

Key Assessment Assumptions and Limitation of Assessment Methodologies

Assessment Methodologies	Assessment Assumptions	Limitations of Assessment Methodologies / Assumptions	Prior Agreements with EPD		Proposed Alternative Assessment Tools/ Assumptions (if applicable)				
			EIA Study Brief Clause Reference	Relevant Document					
Air Quality Impact									
Construction Phase									
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Dust emission will be the major air quality impact. Quantitative assessment was carried out by applying FDM model.	<p>Based on current tentative construction programme, Year 2020, 2021, 2022, 2024, 2025, 2027 and 2028 are identified as the assessment years for construction dust assessment. Both short-term and long-term impacts were assessed with conservative approach by assuming 100% active construction area for all work sites. Subject to the construction work at night-time and during Sunday or public holiday, construction working period of 26 days a month and 12 hours a day was assumed.</p> <p>The prediction of dust emissions is based on the typical values and emission factors obtained from United States Environmental Protection Agency (USEPA) Compilation of Air Pollution Emission Factors, AP-42, 5th Edition.</p> <table><tr><td>Heavy construction activities including reclamation (above water), land clearance, site formation, ground excavation, construction of associated facilities etc.</td><td>E = 2.69 Mg/hecture/month of activities</td></tr><tr><td>Wind erosion including surcharge activities</td><td>E = 0.85 Mg/hecture/year</td></tr></table> <p>Watering once per hour on exposed worksites is proposed to achieve dust removal efficiency of 91.7% in accordance with the “Control of Open Fugitive Dust Sources” (USEPA AP-42).</p>	Heavy construction activities including reclamation (above water), land clearance, site formation, ground excavation, construction of associated facilities etc.	E = 2.69 Mg/hecture/month of activities	Wind erosion including surcharge activities	E = 0.85 Mg/hecture/year	The construction programme is indicative and subject to contractors’ actual operation. A conservative approach, assuming 100% active area as Tier 1 Test was adopted in the model run. The actual situation may be better than that of the model prediction.	-	-	N/A
Heavy construction activities including reclamation (above water), land clearance, site formation, ground excavation, construction of associated facilities etc.	E = 2.69 Mg/hecture/month of activities								
Wind erosion including surcharge activities	E = 0.85 Mg/hecture/year								
Operational Phase									
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO.	Vehicular emissions from open road was based on modeling results of EMFAC, while idling vehicular emission are based on “Road Tunnels: Vehicle Emissions and Air Demand For Ventilation” (PIARC 2012). The cumulative air quality impact	-	Section 5(v) of Appendix B	-	N/A				

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Vehicular emission impact was due to moving vehicles along internal roads within PDAs at TCE & TCW, Road P1 (Tung Chung – Tai Ho Section), NLH and other connecting roads; and idling vehicles from HKBCF Island.	due to vehicular emission was predicted by Caline4 model. PATH 2020 (with power plant emission updated to 2019, vehicular emission updated to 2023, and airport emission updated to Year 2031) adopted as background air quality concentration.				
Noise Impact					
Construction Phase (Airborne Noise)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. In accordance with the EIAO, the methodology outlined in the TM-GW was used for construction noise assessment.	Sound power level (SWL) of the Powered Mechanical Equipment (PME) was based in Table 3 of TM-GW and QPME system adopted by EPD.	The prediction of construction noise impacts are based on TM-GW. The SWL of PME was based in TM-GW and QPME system. The actual situation may be better than that of the prediction.	Section 2.2.1(c) and 2.3.1 of Appendix C	Working Paper on Noise Assessment Methodology	N/A
	It is assumed that all PME items required for a particular construction activity will be located at the notional source position of the work areas. The assessment was based on the cumulative SWL of PME likely to be used in each work areas, taking into account the construction period in the vicinity of the receiver location. To predict the construction noise impacts, PME were divided into groups required for individual construction activity. The objective is to identify the worst case scenario representing those items of PME that will be in use concurrently at any given time. The sound pressure level of individual construction activity was calculated, depending on the number of PME and distance from receivers. The noise levels at NSRs were then predicted by the sum of SWLs of all concurrent construction activities with their respective distance correction.	In carrying out the assessment, worst case assumptions have been assumed in order to provide conservative noise impact assessments such as locating all the PME at the notional source position.			
	A positive 3dB(A) facade correction was added to the predicted				

