4 AIR QUALITY IMPACT

4.1 Introduction

4.1.1 This section presents an air quality impact assessment for the construction and operation phases of the Kai Tak Development – Roads D3A & D4A Project. Air sensitive receivers in the vicinity of the study area have been determined and the potential air quality impacts associated with the Project have been assessed accordingly.

4.2 Environmental Legislation, Policies, Plans, Standards and Criteria

4.2.1 The criteria for evaluating air quality impacts and the guidelines for air quality impact assessment are set out in Annex 4 and Annex 12 of the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM).

Air Quality Assessment Criteria

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

Table 4.1 Hong Kong Air Quality Objectives

Pollutant	Maximum Concentration ($\mu g\ m^{-3}$) (1)				
	Averaging Time				
	1 hour (2)	8 hour (3)	24 hour (3)	3 months	Annual (4)
Total Suspended Particulates (TSP)	-	-	260	-	80
Respirable Suspended Particulates (RSP) (5)	-	-	180	-	55
Sulphur Dioxide (SO_2)	800	-	350	-	80
Nitrogen Dioxide (NO_2)	300	-	150	-	80
Carbon Monoxide (CO)	30,000	10,000	-	-	-
Photochemical Oxidants (as Ozone, O_3) (6)	240	-	-	-	-
Lead (Pb)	-	-	-	1.5	-

Notes:
(1) Measured at 298 K and 101.325 kPa.
(2) Not to be exceeded more than three times per year.
(3) Not to be exceeded more than once per year.
(4) Arithmetic mean.
(5) Suspended particulates in air with a nominal aerodynamic diameter of 10 μm or smaller.
(6) Photochemical oxidants are determined by measurement of ozone only.

4.2.3 The EIAO-TM stipulates that the hourly TSP level should not exceed 500 μgm^{-3} (measured at 25°C and one atmosphere) for construction dust impact assessment. Standard mitigation measures for construction sites are specified in the *Air Pollution Control (Construction Dust) Regulation*.

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 works, stockpiling, dusty material handling etc. This Project is expected to include both notifiable works and regulatory works. Contractors and site agents are required to inform the Environmental Protection Department (EPD) on carrying out construction works and to adopt dust reduction measures to reduce dust emission to the acceptable level.

4.3 Description of the Environment

4.3.1 The Kai Tak Development – Roads D3A & D4A Project is located in the runway area of the former Kai Tak Airport. There is no air quality monitoring station located in the proximity of the Project area. EPD's Kwun Tong air quality monitoring station is the nearest station to the Project area.

4.3.2 **Table 4.2** summarizes the annual average concentrations of the air pollutants recorded at the monitoring station from Year 2007 to Year 2011.

Table 4.2 Annual Average Concentrations of Pollutants from Year 2007 to Year 2011 at EPD's Kwun Tong Air Quality Monitoring Station

Pollutant	Annual Average AQO ($\mu g\ m^{-3}$)	Annual Average Concentration ($\mu g\ m^{-3}$)				
		Year 2007	Year 2008	Year 2009	Year 2010	Year 2011
TSP	80	<u>82</u>	72	70	67	74
RSP	55	53	47	48	47	49
SO_2	80	19	17	11	10	12
NO_2	80	63	59	58	59	63

Notes:
Monitoring results exceeded AQO are shown as underlined characters.

4.4 Air Sensitive Receivers

4.4.1 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 to be an air sensitive receiver (ASR). Any other place with which, in terms of duration or number of people affected, has a similar sensitivity to the air pollutants as the aforelisted places are also considered to be an ASR, for example, playground, sitting area of parks / promenade.

4.4.2 The air quality impact assessment area is defined by a distance of 500m expanded from the boundary of the Project. The study area of air quality impact assessment is shown in **Figure 4.1**.

4.4.3 The identified representative ASRs are listed in **Table 4.3** and the corresponding locations are shown in **Figure 4.1**. The assessment heights were taken as 1.5m, 5m, 10m, 20m above ground and so on up to the maximum building height of the respective ASRs.

Table 4.3 Summary of Representative Air Sensitive Receivers

ASRs	Location	Planned Land Use	Max. Building Height, m (1)	Horizontal Distance to Alignment, m
A1	Site 4A1	Residential	65	11
A2	Site 4A1	Residential	65	12
A3	Site 4A1	Residential	80	14
A4	Site 4A1	Residential	80	35
A5	Site 4A2	Commercial	45	9
A6	Site 4B1	Residential	55	10
A7	Site 4B1	Residential	55	15
A8	Site 4B2	Residential	55	13
A9	Site 4B3	Residential	65	13

ASRs	Location	Planned Land Use	Max. Building Height, m (1)	Horizontal Distance to Alignment, m
A10	Site 4B4	Residential	55	14
A11	Site 4B5	Residential	45	16
A12	Site 4B5	Residential	45	15
A13	Site 4C1	Commercial	45	10
A14	Site 4C2	Commercial	55	9
A15	Site 4C3	Commercial	45	9
A16	Site 4C4	Commercial	45	9
A17	Site 4C5	Commercial	45	8
A18	Site 4C5	Commercial	45	10
A19	Site 3C1	Hospital	60	262
A20	Site 3C1	Hospital	60	285

Notes:
(1) The maximum height for Planned ASR was made reference to the OZP.

4.5 Assessment Methodology

Construction Phase (Construction Dust)

4.5.1 Potential air quality impacts during the construction phase are primarily due to fugitive dust emission. Typical dust generating construction activities include surface excavation, roads construction, superstructure construction of landscaped deck and installation of noise barrier panel.

4.5.2 The construction activities for this Project would be commenced in the Year 2014 for completion in Year 2016. The major construction activities for the Project with air quality concern include surface excavation and roads construction. In general, it is expected that no extensive underground construction work would be conducted throughout the construction phase, but mainly at-grade road pavement construction and pre-cast elements for on-site installations of the landscaped deck. All the above activities are not expected to generate significant amount of construction dust. Therefore, no adverse dust impact would be expected at the nearby ASR.

