Appendix 18.1 - Key Assessment Assumptions and Limitations of Assessment Methodologies

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements Author		Proposed Alternative Assessment Tools / Assumptions (if applicable)
			EIA Study Brief Clause Reference	Relevant Documentation	
Air Quality Impact					
Construction Phase					
The air quality impact assessment follows: • Annex 4 and Annex 12 of		The construction programme is indicative and subject to contractors'	N/A	N/A	N/A
the TM-EIAO; and		actual operation.			
• Requirement from the EIA Study Brief (ESB-340/2021).					
Operation Phase					
The air quality impact assessment follows: • Annex 4 and Annex 12 of the TM-EIAO; and • Requirement from the EIA Study Brief (ESB-340/2021).	Vehicular Emission and Start Emission from Proposed Primary Distributor and District Distributor Roads and Other Roads and Associated with Concerned Facilities Vehicular emissions from open road was based on modelling results of EMFAC-HK v4.3 and the air quality impact was predicted using CALINE4 model.	-	N/A	N/A	N/A
	 Start emission was assumed at all local roads irrelevant to the actual location of engine start. Also, all vehicle classes were assumed to have potential trip start on local road, including public transport which usually starts its engine at its termini throughout its service route. Vehicular emission in the assessment: Year 				

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements Author		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief	Relevant	
	2031 for Initial Phase, Year 2034 for Main Phase and Year 2039 for Remaining Phase and 2046+. Proposed Effluent Polishing Plant (EPP) The design of the proposed EPP was referenced to Yuen Long South Effluent Polishing Plant (YLSEPP) and modified the plant design by engineers with the need of STLMC DN. 3 CHP units identical to the design of YLSEPP and 1 boiler with adjusted biogas consumption were adopted in the calculation. Major Point Source The information including valid emission strength, corresponding air pollutant control measures of emission sources and their emission duration extracted from the SP Licence Registry. Dispersion Modelling and Modelling Approach for Proposed EPP, Major Point Source and Portal Emission PATHv2.1 applied to provide background pollutant concentrations in assessing the total impact in the study area. Weather Research and Forecast (WRF) meteorological data were adopted for modelling. The wind speed and mixing heights in the WRF data were further adjusted before meteorological preprocessing by AERMET.		Clause Reference	Documentation	

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief	Relevant	
	!		Clause Reference	Documentation	
	The predicted air quality impact was predicted using AERMOD model.				
	Dispersion Modelling and Modelling Approach for Open Road				
	The secondary contribution due to vehicular emission from road networks was assessed using CALINE4.				
	Cumulative impact of Criteria Air Pollutants Cumulative air pollutant concentration at ASR was derived by the sum of contributions by various sources, and background contribution from PATHv2.1 system on hour-by-hour basis. Averaging results, namely daily and annual, were derived from the cumulative hour-by-hour results in accordance with Title 40, Code of Federal Regulations, US Environmental Protection Agency (USEPA 40 CFR) Part 51 "Revision to the Guideline on Air Quality Models, January 2017". If the total number of valid				
	hours is less than 18 for 24-hour average, the total concentration should be divided by 18 for the 24-hour average. For annual average, the sum of all valid hourly concentrations was divided by the number of valid hours during the year. For daily average, cumulative results at each ASR amongst 365 days were ranked by highest concentration and compared with the				
	maximum allowable concentration to determine the number of exceedance				

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
	throughout a year. The air quality impact on ASRs was then evaluated by number of exceedance per annum against the criteria of EIAO-TM and AQOs.				
Operation Phase (Odour Impa	act)				
The air quality impact assessment follows: • Annex 4 and Annex 12 of the TM-EIAO; and	The specific odour emission rate for the proposed EPP is made reference to the emission rates of YLSEPP adopted in the YLSEPP EIA Report (AEIAR-237/2022).	The prediction are based on designs for planned facilities or facilities currently in operation.	N/A	N/A	N/A
• Requirement from the EIA Study Brief (ESB-340/2021).	• The respective odour emission strength of Proposed Food Waste Pre-Treatment Facilities is made reference to the H ₂ S and NH ₃ monitoring record at the food waste pre-treatment facilities of the Food Waste / Sludge Anaerobic Co-Digestion Tai Po Pilot Plant.				
	The respective odour emission strength and corresponding air pollutant control measures of proposed RTS are generally referenced to West Kowloon Transfer Station (WKTS). The monitored data was also contributed by the odour emission from the grease trap treatment facility at WKTS, however it is considered as a worst-case assumption for the proposed RTS.				
	The odour emission parameters of the retained pig farm would be estimated with reference to the findings of odour sampling at an existing pig farm conducted under the CE 28/2019(CE) Study.				

