

**CONTENTS**

|   |             |
|---|-------------|
| <b>12. CONCLUSION .....</b>                         | <b>12-1</b> |
| 12.1 Introduction.....                              | 12-1        |
| 12.2 Air Quality Impact .....                       | 12-1        |
| 12.3 Noise Impact.....                              | 12-2        |
| 12.4 Water Quality Impact.....                      | 12-2        |
| 12.5 Waste Management .....                         | 12-3        |
| 12.6 Ecological .....                               | 12-3        |
| 12.7 Landscape and Visual Impact.....               | 12-4        |
| 12.8 Cultural Heritage.....                         | 12-4        |
| 12.9 Environmental Monitoring and Audit (EM&A)..... | 12-5        |
| 12.10 Overall Conclusion .....                      | 12-5        |

**Appendices**

Appendix 12.1 Summary of Environmental Impact Associated with the Project

Appendix 12.2 Key Assessment Assumptions and Limitations of Assessment Methodologies

## **12. CONCLUSION**

### **12.1 Introduction**

12.1.1 This Environmental Impact Assessment (EIA) Report has been prepared for the proposed Drainage Improvement Works in Mui Wo (the Project) in accordance with the requirements set out in the EIA Study Brief (ESB-334/2020) 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;
- Ecology;
- Cultural Heritage; and
- Landscape and Visual.

12.1.2 A summary of environmental impacts identified in this EIA is provided in **Appendix 12.1**. The conclusion of the technical chapters of this EIA is described in the following sections.

12.1.3 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 12.2**.

### **12.2 Air Quality Impact**

12.2.1 During construction phase of the Project, potential air quality impact from fugitive dust may arise from excavation works and stockpiling of excavated material and piling works. Potential air quality impact may also arise from the gaseous emission due to the use of PMEs. Odour impact may also arise from the excavation of river sediment. However, adverse air quality impacts due to fugitive dust, gaseous emission from PMEs and odour impact arise from excavation of river sediment during the construction phase are not expected with the implementation of recommended mitigation measures.

12.2.2 During operation phase of the Project, regular maintenance desilting and debris clearance will be necessary. Adverse air quality impacts due to fugitive dust gaseous emission from PMEs and odour impact arise from maintenance works are not anticipated with the implementation of recommended mitigation measures.

12.2.3 Site inspections and audits during construction phase of the Project to ensure proper implementation of the mitigation measures are recommended. Air quality monitoring is considered not necessary during the construction and operation phases of the Project.

### **12.3 Noise Impact**

12.3.1 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 mitigate the construction noise impacts. Practicable mitigation measures, including good construction site practices, use of quiet construction method/PME, temporary noise barriers / noise enclosures, scheduling of PME / construction activities to avoid work during sensitive time (e.g., school examination period) and reduce the concurrent operation of PMEs are recommended. With the implementation of the recommended mitigation measures, the mitigated construction noise levels at all representative NSRs will comply with the daytime construction noise criteria throughout the construction period. Noise monitoring during the construction stage is recommended to ensure compliance with the relevant noise criteria.

12.3.2 No adverse noise impact is anticipated during operation phase after implementation of noise mitigation measures, such as acoustic covers, and proper design of the proposed stormwater pumping station. A commissioning test should be conducted prior to operation of the Project to ensure compliance of the operation noise levels with the stipulated noise standard.

### **12.4 Water Quality Impact**

12.4.1 Potential water quality impact from construction surface runoff, wastewater and sediment release from works into water bodies, construction works within river channel and sewage from workforce have been assessed. With the implementation of mitigation measures (in particular to carry out excavation works for the Project in a confined and dry condition) and proper good site practice proposed, no adverse water quality impact is anticipated during the construction phase of the Project.

12.4.2 The potential water quality impacts arising associated with maintenance works of the drainage channels and change in flow regime have been assessed. Regular maintenance works will be undertaken in dry condition in confined areas. Unacceptable water quality impacts are not expected with appropriate preventive and mitigation measures proposed.

12.4.3 The proposed drainage improvement works is effective in stormwater diversion. The flow across the different channels will remain mostly unchanged under normal circumstances and thus limited change in flow regime would be expected from Project operation. Since there will be no new pollution source under this Project, there will be no unacceptable adverse change in water quality. Sedimentation/ erosion pattern is not expected to be significantly affected given the limited change in flow regime, and any excessive accumulation in the affected rivers after heavy rainstorm will be handled by DSD staff. Appropriate preventive and mitigation measures such as real time monitoring of water quality are recommended to minimise the potential water quality

impact from the proposed drainage improvement works. No unacceptable water quality impact from the proposed drainage improvement works has been predicted.

## **12.5 Waste Management**

12.5.1 With the implementation of good site practices, adverse environmental impact (potential air and odour emissions, noise and wastewater discharge) arising from the management and disposal of waste during the construction and operation phases of the Project are not anticipated.

12.5.2 It is recommended that regular site inspections of the waste management practices would be carried out during the construction phase to determine if wastes are being managed in accordance with the recommended good site practices and Waste Management Plan. The site inspections will investigate all aspects of waste management including waste generation, storage, handling, recycling, transportation and disposal.

## **12.6 Ecological**

12.6.1 The ecological impact assessment has been carried out based on literature reviews and the focused field surveys of twelve months covering both wet and dry seasons completed in 2022. According to the Project alignment, the Project will cause potential temporary and permanent habitat loss to marsh (~0.7ha; including ~0.5ha temporary works area), semi-natural watercourse (~0.7km; including ~0.7km temporary works area), channelised watercourses (~0.4km; including ~0.4km temporary works area), agricultural land (~1.1ha; including ~0.8ha of temporary works area) and village/developed area (~0.5ha; including ~0.5ha temporary works area).