4.5.3 Under the APCO, dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be implemented. In addition, control measures stipulated in the approved KTD Schedule 3 EIA Report will be strictly followed. With effective implementation of these mitigation measures, as shown in detail in **Section 4.8**, adverse construction dust impacts are not expected at the nearby ASR. Quantitative assessment is therefore considered not necessary.

Operation Phase

4.5.4 Potential air quality impacts during the operation phase of the Project would be associated with the following pollution sources:

- Background pollutant concentrations (estimated based on five years averaged monitoring data from EPD's Kwun Tong air quality monitoring station);
- Vehicle emissions from open sections of existing and proposed road networks within 500m from the project site boundary;
- Portal emission from Trunk Road T2 Tunnel Northbound;
- Emission from Trunk Road T2 Ventilation Building inside Kai Tak Development (KTD) site;
- Emission from the proposed hospital within KTD;
- Cruise ship emissions from the proposed cruise terminal at Kai Tak;
- Emission from the existing Typhoon Shelters; and
- Planned heliport emission at the end of runway.

Background Pollutant Concentrations

4.5.5 The background pollutant values adopted for this assessment are derived based on EPD's "Guideline on Assessing the 'TOTAL' Air Quality Impacts". EPD's Kwun Tong air quality monitoring station is the nearest station to the Project area. The mean annual average concentrations of the pollutants measured at this station based on the latest available five years (year 2007 to 2011) data are adopted as the background air quality.

4.5.6 **Table 4.2** summarises the annual average concentrations of the pollutants recorded at the Kwun Tong monitoring station. For the purpose of this assessment, RSP and NO_2 concentration of 48.8 and 60.4 $\mu g/m^3$ respectively were taken as background concentrations for the operation phase assessment.

Identification of Key/Representative Air Pollutants of Vehicle Emissions from Open Road

4.5.7 Vehicular emission comprises a number of pollutants, including Nitrogen Oxides (NOx), Respirable Suspended Particulates (RSP), Sulphur Dioxides (SO_2), Carbon Monoxide (CO), Lead (Pb), Toxic Air Pollutants (TAPs) etc. Accordingly to "An Overview on Air Quality and Air Pollution Control in Hong Kong"[1] published by EPD, motor vehicles are the main causes of high concentrations of respirable suspended particulates (RSP) and nitrogen oxides (NOx) at street level in Hong Kong and are considered as key air quality pollutants for road projects. For other pollutants, due to the low concentration in vehicular emission, they are not considered as key pollutants for the purpose of this study.

(i) Nitrogen Dioxide (NO_2)

4.5.8 Nitrogen oxides (NOx) is a major pollutant from fossil fuel combustion. According to the 2011 Environmental Performance Report published by EPD, electricity generation is the dominant contributor to NOx generation in Hong Kong, accounted for 45% of NOx emission in 2009. Road transport is the second largest NOx contributor which accounted for 22% of the total in the same year.

4.5.9 In the presence of O_3 and VOC, NOx would be converted to NO_2. Increasing traffic flow would inevitably increase the NOx emission and subsequently the roadside NO_2 concentration. Hence, NO_2 is one of the key pollutants for the operational air quality assessment of the Project. 1-hour, 24-hour and annual averaged NO_2 concentrations at each identified ASRs would be assessed and compared with the relevant AQO to determine the compliance.

(ii) Respirable Suspended Particulates (RSP)

4.5.10 Respirable Suspended Particulates (RSP) refers to suspended particulates with a nominal aerodynamic diameter of 10um or less. According to the 2011 Environmental Performance Report published by EPD, electricity generation is the dominant contributor to RSP generation in Hong Kong, accounted for 31% of RSP emission in 2009. Road transport is the second largest RSP contributor which accounted for 29% of the total in the same year. Increasing traffic flow would inevitably increase the roadside RSP concentration. Hence, RSP is also one of the key pollutants for the operational air quality assessment of the Project. The 24-hour and annual averaged RSP concentrations at each identified ASRs would be assessed and compared with the relevant AQO to determine the compliance.

(iii) Sulphur Dioxide (SO_2)

4.5.11 Sulphur dioxide (SO_2) is formed primarily from the combustion of sulphur-containing fossil fuels. In Hong Kong, power stations and marine vessels are the major sources of SO_2, followed by fuel combustion equipment and motor vehicles.[2] SO_2 emission from vehicular

[1] http://www.epd.gov.hk/epd/english/environmentinhk/air/air_maincontent.html
[2] Air Quality in Hong Kong 2011

exhaust is due to the sulphur content in diesel oil. According to EPD's "Cleaning the Air at Street Level"[3], ultra low sulphur diesel (ULSD) with a sulphur content of only 0.005% has been adopted as the statutory minimum requirement for motor vehicle diesel since April 2002, which is 3 years ahead of the European Union. With the use of ULSD, According to the 2011 Environmental Performance Report released by EPD, road transport is the smallest share of SO_2 emission sources in 2009 and only constitutes 0.5% of the total SO_2 emission. From 1 July 2010, EPD has tightened the statutory motor vehicle diesel and unleaded petrol specifications to Euro V level, which further tightens the cap on sulphur content from 0.005% to 0.001%.

4.5.12 In addition, the measured 1-hr average, daily average and annual average SO_2 concentration at all EPD air monitoring stations are all less than 40% of the respective AQO. In view that road transport only contributes a very small amount of SO_2 emission, relatively low measured concentrations and the adoption of low-sulphur and ultra-low-sulphur fuel under the existing government policy, SO_2 would not be a critical air pollutant of concern.

4.5.13 Moreover, cumulative SO_2 emission impacts have been predicted in the approved KTD Schedule 3 EIA Report, with assessments on SO_2 emissions from cruise ships at the cruise terminal at Kai Tak, vehicular emissions, and all the other sources in the study area. The assessment results indicated that the dominant source of SO_2 emission are cruise vessels, which may have adverse impact on ASRs at high levels. For mitigation, the maximum building heights of the adjacent sites from the cruise terminal have been restricted via planning control according to the approved KTD Schedule 3 EIA Report. Due to the negligible contribution of vehicular emission of SO_2 from this Project, insignificant change in the cumulative results of SO_2 concentrations from the approved KTD Schedule 3 EIA Report is expected. SO_2 is therefore not considered as a key pollutant for quantitative assessment for this road project.

