

Key Assessment Assumptions and Limitation of Assessment Methodologies

Assessment Methodologies	Assessment Assumptions	Limitations of Assessment Methodologies / Assumptions	Prior Agreements with EPD	
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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>Construction dust assessment for short-term impact (i.e. 1-hour and 24-hour average) were undertaken by a 2-Tier approach. Tier 1 screening assessment is a theoretical worst case scenario evaluation to identify hot spot areas of construction air quality impact. The identified hot spot areas were further assessed by a more focused Tier 2 assessment to predict the realistic worst case impact by assuming 30% active construction area. Long-term impact (i.e. annual average) were assessed with realistic assumptions of the 6% active construction area for all work sites. Subject to the construction work at night-time and during weekend or holiday, construction working period of 24 days a month and 8 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>	The construction programme is indicative and subject to contractors' actual operation. A conservative approach was adopted in the model run. The actual situation may be better than that of the model prediction.	3.4.4.3(iv)	-

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	<table><tr><td>Heavy construction activities including land clearance, site formation, ground excavation, construction of associated facilities etc.</td><td>E = 2.69 Mg/hectare/month of activities</td></tr><tr><td>Wind erosion</td><td>E = 0.85 Mg/hectare/year</td></tr></table> <p>Watering once per hour on exposed worksites is proposed to achieve dust removal efficiency of 92.1% with an assumed application intensity of 1.6 L/m2, in accordance with the “Control of Open Fugitive Dust Sources” (USEPA AP-42) as given in Appendix 3-2.</p>	Heavy construction activities including land clearance, site formation, ground excavation, construction of associated facilities etc.	E = 2.69 Mg/hectare/month of activities	Wind erosion	E = 0.85 Mg/hectare/year			
Heavy construction activities including land clearance, site formation, ground excavation, construction of associated facilities etc.	E = 2.69 Mg/hectare/month of activities							
Wind erosion	E = 0.85 Mg/hectare/year							
Operational Phase				-				
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Ambient Air Quality was determinate.	Ambient air quality level was based on annual average of Year 2007 to 2011.	A reducing trend of air pollutant concentration was observed. The adopted ambient air quality level may overestimate the future baseline conditions.	3.4.4.3(ii)	-				
Operational Phase (Vehicular Emission)								
The air quality impact assessment for the Project	Vehicular emission factor was based on modeling results of EmFAC. The	Worst case traffic impact assessment conditions were adopted in the model.	3.4.4.3(v)	-				

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follows Annex 4 and Annex 12 of the TM-EIAO. Vehicular emission impact was due to moving vehicles for Eastern and Western Connection Roads and idling vehicles from LMC BCP.	cumulative air quality impact due to vehicular emission was predicted by Caline4 model.	Thus, the assessment may overestimate the vehicular emission impact.		
Operational Phase (Odour Impact)				
The air quality impact assessment for the Project follows Annex 4 and Annex 12 of the TM-EIAO. Cumulative odour impact from the proposed STW was assessed.	Odour emission for proposed SWHSTW expansion was based on the measurement results at existing SWHSTW	-	3.4.4.3(v)	-
	Odour removal from proposed SWHSTW expansion was 95% for full enclosure according to latest engineering design.	-	3.4.4.3(v)	
Noise Impact				
Construction Phase				
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 on Table 3 of TM-GW and quiet plant system.	The prediction of construction noise impacts are based on TM-GW. The SWL of PME was based in TM-GW and quiet plant system. The actual situation may be better than that of the prediction.	3.4.5.2 (i) 3.4.5.2 (v)	-
	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	In carrying 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		-

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	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.	position.		
	A positive 3dB(A) facade correction was added to the predicted noise levels in order to account for the facade effect at each NSR.			-
	On-time percentages for PMEs were reasonably assumed by Engineer.			-
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	The roads proposed under the Project are scheduled to open in 2029. Therefore, the traffic data for year 2044 was adopted for the assessment. The existing noise screening structures,	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	3.4.5.2 (i) 3.4.5.2(vi)(b)	-