12.6.2 Majority of the identified impacts are considered to be low in the absence of mitigation measures. However, the potential impact on direct loss (i.e., permanent and temporary losses) of marsh, watercourses and agricultural land, ecological impact on fauna species of conservation importance, and ecological impact to watercourses due to river reprofiling, temporary stream diversion and the associated change in water flow/ level are considered as low to moderate. Necessary mitigation measures and ecological monitoring programme were proposed for the above potential impacts.

12.6.3 It is predicted that the impacts will mainly arise during the construction phase, as no major activities would be conducted during the operation phase. The routine maintenance and the operation of the completed drainage channel and pumping station would not cause any significant ecological impact. Good site practice and mitigation measures are recommended to minimise potential impacts resulting from operational phase activities.

12.6.4 With the implementation of mitigation measures and precautionary measures, no adverse residual ecological impacts from the Project within and in the vicinity of the works area during construction and operation phases would be anticipated. Off-site mitigation measures are therefore not considered necessary to mitigate the residual impacts any further.

## **12.7 Landscape and Visual Impact**

- 12.7.1 Residual landscape impacts are **slight** on LCA3 (Rural Inland Plains of Mui Wo and Surrounding Villages), LR5 (Agricultural Land) and LR9 (Semi Natural Water Course) during construction and Operation at Day 1, and **insignificant** on all other LRs and LCAs with proper implement of the recommended mitigation measures.
- 12.7.2 Residual visual impacts on VSRs are **slight to insignificant** during construction and Operation at Day 1 with proper implement of the recommended mitigation measures.
- 12.7.3 Approximately 87 nos. of trees will be affected and proposed to be felled by this Project, but these will be adequately compensated for with compensatory planting of not less than 1:1 ratio within the Works Area. Therefore, the estimated nos. of compensatory tree planting will be 87 nos. subjected to the detail design.
- 12.7.4 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 landscape and visual impact at Day 1 of operation. The new structures are expected to blend into the surrounding environment, with denser vegetation at Year 10 of operation. The residual impact on LCAs, LRs and VSRs will become **slight to insignificant** during Operation at Year 10.
- 12.7.5 According to Annex 10 of the EIAO-TM, following the introduction of landscape and visual mitigation measures, the Landscape and Visual Impacts of this Project, are considered acceptable with mitigation measures.

## **12.8 Cultural Heritage**

- 12.8.1 Chung Hau SAI is found within the CHAA, at a distance of about 20m within the works area of the Project. No excavation works of the project will exist in or adjacent to the SAI, therefore no adverse archaeological impact due to the proposed development is anticipated and thus, no mitigation measure is required.
- 12.8.2 No archaeological potential area has been identified within the works area. No archaeological impact is anticipated and thus no mitigation measures is required.
- 12.8.3 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 A&M Ordinance (Cap. 53) are discovered during the course of works.
- 12.8.4 Desktop review supplemented by built heritage survey identified no declared or proposed monuments and Government historic sites identified by AMO in the CHAA. No impact to these items is anticipated and thus no mitigation measures is required for these items.
- 12.8.5 Seven (7) graded historic sites/buildings/structures identified in the CHAA are located over 70m from the Project Boundary. Due to adequate separate distance between the proposed works and graded historic sites/buildings/structures, no impact is anticipated. However, special attention should be paid to avoid adverse physical

impact arising from the proposed works to them. Design proposal, method of works and choice of machinery should be targeted to minimize adverse impacts to them. Any vibration and building movement induced from the proposed works should be strictly monitored to ensure no disturbance and physical damages made to them during the course of works. Monitoring proposal for them, including checkpoint locations, installation details, response actions for each of the Alert/ Alarm/ Action (3As) levels and frequency of monitoring should be submitted for AMO's consideration.

12.8.6 Potential direct impact to the built heritage items identified and listed in Table 9.2 except HB-22 and HB-76 (two agricultural weirs) is not anticipated due to adequate separate distance between the proposed works and the built heritage items.

12.8.7 Two agricultural weirs, HB- 22 and HB-76, are located within works area of the river reprofiling work and proposed fish ladder works in Tai Tei Tong River. Modification of the agricultural weirs and construction of fish ladder are proposed on site in order to achieve beneficial ecological impact like improvement of the river hydraulic performance and fish movement. The agricultural weirs (HB-22 and HB-76) are constructed with concrete and have already undergone various modification and repair works. For instance, HB-22 was modified with wide steps at downstream in 1960s and a further modification in 1970s; while HB-76 underwent significant modification in the early of 1990s, only two concrete block and floor steps remained on site. Hence, their cultural heritage significance is relatively low due to high level of modifications underwent. Therefore, although the modification of the agricultural weir and construction of fish ladder of this project will bring direct impact to the weirs, the impact would be acceptable with mitigation measures. It is recommended that cartographic and photographic records be conducted to record the weirs prior to commencement of modification works.

12.8.8 The operational phase of the Project involves no excavation works, no cultural heritage impact is anticipated and thus, no mitigation measure is required.

## **12.9 Environmental Monitoring and Audit (EM&A)**

12.9.1 An EM&A programme has been developed to ascertain and verify the assumptions implicit to, and accuracy of, EIA study predictions. EM&A requirements have been recommended, where necessary, to check on project compliance of environmental legislation and standards. These are presented in a separate stand-alone EM&A manual.

## **12.10 Overall Conclusion**

12.10.1 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-334/2020) 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.

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