

## **TABLE OF CONTENTS**

<b>18. CONCLUSIONS</b>	<b>18-1</b>
18.1 Introduction .....	18-1
18.2 Summary of Key Environmental Outcomes .....	18-1
18.3 Compensation Areas .....	18-13
18.4 Overall Conclusion .....	18-13

### **List of Appendices**

Appendix 18.1	Summary of Key Assessment Assumptions and Limitation of Methodologies
Appendix 18.2	Summary of Environmental Impacts
Appendix 18.3	Details of Schedule 2 Designated Projects for Environmental Permit Application

## 18. CONCLUSIONS

### 18.1 Introduction

18.1.1.1 This EIA report has provided an assessment of the potential environmental impacts associated with the construction and operation of the Project based on the preliminary engineering design information available at this stage. The assessment, conducted in accordance with the Study Brief No. ESB-340/2021 under the EIAO and the EIAO-TM, covers the following environmental issues:

- Air Quality Impact
- Noise Impact
- Water Quality Impact
- Sewage and Sewerage Treatment Implications
- Waste Management Implications
- Land Contamination
- Landfill Gas Hazard
- Ecological Impact
- Fisheries Impact
- Cultural Heritage Impact
- Hazard to Life
- Landscape and Visual Impact
- Electric and Magnetic Fields

18.1.1.2 The findings of the EIA Study have determined the likely nature and extent of environmental impacts predicted to arise from the construction and operation of the Project. During the EIA process, specific environmental control and mitigation measures have been identified and incorporated into the planning and design of the Project in order to achieve compliance with environmental legislation and standards during both the construction and operation phases. An environmental monitoring and audit (EM&A) programme has also been developed to check on project compliance of environmental legislation and standards. These are presented in a separate, stand-alone EM&A Manual. The Implementation Schedules listing the recommended mitigation measures are presented in **Section 17**.

18.1.1.3 A summary of the environmental outcomes/benefits that have accrued from the environmental considerations and analysis during the EIA study and the implementation of environmental control measures of the Project are presented in the sections below. This has included specific assessment for the Schedule 2 Designated Projects (DP) subject to environmental permit application under this Study. The summary of key assessment assumptions and limitations of methodologies and summary of environmental impacts are presented in **Appendices 18.1** and **18.2**, respectively.

### 18.2 Summary of Key Environmental Outcomes

#### 18.2.1 Environmental Benefits of the Project

18.2.1.1 The Project aspires to turn the existing vast extent of brownfield sites including logistics & freight operation, vehicle-related operation, warehouse/workshop, and open storage, which have created considerable environmental, traffic, visual, and other nuisance, to more optimal uses and better land utilisation for future development of Hong Kong.

18.2.1.2 STLMC DN's public transport plan will be planned with the operation of green transportation systems in mind. TIHs / green PTI will be equipped with ancillary facilities to support the operation of future green transport systems, reducing carbon emissions in the long run.

18.2.1.3 A number of existing livestock farms, including seven pig farms and two chicken farms, will be removed. As operation of livestock farms could be odourous, the clearance of farms

would remove these sources of odour emissions thus improving the overall air quality in the area.

- 18.2.1.4 The proposed Sam Po Shue Wetland Conservation Park (SPS WCP) is adjacent to the STLMC DN. In this regard, a generous eco-interface is proposed along the wetland park interface as well as along the bird flight path (an NBA is proposed at the northern tip of the existing LMC BCP area serving as natural landscape) to enhance biodiversity, as well as to create a sensible transition between rural / natural assets and new developments. The eco-interface is envisioned to have limited provision of recreation facilities to minimize human disturbance.
- 18.2.1.5 All sewage generated from the Project will be discharged to the public sewerage system and diverted to STLMC effluent polishing plant for tertiary treatment. The treated sewage effluent from the EPP will be further treated at the proposed reclaimed water facility and pumped to the Reclaimed Water Service Reservoir. The reclaimed water would be used for non-potable purposes within the Project area. The Project would induce water quality beneficial effect by providing new sewerage to the existing unsewered areas.
- 18.2.1.6 Echoing Hong Kong's Climate Action Plan 2050, the Project has considered implementation of district cooling system, waste reduction initiatives and facilities and green transport mechanisms.

## **18.2.2 Environmentally Friendly Design**

- 18.2.2.1 In order to create an eco-friendly and low-carbon community, sustainable planning and urban design of STLMC DN shall be promoted, integration with the existing green and natural assets. Smart and green mobility would also be integrated in the development of the STLMC DN. An integrated infrastructure system, including sustainable building design, tree planting and urban greening, waste management facilities, shall also be taken into consideration.
- 18.2.2.2 To cater for minimal disturbance to the east-west flight corridor near the Loop, and to the proposed SPS WCP, stepped building heights will be adopted adjacent to these areas.
- 18.2.2.3 Blue-green infrastructure will make use of the water bodies and plants around drainage system, for example rain gardens and flood retention ponds. As this facilitates natural filtering and reduces surface runoff, the quality and quantity of rainwater can be improved, thereby achieving sustainability and resilience. When severe weather patterns bring additional rainfall, these blue-green infrastructure can be used to retain part of the surface runoff, therefore preventing the rivers from being overflowing.

