18. CONCLUSION

Introduction

18.1 The Project covers four designated projects defined in Part 1 of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) as listed below.

- DP1 - A railway and its associated stations (Exhibition Station (EXH) and Admiralty Station (ADM)) under A.2 in Schedule 2 Part 1;
- DP2 - A railway tunnel more than 800m in length between portals under A.7 in Schedule 2 Part 1;
- DP3 - Reclamation works (including associated dredging works) of more than 1 ha in size with a boundary of which is less than 100m from a seawater intake point under C.2 (b) and resulting in 5% decrease in cross sectional area calculated on the basis of 0.0mPD in a sea channel under C.3 (a) in Schedule 2 Part 1; and
- DP4 - A dredging operation exceeding 500,000 m^3 or a dredging operation which is less than 100m from a seawater intake point under C.12 in Schedule 2 Part 1.

18.2 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, and taken into consideration of the potential cumulative impacts from other concurrent projects. The assessment has been conducted, in accordance with the Study Brief No. ESB-193/2008 under the EIAO for the Project, covering the following environmental issues:

- Impact on Cultural Heritage
- Ecological Impact
- Fisheries Impact
- Landscape and Visual Impacts
- Construction Dust Impact
- Airborne Noise Impact
- Ground-borne Noise Impact
- Water Quality Impact
- Waste Management Implications
- Land Contamination
- Hazard to Life

18.3 The findings of this 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. The key assessment assumptions, limitation of assessment methodologies and all relevant prior agreements with the EPD on assessment of different environmental aspects are given in **Appendix 18.1**. The Implementation Schedules listing the recommended mitigation measures are presented in the **Section 17**. A summary of the environmental impacts are presented in the sections below.

Cultural Heritage

18.4 Cultural heritage resources within the Study Area have been identified and reviewed through site

visits and literature review.

18.5 There would be sufficient setback distance between Kellett Island Site of Archaeological Interest and the Project works areas. With lack of archaeological potential site identified within works areas, impact on terrestrial archaeological remains is therefore not envisaged during construction phase.

18.6 The seabed within proposed marine works area has already been disturbed by past reclamation and regular dredging works, according to the findings of literature review and previous Marine Archaeological Investigation (MAI) studies. With no marine archaeological potential within proposed marine works area, impact on marine archaeology is not anticipated.

18.7 With sufficient buffer distances between built heritages and works area, together with appropriate mitigation measures, there would be insignificant visual and vibration impacts during construction and operation phases. Mitigation measures including erection of decorative screen hoardings at work areas and adoption of sympathetic design in aboveground structures are recommended to avoid and minimise the potential visual impacts.

18.8 The construction and operation of the Project would not cause unacceptable impacts on cultural heritage resources, with the implementation of recommended mitigation measures.

Ecological Impacts

Construction Phase

18.9 The key marine-based works proposed under the Project include the construction of cross harbour tunnel across Victoria Harbour, temporary reclamation at Hung Hom Landfall and Causeway Bay Typhoon Shelter (CBTS), Immersed Tube (IMT) casting basin at Shek O Quarry and demolition of Hung Hom Freight Pier. The identified marine habitats within the assessment area are of generally low ecological value. Apart from the two common hard coral species, no other areas or species of conservation interest were identified in the proposed works areas.

18.10 Intertidal habitat of approximately 300 m long artificial seawall and subtidal habitat of 17 ha seabed within the footprint of the proposed works areas in Victoria Harbour would be directly affected in different phases of the marine construction works. In view of the low ecological value of the affected marine habitat and no loss of site of conservation interest or rare species, direct impact to the marine ecology is considered to be acceptable.

18.11 Potential short term disturbance on marine habitat and associated marine life due to deterioration of water quality (i.e. suspended solids elevation) would be resulted from the proposed marine works. The indirect impacts would be temporary, and minimised with implementation of proper mitigation measures (i.e. slit curtain, close grab dredger and reduction of dredging rate, etc.). Overall, no unacceptable impact on marine ecological resources is anticipated.

Operation Phase

18.12 During the operation phase, no maintenance dredging would be expected and no cooling water would be discharged from the operation of the Project to the marine environment directly. Besides, the change in tidal flow pattern due to change in hydrographic regime in Victoria Harbour is considered insignificant (change in discharge through Victoria Harbour by less than 0.1%). Hence no adverse direct and indirect ecological impact is anticipated during the operation phase of the Project.

Fisheries Impacts

Construction Phase

18.13 No fish culture zones and important spawning or nursery grounds were identified within or in the

vicinity of the proposed marine works area.

18.14 The Project would temporarily occupy a maximum of about 5 ha of fishing area at mid Victoria Harbour due to the IMT tunnel construction works. When rockhead or boulder is encountered during tunnel laying, underwater blasting would be required and the fisheries resource within the 1.7 ha lethal zones might be affected. Silt curtain would be deployed at near-shore to minimise damage on any fisheries resource by fencing off fish from entering the lethal zone in the course of blasting. Given the temporary nature of the proposed works and low fisheries importance of the affected area, fisheries impacts is considered as minor and acceptable.