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
	Odour emission rates of inlet works, sedimentation tank and bioreactors in the San Tin Barracks Sewage Treatment Works (STW) generally made reference to the odour emission rates of tanks with similar type of treatment units in Shek Wu Hui STW. The potential odour impact is predicted using AERMOD model.				
Noise Impact					
Construction Phase					T
The noise impact assessment for the project follows: • Annex 5 and Annex 13 of the EIAO-TM; and • Requirement set out under Clause 3.4.4 of the EIA	Sound power level (SWL) of the Powered Mechanical Equipment (PME) was based in Table 3 of Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM) or "Sound power levels of other commonly used PME" (Other PME) published 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.	N/A	N/A	N/A
Study Brief (ESB-340/2021).	 A positive 3dB(A) facade correction was added to the predicted noise levels to account for the facade effect at each identified representative NSR. All PME items required for a particular construction activity was assumed to be located at the notional source position, a position mid-way between the approximate geographical centre of the construction site and its boundary nearest to the NSR, of the work-front where such activity is to be performed in accordance with the GW-TM. 	In carrying out the assessment, worst-case assumptions have been assumed in order to provide conservative noise impact assessments such as locating all the items of PME at the notional source. Assessment for planned NSRs are based on indicative building layout of planned NSRs prepared	N/A	N/A	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements Author		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
	Only the dominant portion of the linear site closest to the NSR with a length to width ratio of 5:1 was considered for the purpose of determining the notional source position, when the construction site is linear in shape with a length to width ratio exceeding 5:1 in accordance with the GW-TM.	from best available information at the time of preparation of this EIA report			
	As a worst-case assumption, noise impact at the nearest sensitive facades of the residential buildings to the sources position was assessed, and noise assessment points of all NSRs were assumed at the same height as the work-front.				
	Based on the best-available information during the preparation of this EIA Report, no construction activities would be carried out during the restricted hours.				
Operation Phase (Road Traffic	c Noise)				
The noise impact assessment for the project follows: • Annex 5 and Annex 13 of the EIAO-TM; and	Road traffic noise was predicted based on the traffic flows, following strictly the procedures stipulated in the "Calculation of Road Traffic Noise (CRTN)" (1988) published	Assessment for planned NSRs are based on indicative building layout of planned NSRs prepared	N/A	N/A	N/A
Requirement set out under Clause 3.4.4 of the EIA Study Brief (ESB-340/2021).	by Department of Transport, UK. Road traffic noise was presented in terms of noise levels exceeded for 10% of the one-hour period having the peak traffic flow (i.e. L ₁₀ , 1hour, dB(A)).	from best available information at the time of preparation of this EIA report."			
	The assessment year for road traffic noise was taken as Year 2046+, which is the maximum traffic projection within 15 years				

