

4. AIR QUALITY IMPACT ASSESSMENT

4.1. INTRODUCTION

4.1.1. This section identifies potential impacts on air quality that may arise from the construction and operation of the Project. The construction dust impact and operational air quality impact from the Project were assessed. Where necessary, appropriate mitigation measures have been recommended to reduce the impacts from the Project at the ASRs to satisfy the related environmental ordinances, legislation, standards and guidelines. The air quality impact assessment is conducted in accordance with the criteria and guidelines as stated in Annexes 4 and 12 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) as well as the requirements given in Section 3.4.4 and Appendix B of the EIA Study Brief (No. ESB-347/2021) issued in October 2021.

4.2. ENVIRONMENTAL LEGISLATION, STANDARDS AND GUIDELINES

General

4.2.1. The relevant legislations, standards and guidelines applicable to the present study for the assessment of air quality impacts include:

- Air Pollution Control Ordinance (APCO) (Cap. 311);
- Air Pollution Control (Construction Dust) Regulation;
- Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation;
- Air Pollution Control (Fuel Restriction) Regulation; and
- Environmental Impact Assessment Ordinance (EIAO) (Cap.499), EIAO-TM, Annex 4 and Annex 12.

Air Pollution Control Ordinance: Air Quality Objectives (AQOs)

4.2.2. The prevailing AQOs has been in forced since 1st January 2022 are summarised in **Table 4.1**.

Table 4.1 Hong Kong Air Quality Objectives

Pollutant	Averaging Time	Concentration Limit ($\mu\text{g}/\text{m}^3$) ^[1]	Number of Exceedances to be allowed
Sulphur Dioxide (SO ₂)	10-minute	500	3
	24-hour	50	3
RSP or PM ₁₀ ^[2]	24-hour	100	9
	Annual ^[4]	50	N/A
FSP or PM _{2.5} ^[3]	24-hour	50	18 ^[5]
	Annual ^[4]	25	N/A
Nitrogen Dioxide (NO ₂)	1-hour	200	18
	Annual ^[4]	40	N/A
Ozone (O ₃)	8-hour	160	9
Carbon monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
Lead (Pb)	Annual ^[4]	0.5	N/A

Note:

[1] All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.

[2] Respirable suspended particulates (RSP) means suspended particles in air with a nominal aerodynamic diameter of 10 μm or less.

[3] Fine suspended particulates (FSP) means suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less.

[4] Arithmetic mean

[5] The new AQO allows 35 days of exceedance per calendar year for daily FSP for non-government projects. However, government projects shall adopt a more stringent standard with the number of allowable exceedances of 18 days per calendar year.

EIAO-TM

4.2.3. The criteria and guidelines for evaluating air quality impacts are set out in Section 1 of Annex 4 and Sections 1 to 3 of Annex 12 respectively of the EIAO-TM. Annex 4 of the EIAO-TM stipulates the criteria for evaluating air quality impact which include the following:

- (a) meet the AQO and other standards established under the *APCO (Cap. 311)*;
- (b) meet 5 odour units based on an averaging time of 5 seconds for odour prediction assessment;

- (c) for air pollutants not established under the *APCO* nor above: meet the standards or criteria adopted by recognized international organizations such as the World Health Organization or the United States Environmental Protection Agency to be agreed with the Director.

Annex 12 describes the guidelines on conducting air quality assessment, including determination of ASR, identification of emission characteristics and impact prediction and assessment etc.

Air Pollution Control (Construction Dust) Regulation

- 4.2.4. With reference to the *Air Pollution Control (Construction Dust) Regulation*, it specified processes that require special dust control. The Contractors are required to inform the EPD and adopt proper dust suppression measures while carrying out “Notifiable Works” (which requires prior notification by the Regulation) and “Regulatory Works” to meet the requirements as defined under the Regulation.

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

- 4.2.5. The *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation* came into operation on 1 June 2015. Under the regulation, non-road mobile machinery (NRMMS), except those exempted, are required to comply with the prescribed emission standards. From 1 September 2015, all regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Starting from 1 December 2015, only approved or exempted NRMMS with a proper label are allowed to be used in specified activities and locations including construction sites. The Contractor is required to ensure the adopted machines or non-road vehicle under the Project could meet the prescribed emission standards and requirement.