(iv) Carbon Monoxide (CO)

4.5.14 Carbon Monoxide (CO) is a typical pollutant emitted from fossil fuel combustion and comes mainly from vehicular emissions. With reference to the "*Air Quality in Hong Kong 2011*", measured the highest 1-hour average (4030µg/m^3) and the highest 8-hour average (3309 µg/m^3) were both recorded at the Causeway Bay roadside station; these values were around one seventh and one third of the respective AQO limits. In view that there is still a large margin to the AQO, CO would not be a critical air pollutant of concern.

(v) Ozone (O_3)

4.5.15 Ozone (O_3) is produced from photochemical reaction between NOx and VOCs in the presence of sunlight, which will not be generated by this project. Concentration of O_3 is governed by both precursors and atmospheric transport from other areas. When precursors transport along under favorable meteorological conditions and sunlight, ozone will be produced. This explains why higher ozone levels are generally not produced in the urban core or industrial area but rather at some distance downwind after photochemical reactions have taken place. In the presence of large amounts of NOx in the roadside environment, O_3 reacts with NO to give NO_2 and thus results in O_3 removal. O_3 is therefore not considered as a key air pollutant for the operational air quality assessment of a road project.

(vi) Lead (Pb)

4.5.16 The sale of leaded petrol has been banned in Hong Kong since April 1999. According to the "*Air Quality in Hong Kong 2011*", the measured ambient lead concentrations were ranging from 20ng/m^3 to 104 ng/m^3. The measured concentrations were well below the AQO limits. Therefore, lead is not considered as a critical air pollutant of concern.

(vii) Toxic Air Pollutants (TAPs)

[3] http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/cleaning_air_atroad.html

4.5.17 Vehicular exhaust is one of the emission sources of Toxic Air Pollutants (TAPs), which are known or suspected to cause cancer or other serious health and environmental effects. With reference to EPD's *Assessment of Toxic Air Pollutant Measurements in Hong Kong Final Report* [4], monitored TAPs in Hong Kong include diesel particulate matters (DPM), toxic elemental species, dioxins, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), carbonyls, and volatile organic compounds (VOCs). According to the results of *Assessment of Toxic Air Pollutant Measurements in Hong Kong Final Report* and *Sources of PCB emissions*[5], vehicular emission is not considered as primary source of dioxins, PCBs, carbonyls and most toxic elemental species in Hong Kong. Therefore, these pollutants are not considered as key pollutants for quantitative assessment for the operation phase of a road project.

Diesel Particulate Matters (DPM)

4.5.18 Diesel Particulate *Matters* (DPM), as part of the overall Respirable Suspended Particulates (RSP), is one of the most important parameter contributing to the overall health risk of the population. Local vehicular emission is one of the major sources of DPM.

4.5.19 EPD has embarked on the following three key programmes to reduce the diesel particulate level at the roadside[6]: (a) the LPG taxi and light bus program; (b) the introduction of an advanced test to check diesel vehicle smoke emission; and (c) the retrofit of pre-Euro diesel commercial vehicles with diesel oxidation Catalysts (DOCs). According to EPD's website[7], franchised bus companies have also retrofitted their Euro I buses with diesel oxidation catalysts (DOCs) and Euro II and III buses with diesel particulate filters (DPFs). A DPF can reduce particulate emissions from diesel vehicles by over 80%.

4.5.20 As recommended by EPD's *Assessment of Toxic Air Pollutant Measurements in Hong Kong Final Report*, elemental carbon (EC) is used as a surrogate for DPM, and with reference to *Measurements and Validation for the 2008/2009 Particulate Matter Study in Hong Kong*[8], EC showed a significant decrease in concentration from 2001 to 2009 in Hong Kong, i.e. -47.5%, -30.0% and -28.3% at Mong Kok, Tsuen Wan and Hok Tsui Monitoring Sites, repectively. With the continual efforts by EPD to reduce particulate emission from the vehicular fleet, a discernible decreasing trend is noted in the level of particulate matter. Therefore, DPM is not selected as representative pollutant for quantitative assessment for this project.

Polycyclic Aromatic Hydrocarbons (PAHs)

4.5.21 Polycyclic Aromatic Hydrocarbons (PAHs) are organic compounds of two or more fused benzene rings, in liner, angular or cluster conformations. Local vehicular traffic is also an important source of PAHs. For this group, the most important TAP is Benzo[a]pyrene, and it is often selected as a marker for the PAHs[9]. The EU Air Quality Standards for PAHs (expressed as concentration of Benzo[a]pyrene) is 1 ng/m^3 for annual average[10]. With reference to "*Air Quality in Hong Kong 2011*", annual average concentrations of PAHs (Benzo[a]pyrene) measured at EPD's TAP monitoring stations (Tsuen Wan and Central/Western) were 0.22ng/m^3, which is far below the EU Standards. Thus, PAHs are not considered as key pollutants for quantitative assessment for this project.

Volatile Organic Compounds (VOCs)

4.5.22 Volatile Organic Compounds (VOCs) are of great concern due to the important role played

[4] http://www.epd.gov.hk/epd/english/environmentinhk/air/studyrpts/assessment_of_tap_measurements.html
[5] http://www.eea.europa.eu/publications/EMEPCORINAIR5/Sources_of_PCB_emissions.pdf/view
[6] http://www.epd.gov.hk/epd/english/news_events/legco/files/EA_Panel_110526a_eng.pdf
[7] http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/cleaning_air_atroad.html
[8] http://www.epd.gov.hk/epd/english/environmentinhk/air/studyrpts/files/HKEPDFinalReportRev_11-29-10_v2.pdf
[9] Assessment of Toxic Air Pollutant Measurements in Hong Kong Final Report
[10] http://ec.europa.eu/environment/air/quality/standards.htm

by them in a range of health and environmental problems. The US EPA has designated many VOC, including those typically found in vehicular emission, as air toxic. According to *Assessment of Toxic Air Pollutant Measurements in Hong Kong Final Report*, among the VOC compounds, benzene and 1,3-butadiene are the most significant ones for Hong Kong The UK Air Quality Standards for benzene and 1,3-butadiene are 5.0µg/m^3 and 2.25 µg/m^3 respectively [11]. Accordingly to "*Air Quality in Hong Kong 2011*", annual average concentrations of benzene and 1,3-butadiene at EPD's TAP monitoring stations (Tsuen Wan and Central/Western) were 1.53 - 1.62 µg/m^3 and 0.13 µg/m^3, respectively, which is far below the UK Standards. Thus, VOCs are not considered as key pollutants for quantitative assessment for this project.

