

4. AIR QUALITY

4.1 Introduction

- 4.1.1 Assessment on the potential air quality impacts associated with the construction of the Project is presented in this section. Representative Air Sensitive Receivers (ASRs) in the vicinity of the study area are identified. The potential air quality impacts on these ASRs arising from dust emission from construction activities have been assessed and appropriate mitigation measures are proposed to alleviate the potential air quality impacts.
- 4.1.2 The operation of Sha Tin WTW does not involve any air polluting activities, air quality impact is therefore not anticipated during operation phase of the Project and will not be assessed in this section.

4.2 Environmental Legislation, Plans, Standards, and Guidelines

- 4.2.1 The criteria and guidelines for air quality assessment are laid down in Annex 4 and Annex 12 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). In addition, specific requirements on air quality assessment for this Project are stipulated in Clause 3.4.6 of the EIA Study Brief (No. ESB-220/2011).

Air Quality Objectives & EIAO-TM

- 4.2.2 The Air Pollution Control Ordinance (APCO) provides the statutory authority for controlling air pollutants from a variety of sources. The Hong Kong Air Quality Objectives (AQOs), which stipulate the maximum allowable concentrations over specific periods for typical pollutants, should be met. The relevant AQOs are listed in **Table 4.1**.

Table 4.1 Hong Kong Air Quality Objectives

Pollutants	Averaging Time	Concentration Limit ($\mu\text{g}/\text{m}^3$)	No. of Exceedances to be Allowed per Calendar Year
Respirable Suspended Particulates (RSP) ⁽¹⁾	24-hour	100	9
	1-year	50	Not applicable
Fine Suspended Particulates (FSP) ⁽²⁾	24-hour	75	9
	1-year	35	Not applicable

Note:

- (1) RSP means suspended particles in air with a nominal aerodynamic diameter of 10 μm or less.
(2) FSP means suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less.

- 4.2.3 Annex 4 of the EIAO-TM stipulates that the hourly Total Suspended Particulates (TSP) level should not exceed 500 $\mu\text{g}/\text{m}^3$ (measured at 25°C and one atmosphere) for construction dust impact assessment.

Air Pollution Control (Construction Dust) Regulation

- 4.2.4 Notifiable and regulatory works are under the control of Air Pollution Control (Construction Dust) Regulation. Notifiable works are site formation, reclamation, demolition, foundation and superstructure construction for buildings and road construction. Regulatory works are building renovation, road opening and resurfacing, slope stabilisation, and other activities including stockpiling, dusty material handling, excavation, concrete production, etc. This Project is expected to include both notifiable works and regulatory works. Contractors and site agents are required to inform EPD and adopt dust reduction measures to minimize dust emission, while carrying out construction works, to the acceptable level.

4.3 Description of the Environment

4.3.1 The Project site is located within the existing Sha Tin WTW. The locality of the Project area is a new development area. The Project site is surrounded by the slope of Kam Shan and Lion Rock from north to south, and immediately to the east of the Project site is the existing MTR East Rail Line. Further to the northeast and east of the Project site is a mixture of residential uses, commercial uses, recreational area and educational institutes.

Background Air Quality

4.3.2 With reference to EPD's Air Quality Annual Report, the recent five years (2009 – 2013) annual average particulate matter concentrations recorded at EPD's air quality monitoring station closest to the Project site, namely the Shatin station, are presented in **Table 4.2**. The long-term (5-year) average of these annual average monitoring data obtained by EPD at the Shatin station is taken as the background concentration for the Project site in accordance with EPD's Guidelines on Assessing the 'TOTAL' Air Quality Impacts.

Table 4.2 Annual Average Pollutant Concentration in the Latest Five Years (Year 2009 – 2013) at Shatin Air Quality Monitoring Station

Pollutant	Annual Average Concentration ($\mu\text{g}/\text{m}^3$)					Background Concentration ($\mu\text{g}/\text{m}^3$)
	2009	2010	2011	2012	2013	
TSP	60	67	66	54	57	60.8
RSP	45	45	47	39	42	43.6
FSP	N/A	N/A	N/A	26	29	27.5*

Remarks:

- N/A indicate data not available.
- Asterisk indicates background concentration calculated from the available data (year 2012 and 2013) only.
- FSP concentrations were not available for years earlier than 2012.