Air Pollution Control (Fuel Restriction) Regulation

- 4.2.6. The *Air Pollution Control (Fuel Restriction) Regulation* was enacted in 1990 and amended in 2008. The regulation imposes legal control on the type of fuels allowed for use and their sulphur contents in commercial and industrial processes. Gaseous fuel, conventional solid fuel with a sulphur content not exceeding 1% by weight or liquid fuel with a sulphur content not exceeding 0.005% by weight and a viscosity not more than 6 centistokes at 40°C, such as Ultra Low Sulphur Diesel (ULSD) are permitted to be used in commercial and industrial processes.

Recommended Pollution Control Clauses for Construction Contracts

- 4.2.7. The *Recommended Pollution Control Clauses (RPCC)* are generally good engineering practice to minimize inconvenience and environmental nuisance to nearby residents and other sensitive receivers. Some modifications may be necessary to suit specific site conditions.

DEVB's TC No.1/2015, Emissions Control of NRMMs in Capital Works Contracts of Public Works

- 4.2.8. This Circular promulgates the requirements for the use of NRMMs approved under the *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation* (“the Regulation”) in new capital works contracts of public works including design and build contracts, in addition to the statutory requirements of the Regulation.

DEVB's TC No. 13/2020, Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts

- 4.2.9. In response to the carbon emission reduction target as specific in the “Hong Kong Climate Action Plan 2030+”, timely provision of electricity could help reduce carbon emission arising from operation of diesel generators at the beginning of the construction works. At the detailed design stage, the Project Team should timely apply for the temporary electricity with a target that the necessary cables laying works could be completed before the commencement of the works contract. In addition, timely provision of electricity to construction sites can facilitate the use of Electric Vehicles (EVs) in public works contracts. The Project Team should specify the use of EV(s) as well as the installation of designated medium-speed charger for each EV as a standard provision at the site accommodation in each public works contract.

4.3. DESCRIPTION OF EXISTING ENVIRONMENT

Background

- 4.3.1. The Project Site is located at southern side of HKO Headquarters in Tsim Sha Tsui District which is an urban area with mixture of commercial and residential developments. The Project Site is surrounded by Hillwood Road to the north, Austin Avenue to the east, Knutsford Terrace to the south and Nathan Road to the west. The Project Site is zoned “G/IC” according to the approved Tsim Sha Tsui OZP No. S/K1/28, whilst the surrounding areas are predominately zoned “Commercial”, “Residential”, “Government, Institution or Community” and “Open Space”. As shown in [Figure 1.1](#), developments in the vicinity of the Site are identified and summarised in *Section 2.1.2*.
- 4.3.2. Dominant air pollution sources include the road traffic emissions mainly from Nathan Road, Kimberley Road and Hillwood Road.

Existing Air Quality in Yau Tsim Mong District

- 4.3.3. Since there is no EPD air quality monitoring station (AQMS) in Tsim Sha Tsui, the air quality data of the nearest general AQMS at Sham Shui Po are adopted to represent the ambient air quality of the area. Latest available 5 years of air quality data, i.e. 2018 to 2022, are summarised in **Table 4.2** to depict the trend of the localised air quality.

Table 4.2 Background Air Quality at Sham Shui Po Monitoring Station

Pollutant	Averaging Time	Concentration 2018-2022 ($\mu\text{g}/\text{m}^3$) ^{[1][2]}					Annual AQO ($\mu\text{g}/\text{m}^3$)
		2018	2019	2020	2021	2022	
CO	1 st highest 1-hour ^[3]	N.A.	N.A.	N.A.	N.A.	N.A.	30,000
	1 st highest 8-hour ^[3]	N.A.	N.A.	N.A.	N.A.	N.A.	10,000
FSP/ PM _{2.5}	19 th highest 24-hour	37	33	27	28	27	50
	Annual	21	18	14	14	12	25
NO ₂	19 th highest 1-hour	152	176	151	171	158	200
	Annual	49	48	45	47	43	40
O ₃	10 th highest 8-hour	147	164	134	136	162	160
RSP / PM ₁₀	10 th highest 24-hour	59	65	59	67	49	100
	Annual	33	33	28	28	25	50
SO ₂	4 th highest 10-min	98	41	40	38	48	500
	4 th highest 24-hour	21	14	12	12	13	50

Notes:

[1] Monitoring result(s) exceeding the AQO is/are underlined.

[2] All air quality data were extracted from EPD's Environmental Protection Interactive Centre.

[3] CO concentration from 2018-2022 is not available at Sham Shui Po Monitoring Station.