18.15 Indirect impacts due to change of water quality resulting from dredging and reclamation works would be temporary and localized. Mitigation measures recommended for controlling water quality impact, such as installation of silt curtain, use of closed grab dredger and reduction of dredging rate, would serve also to protect fisheries from indirect impacts and ensure no unacceptable impact on fisheries resources and operations.

Operation Phase

18.16 No major operation phase impacts are expected. The protective armour rock layer covering the surface of the finished IMT would protrude above the natural seabed but it would largely be kept at a level below the existing Cross Harbour Tunnel to minimise impact on any potential trawling activities in Victoria Harbour.

Landscape and Visual Impacts

18.17 The Project will inevitably result in some landscape and visual impacts during construction and operation phases. These impacts have been minimised through careful consideration of alternatives, minimization of works areas, incorporation of aesthetic external designs and landscape treatments of proposed structures which include Hong Kong Park Ventilation Building (HKB), ADM ventilation structures and cooling tower, EXH, South Ventilation Shafts, Plant Rooms and Emergency Access (SOV) and North Ventilation Building, Shafts, Plant Rooms and Emergency Access (NOV).

18.18 The Project will not exceed the building height restriction of the respective planning zones. It is considered that the Project would fit in well with the current and future planning settings and would not conflict with statutory town plans of the areas.

18.19 Approximately 930 existing trees will be affected by the proposed works, of which approximately 240 trees will be transplanted and approximately 690 trees will be felled. Many of the affected trees are of semi-mature to mature size. None of these are Registered Old and Valuable Trees. There are no rare species or endangered species but only common species. Under the proposed scheme for the Project, opportunities for tree compensation within the Project boundary has been fully explored and incorporated in the proposed mitigation measures as much as practicable. Due to limited available space for tree planting within the project boundary, compensatory tree planting of a ratio of 1:1 in terms of quantity are proposed. Detailed tree removal application will be submitted in accordance with ETWB TC(W) No. 3/2006. There will be no permanently alienation of landscape areas. All landscape areas which will be temporarily alienated will be reinstated on a like to like basis after completion of temporary works. Meanwhile, in addition to the compensated trees, new landscape resources such as horizontal greening including green roof and landscaped mound and vertical greening including vertical panel and climbers are proposed as alternative compensatory planting for the aboveground structures including NOV, SOV and EXH to optimise greening opportunities within the Project boundary. It is considered that with the proposed compensated trees and the proposed new landscape resources, the overall residual impact on existing trees and greenery would be reduced to an acceptable level.

18.20 Under the Project, there would not be any open space and amenity area to be permanently or partly lost. Some of the open space and amenity areas such as Fenwick Pier Street Public Open Space, Wan Chai Sports Ground, Tunnel Approach Rest Garden, Amenity Area at Gloucester Road and

Cross Harbour Tunnel Entrance will be temporarily alienated during the construction phase. These open spaces and amenity areas will be reinstated on a like-for-like basis after completion of temporary works. The planting area at Convention Avenue Bus Terminus, planting areas at Harbour Road Sports Centre and landscape areas in the existing Police Officers' Club (POC) will be permanently alienated and these resources will be transformed to new landscape resources at the proposed EXH, reprovisioned Harbour Road Sports Centre and Wan Chai Swimming Pool (IGH/TP) and proposed SOV (to be integrated with the reprovisioned POC). The affected area in Harcourt Garden and Hong Kong Park will be reinstated and the proposed aboveground structures will be well integrated with the future design of the Harcourt Garden and Hong Kong Park. With the implementation of the landscape mitigation measures, it is considered that the residual impacts on these landscape resources are slight to insubstantial in Year 10 of the operation phase.

18.21 The majority of the proposed permanent works are located in the Wan Chai Civic Urban Waterfront landscape character area (LCA). During construction phase, due to the extensive works areas proposed in these LCA, there would still be moderate residual impact with the implementation of mitigation measures. However, during the operation phase, the residual landscape impact would be reduced to slight in Day 1 and further reduced to insubstantial in Year 10 when the compensatory planting and landscape reinstatement works become mature.

18.22 During the construction stage, there would still be moderate to slight residual visual impact on some VSRs on high rise development and VSRs at ground level who can oversee the construction sites. These impacts are temporary in nature and would be significantly reduced in operation phase of the Project.

18.23 On Day 1 of operation, there would still be moderate residual visual impact on VSRs overseeing the EXH at high level and at pedestrian level. These VSRs include commercial VSRs in Great Eagle Centre, Harbour Centre, China Resources Building, Sun Hung Kai Centre and AXA Centre and travellers along Convention Avenue and Fleming Road. The proposed EXH including Entrances A and B, plant buildings and ventilation shafts has significantly altered the visual context of the area. With the implementation of mitigation measures including aesthetic design of above ground structures, green roof and trees planting around the EXH, the residual visual impact on these VSRs would be moderate in Day 1 of operation phase and further reduced to slight in Year 10 of operation phase when the proposed trees planting become mature.