## **18.2.3 Key Environmental Problem Avoided**

### Avoidance of Ramsar Site

- 18.2.3.1 The Project boundary has been revised to avoid direct encroachment into the Mai Po Inner Deep Bay Ramsar Site. Considering the extensive area of wetland habitats within this Ramsar site, its capacity to support a high diversity and abundance of wildlife, and its international ecological importance, the direct encroachment of the Ramsar site have been actively avoided to preserve the site of conservation importance and the associated ecological resources.

### Avoiding Loss of the MPV Egretty and core area of MPLV Egretty

- 18.2.3.2 The Mai Po Village Egretty and the core area of Mai Po Lung Village Egretty located to the western portion of the Project area will be preserved. In view of the encroachment of Project boundary into the MPLV Egretty, the Project was carefully designed with the aim to preserve the MPLV Egretty, and the vegetation currently used by the breeding ardeids, as best as possible. An "Open Space" is proposed to preserve the core area of the egretty

and the vegetation (refer to **Section 10** on Ecology of EIA report refers). As such, direct loss of the whole egretty due to encroachment of the Project footprint has been actively avoided. Furthermore, encroachment into the MPV Egretty was also avoided under the Project.

#### Avoidance of Loss of Flight Corridor

- 18.2.3.3 To avoid loss of connectivity for wildlife due to the proposed development, flights paths and wildlife movement corridors have been incorporated in the Project, while also making use of NBA to avoid flight paths obstruction and fragmentation of wildlife movement corridor. This includes a 300 m wide flight corridor near LMC BCP and the Loop, at the northern portion of the Project area, to maintain the existing flight corridor for flight movement between the east and west.

#### Avoidance of Loss of Woodland Habitat

- 18.2.3.4 Upon initial findings and early development of the Project, the Project boundary has been refined to avoid and minimise loss of sensitive habitats. The woodland south of Pang Loon Tei (behind San Tin Barracks) and the adjacent natural watercourse were both considered to be of moderate-high ecological value, while various mammal species of conservation importance were recorded using the woodland habitat. The Project boundary has avoided encroachment into both woodland and natural watercourse habitats.

### **18.2.4 Environmental Benefits of Environmental Protection Measures Recommended**

- 18.2.4.1 This section outlines the environmental benefits of key environmental protection measures recommended. As detailed in this EIA Study, measures in relation to electric and magnetic field are not required. A list of key mitigation measures for each of the Schedule DP is outlined in **Appendix 18.3**.

#### Air Quality Impact

- 18.2.4.2 During construction phase, dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation and good site practices are recommended to be carried out to minimize construction dust impact. In order to help reduce carbon emission and pollution, timely application of temporary electricity and water supply would be made and electric vehicles would be adopted in accordance with DEVB TC(W) No. 13/2020 – Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts in the Project. Measures would be taken to minimise the exhaust emission from non-road mobile machinery (NRMMs). With the implementation of these measures, no adverse construction phase air quality impact would be anticipated.
- 18.2.4.3 Odour removal system should be installed at the refuse collection points (RCPs), refuse transfer station (RTS), and sewage pumping stations (SPS) and maintaining negative pressure to prevent foul air from escaping the building. During operation phase, to avoid the potential odour impact, specific building considerations should be incorporated such as design of central air-conditionings for the buildings at Site G.5.8, G.5.9, G.5.10, G.5.11, G.5.12 and OU(I&T)3.1.8, and the fresh air intake of these buildings being positioned 20mAG or above.
- 18.2.4.4 Within the effluent polishing plant (EPP), treatment units/facilities with potential odour emission will be covered and the exhausted air will be conveyed to deodourisers for treatment before exhausting to the environment. Furthermore, sludge tanks which its air-tightness has been proved by DSD should be deployed for transporting sludge.

#### Noise Impact

- 18.2.4.5 During construction phase, adopting quality PME, movable noise barriers, enclosures for construction plants, quieter construction method for piling work and proper grouping of PME for some construction activities at critical work areas is recommended. The Contractor should, subject to the actual site conditions, proactively adopt quieter rock breaking equipment, hydraulic crusher or non-mechanical breaking method (e.g. use of chemical expansion agent, quieter type blade saw and bursting system) to carry out the demolition / excavation works, where practicable. With the implementation of recommended mitigation measures, the predicted construction noise levels at the representative noise sensitive receivers would comply with the construction noise criteria stipulated in the EIAO-TM.
- 18.2.4.6 All noise sensitive receivers would comply with relevant traffic noise criteria with the implementation of direct mitigation measures, including the application of LNRS and acoustic window/balconies at housing sites and vertical/cantilevered noise barrier. With the adoption of the proposed maximum allowable SWLs for the proposed fixed plant, the fixed noise levels at representative NSRs would comply with the relevant noise criteria, no adverse noise impact from the proposed fixed noise sources of the Project would be anticipated. No adverse airborne and ground-borne railway noise impact would be anticipated.