- 4.3.4. Exceedance of concentration of NO₂ and O₃ in the AQO has been recorded at Sham Shui Po Monitoring Station. The exceedance of NO₂ is likely due to the influence from exhaust emission from traffic on the busy networks (e.g. Lai Chi Kok Road and Yen Chow Street etc.) in Shan Shui Po Area, whereas the exceedance of O₃ is mainly caused by regional air pollution problem and it is not directly emitted from man-made sources. However, the results show a decreasing trend in the concentration of all pollutants in these 5 years.

Future Ambient Air Quality Condition

- 4.3.5. Background concentrations were extracted from PATH v2.1 (Pollutants in the Atmosphere and their Transport over Hong Kong), which is regional air quality model, and has been deployed by EPD to simulate air quality over Hong Kong against Pearl River Delta region.
- 4.3.6. The PATH v2.1 data at (40,31) in Year 2025 represents the future background air quality concentrations at the Project Site area. A summary of the background concentration in the Year 2025 is shown in the **Table 4.3** below.

Table 4.3 Future Background Concentration of Pollutants (Year 2025)

Pollutant	Averaging Time	AQOs Concentration Limit ($\mu\text{g}/\text{m}^3$)	Background Concentration (40_31_L1) ($\mu\text{g}/\text{m}^3$) ^[1]		Compliance of AQOs
Sulphur Dioxide (SO ₂)	10-minute	500	51.5	4 th peak 10 min	Yes
	24-hour	50	10.13	4 th peak 24-hr	Yes
RSP or PM ₁₀	24-hour	100	64.45 ^[2]	10 th peak 24-hr	Yes
	Annual	50	28.48 ^[2]	Annual Average	Yes
FSP or PM _{2.5}	24-hour	50	31.69	19 th peak 24-hr	Yes
	Annual	25	15.31 ^[2]	Annual Average	Yes
Nitrogen Dioxide (NO ₂)	1-hour	200	139.77	19 th peak 1-hr	Yes
	Annual	40	26.52	Annual Average	Yes
Ozone (O ₃)	8-hour	160	<u>202.84</u>	10 th peak 8-hr	No
Carbon Monoxide (CO)	1-hour	30,000	937.93	1 st peak 1-hr	Yes
	8-hour	10,000	759.85	1 st peak 8-hr	Yes

Notes:

[1] Prediction result(s) exceeding the AQO is/are underlined.

[2] With reference to the EPD's Guidelines on Choice of Models and Model Parameters, PATH v2.1's output of RSP and FSP concentrations should be adjusted as follows:

- 10th highest daily RSP concentration: add 11.0 $\mu\text{g}/\text{m}^3$
- Annual RSP concentration: add 10.3 $\mu\text{g}/\text{m}^3$
- Annual FSP concentration: add 3.5 $\mu\text{g}/\text{m}^3$

4.3.7. As shown in **Table 4.3**, the PATH background demonstrates that the concentrations of pollutants are well below the AQO as mentioned in *Section 4.2.3*, except for Ozone (O₃). There is a great buffer from the AQO for most of the pollutants other than Ozone.

4.3.8. Ozone is formed from dioxygen by the action of ultraviolet light and also atmospheric electrical discharges. Neither industrial emissions nor vehicular emissions nor portal emissions would be its primary source. O₃ is therefore not considered as a key parameter in this assessment.

4.4. IDENTIFICATION OF AIR SENSITIVE RECEIVERS

4.4.1. As stated in *Section 3.4.4.2* of the EIA Study Brief, the study area for the air quality impact assessment should be defined by a distance of 500 m from the boundary of the Project Site.

Existing and planned / committed ASRs were identified in accordance with Annex 12 of the EIAO-TM.

4.4.2. The existing ASRs were identified with reference to the latest best available information at the time of preparation of this report, including those earmarked on relevant OZP (approved Tsim Sha Tsui OZP No. S/K1/28), Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land used plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board. Various site surveys were conducted to verify the sensitive receivers and confirm with the desktop studies.