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	noise levels in order to account for the facade effect at each NSR.				
	On-time percentages of utilization rates for were reasonably assumed by Engineer.				
Construction Phase (Groundborne Noise)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. The TM-Places under the NCO stipulates that noise transmitted primarily through the structural elements of building, or buildings, shall be 10 dB(A) less than the relevant ANLs. The method used to predict construction groundborne noise is based on the U.S. Department of Transportation “High-Speed Ground Transportation Noise and Vibration Impact Assessment”, 1998.	Vibration source referenced to in-situ measurements from the bored tunneling machines	-	Section 2.2.1(c) and 2.3.1 of Appendix C	Working Paper on Noise Assessment Methodology	N/A
	Coupling loss into building structure: 10 dB				
	Coupling loss of 2dB reduction per floor				
	Conversion from Floor Vibration to Noise Levels: 27dB				
Operational Phase (Road Traffic Noise)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. Traffic noise was predicted using the methodology provided in the UK Department of Transport	Since the first population intake and ultimate occupation year of the Project will be in Year 2023 and 2029 respectively, and operation of the proposed road network will commence in Year 2030, the assessment year for road traffic noise is taken as Year 2045 (which is the maximum traffic projection within 15 years after full operation for the proposed development). In addition, different phasings for population intake at Year 2023, 2025 and 2027 will be conducted.	Traffic noise levels were predicted based on free flow condition. Traffic congestion and hence reduced traffic speed were not taken into account in the noise model. Quantitative uncertainties in the assessment of impacts should be considered when	Section 3.2.1(a), 3.2.1(c) and 3.2.2(a) of Appendix C	Working Paper on Noise Assessment Methodology	N/A

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calculation of Road Traffic Noise (CRTN) 1988. The assessment was based on projected peak hour flows for the worst year within 15 years after commissioning of population intake/ proposed road networks.	The existing noise screening structures, existing mitigation measures and mitigation measures by other concurrent projects within the vicinity were taken into account in the assessment.	drawing conclusions from the assessment. In carrying out the assessment, realistic worst case assumptions have been made in order to provide a conservative assessment of noise impacts. For the assessment of road traffic noise impact, peak hourly traffic flows from the worst case traffic impact assessment were adopted.			
Operational Phase (Fixed Noise Sources)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. The maximum allowable Sound Power Levels (SWL) were predicted to meet the relevant noise criteria at the representative NSRs.	The noise level of planned fixed noise sources was referenced from relevant EIA studies or the best available information. It was assumed that the noise levels presented in those EIA reports would be the maximum allowable SWL.	Silencer and enclosure installation may be refined in detailed design.	Section 4.2.1(a) and 4.2.1(c) of Appendix C	Working Paper on Noise Assessment Methodology	N/A
Operational Phase (Aircraft Noise)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. The assessment was carried out based on the NEF results from approved EIA report for 3RS (AEIAR-185/2014).	The NEF noise contours assessment at Year 2021 (interim phase), Year 2030 (worst operation mode) and Year 2032 (full operation mode) are made reference to approved 3RS EIA (AEIAR-185/2014).	Appropriate development phasing will be considered to ensure all NSRs within PDAs of TCE and TCW will be outside the NEF 25 contours during the time of population intake.	Section 5.1 and 5.2(a) of Appendix C	Working Paper on Noise Assessment Methodology	N/A
Operational Phase (Rail Airborne Noise)					
The noise impact assessment for the Project follows	A list of correction factors from CRN (e.g. rail deterioration, train speed, deck reflection etc.) have been included in the	A 3 dB(A) rail deterioration is adopted.	Section 6.1, and 6.2.1(a)	Working Paper on Noise Assessment	N/A

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Annex 5 and Annex 13 of the TM-EIAO and it is predicted according to “Calculation of Railway Noise (1995)” (CRN) by the UK Department of Transport.	assessment and the operation details for future operating scenario is made reference to the information advised by MTRCL.		6.2.1(c) of Appendix C	Methodology	
Operational Phase (Rail Groundborne Noise)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO. The prediction methodology recommended by the “High-Speed Ground Transportation Noise and Vibration Impact Assessment”, 1998 is used in this EIA.	Predictions are in most cases based on assuming the closest distance from the track centreline to the building foundation of the receiver; however, if a particular facility within a structure is the sensitive receiver, the setback distance is assumed to be from the track centreline to the closest part of the affected receivers. Where curved track occurs the track is considered to be straight and perpendicular to the closest setback point of the venue or receiver.	A safety factor of 10 dB(A) is assumed.	Section 6.1, 6.2.1(a) and 6.2.1(c) of Appendix C	Working Paper on Noise Assessment Methodology	N/A
Operational Phase (Helicopter Noise)					
The noise impact assessment for the Project follows Annex 5 and Annex 13 of the TM-EIAO.	Helicopter noise will be generated during flyover mode. Helicopter noise is considered as a ‘point’ source and will be evaluated based on standard acoustic principle of point source propagation. Corrections will be applied for the distance attenuation, façade, barrier or topographical effect where applicable.	As there is no statutory requirement for helicopter noise during evening and nighttime periods. A review on the approved EIA report and international review will be conducted.	Section 7.1 and 7.2.1(c) of Appendix C	Working Paper on Noise Assessment Methodology	N/A
Operational Phase (Marine Traffic Noise)					
No statutory requirement for marine traffic noise. The noise criteria for both daytime and nighttime was determined based on	The prevailing noise measurement conducted has included existing noise sources including those from marine traffic near Tung Chung area, public pier in Tung Chung, piers in HKIA. Nevertheless, SEL of the existing ferry commuting between Tuen Mun, public Pier in Tung Chung, Sha Lo Wan and Tai O	As there is no statutory requirement for marine traffic noise, an approach by making reference to the approved EIA report for the Proposed Joint User	Section 8.1, 8.2.1(a) and 8.2.1(c) of Appendix C	Working Paper on Noise Assessment Methodology	N/A

