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- Appendix 14.1 Summary of Environmental Impacts Associated with the Project
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14. CONCLUSION

14.1 Introduction

14.1.1 This Environmental Impact Assessment (EIA) Report has been prepared for the proposed Drainage Improvement Works in Ta Kwu Ling (the Project) in accordance with the requirements set out in the *EIA Study Brief (ESB-322/2019)* and the *Technical Memorandum on EIA Process (EIAO-TM)*. Aspects that have been considered in this EIA Report include:

- Air Quality;
- Noise;
- Water Quality;
- Waste Management;
- Land Contamination;
- Ecology;
- Fisheries;
- Cultural Heritage; and
- Landscape and Visual.

14.1.2 A summary of environmental impacts identified in this EIA is provided in **Appendix 14.1**. The conclusion of the technical chapters of this EIA is described in the following sections.

14.1.3 The key assessment assumptions, limitation of assessment methodologies and related prior agreements with EPD / other authorities on assessment of different environmental aspects are given in **Appendix 14.2**.

14.2 Air Quality Impact

14.2.1 Construction works of the Project will inevitably generate some fugitive dust, especially during the excavation of the proposed channel. With the section-by-section construction approach, the areas of excavation works should be limited in scale. Regular site wetting will also help to control wind-blown nuisances.

14.2.2 Excavation and handling of river bed material may cause odour impacts during construction and operation. With the implementation of good site practice, odour nuisance is not anticipated.

14.2.3 Through proper implementation of dust control measures required under the *Air Pollution Control (Construction Dust) Regulation* and the *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation*, construction fugitive dust should be controlled at source to satisfactory levels.

14.2.4 Maintenance works for the Project will be small-scale in nature. During the operation phase, the Project will unlikely cause any adverse air quality impacts in terms of dust and odour.

- 14.2.5 In order to ensure and demonstrate that mitigation measures are properly implemented during the construction stage for reducing the air quality impacts from the Project, monthly site inspections and audits will be conducted as part of the EM&A Programme of the Project.

14.3 Noise Impact

- 14.3.1 Owing to the close proximity of some of the NSRs to the works area of the Project, mitigation measures are required to be implemented to all representative NSRs to mitigate the construction noise impacts. Practicable mitigation measures, including good construction site practices, use of quiet PME, temporary noise barriers and noise enclosures, and scheduling of PME/construction activities, are recommended. With the implementation of the recommended mitigation measures, the mitigated construction noise levels at the representative NSRs will comply with the day time construction noise criterion of 75 dB(A) throughout the construction period. Noise monitoring during the construction stage is recommended to ensure compliance with the relevant noise criterion.
- 14.3.2 No adverse noise impact is anticipated during operation phase as the Project does not have fixed noise source during operation.

14.4 Water Quality Impact

- 14.4.1 The potential sources of water quality impacts associated with the construction and operation of the Project have been identified and the potential impacts were evaluated.
- 14.4.2 Potential impacts arising from the proposed construction works are predicted to be largely confined to the specific works areas. With proper implementation of the recommended mitigation measures, in particular the establishment of dry conditions for excavation works within the existing watercourse and good construction site practices as recommended in relevant regulatory guidelines, adverse water quality impacts are not expected at the identified WSRs.
- 14.4.3 During the operation phase, changes to hydrodynamic regime within the Project Site are predicted to have no adverse impacts. Adverse water quality impacts are not expected at any identified WSRs during the operation phase as the Project will not generate any new pollution loads and the maintenance works to remove excessive silt, vegetation, debris and obstructions are small scale in nature. The improved flow condition in the proposed Drainage Channel TKL04 and 05 may alter the pattern of sediment deposition and erosion along the downstream section of Ping Yuen River and Shenzhen River. With regular maintenance works at these downstream sections to remove excessive sediments, it is not anticipated that the Project will lead to any unacceptable adverse water quality impacts by altering their sediment deposition and erosion pattern.
- 14.4.4 With the implementation of the recommended mitigation measures, it is expected that unacceptable residual water quality impacts from the construction

and operation of the Project would not arise. Nevertheless, a monitoring programme is recommended during construction phase to verify the predictions of the EIA and ensure compliance with the assessment criteria.