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements Author		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
	after full operation of the proposed roadwork. • "Project roads" are completely new or are				
	substantially altered by the Project. Proposed roads and the sections of San Tin Highway to be widened have been identified as "Project roads". All road sections defined in the scope of designated project in the EIAO are considered as "Project Roads".				
	 "Existing" Roads which are unchanged or without significant traffic noise impact (i.e. the traffic noise level with the road project would be less than that without the road project at the design year by 1.0 dB(A)). 				
Operation Phase (Fixed Noise	Sources)				
The noise impact assessment for the project follows: • Annex 5 and Annex 13 of the EIAO-TM; and • Requirement set out under Clause 3.4.4 of the EIA Study Brief (ESB-340/2021).	The fixed plant noise assessment has been carried out by determining the maximum allowable SWL based on backward calculation of separation distance between the noise source and the nearest NSRs regardless on the percentage usage. It is assumed that all existing and planned fixed noise sources would be operated simultaneously at any time of the day for the worst-case scenario. Night-time criterion was adopted for conservative assessment to determine the maximum allowable sound power level.	For determining the distance correction factors, the horizontal distances between the noise source positions and the NSRs were used for representing the worst level of the representative NSRs. The distance between NSRs and the noise sources (slant distance) could be larger and the maximum allowable SWL could be lower than the prediction. Assessment for planned	N/A	N/A	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
		NSRs are based on indicative building layout of planned NSRs prepared from best available information at the time of preparation of this EIA report			
Operation Phase (Firing Rang	e Noise)				
The noise impact assessment for the project follows: • Annex 5 and Annex 13 of the EIAO-TM; and • Requirement set out under Clause 3.4.4 of the EIA Study Brief (ESB-340/2021).	 Noise generated by crowd activities at the Tam Mei Barracks and San Tin Barracks was qualitatively assessed by soliciting the number of complaints regarding crowd activities in the barracks and comparing the distance between existing and planned noise sensitive receivers. Firing range noise impact assessment was conducted based on the approach adopted in Agreement No. CE61/2007(CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation (NENT NDA) and Agreement No. CE31/2014(CE) Engineering Study for Police Facilities in Kong Nga Po – Feasibility Study (KNP). 	Due to site access issue, noise measurement was conducted near Tam Mei Barracks and San Tin Barracks. Assessment for planned NSRs are based on indicative building layout of planned NSRs prepared from best available information at the time of preparation of this EIA report.	N/A	N/A	N/A
Operation Phase (Rail Noise)					
The noise impact assessment for the project follows: • Annex 5 and Annex 13 of the EIAO-TM; and	 Airborne railway noise impact has been predicted according to "Calculation of Railway Noise (CRN) (1995)" by the UK Department of Transport. Whilst the calculation would be based on CRN, the train 	Assessment for planned NSRs are based on indicative building layout of planned NSRs prepared	N/A	N/A	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements Author		Proposed Alternative Assessment Tools / Assumptions (if applicable)
Assumptions	Assumptions	EIA Study Brief Clause Reference	Relevant Documentation		
Requirement set out under Clause 3.4.4 of the EIA Study Brief (ESB- 340/2021).	noise (both rolling noise and air-conditioning noise) source term would base upon the noise level measured during the commissioning of SP1900 train and is based on a disc braked Electric Multiple Unit (EMU). The source term has made reference to the Environmental Impact Assessment report for Shatin to Central Link – Tai Wai to Hung Hom Section. Operating scenarios of the Lok Ma Chau Spurs Line were provided by MTRC. Ground-borne railway noise from Northern Link would follow the requirements and criteria set out in the EIAO-TM to determine the environmental acceptability.	from best available information at the time of preparation of this EIA report.			
Water Quality Impact					
Construction Phase					
The water quality impact assessment follows: • Annexes 6 and 14 of the EIAO-TM; and	The types and quantities of water pollution to be generated from the Project are based on the Project design and / or engineering assessments.	N/A	N/A	N/A	N/A
Requirement set out under Clause 3.4.5 of the EIA Study Brief (ESB- 340/2021).					
Operation Phase					
The water quality impact	The current water quality situation was determined using the water quality model	A conservative approach was adopted in the model	N/A	N/A	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements Author		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		С	EIA Study Brief Clause Reference	Relevant Documentation	
assessment follows: • Annexes 6 and 14 of the EIAO-TM; and • Requirement set out under Clause 3.4.5 of the EIA Study Brief (ESB-340/2021).	 adopted in the YLSEPP EIA Report (AEIAR-237/2022). The model assumptions of the "without Project" scenario followed that adopted in "Scenario 2" of the YLSEPP EIA Report. It is assumed that the emergency discharge would occur for a period of 2 hours with a total discharge volume of 27,500 m³. The general settings of the model such as the approach to the setup of boundary and initial conditions as well as the model coefficients and parameters followed those adopted in the YLSEPP EIA Report. The maximum Project design capacity of 125,000 m³/day was adopted for worst-case assessment as it represents the worst-case in terms of the amount of Project flow under operation phase. The pollution loading of other background discharges to the marine water was based on the pollution loads complied for the model adopted in the YLSEPP EIA Report. 	run. The actual situation may be better than that of the model prediction.			
Sewage and Sewerage Treatm	ent Implication				
The sewerage and sewage Treatment assessment follows: Section 6.5 in Annex 14 of the EIAO-TM; Guidelines for Estimating	 Sewage flow estimation are based upon EPD Report No. EPD/TP 1/05 Guidelines for Estimating Sewage Flows (GESF). Unit flow factors and peaking factors are in accordance with EPD's GESF. Sewage loading is estimated using the global 	Actual sewage flows may be marginally different than estimated sewage flows due to lack of calibration of unit flow factors.	N/A	N/A	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
Sewage Flows for Sewage Infrastructure Planning, Sewerage Manual Part 1 from DSD; and	unit load factors in Table 4 of the Sewage Manual Part 1. The EPP Effluent Discharge Standard is reference to YLEPP standard and approved				
• Requirement set out under Clause 3.4.6 of the EIA Study Brief (ESB-340/2021).	·				
Waste Management Implication	on				
The waste management assessment follows: • Annex 7 and Annex 15 of the EIAO-TM; and	The waste quantities to be generated from the Project were estimated based on the engineering assessment.	N/A	N/A	N/A	N/A
 Requirement set out under Clause 3.4.7 of the EIA Study Brief (ESB- 340/2021). 					
Land Contamination					
The land contamination assessment follows: • Annex 19 of the EIAO-TM; • 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	The arsenic threshold of 571 mg/kg will act as a remedial threshold concentration.	The majority of identified potentially contaminated sites are privately occupied and inaccessible for site walkover at the time of reporting. Drone reconnaissance of the Project Area was undertaken with video and photographs taken to identify current land use.	3.4.8.5	Methodology Statement on Health Impact Assessment	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies / Assumptions	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
			EIA Study Brief Clause Reference	Relevant Documentation	
Goals (RBRGs) for Contaminated Land Management, EPD, Revised in April 2023;					
Guidance Notes for Contaminated Land Assessment and Remediation, EPD, Revised in April 2023;					
 Practice Guide for Investigation and Remediation of Contaminated Land, EPD, Revised in April 2023; and 					
 Requirement set out under Clause 3.4.8 of the EIA Study Brief (ESB- 340/2021). 					
Landfill Gas Hazard					
The landfill gas hazard assessment follows: • Annexes 7 and 19 of the TM-EIAO;	N/A	N/A	N/A	N/A	N/A
Landfill Gas Hazard Assessment Guidance Note (1997) (EPD/TR8/97); and					
 Requirement set out under Clause 3.4.9 of the EIA Study Brief (ESB- 					