Water Quality Impact / Sewerage and Sewage Treatment Implications

- 18.2.4.7 During Construction phase, potential pollution to nearby water bodies should be controlled by preventing or minimising the likelihood of pollutants being in contact with rainfall or run-off site runoff, and abate pollutants in the stormwater surface run-off prior to the discharge of surface run-off to the nearby water bodies by implementation of the Best Management Practices (BMPs) and practices outlined in ETWB TC (Works) No. 5/2005 “Protection of natural streams / rivers from adverse impacts arising from construction works”.
- 18.2.4.8 The construction works for removal and diversion of watercourses should be undertaken within a dry zone. Cofferdams or similar impermeable sheet pile walls should be used as necessary to isolate the works areas from the neighbouring waters. Site practices outlined in the ProPECC PN 2/23 “Construction Site Drainage” and ETWB TC (Works) No. 5/2005 should be adopted for the proposed demolition or diversion of watercourses where applicable.
- 18.2.4.9 All the ponds and wet areas to be removed should be isolated and not connected to any existing watercourse. Construction works at the existing ponds / wet areas should be conducted only after dewatering of these ponds / wet areas is fully completed. The drained water generated from the dewatering of these ponds / wet areas to be removed should be temporarily stored in appropriate storage tanks or containers for reuse on-site as far as possible. Any surplus drained water should be tankered away for disposal at the STW in a controlled manner.
- 18.2.4.10 No discharge of sewage to the stormwater drains or inland water will be allowed. Adequate and sufficient portable chemical toilets should be provided in the works areas to handle sewage from construction workforce. A licensed collector should be employed to clean and maintain the chemical toilets on a regular basis.
- 18.2.4.11 Prior to any excavation works within the potentially contaminated areas, the baseline groundwater quality in these areas should be reviewed based on the past relevant site investigation data and any additional groundwater quality measurements to be performed with reference to “Guidance Note for Contaminated Land Assessment and Remediation” and the review results should be submitted to EPD for examination.
- 18.2.4.12 An Emergency Response Plan is recommended to minimise the potential impact from construction site discharges under failure of treatment facilities during emergency situations or inclement weather.
- 18.2.4.13 Regarding the design of the EPP, peaking factors should be applied for all major treatment units and electrical and mechanical equipment to avoid equipment failure. By-pass

mechanism would be provided for both coarse screens and fine screens in the inlet to avoid/minimize failure in coarse/fine screens. Interim by-pass would be provided after the primary sedimentation tank to avoid raw sewage by-pass as much as possible. Standby unit for all major equipment would be provided in case of unexpected breakdown of pumping and treatment facilities such that the standby pumps and treatment facilities could take over and function to replace the broken pumps. Back-up power for dual power supply would be provided in case of power failure to sustain the function of pumping and treatment facilities. Emergency Response Plan will be formulated prior to commissioning of STLMC EPP to set out the emergency response procedures and actions to be followed in case of equipment or sewage treatment failure.

- 18.2.4.14 Precautionary measures include regular inspection, checking and maintenance, provision of twin rising main, provisions of leakage collection systems, etc. are recommended to minimise the risk of failure of the proposed sewerage system. Precautionary measures are proposed in the design of the SPS including standby pump and screen, backup power supply, emergency storage tank, telemetry system to the nearest manned station / plant, etc. It would minimise the chance of emergency sewage discharge at the SPS.
- 18.2.4.15 All sewage generated from the Project will be discharged to the public sewerage system and diverted to STLMC EPP for proper treatment. The TSE from the EPP will be treated at the proposed reclaimed water facility meeting the water quality standards endorsed by the “*Working Group on the Implementation of Reclaimed Water Supply in Sheung Shui and Fanling*” at its meeting on 13 July 2012 for non-potable uses and pumped to the Reclaimed Water Service Reservoir. The reclaimed water would be suitable for reuse within the Project such as toilet flushing and controlled irrigation. Pipework would be colour coded to distinguish reclaimed water pipework from potable pipework. The Project would induce water quality beneficial effect by providing new sewerage to the existing unsewered areas.
- 18.2.4.16 In view of the potential adverse effect of emergency sewage bypass and sewage leakage on the quality of the nearby watercourses, various precautionary measures are proposed to be incorporated in the design of the SPS and rising mains to avoid emergency bypass and leakage of sewage to the maximum practicable extent. A Contingency Plan is also recommended to deal with the remote occurrence of emergency discharge. With the incorporation of the precautionary measures and Contingency Plan as recommended in this EIA, the possibility of emergency sewage bypass and sewage leakage would be remote and the potential water quality impacts in the unlikely event that an overflow / leakage does occur would be minimised.
- 18.2.4.17 Another source of potential impact during the operational phase will be the run-off or non-point source pollution from road surfaces and developed areas. Stormwater control measures including adequate stormwater drainage system with suitable pollutant removal devices, blue-green infrastructure and best stormwater management practices are recommended for the Project to minimise the non-point source pollution. With proper implementation of the recommended mitigation measures, it is anticipated that the water quality impacts associated with the non-point source discharge from road surfaces and developed areas would be minimised.

#### Waste Management Implication

- 18.2.4.18 In general, the waste management hierarchy of avoidance and minimisation, reuse, recovery and recycling should be followed. The inert portion of the construction and demolition (C&D) materials should be reused on-site as fill or recycled as aggregate for other projects as far as practicable. Prior to disposal of non-inert C&D materials, wood, steel and other metals should also be separated for reuse and / or recycling where practicable so as to minimise the quantity of waste to be disposed of at landfill. In order to monitor the delivery of C&D materials at the designated public fill reception facility and landfill and to control fly-tipping, a trip-ticket system should be included. CCTV should also be installed at the vehicular entrance and exit of the site to monitor handling of C&D materials disposal. To prohibit illegal dumping and landfilling of C&D materials, as well as proper delivery to concurrent project sites for re-use, the dump trucks engaged on site

should be equipped with GPS or equivalent automatic system for real time tracking and monitoring of their travel routings, parking locations and disposal activities. Provided that the waste is handled, transport and disposal of using approved methods, adverse environmental impact would not be expected.