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prevailing measurement and relevant information on SEL of existing ferry. An approach to establish the noise criterion based on the prevailing noise measurement had been adopted in the approved EIA report for the Proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun (AEIAR-070/2003).	has also been measured. The source term for the proposed yacht has been measured at Gold Coast Yacht Club and Aberdeen Harbour.	Complex and Wholesale Fish Market at Area 44, Tuen Mun (AEIAR-070/2003) to establish the assessment based on prevailing noise measurement (including daytime, evening time and nighttime periods).			
Water Quality Impact					
Construction Phase					
Assessment of water quality impact in construction phase refers the methodology in Annex 14 of the TM-EIAO.	<p>The filling rates for public fill and sand blanket for reclamation works are assumed as 0.079 m³/s per barge and 0.208 m³/s per barge respectively. The working hours for filling activities is assumed from 8:00 to 18:00.</p> <p>The sediment loss rate for public fill and sand blanket is assumed to be 5% of fine content percentage in filling materials (< 63µm) and sea wall reduction of 45%.</p>	The large coverage extent of the original Western Harbour Model (WHM) makes it impractical to refine the entire grid to achieve the desired resolution within the vicinity of the Project, hence local refinement was adopted. In addition, due to the large coverage area of the WSRs and model stability constraints, the model grid resolution at some WSRs will be larger than 75m x 75m, particularly those located furthest away from the project.	Section 2 of Appendix D	Working Paper on Water Quality Assessment Methodology	N/A
Operational Phase					
Assessment of water quality impact in operational phase refers the methodology in	Discharge sources and pollutant concentrations in pollution loading inventory.	The large coverage extent of the original Western Harbour Model (WHM) makes it impractical to	Section 2 of Appendix D	Working Paper on Water Quality Assessment	

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Annex 14 of the TM-EIAO.		refine the entire grid to achieve the desired resolution within the study area, hence local refinement was adopted. In addition, due to the large coverage area of the WSRs and model stability constraints, the model grid resolution at some WSRs will be larger than 75m x 75m, particularly those located furthest away from the project.		Methodology	
Sewerage and Sewage Treatment Implications					
The sewerage and sewage treatment implications assessment for the Project follows Section 6.5 in Annex 14 of the EIAO-TM, Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, Sewerage Manual Part 1 from DSD.	Estimation of sewage arising from the residential and non-residential discharges, with flow build-up, within the catchment up to an ultimate development year.	-	Section 1 of Appendix E	Working Paper on Sewerage and Sewage Treatment Implications	N/A
Waste Management Implication					
The waste assessment for the Project follows <ul style="list-style-type: none"> TM-EIAO Annex 7 and Annex 15 Waste Disposal Ordinance (Cap. 354); Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C); 	<p>No additional sediment sampling is required as the locations of vibrocores and the validity of sediment quality based on marine sediment sampling conducted in early 2014 are still considered applicable.</p> <p>Waste generated in the construction phases are determined based on the design of the project and are advised by the engineer.</p> <p>Waste generated in the operational phase is determined based</p>	-	Section 3(i) of Appendix F	Sediment Quality Review Report	N/A

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<ul style="list-style-type: none"> Land (Miscellaneous Provisions) Ordinance (Cap. 28); Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation; and Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). 	on population parameters and land use of the proposed project.				
Land Contamination Impact					
<p>The land contamination assessment for the Project follows</p> <ul style="list-style-type: none"> Annex 19 of the Technical Memorandum on Environmental Impact Assessment Process (TM-EIA), Guidelines for Assessment of Impact On Sites of Cultural Heritage and Other Impacts (Section 3 : Potential Contaminated Land Issues), EPD, 1997; Guidance Manual for Use of Risk-Based Remediation Goals 	Assumptions made in the assessment are based on latest site boundaries, as well as current and historical land uses.	Four potentially contaminated sites, i.e. TC-1, TC-4, TC-9 and TC-10, are located in private lots and are still in operation. Therefore, access for environmental site investigation cannot be granted until the land is resumed.	Section 1(iv) of Appendix F	Contamination Assessment Plan	N/A