18.24 Residual Impacts on other VSRs due to the Project are considered as slight to insubstantial during Day 1 of operation and would be reduced to insubstantial in Year 10 when the proposed landscape mitigations mature.

18.25 Cumulative landscape and visual impacts during the construction and operation phases from other concurrent projects which include the Shatin to Central Link – Mong Kok East to Hung Hom Section (SCL (MKK-HUH)), South Island Line (East) (SIL(E)), Wan Chai Development Phase II (WDII) and Central Wanchai Bypass (CWB) are assessed. No insurmountable cumulative landscape and visual impact is anticipated.

18.26 As a whole, it is considered that the residual landscape and visual impacts of the proposed project is considered acceptable with mitigation measures summarised as follows:

Construction Phase

- Transplanting affected trees in accordance with ETWB TCW 3/2006;
- Compensatory planting for the affected trees as far as practicable;
- Control of night-time lighting glare;
- Decoration of hoarding;
- Control on the height and disposition/arrangement of all temporary facilities during construction; and
- Reinstatement of temporary works areas.

Operation Phase

- Design aesthetics for aboveground structures;
- Buffer planting to provide screening;
- Roof greening;
- Climbers to soften the building structure;
- Landscape mound to provide screening; and
- Vertical greening.

Construction Dust Impact

18.27 The Study Areas of this Project include Hung Hom, Causeway Bay, Wan Chai and Admiralty. The construction works of this Project on Kowloon side would likely interface with SCL (MKK-HUH), Shatin to Central Link – Tai Wai to Hung Hom Section (SCL (TAW-HUH)), and Kwun Tong Line Extension (KTE). On Hong Kong Island side, the Project would likely interface with Wan Chai Development Phase II (WDII) and Central-Wan Chai Bypass (CWB). There is also an off-site IMT casting basin at Shek O.

18.28 Potential dust impact associated with the construction of the Project has been assessed in the EIA Report. A total of 18 representative air sensitive receivers (ASRs) are identified for this assessment within 500m from the boundaries of all associated works areas under the Project in accordance with the criteria set out in the EIAO-TM. Under the Project, potential sources of dust impact would include excavation, materials handling, spoil removal and wind erosion.

18.29 Under the unmitigated scenario, the predicted cumulative maximum hourly, daily and annual average TSP levels at most of the representative ASRs would exceed the criteria of Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) and Air Quality Objectives (AQO). Proper dust mitigation measures, including watering on the active construction areas/haul roads, enclosing the unloading process at barging point, and the implementation of good site practices, were thus proposed.

18.30 With the implementation of the recommended dust mitigation measures, the predicted cumulative maximum hourly, daily and annual levels of total suspended particulates (TSP) at all representative ASRs would comply with the criteria of EIAO-TM and AQO.

18.31 The operation of the concrete batching plant at Shek O is classified as Specified Process (SP), and the Contractor should apply for a license under Air Pollution Control Ordinance (APCO) before operation. Suitable mitigation measures stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented.

Air-borne Noise Impact

Construction Phase

18.32 Noise arising from the construction activities of the Project would potentially have unavoidable impact on the noise sensitive receivers (NSRs) located in the vicinity of the works areas. Without any mitigation measures, construction noise levels at most of the representative NSRs are predicted to exceed the EIAO-TM daytime construction noise criterion.

18.33 Mitigation measures including good site practices, quieter plant, movable noise barriers and noise insulating fabric are recommended to reduce the noise levels to within the EIAO-TM noise criterion. With the recommended mitigation measures in place, noise levels from the Project itself at all

representative NSRs are predicted to fully comply with the EIAO-TM daytime construction noise criterion.

18.34 Several concurrent projects would be conducted in the vicinity of the Project, including SCL (MKK-HUH), SCL (TAW-HUH), WDII and CWB projects. Mitigated cumulative construction noise levels at the representative NSRs are predicted and residual cumulative noise impact of 1 dB(A) for a short duration of non-persistent two months would be found at NSR EX 1 (Causeway Centre, Block A). All practical mitigation measures have been exhausted to minimise the construction noise impact from the Project at EX 1. The residual cumulative noise impact would not be significant and considered as minor and acceptable.

Operation Phase

18.35 Maximum allowable sound power level emitted from louvers of fixed plants were predicted. With the proper selection of plant and adoption of acoustic treatment to meet the maximum allowable sound power level, noise levels arising from the fixed plant of the Project at NSRs would comply with the EIAO-TM criteria.