- 18.2.4.19 The types of waste anticipated during construction phase included C&D materials, chemical waste, general refuse, excavated sediments and floating refuse; while municipal solid waste (MSW), chemical waste and screenings, grits and sewage sludge are expected during operation phase.
- 18.2.4.20 Should asbestos containing materials (ACM) are identified, precautionary measures related to the handling and disposal of asbestos should be adopted in accordance with the EPD's Code of Practice on Handling, Transportation and Disposal of Asbestos Waste and ProPECC PN 2/97 Handling of Asbestos Containing Materials in Buildings.
- 18.2.4.21 General refuse should be stored in enclosed bins or compaction units separate from C&D materials and chemical wastes. A reputable waste collector should be employed by the contractor to remove general from the site, separately from C&D materials and chemical wastes, on a regular basis to minimise odour, pest and litter impacts. The collected general refuse would be disposed of at designated landfill. Clearly labelled recycling bins should be provided on site in order to encourage segregation and recycling of aluminium and plastic wastes, and wastepaper in order to reduce general refuse production.
- 18.2.4.22 If chemical waste is produced, the Contractor / future operator will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste. Chemical waste should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical waste (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while chemical waste that cannot be recycled should be disposed of at either the CWTC, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.
- 18.2.4.23 MSW generated from residential, commercial and industrial buildings should be collected with lidded bins, delivered to the refuse collection room and stored in enclosed containers installed in each to prevent windblown, vermin, water pollution and visual impact. At least daily collection should be arranged by the waste collector to transport the waste to the RCPs or RTS.
- 18.2.4.24 The major solid waste types produced from the EPP would be the screenings and grits collected from the inlet works and the dewatered sludge collected from the sewage treatment process. Screenings and grits generated from the EPP is suggested to be disposed of at the landfill whereas the dewatered sludge generated from the EPP is suggested to be treated at the sludge treatment facility (STF), subject to detailed design. The screenings, grits and dewatered sludge will be delivered by road transport in water tight containers or skips to avoid odour emission during transportation. Unloading process will be operated in the designated room inside STF which should be enclosed and served by negative pressure by extracting odorous gas to deodourising unit.
- 18.2.4.25 With the abovementioned mitigation measures, no adverse waste management implications associated with handling, storage and disposal of wastes would be expected.

#### Land Contamination

- 18.2.4.26 Based on the findings from desktop review (e.g. review of historical aerial photos and relevant information from EPD and FSD), drone reconnaissance and site surveys, 500 potentially contaminated sites have been identified.

- 18.2.4.27 The majority of 195 potentially contaminated sites were inaccessible for detailed reconnaissance at the time of reporting. As the identified potentially contaminated sites are still in operation and the development will only commence in phases from 2024, potential exists for changes in land use or the nature of operations prior to development within both the potentially contaminated site and other surveyed sites.
- 18.2.4.28 Detail site reconnaissance was carried out for 9 of 195 potentially contaminated sites (Sites S201, S202, S301, S302, W101, W102, W103, W104 and W105). Access has not yet granted by the Lands Department due to objections from villagers relating to the STLA application.
- 18.2.4.29 By implementing the recommended further works under the Project, the potentially contaminated site(s) within the Project boundary would be located and any contaminated soil and groundwater would be identified and treated. Future works include: site re-appraisal, SI works as well as submission of supplementary Contamination Assessment Plan(s) (CAP(s)) and, Contamination Assessment Report(s) (CAR(s)) for the EPD's approval after the sites are handed over to project proponent for development. If contaminated soil and/or groundwater were identified, remediation should be carried out according to EPD's approved Remediation Action Plan (RAP(s)) and Remediation Report(s) (RR(s)) should be submitted to EPD for agreement after completion of the remediation works. No development works shall be commenced prior to EPD's agreement of the RR(s).
- 18.2.4.30 Based on the findings of the assessment, 195 potentially contaminated sites are identified from land uses including container storage, equipment/machinery storage; recycling facilities, vehicle repair/maintenance workshops, diesel refuelling facilities, waste dumping grounds, metal workshops, etc.
- 18.2.4.31 At all sites, contamination (if any) is anticipated to be localised as the types of operations are not large-scale polluting installations / facilities, such as oil depots and power plants, where the nature of those operations has greater potential to result in widespread contamination.
- 18.2.4.32 COCs with potential to be present at potentially contaminated sites include metals, VOCs, SVOCs, PCRs and PCBs. These COCs are treatable using established physical, chemical and biological techniques and have been successfully remediated using proven remediation techniques in Hong Kong. By implementing the recommended works, contaminated soil and groundwater within the Project boundary would be identified and treated.
- 18.2.4.33 Recommended further works would not only mitigate health risk to future occupants, the works would also demonstrate sustainable reuse of treated soils as useful materials (such as backfill); thereby minimising the amount of waste disposed to landfill.
- 18.2.4.34 High levels of naturally occurring arsenic in soil is confirmed by ground investigation works. Health Impact Assessment has calculated a risk based arsenic threshold of 571 mg/kg which acts as a remedial threshold concentration. Further arsenic assessment and a detailed treatment approach has been proposed based on the RODP.
- 18.2.4.35 Further arsenic assessment should be carried out during site formation and during construction of foundation. The Project Proponent will treat the high arsenic containing soil in the shallow region before land allocation or land lease to ensure no adverse health impact to future occupants. The treatment depth will depend on the future land use. Subsequent Developer/Works Departments will treat HAC soil in deeper regions during excavations including basement, piling and utilities.