Identification of Assessment Years

4.5.23 According to the construction programme, the completion of the Project would be in Year 2016. Based on the findings of the traffic impact assessment that have taken into account the future changes of road network in the surrounding area, the predicted traffic flow on the proposed Roads D3A & D4A will continue to grow upon road commissioning in 2016 till year 2031 due to the considerable amount of traffic generated by the intake of the developments in the Runway Precincts during this period including the commercial/hotel developments, residential developments and the Tourism Node. In other words, the predicted traffic flow on the proposed Roads D3A & D4A within the next 15 years upon commencement of operation in 2016 would be highest at 2031.

4.5.24 With regards to the vehicular emission factors, taking into account solely the natural retirement of aged vehicles and the replacement with newer vehicles with better exhaust technologies, the vehicular emission factors would be under a decreasing trend. In other words, the vehicular emission factors at 2016 would represent the highest vehicular emission factors within 2016 to 2031.

4.5.25 Therefore, as a conservative approach for this assessment, the highest emission scenario given the combination of vehicular emission factors and traffic flow within the entire 15 years period (year 2016 to 2031) is taken as the combination of the year 2016 vehicular emission factors together with the highest predicted traffic flow (i.e. at year 2031) within 15 years upon the commissioning year of the Project.

Vehicle Emissions from Open Road

4.5.26 Air quality impacts associated with road traffic are caused mostly by NO_2 and RSP. CALINE4 dispersion model was used for calculation of the 1-hour average NO_2, 24-hour average NO_2 and RSP, and annual average NO_2 and RSP concentrations. Open sections of existing and planned road network within 500 m from the boundary of the Project area were considered in the model.

4.5.27 The predicted 24-hour traffic flows and vehicle mixes for the road network within the next 15 years upon commencement of operation of the proposed road at Year 2016 were taken to assess the worst-case air quality impacts.

4.5.28 Due to the traffic growth, the highest predicted traffic flow within 15 years after completion of the Project has been projected, and the projected 24-hour traffic flows and vehicle compositions were adopted in this air quality assessment and are attached in **Appendix 4.1**. The methodology to produce the traffic data (include 24-hr traffic flow, trips, daily vehicle-kilometer-travelled (VKT) & speed fraction) and the traffic data adopted for this EIA study has been agreed by the Transport Department (TD) (**Appendix 4.2**).

4.5.29 EMFAC-HK model was adopted to estimate the vehicle emission rates of nitrogen oxides and particulate matter.

[11] http://www.medway.gov.uk/environmentandplanning/environmentalhealth/airquality/airqualityfordevelopers.aspx

4.5.30 The "vehicle fleet" refers to all motor vehicles operating on roads within this Study Area. The modelled fleet was broken down into 16 vehicle classes based on the information as shown on *Table 4.4 (Registration and Licensing of Vehicle by Fuel Type) of the Transport Monthly Digest* and vehicle population provided by EPD. The vehicle group classification was based on the definition in *The Annual Traffic Census 2011 – Appendix F Vehicle Classification System*. Detailed methodology of conversion between the vehicle types used in the forecast traffic and the 16 classes defined in EMFAC-HK Model is presented in **Appendix 4.2**.

4.5.31 Referring to EPD's *Guideline on Modelling Vehicle Emissions Appendix 1 "EMFAC-HK: Vehicle Class Details",* the 16 vehicle classes modelled in EMFAC-HK are summarized in **Table 4.4**. The working example illustrating the conversion process is available in Table 1a and Table 1 of **Appendix 4.7**.

Table 4.4 Vehicle Classes in EMFAC-HK Model

Index	Vehicle Class Description	Gross Vehicle Weight (tonnes)
1	Private Cars (PC)	ALL
3	Taxi	ALL
4	Light Goods Vehicles (<=2.5t)	<=2.5t
5	Light Goods Vehicles (2.5-3.5t)	>2.5-3.5t
6	Light Goods Vehicles (3.5-5.5t)	>3.5-5.5t
7	Medium & Heavy Goods Vehicles (5.5-15t)	>5.5-15t
8	Medium & Heavy Goods Vehicles (>=15t)	>15t
11	Public Light Buses	ALL
12	Private Light Buses (<=3.5t)	<=3.5t
13	Private Light Buses (>3.5t)	>3.5t
14	Non-franchised Buses (<6.4t)	<=6.36t
15	Non-franchised Buses (6.4-15t)	>6.36-15t
16	Non- franchised Buses (>15t)	>15t
17	Single Deck Franchised Buses	ALL
18	Double Deck Franchised Buses	ALL
19	Motor Cycles	ALL

4.5.32 With reference to the road design, the design speed limits of all road links within the Study Area include 50kph, 70kph and 80kph. Hence, three sets of emission factors for the three road types were calculated.

4.5.33 The latest model version EMFAC-HK v2.1 provided by EPD was employed in this Study. The input parameters and model assumptions made in EMFAC-HK model are summarized as follows.

4.5.34 Referring to the EPD's *Guideline on Modelling Vehicle Emissions*, the EMFAC-HK has two models – "EMFAC-HK V2.1 (BC)" and "EMFAC-HK V2.1 (I and M)". The former has no I/M program and works only for calendar years from 1997 to 2012 while the latter has taken into account the effect of the I/M program using remote sensing and dynamometer testing for petrol/LPG vehicles and works for calendar years from 2013 to 2040. The model year of this Project is Year 2016, therefore, "EMFAC-HK V2.1 (I and M)" was chosen.

