

Your Ref.

By Hand

Our Ref. 405046-0060

Date 12 August 2021

Environmental Protection Department
Waste Reduction and Recycling Section (1)
5/F., Centre Parc,
11 Sheung Yuet Road,
Kowloon Bay, Kowloon, Hong Kong

Attention: Ms WONG Wing-yi, Eunice (AE(WR)32)

Dear Madam,

Agreement No. CE 9/2019 (EP)
Development of a Pilot Plant for Woody Waste Recycling –
Investigation, Design and Construction
Submission of Technical Note for 24 Hours Operation of Pilot Plant at Lot T8-T11 at EcoPark
from Jan 2022 to Dec 2023 (Issue 5)

We are pleased to submit the hard copy of Technical Note for 24 Hours Operation of Pilot Plant at Lot T8-T11 at EcoPark from Jan 2022 to Dec 2023 (Issue 5) for your retention.

Should you have any queries, please feel free to contact Mr. Lee Ka Leong at 2608 7433 or Ms. Hazel Wong at 2608 7459.

Yours faithfully,
for and on behalf of
BINNIES HONG KONG LIMITED



JAMES H.Y. CHAN
DIRECTOR

JC/WSC/LD
Enclosure(s)



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ISSUE 5

Technical Note for 24 Hours Operation of Pilot Plant at Lot T8-T11 at EcoPark from Jan 2022 to Dec 2023

Agreement No. CE 9/2019 (EP) Development of a Pilot Plant for Woody Waste Recycling – Investigation, Design and Construction

BINNIES PROJECT NO. 405046
BINNIES FILE NO. 405046.70.0008

Report Authorized for Issue
By:



For and on Binnies
Hong Kong Limited

PREPARED FOR



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1 Introduction

1.1 BACKGROUND AND PURPOSE

1.1.1 EcoPark has been in operation since 2007, located in Tuen Mun Area 38, separated into two phases (Phase 1 and Phase 2). The site location of EcoPark is shown in Exhibit 1-1. EcoPark occupies a total area of 20 hectares, while 14 hectares are assigned as rentable areas for recycling activities. By offering affordable rents to local recycling facilities, EcoPark aspires to encourage local investment or technological advancement in the environmental and recycling industry. This sustains EcoPark's goal of returning recyclable materials into the production line and consumption loop.

Exhibit 1-1 Site Location of EcoPark and Environs



- 1.1.2 Ten tenants and two operators have been currently occupying the lots of EcoPark to carrying out a variety of recycling services. This includes recycling of waste cooking oil, waste metals, waste wood, Waste Electrical and Electronic Equipment (WEEE), waste plastics, waste batteries, construction and demolition waste, waste glass and waste rubber tyres.
- 1.1.3 EcoPark is a Designated Project (DP) under G.4(b) of Part 1, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO). An Environmental Impact