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provided in the UK Department of Transport calculation of Road Traffic Noise (CRTN) 1988. The assessment was based on projected peak hour flows for the worst year within 15 years after opening of the road.	<p>existing mitigation measures and mitigation measures by other concurrent projects were taken into account in the assessment.</p> <ul style="list-style-type: none"> • Low noise surfacing on the existing Fanling Highway • Existing 0.8m parapet along Fanling Highway • EP-404/2011 “Agreement No. CE 45/2008 (CE) Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Environmental Impact Assessment Report” • EP324-2008 “Agreement No. CE 58/2000 Design and Construction Assignment for Widening of Tolo Highway/Fanling Highway” <p>Mitigation measures proposed include the followings:</p> <ul style="list-style-type: none"> • Low noise surfacing on the existing Ma Sik Road • 3m, 4m, 5m, 7m high noise barriers, 5m vertical noise barrier with 3m cantilevered arm at 45° along proposed road, 7m vertical noise barrier with 3m cantilevered arm at 45° along proposed road • Semi-enclosure and full enclosure along proposed road • Layout plan according to revised RODP 	<p>uncertainties in the assessment of impacts should be considered when drawing conclusions from the assessment.</p> <p>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.</p>		

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Operational Phase (Fixed Noise Sources)				
The noise impact assessment for the Project follows Noise Control Ordinance, Annexes 5 and 13 of the TM-EIAO.	All of the existing fixed noise sources such as Lo Wu Classification Range (KTN G1-1, KTN G1-2), Lok Ma Chau Ventilation Shafts (KTN A1-11, KTN A1-12, KTN B1-5, KTN D1-2) and Reprovision of Temporary Wholesale Market (FLN D1-6) will be conducted by noise measurement. As there is no information on the planned fixed noise sources such as Public Transport Interchange (KTN A1-5, FLN D2-9, FLN B3-6), Electricity Sub-station (KTN B2-4, FLN B2-5), Parking and Operation Facilities for Environmental Friendly Transport System (FLN B2-2), only qualitative assessment has been conducted. However, for some standard noise sources such as District Cooling System (KTN B1-7), Sewage Treatment Works Extension – Phase 2 (FLN A2-3), Sewage Pumping Station (KTN D1-3, KTN F1-2, FLN A1-6, FLN B1-4, FLN B2-3, FLN C2-3), Pumping Station (FLN A1-2) and Sports Ground / Sports Complex (KTN F1-1), quantitative assessment has been made reference to the approved EIA such as Main Arena of the 2008 Olympic Equestrian Event EIA Report (EIA-118/2005), Tuen Mun Area 54 Sewage Pumping Station	Silencer and enclosure installation may be refined in detailed design. Cluster of small power loudspeaker may be refined in detailed design. Directional loudspeaker and orientate to point towards the audience may be refined in detailed design. “Limiter” device in the system to set the upper bound of the output sound level may be refined in detailed design.	3.4.5.2 (i) 3.4.5.2(vi)(a)	-

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	EIA (EIA-150/2008).			
Operational Phase (Helicopter Noise)				
The noise impact assessment for the Project follows Annexes 5 and 13 of the TM-EIAO.	The helipad is located at 80m away from nearest planned sensitive uses. Sound pressure level has been determined according to standard acoustic principle.	Helicopter noise source term is based on previous Environmental Impact Assessment Study for Helipad at Yung Shue Wan, Lamma Island.	3.4.5.2 (i) 3.4.5.2(vi)(c)	-
Water Quality Impact				
The water quality impact assessment for the Project follows Annexes 6 and 14 of the EIAO-TM. Qualitative assessment was conducted for water quality impact in both construction and operational phase.	-	-	3.4.6	-
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.	<p>Sewage flow estimation are based upon EPD Report No. EPD/TP 1/05 <i>Guidelines for Estimating Sewage Flows (GESF)</i>.</p> <p>Unit Flow Factors – the factor for different land uses in accordance with EPD's GESF.</p> <p>Unit Load Factors - the global unit load factors are used to estimate the sewage loading from the proposed developments in accordance with EPD's GESF.</p>	Actual sewage flows may be marginally different than estimated sewage flows due to lack of calibration of unit flow factors.	3.4.7	-