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(RBRGs) for Contaminated Land Management, EPD, 2007; • Guidance Notes for Contaminated Land Assessment and Remediation, EPD, 2007; • Practice Guide for Investigation and Remediation of Contaminated Land, EPD, 2011					
Ecological Impact					
The ecological impact assessment follows Annexes 8 and 16 of the TM-EIAO.	-	Assessment of ecological baseline is based on ecological surveys and literature review. Surveys were taken of representative locations and transect routes in and near the vicinity of the assessment area. Baseline descriptions are therefore unlikely to be entirely comprehensive, though they are considered sufficiently representative to allow subsequent assessments to be made.	-	-	N/A
Fisheries Impact					
The fisheries impact assessment follows Annexes 9 and 17 of the TM-EIAO.	-	Assessment of fisheries baseline is based on field surveys and literature review. Baseline descriptions are therefore unlikely to be entirely comprehensive,	-	-	N/A

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		though they are considered sufficiently representative to allow subsequent assessments to be made.			
Landscape and Visual Impact					
The landscape and visual impact assessment follows Annexes 10 and 18 of the EIAO-TM and the EIAO Guidance Note No.8/2010.	<p>The assessment is based on the latest RODP, footprints and preliminary design scheme with the latest relevant OZPs and the best available information.</p> <p>Building heights are assumed to be the maximum permissible height in each site as stipulated in the RODP parameters.</p> <p>The Broad Brush Tree Survey is in aid of the aerial photos and the Ecology Impact Assessment of the Project, and based on the topographical survey conducted prior to the tree survey, and site visit to accessible areas of the Project.</p> <p>The future management / maintenance of the proposed new trees will be handed over to the project proposer in accordance to Development Bureau Technical Circular (Works) (DEVB TCW) No. 10/2013 – Tree Preservation.</p>	<p>Assessment of sensitivity of receivers and the magnitude of changes of project works are inherently subjective. No detailed data exists for future planned projects other than described in the report. Changes to these may affect the evaluated impacts of the Project.</p> <p>Not all the survey sites are accessible to capture tree survey information. For those inaccessible areas, e.g. private lands and fenced off orchards or farmland, no site visits were conducted in these village areas and in its immediate vicinity as the tree surveyors were precluded from access to these areas by local villagers/parties. For the inaccessible areas without topographical survey data, the Broad Brush Tree Survey information is described based on the review of aerial photos and the Ecology Impact Assessment</p>	Section 1 of Appendix J	-	N/A

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		<p>of the Project.</p> <p>Individual tree impact as a result of the proposed developments is subject to further review at detailed design phase of the project in accordance with Development Bureau Technical Circular (Works) (DEVB TCW) No. 10/2013 – Tree Preservation.</p> <p>Not all sites are accessible to capture baseline photographs for the visual impact assessment. This is mainly due to access not being granted to private properly and higher levels of buildings, meaning descriptions of views from these locations have been extrapolated from visiting the surrounding areas and from aids such as illustrations, to help predict impacts.</p>			
Impact on Cultural Heritage					
Construction Phase (Terrestrial Archaeology, Marine Archaeology and Built Heritages)					
The impact assessment follows Annexes 10 and 19 of the TM-EIAO.	The assessment for terrestrial archaeology and marine archaeology are based on desktop review and relevant surveys considered under the Project. The built heritage assessment was based on existing information available from public domain and supplement through a built heritage survey.	Site access constraints including 1) access to private lots; 2) graves; 3) fierce dogs; 4) obstruction; and 5) vegetation, erosion and exposed bare bedrock were encountered at the time of	Section 1 and 2 of Appendix K	<p>Terrestrial Archaeological Survey Proposal</p> <p>Marine Diver Survey Proposal</p>	N/A

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		terrestrial archaeological survey.			
Operational Phase (Terrestrial Archaeology, Marine Archaeology and Built Heritages)					
The impact assessment follows Annexes 10 and 19 of the TM-EIAO.	The assessment for terrestrial archaeology and marine archaeology are based on desktop review and relevant surveys considered under the Project. The built heritage assessment was based on existing information available from public domain and supplement through a built heritage survey.	-	Section 1 and 2 of Appendix K	Terrestrial Archaeological Survey Proposal Marine Diver Survey Proposal	N/A