#### Landfill Gas Hazard

- 18.2.4.36 During construction phase, the risk was classified as very low (insignificant) that no precautionary measures are required.
- 18.2.4.37 As protection measure, for the development of an electricity substation within the CZ, generic passive precautionary measures may include utility protection measures for services passing through the consultation zone, creation of a subsurface preferential gas venting pathway or construction of a subsurface gas barrier and venting of manholes and above ground terminations. In ground venting or gas barrier protection measures may be located on the boundary of the development closest to the landfill. Dependent upon the orientation of the development and detailed design, utilities penetrating a ground floor slab on grade may require sealing.
- 18.2.4.38 During the operation phase of the development, if further groundworks or construction works are planned, the same landfill gas precautionary measures as those recommended for the construction stage should be followed.
- 18.2.4.39 Provided that the operation phase protection measures are appropriately designed and properly implemented, safety will be safeguarded and landfill gas impacts will be mitigated.

#### Ecological Impact (Terrestrial and Aquatic)

- 18.2.4.40 The principle of avoidance, minimisation, and compensation for all ecological resources have been considered in the development of the Project. Recommendation for enhancement have been provided as appropriate. Incorporation of Non-Building Areas (NBA) and associated limitation of building heights would avoid obstruction and minimise the potential disturbance of the recorded flight corridors.
- 18.2.4.41 In view of the presence of sensitive ecological resources, key avoidance measures that have been considered and adopted under the Project include the avoidance of encroachment into Mai Po Inner Deep Bay Ramsar Site; the preservation of MPLV Egret, its core roosting area and the associated vegetation; the incorporation of flight path with NBA to allow movement corridor; and avoiding and minimising loss of woodland habitats at various locations within the Project boundary.
- 18.2.4.42 Further mitigation measures are proposed for the potential direct impacts on the MPLV Egret, San Tin Open Storage Area Night Roost and Ha Wan Tsuen Night Roost. An "Open Space" is proposed under the Project, where the loss of the roosting substratum at the MPLV Egret would be avoided and minimised. A buffer area of 100 m was proposed for the egrets, where construction activities within the buffer area should only be conducted outside the breeding season (from late-September to February in the following year) in order to minimise the potential disturbance impact on the Egret, unless AFCD's prior approval on construction method has been obtained and appropriate mitigation measures have been proposed and adopted. Enhancement measures (e.g. water features and planting of mature trees) are also proposed at the "Open Space" located adjacent to the MPLV Egret to promote ardeid usage. While the loss of San Tin Open Storage Area Night Roost and Ha Wan Tsuen Night Roost would be unavoidable, roosting area would be re-provided in a diverted watercourse and adjacent to the proposed AFCD Fisheries Research Centre respectively, under the Project. The re-provided night roost would comprise water features and mature individuals of native tree species that are currently used as a roosting substratum. A buffer area of 100 m was also proposed at the night roosts, where noisy construction activities (with the use of PME) should cease at least an hour before sunset and shall commence at least an hour after sunrise on the following day.
- 18.2.4.43 Considering the size of the potential direct and indirect impacts on wetland habitats (including ponds, marsh / reed, watercourses, etc.) within the sites of conservation importance (wetlands concerned), a wetland compensation strategy has been developed to achieve the compensation requirement in accordance with the EIAO-TM, by enhancement of ecological functions and capacity of the existing habitats to sufficiently

compensate the wetland loss arising from the development of San Tin Technopole and achieve no-net-loss in ecological function and capacity of the wetlands concerned. This includes the establishment of “ecologically enhanced fishponds” and “enhanced freshwater wetland habitats”, preliminarily identified within the proposed Sam Po Shue Wetland Conservation Park (SPS WCP) and is anticipated to improve the connectivity of wetland habitats in the region, while conservation strategies to be implemented within the proposed SPS WCP are anticipated to provide ecological enhancement.