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation	
340/2021).					
Ecological Impact					
The ecological impact assessment follows: Annexes 8 and 16 of the EIAO-TM for the criteria, general approach and methodology for assessment of ecological impacts; EIAO Guidance Note No. 3/2010, No. 6/2010, No. 7/2010 and No. 10/2010 for general guidelines for conducting ecological baseline surveys and environmental mitigation measure recommendations; and Requirement set out under Clause 3.4.10 of the EIA Study Brief (ESB-340/2021).	Assumed extent of disturbance impacts for large, disturbance sensitive avifauna species were taken as 0-100m and 100-200m at the exclusion zone for low-rise buildings and mid-to high-rise buildings respectively; 100-200m and 200-400m at the reduced density zone for low-rise buildings and mid-to high-rise buildings respectively during construction phase. During operation phase, the extent were 0-50m and 50-100m at the exclusion zone for low-rise buildings and mid-to high-rise buildings respectively; 0-100m and 100-200m at the reduced density zone for low-rise buildings and mid-to high-rise buildings respectively. 0% usage was assumed at exclusion zone while 50% usage was assumed at reduced density zone.	Limited accessibility was available at Lok Ma Chau Ecological Enhancement Area (LMC EEA) as part of the management regime to reduce access and disturbance from humans and dogs. Baseline conditions of this mitigation wetland were made reference to existing studies and monitoring of the LMC EEA. Where coverage by walk-transect was not possible (e.g. inaccessible areas within workshops, open storage, or barrack areas, areas close to firing range where access is not allowed, hillside areas with limited accessibility and safety concern), high-power binoculars were used to determine the habitat structure, general vegetation composition, at a location as close as	N/A	N/A	N/A