4.5.35 According to EPD's guideline, "Burden mode" is used for calculating area-specific emission inventories. It was selected for this Project, since it can provide hourly vehicular emissions, taking into account of ambient conditions and speeds combined with vehicle activity, i.e. the number of vehicles, the kilometers driven per day and the number of daily trips. Both CSV and MVE17G (BCD) CSV output file formats were produced.

4.5.36 Each vehicle class has diverse technological factors in different years. According to the underlying assumption in EMFAC-HK model, each vehicle class can be modelled by the individual behaviour of unique technology groups. Each technology group represents the vehicles from the same class but have distinct emission control technologies, have similar in-use deterioration rates and respond the same to repair. It means that the vehicles from the same class have the same emission standards or specific equipment installed on them (e.g. multi-port fuel injection, three-way catalyst, adaptive fuel controls, etc) which made them have the same performance.

4.5.37 The "*2010 Licensed Vehicle by Age and Technology Group Fractions"* provided in EPD's website was adopted in this assessment. Since the provided exhaust technology fractions are only up to Year 2010, for those after Year 2010 were projected in accordance with EPD's *Guideline on Modelling Vehicle Emissions – Appendix 2 "Implementation Schedule of Vehicle Emission Standards in Hong Kong (Updated as at 2 April 2012)"* and *Appendix 3 "EMFAC-HK V2.1 Exhaust Technology Group Indexes"*.

4.5.38 According to EPD's *Guideline on Modelling Vehicle Emissions - Appendix 2*, the implementation schedules of Euro V and Euro VI standards are in the middle of a year for some vehicle classes or fuel types. Since the detailed fraction data is not available after Year 2010, as a conservative approach, the exhaust technology fractions of these vehicle classes or fuel types were assumed to be kept as the previous standards fully for the scheduled year, while upgraded to the higher standards fully at the following year. The adopted exhaust technology fractions are presented in **Appendix 4.3**.

4.5.39 Evaporative technology fraction in the model was based on the default value.

4.5.40 As recommended in the EPD's *Guideline on Modelling Vehicle Emissions*, default vehicle populations forecast in EMFAC-HK was used.

4.5.41 The default accrual rates in EMFAC-HK were estimated from the local mileage data adjusted to reflect the total VKT for each vehicle class. The default value was used.

4.5.42 The diurnal variation of daily trips was used to estimate the start emissions of petrol and LPG vehicles, thus the trips of diesel vehicles would be zero. The number of trips per day of petrol and LPG vehicle was equal to the number of cold starts per day. The cold start is only allowed at the middle in some of the local roads with speed of 50kph. Detailed list of the roads with cold starts (local roads) is shown in **Appendix 4.1**.

4.5.43 For those roads with cold starts, the diurnal variation of daily trips in the Study Area for the highest predicted traffic flow within 15 years upon the commissioning year of the Project applied in the EMFAC-HK model was provided by the traffic consultant has been agreed by the TD. The adopted daily trips are summarized in **Appendix 4.3**. The working example illustrating the estimation is available in Table 2 of **Appendix 4.7**.

4.5.44 Vehicle-kilometer-travelled (VKT) represents the total distance travelled on a weekday. The VKT was calculated by multiplying the number of vehicle which based on the highest predicted hourly traffic flow within 15 years upon the commissioning year of the Project, and the length of road travelled in the Study Area. The diurnal variation of VKT in the Study Area was provided by the traffic consultant, and the input in the model was by vehicle/fuel/hour. The adopted daily VKT are summarized in **Appendix 4.3**.

4.5.45 Speed fraction represents the percentage in different speed ranges of each vehicle type weighted by VKT. The speed limits of existing road were made reference to the Traffic AIDs (plan marked the road marking, traffic sign and speed limits) from TD, while the speed limits of proposed road were provided by traffic consultant. Design speeds of all existing and proposed roads are presented in **Appendix 4.1**.

4.5.46 In accordance with the Road Traffic Ordinance, for any road with design speed limit of 70kph or above, the maximum speed limit for medium goods vehicles, heavy goods vehicles, buses and buses shall be limited to 70kph. Thus, the speeds of medium goods vehicles, heavy goods vehicles and buses from the flow speed of 70kph, whichever is lower, are adopted. For the public light buses, the maximum speed limit should be limited to 80kph. Thus, the speeds of public light buses from the flow speed or 80kph, whichever is lower, are adopted.

4.5.47 The 24-hour speed fraction of each vehicle type was based on traffic data provided by the traffic consultant. The adopted speed fraction is summarized in **Appendix 4.3**. The working example illustrating the calculation of speed fractions is available in Table 3 of **Appendix 4.7**.

4.5.48 According to the information provided by Hong Kong Observatory (HKO), Kai Tak Weather Station is the nearest station of the Project. However, this station only records the wind direction and stability class. Thus, data recorded at King's Park meteorological station, which is the second nearest station to the Project site, were adopted for the model input, and summarized in **Appendix 4.3**.

4.5.49 The hourly emissions of NOx and RSP for this highest emission scenario were divided by the number of vehicles and the distance travelled to obtain the emission factors in gram per miles per vehicle. The calculated 24-hour emission factors of 16 vehicle classes for three road types were adopted in this air quality impact assessment and are presented in **Appendix 4.4**.

4.5.50 The forecast traffic flow, diurnal variation of daily trips and daily VMT and speed fraction with 16 vehicle classes have been submitted to the TD. The response from TD is attached in **Appendix 4.2** for reference.

4.5.51 The United States Environmental Protection Agency (USEPA) approved CALINE4 dispersion model was used to assess traffic emissions impact from existing and planned road network. Surface roughness coefficient of 100cm was taken in the CALINE4 model.