14.5 Waste Management

- 14.5.1 The proposed drainage improvement works is adopted in a manner of optimizing land resumption and balancing different design constraints. The proposed alignment is designed to follow the original river as far as practicable in order to minimize the generation of inert C&D materials. Wastes generated by the construction activities are likely to include inert and non-inert C&D materials from the construction works, general refuse from the workforce and chemical waste from any maintenance of construction plant and equipment. Provided that these identified wastes arisen are handled, transported and disposed of using approved methods and that the recommended good site practices are strictly followed in terms of the avoidance-minimisation-reuse-recycling-disposal hierarchy, unacceptable environmental impacts are not anticipated during construction of the Project.
- 14.5.2 The waste generated by different construction activities are categorised into “Site Clearance/ Demolition Materials”, “C&D Materials during Construction”, “Chemical Waste” and “General Refuse”. The estimated quantities are about 24,394m³, 217,130m³ 50L/month and 39kg/day respectively. In general, the excavated inert C&D materials will be reused as much as practicable of about 119,520 m³ and the rest will be sent to public fill facilities (i.e. Fill Bank at Tuen Mun Area 38) for disposal. The recyclable C&D materials will be sort out from the non-inert C&D materials before disposal at NENT Landfill. The chemical waste will be collected and then recycle, dispose to approved chemical waste treatment facilities (e.g. Chemical Waste Treatment Centre (CWTC) at Tsing Yi). The general refuse will be disposed to NENT Landfill.
- 14.5.3 The recommended measures can be enforced by incorporating them into the waste management requirements in the WMP as part of the EMP and it shall be submitted to Architect/Engineer for approval before construction. Environmental site audit would be necessary to ensure the implementation of proper waste management practices during construction.
- 14.5.4 A C&DMMP shall be prepared and submit to the Public Fill Committee of CEDD for approval prior to commencement of the detailed design in accordance with Appendix 4.12 of Chapter 4 of the Project Administration Handbook for Civil Engineering Works (PAH).

14.5.5 For the operation phase, silts, vegetation, debris and obstruction are expected to be generated during maintenance works of the river. Such waste will be removed by manual means and disposed of to landfill after the clearance works. All chemical waste (i.e. lubricants, oils, solvents and paint products) should be properly stored, labelled and removed by licensed waste collectors in accordance with Waste Disposal (Chemical Waste) (General) Regulation. No unacceptable environmental impacts are anticipated with proper waste management practices.

14.6 Land Contamination

14.6.1 A land contamination assessment has been conducted for this Project. Suspected contaminative sites within the Project area were identified and considered as Concerned Area. Based on a review of historical information and current land uses, the potential contamination hotspots in Concerned Area A, B1 and B2 were identified and 10 sampling locations were proposed for further SI. Findings of the site appraisal and proposed soil and groundwater sampling and testing plan are presented in the enclosed CAP.

14.6.2 All the Concerned Area (i.e. Area A, Area B1 and Area B2) were still in operation and not accessible for site inspection and SI at the time of EIA. Although the Project Area, excluding the Concerned Areas, is not identified as potentially contaminated sites during the course of this CAP study, the site is still in use. Change in land use could take place on this site, which may cause potential land contamination. Further works including site re-appraisal for Project Area and submission of supplementary CAP(s), CAR(s) /RAP(s) and RR(s) shall be carried out by future project proponent to confirm whether the following SI locations will be still valid to reflect the land conditions. The further works shall follow EPD's Guidance Manual, Guidance Note and Practice Guide.

14.6.3 Based on the land use types identified in the Concerned Area, these areas are typically used for goods storage with possibly small portion for potential contaminating activities such as chemical handling or storage. Therefore, it is anticipated the extent of land contamination, if any, would be localised.

