stage there is no need for mitigation as no impacts are expected.

However, it is noted that if antiquities or supposed antiquities are discovered in the course of excavation works, the project proponent must arrange a temporary suspension of works in the affected area and notify AMO immediately of the discovery. Course for further action would be agreed with AMO prior to continuation of the works. Sufficient resource as well as time for conducting necessary archaeological works should be provided by the project proponent if so required.

13.10.2 Built Heritage

No mitigation measures have been identified to be necessary for built heritage resources during the construction and operation phases in the Built Heritage Impact Assessment. The construction and operation of the proposed OWTF 2 will not cause any insurmountable adverse impacts and no cumulative impacts will occur as a result of this Project.