4.4.3. Representative ASRs were identified are shown in [Figure 4.1](#) and summarised in [Table 4.4](#).

Table 4.4 Representative Air Sensitive Receivers

ASR ID	Description	Approx. Horizontal Distance to Project Site (m)	Maximum Building Height (mPD)	Land Use
ASR01	HKO Quarters No.2&3 (Within HKO Headquarters)	0	43	Residential
ASR02	HKO Quarters No.1 (Within HKO Headquarters)	0	43	Residential
ASR03	King's Mansion	10	60	Residential
ASR04	New Knutsford House	12	61	Residential
ASR05	Lok Fun Mansion	10	59	Residential
ASR06	Carlton Building	10	58	Residential
ASR07	St. Andrew's Church	46	44	Place of worship
ASR08	Tsim Sha Tsui District Kaifong Welfare Association	6	40	Community
ASR09	Ramada Hong Kong Grand	69	90	Hotel
ASR10	St. Mary's Canossian School and College	142	30	Educational
ASR11	Kowloon Bowling Green Club	134	16	Recreational
ASR12	People's Liberation Army Garrison Hospital	358	45	Hospital
ASR13	Mira Place	14	41	Commercial
ASR14	Kowloon Park Swimming Pool	152	38	Recreational
ASR15 [#]	Annex Block (Within Project Site)	Not Applicable	45	Government, Institution, Community
ASR16 [#]	Red House (Within Project Site)	Not Applicable	30	Government, Institution, Community

Notes: #: Planned ASRs under this Project .

4.5. IDENTIFICATION OF POTENTIAL SOURCES OF IMPACTS

Construction Phase

- 4.5.1. Major source of potential air quality impact during construction phase would be fugitive dust generated from wind erosion of the stockpiles and open sites, as well as from the following construction activities:
- Site Preparation;
 - Excavation and Foundation;
 - Formwork and reinforcement works; and
 - Gaseous emissions from diesel-powered construction equipment.
- 4.5.2. There are two concurrent projects in the vicinity of the Project Site, as summarised in **Table 2.4**. The concurrent project “Expansion of Hong Kong Science Museum and Hong Kong Museum of History” is located approximately 300m to the east of the Project Site. The Project undergoes pre-construction activities currently and is scheduled to complete in 2026-2027. Therefore, the construction of the Project may have an overlapping with the expansion works of museums for a short period of time. For another concurrent project “Drainage Improvement Works”, it is expected to be small-scaled, and potential dust impact arising from it would be limited and localised. Since there is a great separation distance between the two projects, adverse cumulative dust impact during the construction phase of the Project would not be anticipated. Therefore, with the implementation of sufficient dust suppression measures as stipulated under *the Air Pollution Control (Construction Dust) Regulation* and good site practices, significant dust generated from the construction of the planned developments is not anticipated.
- 4.5.3. Toxic air pollutants (TAPs) in the form of volatile organic compounds (VOC) are anticipated from the use of chemicals, such as solvents, cleaning agents and fuels, for the maintenance and servicing of construction plants and vehicles during construction phase. Considering that the quantities of chemicals to be used would be limited, the amount of VOC generated would be small. The works areas would be aboveground and in outdoor setting, such that the VOC would be able to disperse and would not accumulate at the works areas. With proper handling of the chemicals, environmental and health impacts associated with TAPs are anticipated to be insignificant.
- 4.5.4. Fuel combustion from the use of powered mechanical equipment (PMEs) during construction works could be a potential source of air pollutants such as NO₂, SO₂ and CO. To reduce SO₂ emission, *Air Pollution Control (Fuel Restriction) Regulation* was enacted in 1990 to impose legal control on the types of fuel allowed for use and their sulphur contents in commercial and industrial processes. To improve air quality and protect public health, EPD has introduced *the Air Pollution control (Non-road Mobile Machinery) (Emission) Regulation* since 1 December 2015, under which only approved or exempted NRMMs are allowed to be used in construction sites. In addition, all construction plants are required to use ULSD (defined as diesel fuel containing not more than 0.005% sulphur by weight) as stipulated in *Environment, Transport and Works Bureau Technical*

Circular (ETWB-TC(W)) No. 19/2005 on Environmental Management on Construction Sites. Furthermore, given the localized and small scale of the Project, as well as the small number of PMEs involved, adverse air quality impacts due to emissions from the use of PMEs would be unlikely.

Operation Phase

- 4.5.5. The use of the new Annex Block and the refurbished Red House are similar to other typical cultural office and institutional uses in Hong Kong, including normal office work and public visits. Areas in HKO Headquarters for public education, including the History Room, will be open to registered visitors. In this connection, dust generation or gaseous emissions are not expected. While about 7 open car parking spaces for the new Annex Block will be provided tentatively, there will be no public car parking space, and the majority of visitor are expected to travel to the Project Site by public transportation or on foot. Additional traffic flow induced by the Project is considered insignificant.
- 4.5.6. Review of Specified Process License registered was conducted on 30 September 2019. It is noted that no records of industrial chimney with Specified Process License located within 500m assessment area of the Project Site was identified. Site survey within the 500m assessment area was conducted on 20 June 2022 to examine the site condition. No chimney was identified within 500m assessment area from the Project Site according to the site survey. Vehicular emission from the surrounding road networks is considered the dominant source of air pollutants affecting the Project Site.
- 4.5.7. Since dust generation and gaseous emission are not anticipated during the operation phase from the Project, additional traffic flow induced by the operation of the Project is also insignificant. Therefore adverse cumulative air quality impact arising from the Project and planned concurrent projects during operation phase is not expected.