Ground-borne Noise Impact

18.36 Construction ground-borne noise impacts arising from rock breaking/drilling associated with the operation of tunnel boring machine (TBM) and Powered Mechanical Equipment (PME) (such as hydraulic breaker, drill rig, pile rig, etc) were found to comply with noise criteria. No adverse cumulative construction ground-borne noise impacts are predicted. Therefore, in terms of ground-borne noise impacts, both TBM and Cut & Cover tunnel construction methods are considered to be environmentally feasible and acceptable.

18.37 During operation phase, predictions of ground-borne noise levels at the representative NSRs are performed using the methodology recommended by the US Department of Transportation. With suitable trackform, the predicted ground-borne noise criteria at all representative NSRs would comply with the adopted noise criteria. Potential cumulative impact from existing/future rail lines has been considered. No adverse cumulative impact is anticipated.

Water Quality Impact

Construction Phase

18.38 The assessment has evaluated the potential impacts caused by marine construction works on water quality due to the elevation of suspended sediments concentrations, depletion of dissolved oxygen and increases in contaminants concentration. The worst-case scenarios during the marine construction period, taking into account the cumulative effects from other concurrent marine works in Victoria Harbour have been assessed. It is predicted that, with the implementation of the recommended mitigation measures, such as the installation of silt curtain, use of closed grab dredgers and reduction of dredging rate, there would be no unacceptable water quality impacts arising from the Project-related marine construction works and due to the cumulative effects from other concurrent marine construction activities. A marine water quality monitoring and audit programme will be implemented to ensure the effectiveness of the proposed water quality mitigation measures.

18.39 The key issue from the land-based construction activities would be the potential water quality impact due to the release of sediment-laden water from surface works areas, open cut excavation, tunnelling works and discharge of construction site effluent. Minimisation of water quality deterioration could be achieved through implementing adequate mitigation measures. Regular site inspections would be undertaken routinely to inspect the construction activities and works areas in order to ensure the recommended mitigation measures are properly implemented. No unacceptable water quality impact would be expected from the land-based construction works with proper implementation of the recommended mitigation measures.

Operation Phase

18.40 Due to the change in seabed levels along the tunnel section within Victroria Harbour after the project implementation, there could be potential impact on the flow regime and the associated water quality in Victoria Harbour. In order to assess the change in the overall assimilative capacity of Victoria Harbour, the flow discharge across two cross sections at the eastern and western ends of the harbour was calculated. The model results indicated that the operation of the SCL IMT tunnel would not change the discharge through Victoria Harbour by more than 0.1%. Considering the marginal change in flow discharge through Victoria Harbour, no major impacts on the assimilative capacity and, thus, the water quality of Victoria Harbour is expected as a result of the Project. No mitigation measures specific to operation phase hydrodynamic / hydrology impact would be required.

18.41 Other key operational impacts from the Project would arise from tunnel/station run-off and effluent discharges from the stations and maintenance activities, which could be minimized through implementing adequate mitigation measures.

Waste Management Implications

Construction Phase

18.42 Implementation of the proposed waste minimization, reuse, control and mitigation measures are anticipated to minimise potential water quality, dust, odour, and noise impacts associated with handling, transportation and disposal of the identified wastes arising from the construction phase of the Project.

18.43 During construction, it is estimated that approximately 1,097,000m^3 of inert C&D materials would be generated which is proposed to be reused offsite by other projects (e.g. Hong Kong – Zhuhai – Macao Bridge / Tuen Mun – Chek Lap Kok Link) as far as possible, with disposal at public fill reception facilities or Taishan as the last resort. About 30,000m^3 of non-inert C&D materials would be generated and disposed at landfill.

18.44 The total volume of dredged/ excavated sediment generated from the Project is estimated to be approximately 841,800m^3. Based on the results of the chemical and biological screening, approximately 315,000m^3 of sediment is suitable for Type 1 – Open Sea Disposal, 14,000m^3 of sediment is suitable for Type 1 – Open Sea Disposal (Dedicated Sites), 496,300m^3 of sediment requires Type 2 – Confined Marine Disposal and 16,500m^3 of sediment requires Type 3 – Special Treatment/Disposal in accordance with *Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002 - Management of Dredged/Excavated Sediment* (ETWB TC(W) No. 34/2002).

18.45 It is proposed that the excavated Type 3 sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. A proposal on the use of geosynthetic containers on Type 3 sediment should be submitted to TCO/EPD for agreement at a later stage of the Project and prior to the dredging and excavation works.

18.46 With the implementation of the mitigation measures recommended in accordance with the requirements of the ETWB TC(W) No. 34/2002, no adverse environmental impacts would thus arise.

Operation Phase

18.47 The types and quantities of waste that would be generated during the operation phase have been assessed. It is expected that large quantities of waste would not be generated from the operation of the Project. The handling, collection, transportation and disposal practices of the identified waste generated during operation should follow the current practices of other operating railway lines.

Adverse environmental impacts are hence not anticipated with the implementation of mitigation measures.

Land Contamination

18.48 The land contamination assessment examined the potential contaminating land uses within the Project area and investigated the potential impacts of the contamination on future use. Construction workers were identified as the main sensitive receptor and the assessment involved site appraisal, site investigation, and assessment of contamination extent.