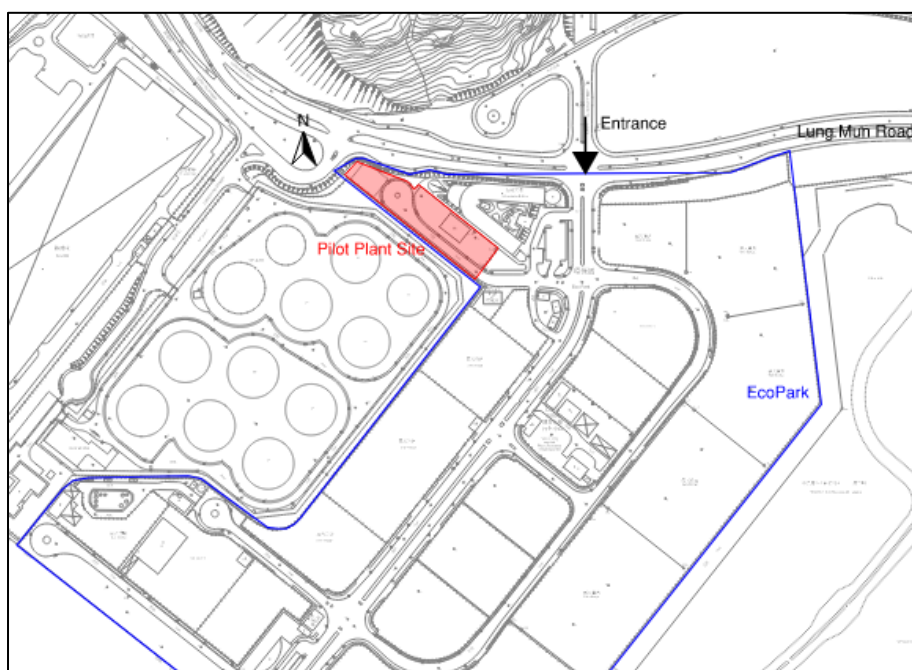
Assessment (EIA) Report (AEIAR-086/2005), and Environmental Monitoring and Audit (EM&A) Manual were approved in 2005 for EcoPark. The Director of Environmental Protection (the Director) granted EcoPark the first Environmental Permit (EP) (EP-226/2005) and the current EP is (EP- 226/2005/G), which all EcoPark facilities are subject to the EP. Recently, Hong Kong has expressed an interest in recycling woody waste into biochar. Recycling woody waste would be beneficial in alleviating the burden on landfill sites, and biochar would be a useful material to improve soil fertility. Therefore, a Pilot Biochar Production Plant (PBPP) is proposed to install at an undeveloped area (Lot T8-T11), Phase 1 of EcoPark (this Project). The PBPP will offer woody waste recycling service, which corresponds with the aims of EcoPark to promote material recycling. The PBPP is proposed to commence construction in Q4 2021. The PBPP is proposed to commence operation in Dec 2022, operate 24 hours per day, 7 days a week

- 1.1.4 According to the issued EP, Part C, Condition 4.4, a detailed proposal should be submitted for approval by the Director of the Environmental Protection for any chimney emissions outside the 0700 hrs to 1900 hrs period.
- 1.1.5 This Technical Note is prepared to assess the air quality impact of the proposed biochar plant at the operation of 24 hours per day, 7 days a week.

1.2 PROPOSED PILOT PLANT INSTALLATION

- 1.2.1 The location of the PBPP is shown on Exhibit 1-2. The Pilot Plant site has an area of about 3,500 to 4,000 square metres (m²). The plant has a nominal capacity of 1000 kg of woody waste feedstock per hour, including two pyrolysis units. The feedstock will be provided by EPD's Y-Park in Tsang Tsui, the types of woody waste are hard yard waste and cut bamboo waste.

Exhibit 1-2 Site Location of Proposed Pilot Plant





2 Assessment Criteria

2.1 ENVIRONMENTAL LEGISLATION AND STANDARDS

2.1.1 The relevant legislations, standards and guidelines applicable to 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; and
- EIAO-TM Annex 4 and Annex 12

2.1.2 The Air Pollution Control Ordinance and its subsidiary regulation provide the statutory control of air pollutants from a variety of sources. The APCO makes provision abating, prohibiting and controlling emissions of any solid, particulate, liquid, vapour, objectionable odours or gaseous substances into the atmosphere. The whole of the HKSAR has been covered by Air Control Zones. The Hong Kong Air Quality Objectives (AQOs) stipulate maximum acceptable concentration of air pollutants. The prevailing AQO is shown in **Exhibit 2-1** below.

Exhibit 2-1 Hong Kong Air Quality Objectives

Air Pollutant	Averaging Time	Concentration ($\mu\text{g m}^{-3}$) ^(a)	No. of Exceedances Allowed per Year
Sulphur Dioxide (SO ₂)	10 minutes	500	3
	24-hours	125	3
Respirable Suspended Particulates (RSP) ^(b)	24-hours	100	9
	Annual	50	-
Fine Suspended Particulates (FSP) ^(c)	24-hours	75	9
	Annual	35	-
Nitrogen Dioxide (NO ₂)	1-hour	200	18
	Annual	40	-
Ozone (O ₃)	8-hours	160	9
Carbon Monoxide (CO)	1-hour	30,000	-
	8-hours	10,000	-
Lead	Annual	0.5	-
Notes: (a) Measured at 298K and 101.325 kPa. (b) Suspended particles in air with a nominal aerodynamic diameter of 10 μm or less (c) Suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less			