Air Sensitive Receivers

4.3.3 In accordance with Annex 12 of the EIAO-TM, any domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, educational institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre are considered as ASRs. As stated in the EIA Study Brief, the boundary of the assessment area for air quality assessment should be 500 m from the Project boundary. A total of 6 representative ASRs, which are considered to be most likely to be affected by the construction of the Project, have been identified for this assessment. The selected representative ASRs are listed in **Table 4.3** and their locations are illustrated in **Figure 4.1**.

Table 4.3 Representative Air Sensitive Receivers

ASRs	Description	Land Use	Distance from the Project Boundary (m)	No. of Storey
ASR-1	The Blossom Phase 4	Residential	100	2
ASR-2	The L Louey	Residential	25	2
ASR-3	Hin Keng Estate - Hin Yau House	Residential	95	35
ASR-4	Hin Keng Estate - Hin Wan House	Residential	115	35
ASR-5	Hin Keng Estate - Hin Kwai House	Residential	145	35
ASR-6	Sha Tin Height Tunnel Administration Building	Office	180	3

4.4 Identification of Environmental Impacts

4.4.1 With reference to the construction methods described in Section 3, the potential dust impact associated with the proposed construction works would be limited. The major dusty construction

activities include excavation works, truck haulage, demolition and cut-back of the existing engineered slope and wind erosion of open active site. Reprovisioning of the South Works would also involve construction of new Administration Building cum Mainland East Laboratory, pre-treatment facilities, Water Treatment Works Logistics Centre, switchgears and power supply, South Works Pumping Station and washwater recovery facilities. However, these superstructure construction and concreting works are not dusty construction activities and should not cause adverse dust nuisance.

4.5 Assessment Methodology

- 4.5.1 Under the APCO, relevant dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be implemented during the construction phase of the Project. Besides, as described in Section 4.4 above, significant dusty activities are not anticipated during the construction phase of this Project. With effective implementation of the dust suppression measures, adverse construction dust impacts are not expected at the ASRs. Quantitative assessment is therefore considered not necessary.

4.6 Prediction and Evaluation of Environmental Impacts

- 4.6.1 The construction of the Project would commence in 2015 for completion in early-2021 (see construction programme in **Appendix 2.1**). The total construction programme is about **70** working months. According to the current construction programme, the demolition and construction works are scheduled to be conducted in sequence. Some of the construction tasks would be carried out concurrently. Details of the major dusty construction activities are discussed below and the locations of the dusty construction activities are shown in **Figures 4.2** and **4.3**.

Excavation Works

- 4.6.2 The most dusty construction activities would likely be excavation works. Excavation works would be required for the construction of the retaining wall and new access road, Water Treatment Works Logistics Centre, washwater recovery tanks, Pre-ozonation House, Flocculation Tanks, High Rate Sedimentation Tanks, Intermediate Ozonation House, Stage 2 Granular Media Filters. These excavation works would be carried out over a reasonable period to minimise the daily excavated volume. With the small volume of excavated materials to be generated daily and disposed off-site, the potential dust impact at the nearby ASRs shall not be significant with the effective implementation of good site practices and dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation.

Demolition of Existing Structures

- 4.6.3 The demolition works of the existing South Works including chemical house, washwater recovery tanks and administration building would each take about 3 to 18 months. Given the short duration and small scale of the demolition works and with the implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation together with good site practices, the potential dust impact would be minimal. No adverse dust impacts on the nearby ASRs would be anticipated.