18.49 Along the alignment and at the proposed facilities, intrusive site investigations were conducted at three accessible Stage 1 sites. A total of 19 soil samples and one groundwater sample were collected from four borehole/trial pits and were analyzed as proposed in the Contamination Assessment Plan for Stage 1.

18.50 Based on the findings from the Stage 1 site investigation (SI), no adverse impacts have been identified within the Project area. Precautionary measures are proposed for the excavation of soil, treatment of soil and general environmental measures, together with health and safety considerations on site during the construction stage.

18.51 Due to current land use and site constraints, site investigation was not conducted for one site within the Project works area during Stage 1 SI. This site would be investigated in conjunction with the Stage 2 SI, which will be undertaken after decommissioning of existing buildings and access has been granted. The potential contamination (if any found) at the sites to be investigated during the Stage 2 SI are expected to be surmountable, with the proposed mitigation measures.

Hazard to Life

18.52 As there is no overnight storage of explosives, a Quantitative Risk Assessment (QRA) of the storage and transport of explosives is not required as per Section 3.4.9.2 of the EIA Study Brief No. ESB-193/2008 (EIA SB). However, underwater blasting works may be required when bedrock or large boulders are encountered during the IMT tunnel construction in Victoria Harbour. The statutory /licensing requirements with respect to explosives under the Dangerous Goods Ordinance (Cap. 295) have been described and any guidelines and/or advice obtained from relevant departments/ authorities have been documented.

18.53 Following a consultation with China Gas Company Limited (HKCG) and a review of the relevant Ordinance, Code of Practice and other HKCG requirements, as required in Section 3.4.9.3 of the EIA Study Brief, a number of protective measures have been described to avoid and minimise the hazard to life issues in relation to fuel gas safety during the construction phase.

Overall Summary

18.54 This EIA has been conducted based on the best and latest information available during the course of the EIA Study. 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.

18.55 Overall, this EIA has demonstrated general compliance with the environmental standards and legislation with the implementation of the proposed mitigation measures during the construction and operation phases. This EIA has also demonstrated general acceptability of the residual impacts and thus the population and environmentally sensitive resources in the vicinity of the Project would be sufficiently protected. Environmental monitoring and audit mechanisms have been recommended for the construction and operation of the Project, where necessary, to verify the effectiveness of the

recommended mitigation measures. A summary of the environmental impacts associated with the Project is presented in **Table 18.1**.

Table 18.1 Summary of Environmental Impacts associated with the Project

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Cultural Heritage					
Built heritage resources	With sufficient buffer distances between built heritages and the proposed works area, no adverse cultural heritage impact is expected.	• Guidelines for Cultural Heritage Impact Assessment • EIAO-TM Annex 10 and Annex 19	Not applicable	• No specific mitigation measure for built heritage would be required. • The use of sensibly designed screen hoardings for mitigating landscape and visual impacts to minimise the potential visual impact on identified heritage buildings.	No adverse residual impacts would be anticipated.
Terrestrial Archaeological Resources	No terrestrial archaeological resources are identified within Study Area.	• Guidelines for Cultural Heritage Impact Assessment • EIAO-TM Annex 10 and Annex 19	Not applicable	No mitigation would be required.	No adverse residual impacts would be anticipated.
Marine Archaeological Resources	No marine archaeological resources are identified within Study Area.	• Guidelines for Marine Archaeological investigation • EIAO-TM Annex 10 and Annex 19	Not applicable	No mitigation would be required.	No adverse residual impacts would be anticipated.
Ecological Impacts					
Construction Phase					
Ecological resources at and near the Project area	<u>Direct impact</u> • Temporary loss of approximately 17 ha of soft bottom and subtidal habitat and approximately 300 m long artificial seawall within Victoria Harbour • Temporary loss of	• EIAO-TM Annex 8 and Annex 16 • The Protection of the Harbour Ordinance (Cap. 531) • The Water Pollution Control	Not applicable	• No specific mitigation measures for ecology is required. • Implementation of water quality control measures such as installation of silt curtains around dredger(s), use of	<u>Direct Impact</u> • Temporary loss of the marine habitats • All the marine habitats and associated marine life that would be

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	approximately 10 ha of newly established marine habitat in the marine cove of Shek O Quarry site after rehabilitation. <u>Indirect impact</u> • Short term indirect impact to marine habitat and associated marine life due to deterioration of water quality as a result of the proposed marine works.	Ordinance(Cap. 358) • International Union for Conservation of Nature and Natural Resources (IUCN) 206 Red Data Books • The PRC National Protection Lists of Important Wild Animals and Plants		closed grab dredger and reduction of dredging rate to minimise indirect impacts on marine life due to changes of water quality.	temporary loss are of low ecological value and the impact would be temporary and reversible. Residual impact due to the short-term loss is therefore considered acceptable. <u>Indirect impact</u> • With the implementation of the proposed mitigation measures as recommended in for water quality impacts, residual impact on marine ecology due to the deterioration in water quality as a result of the Project works would be minimised. In considering the low ecological value of marine habitats within or in the vicinity of the affected area and the temporary nature of the impact, the residual impact is considered acceptable.
Operation Phase					
Ecological resources at and near the Project area	• No adverse operation phase impact on marine	• EIAO-TM Annex 8	Not applicable	• No mitigation would be required.	No adverse residual impacts would be