3 Air Quality Assessment

3.1 ASSESSMENT METHODOLOGY & EMISSION INVENTORY

Assessment Period

3.1.1 The assessment period of this assessment will be from Jan 2022 to Dec 2023.

Locations and Inventory of Air Emissions

3.1.2 Design stack parameters and emission concentrations from the PBPP are provided by design engineer and are summarized in **Exhibit 3-1** and **Exhibit 3-2** below. The air pollutants of concern include NO₂, PM₁₀, PM_{2.5}. The location and inventory of these PBPP emission are shown in **Exhibit 3-3**, **Exhibit 3-4** and **Appendix A** respectively.

Exhibit 3-1 Stack Parameter Proposed under this Project

ESTIMATED EXHAUST FLOW RATE	STACK HEIGHT	STACK DIAMETER	EXIT TEMPERATURE	EXHAUST GAS VELOCITY
5,100 m ³ /hr	13m above ground (ground level: 6.8mPD)	0.3 m	160 °C	20 m/s

Exhibit 3-2 Emission concentration of the PBPP

AIR POLLUTANT	EMISSION CONCENTRATION (HOURLY AVERAGE) (mg/m ³)	EMISSION RATE ADOPTED IN THE ASSESSMENT (G/S)	BPM'S CONCENTRATION LIMIT ⁽¹⁾ (mg/m ³)		COMPLY WITH BPM (Y/N)
			HALF HOURLY AVERAGE	DAILY AVERAGE	
Particulates	10 ⁽²⁾	0.01417 ⁽²⁾	30	10	Y
Gaseous and vaporous organic substances, expressed as total organic carbon	minimal ⁽³⁾	0 ⁽³⁾	20	10	Y
Nitrogen oxides ⁽⁴⁾	120	0.17	400	200	Y
Carbon monoxide	minimal ⁽³⁾	0 ⁽³⁾	100	50	Y
Sulphur dioxide	minimal ⁽³⁾	0 ⁽³⁾	N/A	N/A	N/A

Note:

(1) The concentration limits for emissions from carbonization and gasification plant is extracted from Annex I of BPM 8/1 (2019) - *A Guidance Note on The Best Practicable Means For Specified Process – Gas Works (Carbonization And Gasification Of Plant Biomass)*

(2) Concentration of 10 mg/m³ and rate of 0.01417 g/s are assumed in the model for both PM₁₀ and PM_{2.5} emission.

(3) As confirmed by design engineer, only clean and mainly natural wood waste are fed into the plant, the emission concentrations of gaseous and vaporous substances, Carbon monoxide and sulphur dioxide are expected to be minimal and comply with BPM. 0g/s is assumed in the assessment.

(4) Expressed as nitrogen dioxide (NO₂)

(5) N/A – Not applicable



Exhibit 3-3 Indicative Locations of Surrounding Emission Sources (Nitrogen Oxides)