- 18.2.4.44 For plant species of conservation importance, detailed vegetation survey should be conducted prior to the commencement of construction works to identify potentially affected plant individuals, with appropriate mitigation measures such as transplantation or seeding planting to be proposed under a Protection and Transplantation / Seedling Planting Proposal. For fauna species of conservation importance with low mobility, detailed pre-construction surveys should also be conducted for these species, with appropriate mitigation measures including translocation (for low mobility species such as amphibians, freshwater fish and crabs), or nest control measure (for breeding / nesting avifauna species of conservation importance), to be proposed under a separate Translocation Proposal and Nest Control Proposal. In view of the small area of woodland loss, a woodland compensation plan would be formulated and submitted prior to the commencement of construction at the woodland habitat.
- 18.2.4.45 Movement corridor of wildlife (including non-flying mammal species) has also been considered and maintained under the Project, in both northern and southern portions of the Project site to mitigate for potential impacts due to habitat fragmentation. Wildlife corridors (that comprise both aboveground and underpass elements) were incorporated in the Project between the Loop and the SPS WCP (on the north) and between wooded habitats (on the south). These wildlife corridors would provide opportunity for ecological linkage, allowing movement of non-flying mammals. In particular, the mammal species Eurasian Otter would be benefited by the proposed wetland enhancement at SPS WCP, and incorporation of wildlife corridor, while pre-construction site check was also proposed for this mammal species.
- 18.2.4.46 With the implementation of the proposed mitigation measures, residual ecological impacts from habitat loss are not anticipated. Furthermore, with the proposed wetland compensation and the incorporation of enhancement opportunities (e.g. revitalisation of the STEMDC, landscape planting within the proposed development), overall habitat quality in the majority of the Project boundary is anticipated to be improved.

#### Fisheries Impact

- 18.2.4.47 Impact on aquaculture activities resulting from the loss of active fishponds and inactive fishponds within the Project boundary is considered to be of potentially moderate and minor impacts respectively. A fisheries enhancement area of about 40 ha located within the SPS WCP is recommended to compensate for the direct permanent loss of active and inactive fishponds. Various measures were proposed to enhance fisheries resources, including the implementation of AFCD Fisheries Research Centre under the initial phase of the Project, proper planning of aquaculture activities in the proposed SPS WCP, and incorporation of modernised aquaculture (e.g. intensive indoor/outdoor high-density aquaculture activities with introduction of innovative green technology such as recirculating aquaculture system, compartmentalization, remote real-time environmental monitoring, species selection, ecological polyculture, nutrition management, disease prevention and health management that create water bodies and environmental conditions suitable for aquaculture activities with high-density stocking conditions).

#### Cultural Heritage

- 18.2.4.48 Preservation by record must be carried out before demolition of Tin Tak Heroes Temple (MPL01), Mai Po Lung Vegetable Marketing Co-operative Society Ltd. (MPL02) and Sun Tin Vegetable Marketing Co-operative Society Ltd. (SHT01). A comprehensive record through 3D scanning, video recording and cartographic and photographic recording should

be conducted by the Project Proponent of subsequent developer(s) prior to any construction works. A copy of these records should be provided to AMO for record purpose and future use, such as research, exhibition and educational programmes.

- 18.2.4.49 Monitoring of ground-borne vibration, tilting and ground settlement, is proposed to be employed for Entrance Gate, Enclosing Walls and Shrine, Yan Shau Wai (HBN186) during the site formation and construction phases. The monitoring should be incorporated with a set of Alert, Alarm and Action (3As) system strictly following AMO's monitoring requirements for grade 3 historic building. The actual 3As criteria for HBN186 should be agreed with the AMO prior to the commencement of construction works. A monitoring proposal, including checkpoint locations, installation details, response actions to be taken when reaching each of the Alert/ Alarm/ Action (3As) levels and frequency of monitoring should be submitted to AMO and relevant stakeholder(s) for consideration before commencement of the works. Record of monitoring should be submitted regularly to AMO during the construction. AMO should be alerted in case any irregularities are observed.
- 18.2.4.50 For Gurkha Cemetery (BH03), Mans' Boundary Stone (BH06), Grave of Man Lun Fung ("麒麟吐玉書") (BH07), Grave of Man Chung Luen (BH08), Grave of Man Chu Shui (BH10), Grave of Mrs Man Leung (BH11) and Grave of Chong Yin Kei (BH12), ground-borne vibration, tilting and ground settlement monitoring and structural strengthening measures are required during construction phase. A baseline condition survey and baseline vibration impact assessment should be conducted for these non-building structures by a qualified building surveyor or qualified structural engineer during pre-construction stage of the proposed developments.
- 18.2.4.51 Monitoring of ground-borne vibration, tilting and ground settlement, is also proposed to be employed for Yeung Hau Temple (San Tin) (MPT01) and Structure between No. 5 and No. 7, Shek Wu Wai (SWW01) during the site formation and construction phase under Buildings Ordinance. The monitoring should be incorporated with a set of Alert, Alarm and Action (3As) system strictly following the requirements set out in Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers - Ground-borne Vibrations and Ground Settlements Arising from Pile Driving and Similar Operations (PNAP APP-137) on vibration-sensitive and dilapidated buildings. The actual 3As criteria shall be further confirmed via an assessment on the effects of ground-borne vibrations, settlements and tilting on MPT01 and SWW01. Prior agreement and consent should be sought from the owner(s), stakeholder(s) and relevant Government department(s) for the installation of monitoring points on the building before commencement of the works. Record of monitoring should be submitted regularly to the Buildings Department during the construction under Buildings Ordinance. Buildings Department should be alerted in case any irregularities are observed.
- 18.2.4.52 A safe access route to Yeung Hau Temple (San Tin) (MPT01), Gurkha Cemetery (BH03), Grave of Man Lun Fung ("麒麟吐玉書") (BH07), Grave of Man Chung Luen (BH08), Grave of Man Chu Shui (BH10) and Grave of Mrs Man Leung (BH11) should be maintained during construction phase.
- 18.2.4.53 The Contractors should enforce protocol to forbid any light machinery, such as handheld jackhammer, or heavy machinery to come into direct contact with Yeung Hau Temple (San Tin) (MPT01), which is located right next to the Project Boundary. Physical protective barriers/ covers or intervention/cushioning materials, including but not limited to covering or sheltering, shall be provided during the proposed construction works to separate the works areas from the structure. No piling works shall be allowed within the protective zone. No worker or any construction related equipment(s) and material(s) should trespass the protective zone.
- 18.2.4.54 Implementation of mitigation measures in the Air Pollution Control (Construction Dust) Regulation, dust suppression measures and good site practice should be observed by the

project proponent during the construction phase in order to avoid dust accumulation on the Yeung Hau Temple (San Tin) (MPT01) and Grave of Chong Yin Kei (BH12).