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	ecology	and Annex 16 • The Protection of the Harbour Ordinance (Cap. 531) • The Water Pollution Control Ordinance(Cap. 358) • International Union for Conservation of Nature and Natural Resources (IUCN) 206 Red Data Books • The PRC National Protection Lists of Important Wild Animals and Plants			anticipated.
Fisheries Impacts					
Construction Phase					
Fisheries resources within Victoria Harbour	• Temporary loss of about 1.5-5 ha of fishing area during various phases of marine works in Victoria Harbour. • Short term indirect impact on fisheries resources due to deterioration of water quality as a result of the proposed marine works.	• EIAO-TM Annex 9 and Annex 17 • Fisheries Protection Ordinance (Cap. 171) • Marine Fish Culture Ordinance (Cap. 353) • The Water Pollution Control Ordinance (Cap. 358)	Not applicable	• No fisheries-specific mitigation measures would be required. • Water quality control measures to minimise indirect impact on fisheries due to changes of water quality.	• Temporary loss of the fishing area. In view of the small size and low fisheries importance of the area being temporarily occupied, the residual impact is considered acceptable.
Operation Phase					
Fisheries resources within Victoria Harbour	• No adverse operation phase impact on fisheries resources	• EIAO-TM Annex 9 and Annex 17 • Fisheries Protection	Not applicable	• No mitigation would be required.	No adverse residual impacts would be anticipated.

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Ordinance (Cap. 171) • Marine Fish Culture Ordinance (Cap. 353) • The Water Pollution Control Ordinance (Cap. 358)			
Landscape and Visual Impacts					
Construction Phase					
Landscape Resources, Landscape Characters Areas and Visually Sensitive Receivers	• Based on a very broad brush estimate, approximately 930 existing trees would be removed by the Project. • Loss of Fenwick Pier Street Public Open Space, Wan Chai Sports Ground, Tunnel Approach Rest Garden, amenity areas at Gloucester Road and Cross Harbour Tunnel Entrance • Substantial impact on LR14, LR15 and LR16. Impact on other landscape resources varies from moderate to insubstantial. • Impact on landscape characters areas varies from moderate to insubstantial. • Substantial impact on VSRs O3 and O4 who are close to the source of impact. Impact on other VSRs varies from moderate	• Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). • EIAO-TM Annex 10 and Annex 18 • ETWB TC(W) No. 2/2004 • ETWB TC(W) No. 3/2006	Not Applicable	• Transplanting affected; • Compensatory planting for the affected trees; • Control of night-time lighting glare; • Decoration of hoarding; • Control on the height and disposition/arrangement of all temporary facilities during construction; and • Reinstatement of temporary works areas.	• Temporary residual substantial impact on LR14, LR15 and LR16; temporary residual moderate impact on LR06, LR06a, LR12, LR13 and LR18; temporary residual slight impact on LR01, LR02, LR03 and LR27. • Temporary residual moderate impact on LCA05 and LCA07; temporary residual slight impact on LCA03, LCA04, LCA11, LCA14 and LCA17. • Temporary residual moderate to insubstantial impact on VSRs adjacent to works areas..

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	to slight.				
Operation Phase					
Landscape Resources, Landscape Characters and Visually Sensitive Receivers	The unmitigated impact for Landscape Resources, Landscape Characters and Visually Sensitive Receivers would remain the same as the impact during construction phase.	• Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). • EIAO Technical Memorandum on EIA Process (EIAO-TM) Annex 10 and Annex 18 • ETWB TC(W) No. 2/2004 • ETWB TC(W) No. 3/2006	Not Applicable	• Aesthetic design for above ground structures; • Buffer planting to provide screening; • Roof greening; • Climbers to soften the building structure; • Landscape mound to provide screening; and • Vertical greening.	• Reinstatement of Fenwick Pier Street Public Open Space, Wan Chai Sports Ground, Tunnel Approach Rest Garden, amenity areas at Gloucester Road and Cross Harbour Tunnel Entrance on a like-for-like basis. Residual impact on open space and amenity areas would be reduced to slight to insubstantial in Year 10. • Impact on landscape resources and landscape character areas would become slight to insubstantial byYear 10. • Impact on VSRs adjacent to aboveground structures would become slight to insubstantial in Year 10.
Construction Dust Impact					
Existing commercial, residential and recreational	1-hour Average TSP Conc.: 160– 5593 μg/m^3	EIAO-TM (hourly): 500 μg/m^3	Exceed EIAO-TM (hourly) criterion by up	• Watering on the active works areas, exposed areas and	No adverse residual hourly, daily and annual