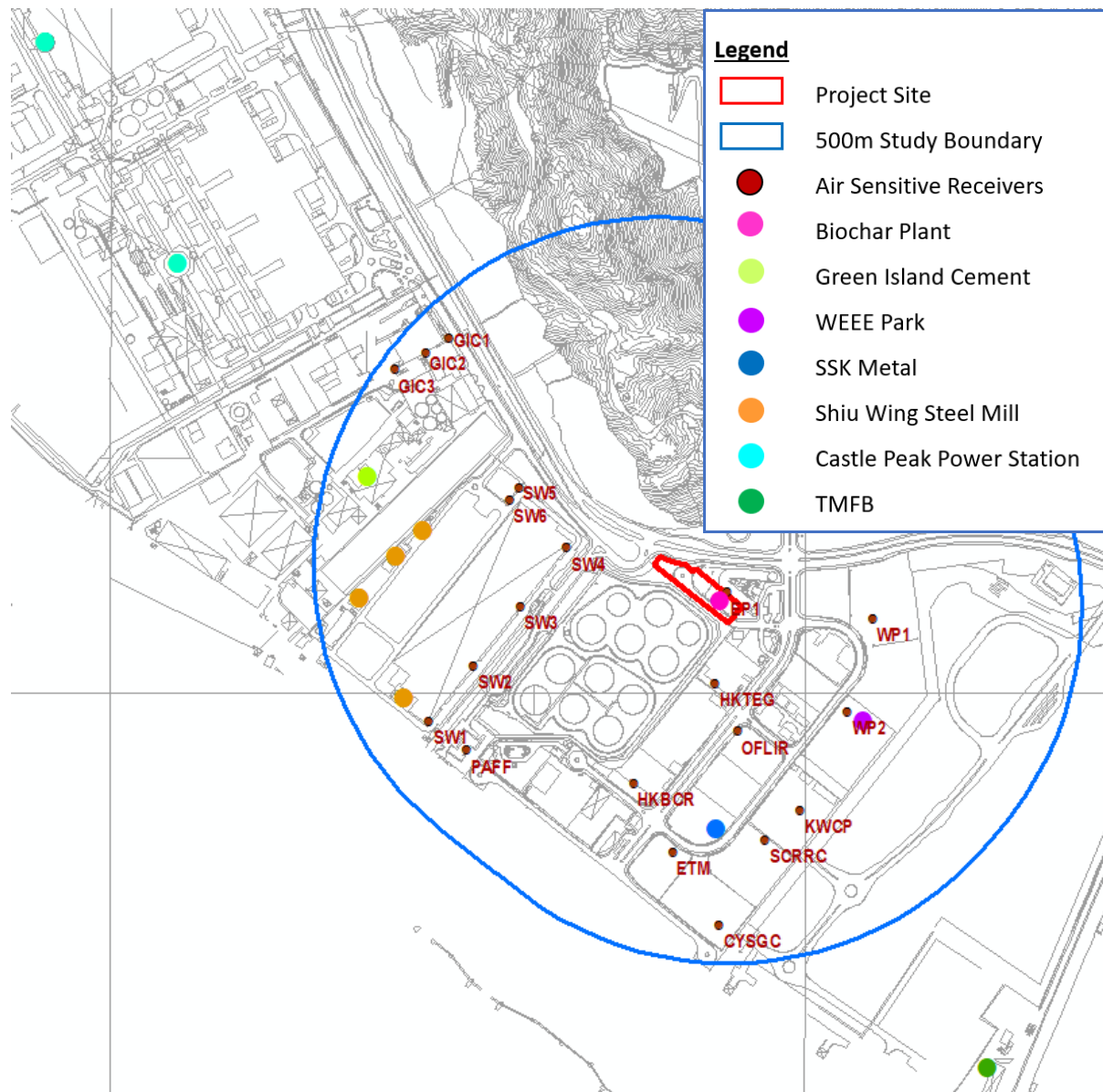