4.5.52 Since Kai Tak Weather Station is the nearest station of the Project, hourly meteorological data for the Year 2011 (including wind speed, wind direction, air temperature, Pasquill stability class and mixing height) of the Kai Tak Weather Station was employed for the model run. As Kai Tak Weather Station does not record temperature data, the ambient temperature data recorded at the King's Park Weather Station were adopted.

4.5.53 Secondary air quality impacts arising from the landscaped deck over the proposed Road D3A and the full height vertical noise barrier (connected to the deck) of south bound of the proposed Road D3A were also incorporated into the air quality model. It was assumed that dispersion of the traffic pollutants would have an effect similar to shifting the road outside of the western edge of the landscaped deck at ground level.

4.5.54 The locations of open road emission sources, 24-hour traffic flows and emission factors for each road link are presented in **Appendix 4.4**.

4.5.55 For the calculation of NO_2 concentrations, the conversion factor from NOx to NO_2 was based on the Ambient Ratio Method (assuming 20% of NOx to be NO_2) which is an acceptable approach as stipulated in EPD's *Guidelines on Choice of Models and Model Parameters*.

<u>Other Emission Sources within the Study Area</u>

4.5.56 Other emission sources within the study area including portal emission from the enclosed section of Road D4A, emission from Trunk Road T2 ventilation building and portal within KTD site, portal emission from Slip Road A Portal, emission from the proposed hospital within KTD, cruise ship emissions from the proposed cruise terminal at Kai Tak, emission from the existing typhoon shelters, and planned heliport emission at the end of runway were predicted using the Industrial Source Complex Short Term (ISCST3) dispersion model. Locations of these emission sources are shown in **Figure 4.2**. According to the information provided by Trunk Road T2 consultant, 90% of the emissions from Trunk Road T2 tunnel were assumed to be from ventilation building and 10% from the portal. The emissions from other sources were made reference to the approved KTD Schedule 3 EIA Report.

- Chimney emission from nearby industrial areas and proposed hospital within KTD –

S6.5.12 to S6.5.14 at Page 6-12 of the approved KTD Schedule 3 EIA Report;
- Emission from proposed heliport – S6.5.15 to S6.5.17 at Page 6-13 of the approved KTD Schedule 3 EIA Report;
- Cruise vessel emission from the cruise terminal at Kai Tak – S6.5.32 at Page 6-14 of the approved KTD Schedule 3 EIA Report. It is noted that there is an update in the methodologies in preparing mobile source port-related emission inventories by USEPA in April 2009. A qualitative review for comparison on the methodologies adopted in the approved KTD Schedule 3 EIA Report and the updated methodologies of USEPA for the calculation of maritime emission factors was conducted and is presented in **Appendix 4.8**. The review results indicated negligible change in the emission factors, and the adoption of the cruise vessel emission presented in the KTD Schedule 3 EIA Report is therefore considered valid;
- Emission from the Kwun Tong Typhoon Shelter and To Kwa Wan Typhoon Shelter – S6.5.39 to S6.5.40 at Page 6-19 of the approved KTD Schedule 3 EIA Report.

4.5.57 The emission inventory for ISCST3 Model is presented in **Appendix 4.5**.

4.5.58 Portal emissions were modelled in accordance with the Permanent International Association of Road Congress Report (PIARC, 1991). Pollutants are assumed to eject from the portal as a portal jet such that 2/3 of the total emissions were dispersed within the first 50 m of the portal and 1/3 of the total emissions within the second 50 m.

4.5.59 Diurnal variation profile of emission from open road source of Road D4A, Trunk Road T2 and Slip Road A was also applied to the corresponding portal and ventilation building emissions.

4.5.60 Since Kai Tak Weather Station is the nearest station of the Project, hourly meteorological data for the Year 2011 (including wind speed, wind direction, air temperature, Pasquill stability class and mixing height) of the Kai Tak Weather Station was employed for the model run. As Kai Tak Weather Station does not record temperature data, the ambient temperature data recorded at the King's Park Weather Station were adopted. The urban dispersion mode in ISCST3 model was selected.

4.5.61 For the calculation of NO_2 concentrations, the conversion factor from NOx to NO_2 was based on the Ambient Ratio Method (assuming 20% of NOx to be NO_2) which is an acceptable approach as stipulated in EPD Guidelines on Choice of Models and Model Parameters.

Cumulative Impact of Criteria Air Pollutants

4.5.62 As mentioned above, background pollutant levels within and adjacent to the Study Area, vehicle emissions from open sections of the existing and planned road networks, and tunnel portal and ventilation building emissions etc will all contribute to the cumulative impact.

4.5.63 Besides the vehicular emissions, emissions from the cruise vessels using the proposed cruise terminal at Kai Tak, emission from proposed hospital at Kai Tak, the proposed heliport, and typhoon shelters within 500m from the project site boundary would also contribute to the cumulative air quality impact.

4.5.64 The pollutant concentrations at the ASRs was predicted by both CALINE4 and ISCST3 models, where

- the CALINE4 model was used to predict the open road emissions from the existing and planned road networks; and
- the ISCST3 model was used to predict all the portal emissions and ventilation shaft emissions, emission from hospital, cruise ship, proposed heliport and typhoon shelters.

4.5.65 To obtain the cumulative pollutant concentration at each receptor, the predicted values from the CALINE4 and the ISCST3 models are added together with the background pollutant concentrations on an hour-by-hour basis.

4.6 Identification of Environmental Impacts

Construction Dust

4.6.1 The construction activities for the Project would be commenced in the Year 2014 for completion in Year 2016 and major civil work will be completed in end 2015. The major construction activities for the Project with air quality concern include:

- surface excavation
- roads construction
- construction of landscaped deck
- installation of noise barrier panel

4.6.2 Potential air quality impacts arising from the construction of the Project would mainly be related to dust nuisance from excavation, material handling and wind erosion of the site. In general, it is expected that no extensive excavation works would be conducted throughout the construction phase and maximum 3 trucks per hour to be operated, but mainly at-grade road pavement construction and pre-cast elements for on-site installations of the landscaped deck. All the above activities are not expected to generate significant amount of construction dust. Furthermore, the separation distance between the nearest ASR namely Kowloon Bay Dangerous Goods Godown and the Project boundary is more than 400m. Therefore, no adverse dust impact would be expected at the nearby ASR.