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
developments in Hung Hom, Causeway Bay, Wan Chai, Admiralty and Shek O areas and a performing art centre in Admiralty. 18 assessment points (refer to **Figure No. NEX2213/C/331/ENS/M60/001 – 004**)	24-hour Average TSP Conc.: 96– 1884 µg/m^3 Annual Average TSP Conc.: 73.9 – 97.2µg/m^3	AQO (daily): 260 µg/m^3 AQO (annual): 80 µg/m^3	to 5093 µg/m^3 Exceed AQO (daily) by up to 1624 µg/m^3 Exceed AQO (annual by up to 17.2 µg/m^3	paved haul roads to reduce dust emission • Enclosing the unloading process at barging point to reduce dust emission • Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices would be carried out to further minimise construction dust impact.	dust impacts would be anticipated.
Airborne Noise Impact					
Construction Phase					
Existing residential blocks in Hung Hom, Causeway Bay, Wan Chai, Admiralty and Shek O areas and a performing arts centre in Admiralty. 8 assessment points (refer to **Figure Nos**. **NEX2213/C/331/ENS/M52/001 – 005**)	Predicted noise levels would range from 52 to 87 dB(A)	EIAO-TM assessment criterion for works during non-restricted hours for domestic premises: 75dB(A)	Exceed the EIAO-TM noise criterion by up to 12 dB(A)	Adoption of good site practices, quieter plant, movable noise barriers and noise insulating fabric to minimise construction noise impact	Residual cumulative impact of 1 dB(A) for 2 months at NSR EX1, Block A, Causeway Centre (about 120 dwellings), due to construction induced from the Project and WDII & CWB Project. It is considered that all practicable measures have been exhausted to minimise the residual impact.
Operation Phase					
Existing residential blocks in Hung Hom, Causeway Bay, Wan Chai and Admiralty areas. 8 assessment points (refer to **Figure Nos.**	Maximum sound power level was predicted to meet the relevant noise criteria.	• EIAO-TM Annex 5 • NSRs near NOV, SOV and EXH: ANL-5dB(A) • NSRs near ADM: ANL-11 dB(A) (i.e. -5-	No exceedance was anticipated.	Proper selection of plant and adoption of acoustic treatment	No adverse residual impacts would be anticipated.

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NEX2213/C/331/ENS/M52/101 – 103)		6 dB(A)) • NSRs near HKB: ANL- 8 dB(a) (i.e. -5-3 dB(A))			
Ground-borne Noise Impact					
Construction Phase					
Existing residential blocks, hotels and performing art centre/educational institutes in Hung Hom, Causeway Bay, Wan Chai and Admiralty areas. 7 assessment points (refer to **Figure Nos**. **NEX2213/C/331/ENS/M52/001 – 004**)	Daytime: 32 – 63 dB(A) for residential NSRs and 52 dB(A) for educational NSR	Construction ground-borne noise criteria: • Daytime: 65 dB(A) for domestic premises, and for educational institutions 60 dB(A) during normal teaching periods and 55 dB(A) during examinations	No exceedance was predicted.	No mitigation would be required.	No adverse residual impacts would be anticipated.
Operation Phase					
Existing residential blocks, hotels and performing art centre/educational institutes in Hung Hom, Causeway Bay, Wan Chai and Admiralty areas. 7 assessment points (refer to **Figure Nos. NEX2213/C/331/ENS/M52/101 – 103**)	Predicted operation ground-borne noise levels would range from <20 to 38 dB(A) during daytime & evening, and <20 to 37 dB(A) during nighttime.	Operational ground-borne noise criterion: 55 dB(A) during daytime & evening, and 45 dB(A) during nighttime	No exceedance was predicted.	No mitigation would be required.	No adverse residual impacts would be anticipated.
Water Quality Impact					
Construction Phase					
Coral communities and seawater intakes along the coastlines of Victoria Harbour (refer to **Figures Nos. NEX2213/C/331/ENS/M59/001– 003**)	The model results indicate that there would be exceedance in SS criteria at WSD seawater intake at Quarry Bay, Wan Chai and Kowloon Station in assessment scenario 1 (with	1. WSD flushing water quality intake criterion for SS: < 10 mg/L 2. Target water quality objectives at coral	Maximum exceedance of SS would be about 10 mg/L above the assessment criteria predicted at seawater intake at Kowloon	• Use of closed grab dredger during dredging and filling operations. • Deployment of silt curtains around dredging areas, and installation of silt screens at	No adverse residual impacts would be anticipated.