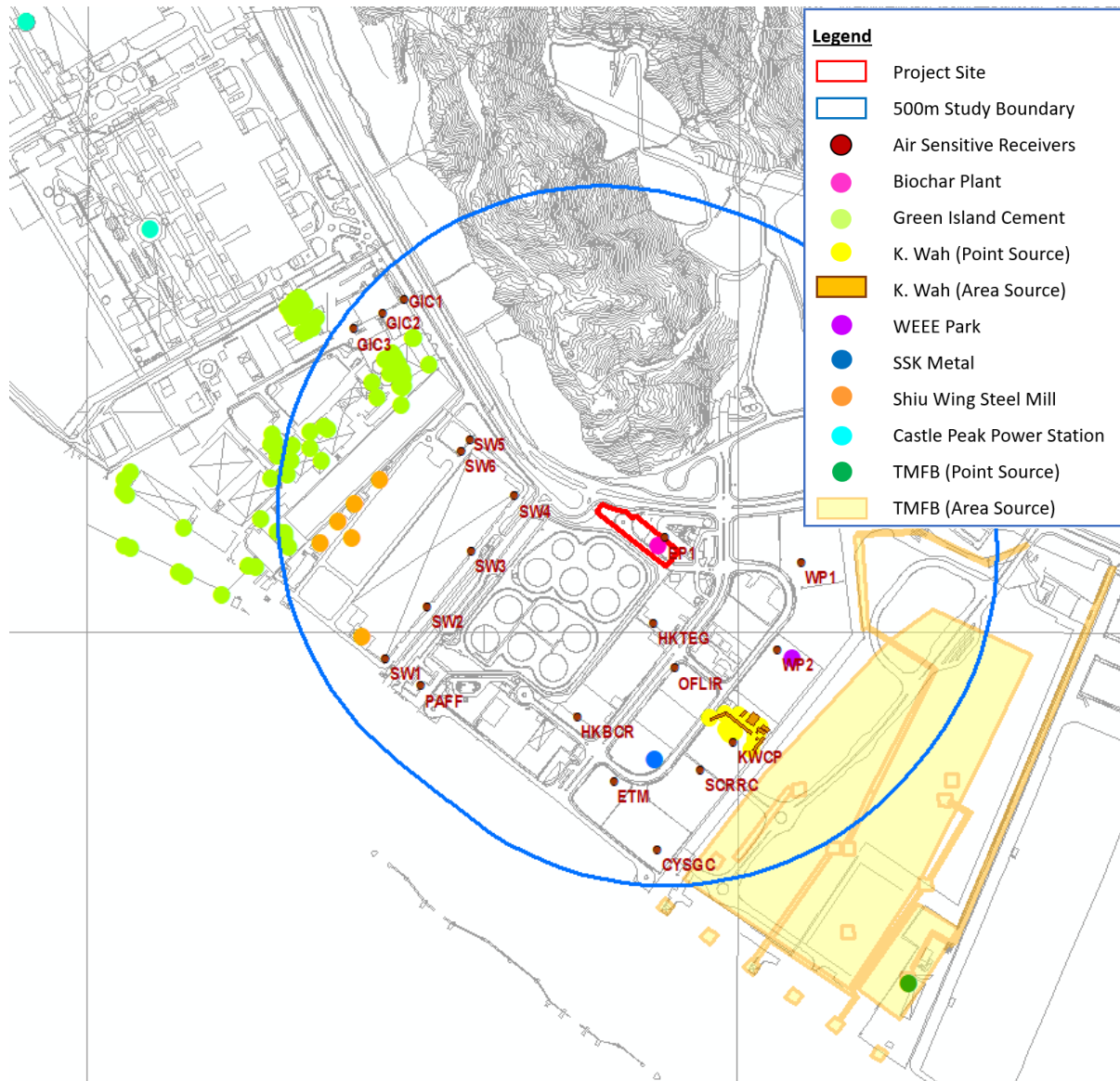