4.6. ASSESSMENT METHODOLOGY

Construction Phase

- 4.6.1. The construction programme, plant inventory and construction works area of the Project were reviewed to evaluate the dust impacts on the nearby ASRs. Given that the construction activities and site area are limited and the scale of construction would be minor, the potential dust impact would be limited and could be well controlled through the dust suppression measures as stipulated in the *Air Pollution Control (Construction Dust) Regulation (Cap. 311R) of APCO (Cap. 311)* and good site practices. Therefore, qualitative approach was adopted for the assessment.

Operation Phase

- 4.6.2. The Project is not a pollution source during operation phase, electricity will be the main source of energy with no liquid/ gaseous fuel to be used. The laboratory provided in the new Annex Block is for calibration of electronic meteorological equipment, with no gaseous industrial emission expected. The only air quality impact generated would be the small amount of vehicular emission induced. Therefore, the Project would not be considered a

pollution source during the operation phase. With the low induced traffic and use of non-polluting energy sources, adverse air quality impact due to the operation of the Project is not anticipated. Therefore, qualitative approach was adopted for the assessment.

4.7. AIR QUALITY IMPACT ASSESSMENT

Construction Phase

4.7.1. The potential dust emission sources would be mainly from the construction work activities of the excavation and wind erosion at the Project Site. As the size of the work site is limited and the excavation is minor such that the amount of excavated materials generated would be small, no adverse dust impact would be anticipated at the representative ASRs with the implementation of sufficient dust suppression measures as stipulated under the *Air Pollution Control (Construction Dust) Regulation* and guidelines stipulated in EPD's *Recommended Pollution Control Clauses for Construction Contracts*.

Mitigation Measures

4.7.2. Sufficient dust suppression measures as stipulated under *the Air Pollution Control (Construction Dust) Regulation (Cap. 311R)* and good site practices such as enclosing stockpiles of sand with three-side enclosure, covering the dusty materials with clean impervious sheet, water spraying of all access roads and site areas, and good house-keeping of the Site should be properly implemented in order to minimise the construction dust generated. These measures and good site practices listed below should be carried out to minimize the construction dust impact:

- Use of regular watering, to reduce dust emissions from exposed site surfaces and unpaved roads particularly during dry weather;
- Use of frequent watering in particularly dusty construction areas close to ASRs;
- Use of frequent watering or water sprinklers for major haul roads, material stockpiling areas and other dusty activities within the construction site;
- Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines;
- Provide hoardings of not less than 2.4 m high from ground level along the site boundary except for site entrance or exit;
- Open temporary stockpiles should be avoided or covered. Where possible, prevent placing dusty material storage plies near ASRs;
- 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 point of the Site;

- Provide wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.
- Imposition of speed control for vehicles on unpaved site roads. 8 km/hr is the recommended limit;
- Where possible, routing of vehicles and positioning of construction plants should be at the maximum possible distance from ASRs;
- Avoid position of material stockpiling areas, major haul roads and dusty works within the construction site close to concerned ASRs; and
- Avoid unnecessary exposed earth.

4.7.3. Guidelines stipulated in EPD's *Recommended Pollution Control Clauses for Construction Contracts* should be incorporated in the contract documents to abate dust impacts. The clauses include:

- The Contractor shall observe and comply with the *APCO* and its subsidiary regulations, particularly the *Air Pollution Control (Construction Dust) Regulation*.
- The Contractor shall undertake at all times to prevent dust nuisance as a result of the construction activities.
- The Contractor shall ensure that there will be adequate water supply / storage for dust suppression.
- The Contractor shall devise and arrange methods of working and carrying out the works in such a manner so as to minimise dust impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.
- Before the commencement of any work, the Contractor may be required to submit the methods of working, plant, equipment and air pollution control system to be used on the Site for the Engineer inspection and approval.

4.7.4. To minimise the exhaust emission from NRMM during the construction phase, below measures in relation to *DEVB TC(W) No. 1/2015 – Emissions Control of Non-road Mobile Machinery in Capital Works Contracts of Public Works* shall be applied as far as practicable:

- Connection construction plant and equipment to main electricity supply and avoid use of diesel generators and diesel-powered equipment;
- Exempted NRMMs shall be avoided;
- Deploy electrified NRMMs as far as practicable.