14.6.4 The identified COCs in soil and groundwater, including metals, VOCs, SVOCs and PCRs, are readily treatable with biological treatment and physical / chemical treatment. In addition, the soil contaminated with the abovementioned COCs had successfully been remediated in Hong Kong using proven remediation techniques. With the implementation of further works, contaminated sites, if any, would be identified and the extent of contaminated soil / groundwater can be located and cleaned-up accordingly. No contamination causing insurmountable impacts to the future land users is expected.

14.7 Ecological Impact

- 14.7.1 The ecological impact assessment has been carried out based on literature reviews and the updated ecological survey conducted between February 2020 and December 2020, which covered both wet and dry seasons. According to the Project alignment, the Project will cause potential habitat loss to abandoned agricultural land (8.64ha), agricultural land (2.70ha), channel (0.89ha), developed area (4.24ha), pond (0.13ha), watercourse (2.45ha) and woodland (1.05ha).
- 14.7.2 Majority of the identified impacts are considered to be low or negligible in the absence of mitigation measures. However, the potential impact on direct loss of watercourse, direct loss of woodland, direct ecological impact on flora and fauna species of conservation importance, indirect disturbance to Ping Che Egretty and impact of water pollution due to construction run-off are considered as low to moderate. Necessary mitigation measures were proposed for the above potential impacts.
- 14.7.3 It is predicted that the impacts will mainly arise during the construction phase, as no major activities would be conducted during the operational phase. The routine maintenance and the operation of the completed drainage channel would not cause any significant ecological impact.
- 14.7.4 With the implementation of mitigation measures and precautionary measures, adverse residual impacts from the Project on the ecological resources within and in the vicinity of the Project Area during construction and operation phase would not be anticipated. Off-site mitigation measures are therefore not considered necessary to mitigate the residual impacts any further.

14.8 Fisheries Impact

- 14.8.1 The baseline review and site surveys indicated that, besides Ping Che Aquaponics Farm, no active fishponds, pond fish culture activities have been identified within the assessment area. With proper implementation of the water quality mitigation measures during construction and operational phases of the Project, no indirect impact on pond fish culture activities in the NWNT area, oyster culture and fishing ground in Deep Bay area due to discharge into Shenzhen River is expected. Fisheries impact arising from construction and operation of the Project is therefore not anticipated.

14.9 Cultural Heritage Impact

- 14.9.1 The Ping Che Site of Archaeological Interest is located far away (269 m) from the Works Area of the Project, due to the large separation distance of the Site from the Works Area, no impact is anticipated and thus, no mitigation measure is required.
- 14.9.2 No archaeological potential area has been identified at the Works Area of the Project. No archaeological impact is anticipated and thus no mitigation measures is required. However, in case of change of the Works Area of the Project, the project proponent should inform the AMO and evaluation the

archaeological potential of additional area that was not covered in this assessment and recommend the need for further archaeological action.