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies /	Prior Agreements with EPD/Othe Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)		
		Assumptions	EIA Study Brief Clause Reference	Relevant Documentation			
		possible.					
Fisheries Impact	Fisheries Impact						
The fisheries impact assessment follows: • Annexes 9 and 17 of the TM-EIAO; and	General categorisation of the status of fishponds included active, inactive, abandoned and others. "Others" were scoped out from further evaluation as they were not related to fisheries assessment.	N/A	N/A	N/A	N/A		
• Requirement set out under Clause 3.4.11 of the EIA Study Brief (ESB-340/2021).							
Impact on Cultural Heritage (E	Impact on Cultural Heritage (Built Heritage)						
The built heritage assessment follows:	Desktop review considered the whole of the assessment area, while site visits were based on all accessible areas that have not been covered by the desktop review.	1.07.	N/A	N/A	N/A		
Annexes 10 and 19 of the TM-EIAO; and							
Requirement set out under Clause 3.4.13 of the EIA Study Brief (ESB- 340/2021).							
Impact on Cultural Heritage (Archaeology)							
The built heritage assessment follows: • Annexes 10 and 19 of the TM-EIAO;	Desktop review considered the whole of the assessment area, while site visits were based on all accessible areas that have not been covered by the desktop review.	Access issue has limited the areas that can be field evaluated. Further assessment on their architectural appraisal and	Appendix L Clause 2	Archaeological Assessment Pan	N/A		
Guidelines for Cultural Heritage Impact Assessment (GCHIA); and		condition, as well as the potential environmental impact imposed by the					

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies / Assumptions	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)		
			EIA Study Brief Clause Reference	Relevant Documentation			
Requirement set out under Clause 3.4.13 of the EIA Study Brief (ESB- 340/2021).		Project was not available at the time of assessment.					
Hazard to Life							
The Hazard to Life assessment follows: • Annex 4 of the TM-EIAO; • Hong Kong Risk	The operation of green fuel stations (GFS) were considered with provision of liquefied petroleum gas for the purpose of assessment.	N/A	N/A	N/A	N/A		
 Hong Kong Risk Guidelines; and 							
Requirement set out under Clause 3.4.14 of the EIA Study Brief (ESB- 340/2021).							
Landscape and Visual Impact	Landscape and Visual Impact						
The landscape and visual impact assessment follows: • Annexes 10 and 18 of the EIAO-TM; • EIAO Guidance Note No.8/2010; and • Requirement set out under Clause 3.4.12 of the EIA Study Brief (ESB-340/2021).	The assessment was based on the RODP, footprints and preliminary design scheme with the latest relevant OZPs and the best available information. As the development proposals may be further refined the assessment assumes the worst-case scenario in terms of the impacts. Buildings, roads and pavement are not considered as landscape resources and have therefore not been included in the mapping of resources. Building heights are assumed to be the maximum permissible height in each site as	Assessment of sensitivity of receivers and the magnitude of changes of Project works are inherently subjective. No detailed data exists other than described in the report. 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	-	Viewpoints agreed by Planning Department	N/A		

Assessment Methodology	Key Assessment Assumptions	Limitations of Assessment Methodologies / Assumptions	Prior Agreements with EPD/Other Authorities		Proposed Alternative Assessment Tools / Assumptions (if applicable)		
			EIA Study Brief Clause Reference	Relevant Documentation			
	stipulated in the RODP parameters.	Technical; Circular (Works) (DEVB TCW) No. 10/2013 – Tree Preservation.					
Impact on Electric and Magne	Impact on Electric and Magnetic Fields						
The electric and magnetic fields assessment follows: Chapter 7 of the Hong Kong Planning Standards and Guidelines; Guidelines issued by the International Commission on Non-ionizing Radiation Protection; and Requirement set out under Clause 3.4.15 of the EIA Study Brief (ESB-340/2021).	N/A	Due to existing site limitations, such as inaccessible by public, the measurement locations are selected to be located nearest to the proposed land use as far as practicable.	N/A	N/A	N/A		