4.6.3 Based on the latest available information, the construction of the proposed Trunk Road T2 would likely commence in end 2015 and be completed by end 2019. The proposed Trunk Road T2 is located 400m away from the Project boundary and would not overlap with the major construction civil works of the Project and thus cumulative dust impact from Trunk Road T2 project is not expected.

4.6.4 Under the APCO, dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be implemented. In addition, control measures stipulated in the approved KTD Schedule 3 EIA Report will be strictly followed. With effective implementation of these mitigation measures, as shown in detail in **Section 4.8**, adverse construction dust impacts are not expected at the nearby ASR.

Operation Phase

4.6.5 The major air pollutant sources during operation phase of the Project would be vehicular emissions from open sections of the existing and planned road networks, portal emission from the enclosed section of Road D4A, emission from Trunk Road T2 ventilation building and portal within KTD site, and portal emission from Slip Road A Portal.

4.6.6 Besides vehicular emissions, emissions from the cruise vessels, emission from proposed hospital, proposed heliport and typhoon shelters within 500m from the project boundary would also contribute to the cumulative air quality impact. The locations of emission sources are presented in **Figure 4.2**.

4.7 Prediction and Evaluation of Environmental Impacts

Construction Dust

4.7.1 Construction activities of the Project will involve surface excavation and roads construction. Extensive excavation works is not expected. All the above activities are not expected to generate significant amount of construction dust.

4.7.2 Potential air quality impacts arising from the construction of the Project would mainly be related to dust nuisance from excavation, material handling and wind erosion of the site. In general, it is expected that no extensive excavation works would be conducted throughout the construction phase and maximum 3 trucks per hour to be operated, but mainly at-grade road pavement construction and pre-cast elements for on-site installations of the landscaped deck. All the above activities are not expected to generate significant amount of construction dust. Furthermore, the separation distance between the nearest ASR (Kowloon Bay Dangerous Goods Godown) and the Project boundary is more than 400m. Therefore, no adverse dust impact would be expected at the nearby ASR.

4.7.3 Control measures stipulated in the Air Pollution Control (Construction Dust) Regulation of Air Pollution Control Ordinance (APCO) should be implemented to ensure that construction impacts are controlled within the relevant standards described above. In addition, control measures stipulated in the approved KTD Schedule 3 EIA Report will be strictly followed. An environmental audit programme for construction phase has been devised to verify the effectiveness of the control measures so as to ensure proper construction dust control. With proper implementation of dust control measures, as shown in **Section 4.8**, significant construction dust impacts at ASR during the construction phase of the Project is not anticipated.

Operation Phase

4.7.4 Taking into account vehicle emissions from open road networks, portal emission from the enclosed section of Road D4A, portal and ventilation building emissions from Trunk Road T2, portal emission from Slip Road A Portal, emissions from the cruise ships, proposed hospital, proposed heliport, and existing typhoon shelters, and the background pollutant concentration, the cumulative 1-hour average NO_2, 24-hour average NO_2 and RSP, and annual average NO_2 and RSP concentrations were predicted and the highest pollutant concentrations at each ASR under the highest emission scenario are presented in **Appendix 4.6**.

4.7.5 Based on the prediction, no exceedance of the 1-hour average NO_2, 24-hour average NO_2 & RSP and annual average NO_2 & RSP would occur at any representative ASRs in the Study Area.

4.7.6 From the results, it is found that the maximum pollutant concentrations from the Project would occur at 1.5m above ground (the lowest assessment height), and the maximum cumulative concentrations would occur at the highest assessment height of some ASRs due to the impact from cruise emission. The predicted cumulative maximum hourly and/or daily and annual average contour plots for NO_2 and RSP at 1.5m, 40m and 95m above ground are presented in **Figures 4.3** to **4.7** (the bolded contours represent the respective AQOs).

4.7.7 From the contour plots, localised exceedances of 1-hour average NO_2 and annual average RSP at 1.5m, 40m & 95m above ground, daily average NO_2 & RSP at 95m above ground and annual average NO_2 at 1.5m and 95m above ground were found. However, no existing or planned ASR (except Site 4D2 - planned Tourism Node) is identified within these predicted exceedance areas at the relevant heights. The detailed discussion on localised exceedance are summarised below. With reference to the S6.8.2 of the approved Schedule 3 Kai Tak Development EIA Report, the fresh air intake for the Site 4D2 (Tourism Node) would be located below 40m above ground. Therefore, adverse air quality impact for the Tourism Node at Site 4D2 is not expected. The modeling results indicated that the predicted cumulative concentrations of NO_2 and RSP at all representative ASRs would comply with the respective AQO.

Exceedance Area	Remarks
1-hr NO_2 concentration	
Figure 4.3a - Over Kai Fuk Road (Exceedance area found at 1.5m above ground)	Exceedance area mainly found on Kai Fuk Road. No ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.3b - Site 3A3 and	With reference to the latest design of DSD desilting