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Waste Management Implications				
The waste management implications assessment for the Project follows Annexes 7 and 15 of the EIAO-TM.	-		3.4.8	
Land Contamination Impact				
The land contamination assessment for the Project follows 1. Annex 19 of the TM-EIAO Guidelines for Assessment of Impact On Sites of Cultural Heritage and Other Impacts (Section 3 : Potential Contaminated Land Issues), EPD, 1997; 2. Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management, EPD, 2007; 3. Guidance Notes for Contaminated Land Assessment and Remediation, EPD, 2007; 4. Practice Guide for Investigation and Remediation of Contaminated Land, EPD, 2011	-	Environmental site investigation was conducted in 4 potentially contaminated sites (3 in KTN and 1 in FLN) within the government land lots in the 3 NENT NDAs. No environmental site investigation was conducted in other potentially contaminated sites within the private land lots due to the private land ownership.	3.4.9.4 &3.4.9.5	-
	-	Anomalistic high arsenic was detected in KTN. Health Risk Assessment for assessing the health risk levels due to the inhalation of arsenic-containing dust during construction stage and incidental ingestion of arsenic-containing soil during operational stage was commenced in March 2012 and is still being conducted. A Health Risk Assessment Report summarizing the extent mapping of arsenic level and health risk assessment findings is thus still under preparation.	3.4.9.4 & 3.4.9.5	-
Hazard to Life				
The Hazard to Life assessment	Chlorine Risk Assessment:	Since the study is based on the	3.4.10	-

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follows the criteria as stated in Annexes 4 of the TM-EIAO.	<p>This assessment is based on the ultimate loading case of the SSWTW, i.e. operation at the maximum design capacity of the SSWTW.</p> <p>Two risk mitigation measures, (1) Provision of a containment barrier at northwest corner of SSWTW, (2) Improvements to access road (markings and signage) to SSWTW, will be implemented by WSD prior to the implementation of the NDAs development. Therefore, these two mitigation measures are taken into account in the risk assessment.</p> <p>The population data in this study are estimated from the Government Population Census, NDA Development Plan, Government websites, public websites and site survey.</p> <p><u>Explosive Risk Assessment:</u> No explosive will be used for the construction of NDA development areas, therefore risk of use / transport / storage of explosives are not considered.</p>	ultimate loading case of the SSWTW as a conservative approach, the actual risk level is lower than the calculated risk level in this study.		
Landfill Gas Hazard				
Construction & Operational Phase	-	-	3.4.11	-
The landfill gas hazard	-	-	3.4.11	-

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assessment follows Annexes 7 and 19 of the TM-EIAO and the Landfill Gas Hazard Assessment Guidance Note (1997) (EPD/TR8/97)				
Impact on Site of cultural Heritage				
Construction Phase (Built Heritage)				
The impact assessment on built heritage follows Annexes 10 and 19 of the TM-EIAO and Criteria for cultural heritage impact assessment.	Assessment on potential impact on built heritage is based on the project work methodology, condition of the built heritage, the distance between the built heritage and the project works, and the geology feature of the study area.	<p>Preliminary assessment does not identify hidden structural defects of the built heritage.</p> <p>Distance between the built heritage and the project works is an approximate value, especially for heritage items not marked on base map (e.g. clan graves), due to the technical limitation of GPS.</p> <p>Built heritage sites (e.g. clan graves) identified are limited to accessible area.</p>	Appendix C of the EIA Study Brief	
Construction Phase (Archaeology)				
The impact assessment on archaeology follows Annexes 10 and 19 of the TM-EIAO and Criteria for cultural heritage impact assessment.	Assessment on potential impact on archaeological resources is based on the proposed zoning, available archaeological data obtained from desktop research and field data and potential of the study area.	Assessment on archaeological potential is based on various backgrounds, such as topography, geology, history and archaeology. Actual surviving and preservation condition of archaeological remains	Appendix C of the EIA Study Brief	