- 18.2.4.55 Further archaeological survey at later stages after land resumption but before site formation works is recommended for Hop Shing Wai Archaeologically Sensitive Area (ASA), Mai Po ASA, Siu Hum Tsuen (West) ASA, Siu Hum Tsuen (East) ASA and Pang Loon Tei ASA. The survey shall be conducted by an archaeologist who must obtain a *Licence to Excavate and Search for Antiquities* from the Antiquities Authority prior the commencement of the fieldworks.
- 18.2.4.56 Archaeological Watching Brief is recommended to be carried out in Shek Wu Wai ASA and Mai Po Lung (South) ASA should works involve soil disturbance occurred (such as site formation) during the construction phase.
- 18.2.4.57 The area of Mai Po Lung (North) ASA is reserved as an egretty (**Section 10** on Ecology of EIA report refers). No impact on archaeology is anticipated, no mitigation measure is required, subjected to the detailed design of this area. Should construction works involving soil disturbance are anticipated during the detailed design stage, project proponent should review the impact assessment and propose adequate mitigation measures to AMO for approval.
- 18.2.4.58 As a precautionary measure, if antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.
- 18.2.4.59 With the full implementation of the proposed mitigation measures, the impacts on cultural heritage are perceived to be acceptable subject to the result of further archaeological survey.

#### Hazard to Life

- 18.2.4.60 Good safety practices should be followed for the design and operation of the EPP. They include provision of adequate gas detectors at the process plant building, provision of safety markings and crash barriers to aboveground piping, digesters and gas holders near the entrance, provision of lightning protection installations, etc.
- 18.2.4.61 A quantitative risk assessment should be conducted should there be a significant population increase in the vicinity of the two green fuel stations (GFSs), or there be a significant increase in the throughput of the GFSs and/or the number of LPG road tanker deliveries. Should usage of the GFS other than LPG filling services is proposed in the future, the QRA should be reviewed.

#### Landscape and Visual Impact

- 18.2.4.62 Given the rural nature of the Project area, the Project will inevitably result in some landscape and visual impacts during construction and operational phases. It is not possible to fully mitigate all landscape impacts in relation to loss of Ponds, agriculture lands, woodlands, or tree planting for affected LRs and LCAs in the construction period and early operation stage, mainly as long periods of time are required to sufficiently compensate for the associated impacts. In addition, approximately 87% of existing trees within the Project area will be potentially felled or transplanted. Compensatory planting will be provided at a 1:1 ratio when appropriate and applicable to compensate for the tree loss due to site development works. In combination with urban design features and landscape enhancement proposed by the Revised RODP, the residual impacts to LRs and LCAs can be reduced to slight to moderate levels eventually.
- 18.2.4.63 During construction phase, mitigation measures recommended include preservation of existing vegetation, transplantation of existing trees, reinstatement of temporarily disturbed

landscape areas, minimise disturbance on watercourses, management of construction activities and facilities, control of night-time lighting, construction of decorative hoarding around construction works, advance planting of screen planting, and creating interface between ponds, wetland, and the Project.