Cumulative Dust Impacts with Concurrent Project

- 4.6.4 It is noted that the construction period of the Shatin to Central Link – Tai Wai to Hung Hom Section [SCL(TAW-HUH)] would overlap with the construction period of this Project.
- 4.6.5 The SCL (TAW – HUH) is an extension of Ma On Shan Line from Tai Wai through the new stations in the east Kowloon, and connecting the West Rail Line (WRL) at Hung Hom Station. According to the approved EIA report of SCL(TAW-HUH) (AEIAR-167/2012), the construction works of SCL(TAW-HUH) near Hin King area, including the alignment at Hin Keng and the Hin Keng Station, would commence in 2012 and be completed by June 2016. As the Project would commence in August 2015, there might be cumulative construction dust impacts in the vicinity of the study area during August 2015 to June 2016.
- 4.6.6 The tentative construction methods of SCL(TAW-HUH) near Hin Keng area include cut-and-cover tunnel construction and at-grade construction of Hin Keng Station and SCL(TAW-HUH) alignment. Potential dust impacts would be expected. Yet, dust suppression measures would be implemented for the SCL(TAW-HUH) project, and as such, no unacceptable construction dust impact was predicted under the SCL(TAW-HUH) EIA study.

- 4.6.7 The construction programme provided in the approved SCL(TAW-HUH) EIA report indicated that the peak construction period for Hin Keng area would occur in year 2013 to 2014, and this peak construction period was referred as worst-case scenario in the EIA study for prediction of air quality impacts. However, the concurrent period for SCL(TAW-HUH) and the Project will be less than a year, from August 2015 to June 2016. Prior to this period, the majority of dusty construction works at Hin Keng area, including most of the bulk excavation would have been finished. During the concurrent period, the construction works of SCL(TAW-HUH) would mainly involve only minor dusty works, such as structural element casting and E&M installation. Therefore, it is expected that the dust generated from SCL(TAW-HUH) during the concurrent period would be much less than that predicted under the worst-case scenario as presented in the approved EIA.
- 4.6.8 On the other hand, with reference to the construction programme of the Project in **Appendix 2.1**, during the concurrent period, only minor construction works would be carried out, including construction of haul road and the associated retaining wall. The other construction activities, including demolition of existing Sha Tin WTW, excavation and construction of various buildings would be started after the construction of SCL(TAW-HUH) is completed in June 2016. Therefore, adverse cumulative construction dust impact from the two projects is not anticipated during the concurrent period of August 2015 to June 2016.
- 4.6.9 Since the scale of this Project is minimal comparing with SCL(TAW-HUH), the amount of dust generation from this Project would be minimal, adverse construction dust impact from the Project alone is also not anticipated.

4.7 Recommended Mitigation Measures

- 4.7.1 To ensure compliance with the relevant standards, dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices should be incorporated into the contract document to control potential dust emission from the site. The major dust suppression measures include:
- Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.
 - Use of frequent watering for particularly dusty construction areas and areas close to ASRs.
 - Side enclosure and covering of any aggregate or stockpiling of dusty material to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.
 - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.
 - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.
 - Provision of not less than 2.4 m high hoarding from ground level along site boundary where adjoins a road, streets or other areas accessible to the public except for a site entrance or exit.
 - Imposition of speed controls for vehicles on site haul roads.
 - Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.
 - Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.

4.8 Evaluation of Residual Environmental Impacts

- 4.8.1 With the implementation of the dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation, no adverse residual dust impact would be expected.

4.9 EM&A Requirements

- 4.9.1 Environmental monitoring and audit for potential dust impacts should be conducted during the construction phase of the Project so as to check compliance with legislative requirements. Details of the monitoring and audit programme are contained in a stand-alone EM&A Manual.

4.10 Conclusion

- 4.10.1 Potential air quality impacts from the construction works of the Project would mainly be related to construction dust from excavation, materials handling, spoil removal, demolition and wind erosion. In view of the nature of works, adverse dust impact at the ASRs would not be expected from the Project. Nevertheless, appropriate dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation should be implemented to minimize any potential dust impact.

~ End of Section 4 ~