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		<p>may vary.</p> <p>Some areas are found to be inaccessible or land access consents were not obtained during the EIA stage of the Project.</p> <p>For the areas identified with unknown archaeological potential, further archaeological survey is necessary to be conducted after land resumption to further supplement data for the AIA.</p>		
Operational Phase (Built Heritage)				
The impact assessment on built heritage follows Annexes 10 and 19 of the TM-EIAO and Criteria for cultural heritage impact assessment.	Assessment assumptions is based on findings of baseline condition survey and baseline vibration assessment conducted by specialist are recommended for concerned built heritage during detail design stage.	<p>Distance between the built heritage and the project works is an approximate value, especially for heritage items not marked on base map (e.g. clan graves), due to the technical limitation of GPS.</p> <p>Built heritage sites (e.g. clan graves) identified are limited to accessible area.</p>	Appendix C of the EIA Study Brief	
Operational Phase (Archaeology)				
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Landscape and Visual Impact				
Operational Phase (Landscape and Visual)				
The landscape and visual impact assessment follows Annexes 10 and 18 of the TM-EIAO.	<p>The assessment is based on latest Stage 3 RODP, footprints and preliminary design scheme.</p> <p>Building heights are assumed to be the maximum permissible height in each site as stipulated in the RODP parameters e.g. all buildings are assumed to be 12 storeys in a site with buildings of 8-12 storeys).</p> <p>There are a number of Designate Projects (DPs) within the RODPs and these will be subject to individual EIA assessment under the EIAO. Additionally for some sites not currently classified as DPs, operators may need to check against the designated projects list in the Schedule 2 of EIAO-TM to determine whether their operations are DPs and if confirmed as DPs, the future operator of the respective sites would need to comply with statutory requirements under the EIAO accordingly. All sites have been incorporated into that assessment using the details currently available, but further details for many of the DPs will only become available at a later stage.</p>	<p>Some sites do not yet have proposed locations of buildings (e.g. some sites reserved for Government use).</p> <p>In reality some building heights may be lower than assumed during the LVIA, meaning visual impacts may be reduced.</p> <p>Individual tree impact as a result of the proposed developments is subject to further review at detail design phase of the project in accordance with ETWB TCW No. 3/2006, '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>	3.4.13	-

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	The future management / maintenance of the proposed new trees will be handed over to the project proposer in accordance to ETWB TCW No. 3/2006, 'Tree Preservation'.			
Ecological Impact				
The ecological impact assessment follows Annexes 8 and 16 of the TM-EIAO.	Assumptions made in the assessment are based on latest RODP, footprints and preliminary design scheme.	Assessment of ecological baseline is based on habitat, flora and fauna surveys and literature review. Surveys were taken of representative locations and transect routes in and near the vicinity of the study area. Baseline descriptions are therefore unlikely to be entirely comprehensive, though they are considered sufficiently representative to allow subsequent assessments to be made.	3.4.14	-
Fisheries Impact				
The fisheries impact assessment follows Annexes 9 and 17 of the TM-EIAO.	Assumptions made in the assessment are based on RODP-12, footprints and preliminary design scheme.	Assessment of fisheries baseline is based on field surveys and literature review. Assessment as to whether fish ponds are active, inactive or abandoned are sometimes difficult, and differences between ponds managed at low intensity and those inactive may not be apparent. However, any such uncertainties have not altered the potential fisheries impact assessment process in any way.	3.4.15	-