- 18.2.4.64 During the development of the Revised RODP, major design measure is proposed which include provision of Wildlife corridor where appropriate and applicable. During operation phases, mitigation measures recommended include sensitive and aesthetically pleasing design of aboveground structures, landscape integration of built development, provision of roadside planting/ amenity planting/ peripheral screening or planting, provision of new tree planting, incorporation of green roof, sensitive design of noise barriers , control of night-time lighting glare, revitalisation and naturalisation of river to create a blue green network, maximise greening on engineering structures and surfaces, landscape treatment on slope, sensitive design of landscape areas/ provision of Open Space, off-site woodland compensation, creation of landscape buffer, stepped building height profile, provision of breezeway/ airpaths, provision of view corridor, and sensitive layout design of above-ground structures for drainage related infrastructure and watercourse impact mitigation within Wetland Conservation Area.
- 18.2.4.65 With the implementation of proposed mitigation measures, it is predicted there would be substantial impact significance on some of the LR and LCA. This includes mainly permanent and irreversible losses such as ponds near San Tin and Sam Po Shue (LR3.1), ponds near Siu Hum Tsuen and Shek Wu Wai San Tsuen area (LR3.2), all wet agricultural land (LR8.0) and large partial loss of dry agricultural land (LR9.0). For LCA, most permanent works are located within the rural inland plain landscape (LCA 4) and rural coastal plain landscape (LCA3). During the construction phase, due to the proposed works in these LCAs, their predicted landscape impact would be substantial. Their residual impact will be further reduced to slight and insubstantial respectively from Day 1 to Year 10 of operation phase due to the proposed mitigation measures, maturing of tree planting and vertical greening. Upon completion of works, this area will become a new planned development including Open Space, residential development, mixed-use development and “G/IC” uses. With appropriate mitigation measures as mentioned above and implementation of good site practises, it will be remained as “substantial” residual impact during construction stage and at Day 1 of operation at “moderate” and reduce to “slight” impact at year 10 of operation. For the loss in high sensitivity landscape resources such as LR3.1, woodland (LR10.0) and mixed woodland (LR11.0), they are well incorporated in the design process to minimise their impact as far as practicable within the landscape framework. Regarding mitigated visual impact, substantial residual visual impacts are anticipated on the recreational VSR REC1 (Hikers along Ngau Tam Shan Hiking Trail), REC3 (Hiker of Ki Lun Shan) and Residential VSR R3 (Residents of San Tin Seven Villages). The residual impact on most of these VSRs would be remain as substantial at construction phase, Day 1 and Year 10 of operation due to their nature and location. Mitigation measures are not able to adequately compensate for such a substantial magnitude of change for these VSRs. Nonetheless, when the proposed landscape mitigations including roadside and amenity planting, vertical green and compensatory trees become mature. The above would help soften the building masses at year 10 of operation and visually blend in with the well-developed cityscape of Shenzhen at the backdrop in Day 1 and Year 10 of operation phases. Moderate residual impact are anticipated for R1, GIC4, REC2 and REC4. Their residual impact will be further reduced to slight and insubstantial at Day 1 and Year 10 of operation after implementation of mitigation measures respectively. Moderate residual impact are also anticipated for T1, T2, R2, R9, R10, R11, O3, O6, REC5, REC6, GIC2 and GIC3 due to their relative closer distance from the source of impact and long viewing duration, despite the lower building profile as proposed in the design consideration and the mentioned mitigation measures, their residual impact at Day 1 and Year 10 will remain at moderate. There would be slight to insubstantial residual impact on other VSRs during construction and operation phase.
- 18.2.4.66 The proposed development of the Project would inevitably change the landscape character and visual environment of the area. The urban design and landscape framework is an intrinsic part of the Project that must be viewed in connection with proposed mitigation

measures. While it is mentioned that not all impacts can be fully reduced or eliminated through the implementation of mitigation measures, the design principles provide enhancement by specifically outlining and dedicating areas for open space, blue-green network, Green Belt, breezeway, view corridor, massing control, aesthetic above ground structure design, and provision of compensatory planting proposal, etc. As such, it is considered that the residual landscape and visual impact are perceived to be acceptable with the full implementation of the mitigation measures. The overall Project is appropriate to the planned context of the area and in the long term with beneficial landscape and visual impacts.

#### Impact from Electric and Magnetic Fields

- 18.2.4.67 According to the Project development layout, the 400kV overhead cable and pylons are situated at and/or are close to the eastern portion of the development area. The potential ELF and EMF impacts to the proposed developments at this portion of the development area have been assessed in accordance with the requirements in the Study Brief. On-site measurement of ELF and EMF at the selected locations which represent the proposed land uses of the development areas were conducted.
- 18.2.4.68 The measured ELF and EMF generated from the existing 400 kV overhead cable were well below the stipulated guideline limits issued by the ICNIRP in 1998. Hence, the existing 400 kV overhead cable located within the Project area would not pose adverse impact to proposed developments of the Project.

### **18.2.5 Population and Environmentally Sensitive Areas Protected**

- 18.2.5.1 The Project has avoided encroachment into existing recognized villages including Shek Wu Wai, Chau Tau Tsuen and Yan Shau Wai. In terms of cultural heritage, all Declared Monuments and Graded Historic Buildings would be preserved.

### **18.3 Compensation Areas**

- 18.3.1.1 To compensate for loss of woodland impacted by the Project, a suitable area near the compensatory woodland for the Development of Lok Ma Chau Loop (AEIAR-176/2013) was identified. This compensatory woodland is situated within the Green Belt zone and was originally of grassland habitat of low ecological value. The establishment of a compensatory woodland therein could increase the total area of the compensatory woodland and strengthen ecological connectivity with adjacent wooded area. A compensatory woodland with an extensive area and integrity could foster natural succession and enhance habitat quality, which could potentially raise the overall ecological value of the area.
- 18.3.1.2 The loss of wetland habitat would be compensated at the proposed SPS WCP. Compensatory wetland in the form of “ecologically enhanced fishponds” shall be established. Some areas of existing brownfield areas, inactive and abandoned fishponds could be converted to ecologically enhanced fishpond habitats. Other wetland habitats (including mitigation wetland, marsh / reed, watercourse, seasonally wet grassland, and wet agricultural land) would be compensated under “enhanced freshwater wetland habitats” at the proposed SPS WCP.

### **18.4 Overall Conclusion**

- 18.4.1.1 The findings of this EIA have provided information on the nature and extent of environmental impacts arising from the construction and operation of the Project. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards.
- 18.4.1.2 Overall, the EIA Report has predicted that the Project would be environmentally acceptable with the implementation of the proposed mitigation measures for construction and operation

phases. An environmental monitoring and audit programme has been recommended to ensure the effectiveness of recommended mitigation measures.