- 14.9.3 As a precautionary measure, the project proponent and his/her contractor are required to inform AMO immediately when any antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered during the course of works.
- 14.9.4 Desktop review supplemented by field visits and built heritage survey identified no declared or proposed monuments and Government identified sites in the CHAA. No impact to these items is anticipated and thus no mitigation measures is required.
- 14.9.5 Six Graded historic buildings (GB-01 to GB-04, GB08 and GB09) and one new built heritage item for grading assessment (GB-05) identified will not be impacted by the Project due to their large separation distance from the works are of the Project. No mitigation measure is required.
- 14.9.6 Special attention should be paid to avoid potential adverse physical impact arising from the proposed works to two Grade 3 historic buildings (GB-06 and GB-07). Design proposal, method of works and choice of machinery should be targeted to minimize potential adverse impacts to these heritage sites.
- 14.9.7 With regard to potential vibration impact, settlement and tilting of two Grade 3 historic buildings (GB-06 and GB-07) may be a concern, it is recommended that during pre-construction stage of the Project and implemented by the works contractor, a baseline condition survey and baseline vibration impact assessment be conducted for these two historic buildings by a qualified building surveyor or qualified structural engineer to evaluate on the necessary construction monitoring and structural strengthening measures for AMO's consideration.
- 14.9.8 Most of the built heritage items identified in the CHAA will not be impacted by the construction work of the Project as they are far away from the Works Area of the Project. Therefore, no mitigation measure is required. However, potential impacts on sixteen (16) built heritage items HB-14, HB-15, HB-16, HB-40, HB-43, HB-44, HB-46, HB-48, HB-49, HB-50, HB-51, HB-53, HB-54, HB-55, HB-56 and HB-72 are identified. Appropriate mitigation measures including baseline condition survey and baseline vibration impact assessment to be conducted by qualified building surveyor or qualified structural engineer during pre-construction stage of the Project. As a precautionary measure, it is also recommended that during construction stage of the Project adjacent to six (6) HB-40, HB-51, HB-53, HB-54, HB-55 and HB-56, proper access and space shall be allowed at/to the shrines so that the local practice of rituals will be not affected.
- 14.9.9 With the implementation of the mitigation measures recommended, the potential impact of the Project during construction phase would be diminished and controlled to acceptable levels, no adverse residual impacts and cumulative impacts are anticipated.

14.9.10 Referring to the latest information provided by DSD on the interfacing projects, the major scopes include sewerage system upgrading works nearby Ping Che Road and drainage improvement works in Ping Yuen River. With implementation of control measures during construction, no adverse impact is anticipated. Considered the scale and nature of the cumulative project, no adverse cumulative impact would be anticipated. To further minimise the potential cumulative impacts during construction phase, it is recommended that the contractor shall plan the works area of the close proximity work sections which will not overlap with the works area of interfacing project as far as practical.

14.10 Landscape and Visual Impact

14.10.1 Residual landscape impacts remain minor on the water course (LR2), agricultural land (LR7) and lowland agricultural landscape (LCA3) after Year 10 of operation. Residual landscape impacts are negligible on all other LRs and LCAs. Certain number of trees will be felled for this Project, but these will be adequately compensated for with compensatory planting of not less than 1:1 ratio within the Project Site. Water course (LR2) and agricultural land (LR7) will be affected by channelisation works of the Project and the residual impacts are considered moderate at construction, minor to moderate at Day 1 of operation and reduce to minor by Year 10 of operation with proper implementation of the recommended mitigation measures.

14.10.2 Overall, residual visual impacts of the VSRs are minor or negligible at Day 1 of operation, and will be diminished to negligible residual impacts at Year 10 of operation.

14.10.3 By operation, construction equipment will have been removed and earthworks completed. Therefore with sensitive architectural design of the structures, tree planting and careful design of lighting, residual visual impacts would further reduce at Day 1 of operation of TKL 04 and TKL 05. The new structures are expected to blend into the surrounding environment, with denser vegetation at Year 10.

14.10.4 In conclusion, according to Annex 10 of the EIAO-TM, following the introduction of the landscape and visual mitigation measures, the Landscape and Visual Impacts of this Project, are considered acceptable with mitigation.

14.11 Environmental Monitoring and Audit (EM&A)

14.11.1 Monitoring of air quality, noise, water quality, ecology, cultural heritage, and landscape and visual impact has been recommended during the construction phase and where appropriate operational phase of the Project. Environmental site audit should be conducted weekly throughout the construction phase to ensure that the proposed mitigation measures are implemented.

14.11.2 The detailed EM&A programme is presented in a standalone EM&A Manual.

14.12 Overall Conclusion

- 14.12.1 The EIA has identified and assessed the potential environmental impacts during the construction and operation of the Project in accordance with the requirements set out in the *EIA Study Brief (ESB-322/2019)* and *EIAO-TM*. The EIA has concluded that with the implementation of the recommended mitigation measures, no unacceptable environmental impacts are envisaged as a result of the construction and operation of the Project and the Project would be in compliance with the applicable environmental legislation and standards.

END OF TEXT