Exceedance Area	Remarks
Proposed Ventilation Building for Road T2 within KTD area (Exceedance area found at 40m above ground)	compounds, the maximum height of this desilting compound at Site 3A3 is +14mPD (i.e. ~9m above ground). No ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.3c - Sites 4B5, 4C3, 4C4 and 4C5 (Exceedance area found at 95m above ground)	Since the proposed maximum building height of Sites 4B5, 4C3, 4C4 and 4C5 is +45mPD (i.e. ~40m above ground), no ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.3c - Site 4D2 - planned Tourism Node (Exceedance area found at 95m above ground)	With reference to the S6.8.2 of the approved Schedule 3 Kai Tak Development EIA Report, the fresh air intake for the Site 4D2 (Tourism Node) would be located below 40m above ground. Therefore, adverse air quality impact for the Tourism Node at Site 4D2 is not expected.
24-hr NO_2 concentration	
Figure 4.4c - Sites 4B5, 4C4 and 4C5 (Exceedance area found at 95m above ground)	Since the proposed maximum building height of Sites 4B5, 4C4 and 4C5 is +45mPD (i.e. ~40m above ground), no ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.4c - Site 4D2 - planned Tourism Node (Exceedance area found at 95m above ground)	With reference to the S6.8.2 of the approved Schedule 3 Kai Tak Development EIA Report, the fresh air intake for the Site 4D2 (Tourism Node) would be located below 40m above ground. Therefore, adverse air quality impact for the Tourism Node at Site 4D2 is not expected.
Annual NO_2 concentration	
Figure 4.5a - Over Kai Fuk Road and other proposed roads in KTD area (Exceedance area found at 1.5m above ground)	Exceedance area mainly found on Kai Fuk Road. No ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.5a - Over typhoon shelters (Exceedance area found at 1.5m above ground)	No ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.5c - Site 4C5 (Exceedance area found at 95m above ground)	Since the proposed maximum building height of Site 4C5 is +45mPD (i.e. ~40m above ground), no ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.5c - Site 4D2 - planned Tourism Node (Exceedance area found at 95m above ground)	With reference to the S6.8.2 of the approved Schedule 3 Kai Tak Development EIA Report, the fresh air intake for the Site 4D2 (Tourism Node) would be located below 40m above ground. Therefore, adverse air quality impact for the Tourism Node at Site 4D2 is not expected.
24-hr RSP concentration	
Figure 4.6c - Site 4C5 (Exceedance area found at 95m above ground)	Since the proposed maximum building height of Site 4C5 is +45mPD (i.e. ~40m above ground), no ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.6c - Site 4D2 - planned Tourism Node (Exceedance area found at 95m above ground)	With reference to the S6.8.2 of the approved Schedule 3 Kai Tak Development EIA Report, the fresh air intake for the Site 4D2 (Tourism Node) would be located below 40m above ground. Therefore, adverse air quality impact for the Tourism Node at Site 4D2 is not expected.
Annual RSP concentration	
Figure 4.7a - Over Kai Fuk Road and other proposed roads in KTD area (Exceedance area found at	Exceedance area mainly found on Kai Fuk Road. No ASRs are identified within the exceedance area, adverse air quality impact is not expected.

Exceedance Area	Remarks
1.5m above ground)	
Figure 4.7a - Over typhoon shelters (Exceedance area found at 1.5m above ground)	No ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.7b - Over sea near cruise terminal (Exceedance area found at 40m above ground)	No ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.7c - Sites 4B5, 4C3, 4C4 and 4C5 (Exceedance area found at 95m above ground)	Since the proposed maximum building height of Sites 4B5, 4C3, 4C4 and 4C5 is +45mPD (i.e. ~40m above ground), no ASRs are identified within the exceedance area, adverse air quality impact is not expected.
Figure 4.7c - Site 4D2 - planned Tourism Node (Exceedance area found at 95m above ground)	With reference to the S6.8.2 of the approved Schedule 3 Kai Tak Development EIA Report, the fresh air intake for the Site 4D2 (Tourism Node) would be located below 40m above ground. Therefore, adverse air quality impact for the Tourism Node at Site 4D2 is not expected.

4.8 Mitigation of Environmental Impacts

Construction Phase

4.8.1 To ensure compliance with the guideline level and AQO at the ASRs, requirements of the *Air Pollution Control (Construction Dust) Regulation* shall be adhered to during the construction period. An environmental audit program shall be implemented to monitor the construction process in order to enforce controls and modify methods of work if dusty conditions arise. In addition, control measures stipulated in the approved KTD Schedule 3 EIA Report will be strictly followed. Furthermore, the following good site practices are recommended to minimise dust impacts during transportation and handling of dusty materials:

- Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.
- Misting for the dusty material should be carried out before being loaded into the vehicle.
- Any vehicle with an open load carrying area should have properly fitted side and tail boards.
- Material having the potential to create dust should not be loaded from a level higher than the side and tail boards and should be dampened and covered by a clean tarpaulin.
- The tarpaulin should be properly secured and should extend at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary before transportation.
- The vehicles should be restricted to maximum speed of 10 km per hour and confined haulage and delivery vehicle to designated roadways inside the site. On-site unpaved roads should be compacted and kept free of lose materials.
- Vehicle washing facilities should be provided at every vehicle exit point.
- The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.
- Every main haul road should be scaled with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet.
- Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides.
- Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.

Operation Phase

4.8.2 According to the assessment results, all the representative ASRs would comply with the AQO limit and thus no further mitigation measure would be required.

4.9 Residual of Environmental Impacts

Construction Phase

4.9.1 With the implementation of the proposed mitigation measures and the dust suppression measures stipulated in *Air Pollution Control (Construction Dust) Regulation* during the construction phase, no adverse residual air quality impact would be expected.

Operation Phase

4.9.2 No adverse residual air quality impact due to the KTD Roads D3A & D4A Project is expected.

4.10 Environmental Monitoring and Audit

Construction Phase

4.10.1 With the implementation of the proposed dust suppression measures & good site practices, no unacceptable dust impact would be expected at the ASRs. No air quality monitoring during the construction phase is considered necessary. However, regular inspections of the construction activities and works areas should be conducted during the construction phase to ensure proper implementation of the recommended mitigation measures.

Operation Phase

4.10.2 According to the assessment results, all the representative ASRs would comply with the AQO limit and thus no further mitigation measure would be required. Air quality monitoring and audit during the operation phase is considered not necessary.

4.11 Conclusion

Construction Phase

4.11.1 Air quality impacts from the construction works for the Project would mainly be related to construction dust from excavation, material handling and wind erosion. With the implementation of mitigation measures specified in the Air Pollution Control (Construction Dust) Regulation, dust impact on air sensitive receivers would be minimal.

Operation Phase

4.11.2 The cumulative air pollutant concentrations associated with the vehicle emissions from open road network of existing and proposed roads, portal and ventilation building emissions and emissions from other sources within 500m from the project site boundary have been assessed. The cumulative air quality impact assessment result shows that all the air sensitive receivers in the vicinity of the Project site would comply with the Air Quality Objectives.