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	SCL IMT construction and other concurrent marine works). In assessment scenario 2 (with SCL IMT construction alone), exceedance in SS assessment criteria is predicted at WSD seawater intake at Quarry Bay and Kowloon Station. At the far-field coral communities, both the predicted SS elevations and sedimentation rates would comply with the relevant criteria.	sites for SS elevations: < 30 % of the background ambient levels 3. Sedimentation rate at corals: <100g/m^2/day 4. EIAO-TM Annex 6 and Annex 14	Station.	selected seawater intakes during marine construction. • Control of dredging and filling rates for marine construction	
Operation Phase					
Coral communities and seawater intakes along the coastlines of Victoria Harbour (refer to **Figures Nos. NEX2213/C/331/ENS/M59/001– 003**)	Operation of SCL would not cause unacceptable impacts upon the water quality in Victoria Harbour.	1. Relevant WQO for marine water stipulated under the WPCO 2. EIAO-TM Annex 6 and Annex 14	No WQO exceedance would be induced by the Project.	<u>Tunnel Run-off and Drainage</u> Oil/grit interceptors / chambers should be provided. <u>Sewage Effluents</u> Connection of domestic sewage generated from the Project should be diverted to the foul sewer. The practices outlined in ProPECC PN 5/93 should be adopted where applicable.	No adverse residual impacts would be anticipated.
Waste Management Implications					
Construction Phase					
Water quality, air and noise sensitive receivers at or near the Project Site, the waste transportation routes and the waste disposal site.	<u>Main waste:</u> • Dredged marine sediment with a total volume of approximately 841,800m^3 <u>Other wastes:</u> • C&D Materials from	• EIAO-TM Annex 7 and Annex 15 • Waste Disposal Ordinance (Cap. 354);	Not applicable.	• C&D wastes would be reused (i.e. other concurrent projects) as far as practicable before off-site disposal • Contaminated dredged sediment (Category M and H)	No adverse residual impacts would be anticipated.

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	demolition and excavation works with a total volume of approximately 1,097,000m^3 • 30,000 m^3 of non-inert C&D material • General refuse with a daily volume of 1,853 kg from workforce • Chemical waste from plant and equipment maintenance	• Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C); • Land (Miscellaneous Provisions) Ordinance (Cap. 28); • Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation; • Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N); and • Dumping at Sea Ordinance (Cap. 466).		would require either Type 1 – Open Sea Disposal (Dedicated Sites) or Type 2 – Confined Marine Disposal at contaminated mud pit allocated by MFC. Category L sediment is suitable for Type 1 – Open Sea Disposal at gazetted marine disposal ground allocated by MFC. • The handling method of dredged Type 3 sediments should adhere to the CWB project under which geosynthetic containment would be employed as disposal method. The sediment should be sealed in geosynthetic containers and disposed of at the designated contaminated mud pit. The pit would be subsequently capped thereby meeting the requirements for fully confined mud disposal. • Other waste reduction measures and good site practices to achieve avoidance and minimization of waste generation from the Project.	
Operation Phase					
Water quality, air and noise sensitive receivers at or near the Project Site, the waste transportation routes and the waste disposal site.	• Insignificant amount of chemical wastes, general refuse and industrial waste to be generated from the operation and maintenance	• Waste Disposal Ordinance (Cap. 354); and • Waste Disposal (Chemical Waste)	Not applicable.	• Follow Code of Practice on the Packaging, Labelling and Storage of Chemical Waste in handling of chemical waste. • Disposal of non-recyclable	No adverse residual impacts would be anticipated.

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	activities of the Project.	(General) Regulation (Cap. 354C).		chemical waste at appropriate facilities like Chemical Waste Treatment Centre (CWTC) at Tsing Yi. • Employ licensed waste collectors for the collection of general refuse and industrial waste.	
Land Contamination					
Potential land contamination sites within the Project Area	Based on the findings from the Stage 1 Site Investigation (SI), no adverse impacts have been identified within the assessment areas. Remaining sites requiring SI would be investigated during Stage 2.	• Section 3 (Potential Contaminated Land Issues) of Annex 19 "Guidelines for Assessment of Impact on Sites of Cultural Heritage and Other Impacts" of the EIAO-TM. • Guidance Note for Contaminated Land Assessment and Remediation" • Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards and Car Repair /Dismantling Workshop" • Guidance Manual for Use of Risk-based Remediation Goals for Contaminated	No exccedance identified under the Stage 1 Site Investigation	• Based on the Stage 1 SI results, no exceedance has been found; therefore no remediation actions are needed. • Precautionary measures such as visual inspection of excavated soils for discolouration and the presence of oils and odours are proposed for the construction stage for both Stage 1 and 2 SI sites. • Excavated soil materials suspected to be contaminated should be temporarily stockpiled, and testing should be undertaken to verify the presence of contamination.	• No contaminants were detected in Stage 1 SI. Therefore, no adverse residual impacts would be anticipated. • For sites under Stage 2 SI, options of remediation methods will be reviewed and implemented so that contaminants will be removed to achieve the remediation targets. After completion of soil remediation for contaminated areas (if identified), no adverse residual impacts would be anticipated.

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards / Criteria	Extent of Exceedances (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
		Land Management			