- 4.7.5. In order to help reduce carbon emission and pollution, timely application of temporary electricity and water supply as well as wider use of electric vehicles in public works contracts would be adopted in accordance with *DEVB TC(W) No. 13/2020 – Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts* in the Project.

Operation Phase

- 4.7.6. The cumulative air quality impact due to the Project, industrial chimneys and open roads within 500m assessment at representative ASRs in Year 2025 has been evaluated. Adverse air quality impact is not expected.
- 4.7.7. The laboratory provided in the new Annex Block is for calibration of electronic meteorological equipment and electrical water heater will be installed for pantry and shower at 2/F and 3/F as energy source. Since electricity will be the main source of energy, no gaseous emission from boiler/stoves that use liquid/gaseous fuel is expected. Based on the evaluation, no industrial emission is induced from Project Site.
- 4.7.8. The vehicular emission from Project is induced by the expected vehicle travelling within the Project Site. It is expected that the worst-case scenario under normal operating conditions would generally occur during daytime of any working day. Based on the evaluation, the traffic volume induced by the operation of Project is expected small and insignificant, and thus, no adverse air quality impact from the vehicular emission is anticipated from operation phase.
- 4.7.9. It is noted that no record of chimney is identified within the assessment area, therefore the industrial emission from surrounding is not anticipated. The main sources of vehicular emission from open road traffic are from Hillwood Road, Kimberly Road and Nathan Road.
- 4.7.10. As reflected by PATH v2.1 data at (40,31), the background concentrations of pollutants in Year 2025 are below the AQO and there is sufficient buffer, except for O₃. As discussed in **Section 4.3.8**, industrial and vehicular emissions are not the main sources of O₃, therefore O₃ is not considered as a key parameter. Therefore, the emission from Project under normal operating conditions is expected not causing adverse impact towards surrounding background air quality.
- 4.7.11. Given that the Annex Block is setback from the main road, there is sufficient buffer zone for vehicle emission from open road traffic. Furthermore, the Annex Block will be equipped with central air condition for daily operation and will not rely on opened window for ventilation. Also, the location of fresh air intake will be carefully designed with sufficient separation distance from nearby roads to minimize the air quality impact. In light of the above, adverse air quality impact is not anticipated in the operation phase. Mitigation measures during operation phase are therefore considered not necessary.

4.8. SUMMARY OF THE MITIGATION MEASURES

- 4.8.1. Mitigation measures listed in *Section 4.7* are recommended to be implemented during construction of the Project.

- 4.8.2. According to the above *Section 4.7*, no adverse air quality impact is predicted in association with the operation of the Project without mitigation measures. Therefore, no mitigation measure is required during operation.

4.9. RESIDUAL IMPACTS

- 4.9.1. No adverse residual impact during construction and operation phases of the Project would be anticipated, provided that the dust suppression measures during construction phase aforementioned in *Section 4.7* are properly implemented.

4.10. ENVIRONMENTAL MONITORING AND AUDIT

Construction Phase

- 4.10.1. No adverse dust impact is anticipated at each representative ASRs, given that dust suppression measures during construction phase aforementioned in *Section 4.7* and recommendations under the *Air Pollution Control (Construction Dust) Regulation* are properly implemented. Regular site environmental audits during the construction of the Project shall be conducted in accordance with the requirements in EM&A Manual.

Operation Phase

- 4.10.2. No adverse air quality impact is expected during the operation of the Project. Hence, EM&A auditing work is considered not necessary.

4.11. CONCLUSION

- 4.11.1. Air quality impact assessment was conducted for the construction and operation phases of the Project within the 500 m study area.
- 4.11.2. For the construction aspect, there would be no major earthworks carried out for the site formation works of the Project Site. With the implementation of sufficient dust suppression measures as recommended and stipulated under the *Air Pollution Control (Construction Dust) Regulation*, adverse construction dust impact would not be anticipated.
- 4.11.3. For the operation of the Project, no adverse air quality impacts would be anticipated as there would be limited vehicular emissions from parking activities of the Project and no gaseous emission from liquid/ gaseous fuel and industrial emission from operation of the laboratory. In addition, it is provided with sufficient buffer zone between Project Site and main road, and no chimney is recorded within assessment area. Thus, no adverse air quality impact is anticipated, hence no mitigation measure is required.

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