Exhibit 3-4 Indicative Locations of Surrounding Emission Sources (Particulates)



Adjacent Industrial Facilities

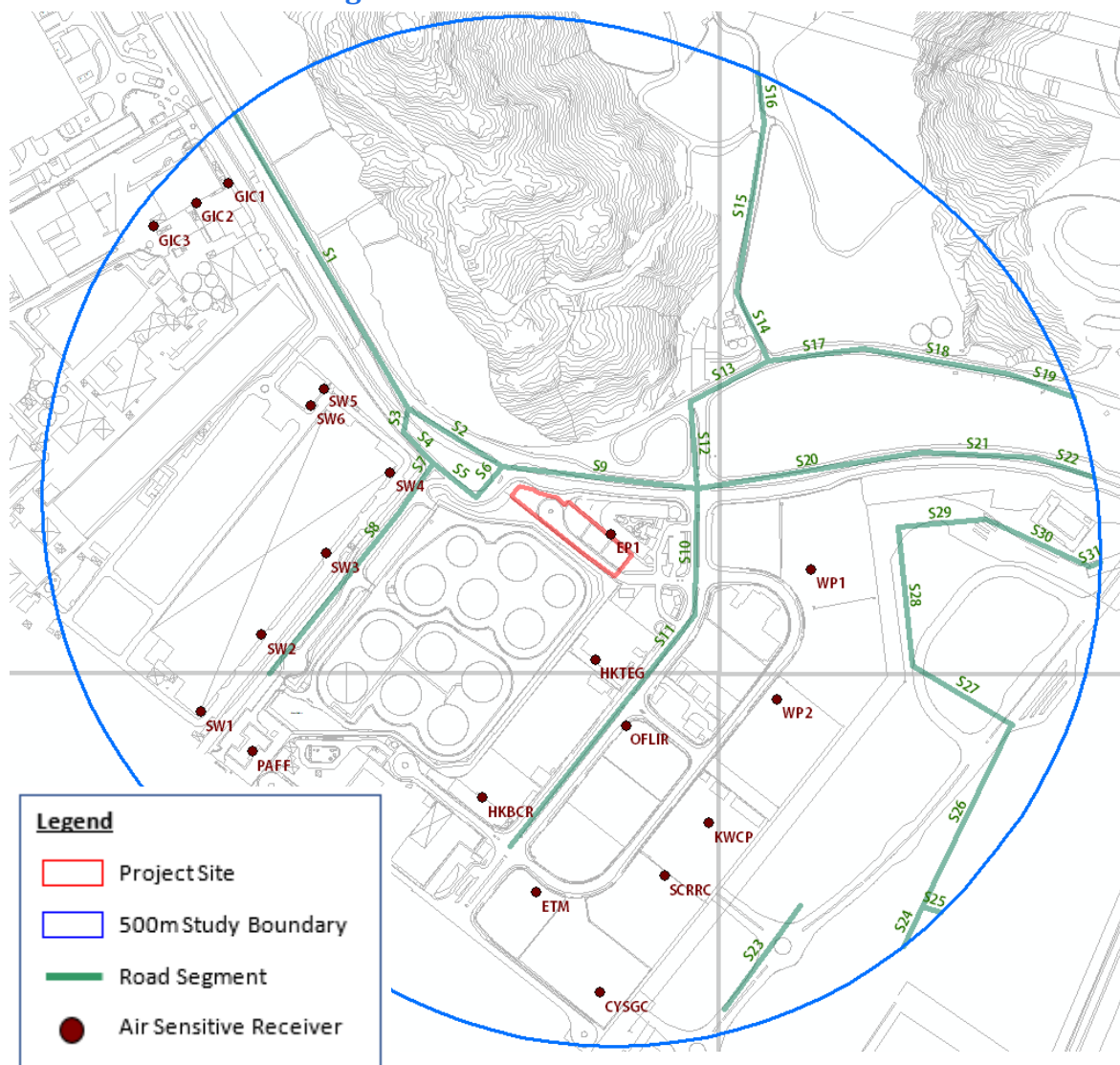
- 3.1.3 Locations of air emission sources including the Green Island Cement, K. Wah, WEEE Park, SSK Metal, Shiu Wing Steel Mill, Castle Peak Power Station and Tuen Mun Fill Bank(TMFB) are shown in **Exhibit 3-3** and **Exhibit 3-4**. The associated emission inventory is provided in **Appendix A**.

Vehicular Emissions

- 3.1.4 For vehicular emissions, reference has been made to *Operation of Tuen Mun Fill Bank at Tuen Mun Area 38 frm2019 to 2023 – First Annual Air Quality Impact Assessment Review (May 2019)*, the associated road configuration and traffic emission data is provided in **Appendix B** and **Exhibit 3-5**.



Exhibit 3-5 Road Configuration



3.1.5 Individual NO₂/NO_x ratios of each vehicle type in 2019 have been used to estimate the overall NO and NO₂ emissions arising from road traffic with reference to recommendation in *EPD's Guidelines for Local-scale Air Quality Assessment Using Models*. The predicted NO concentrations were converted to NO₂ based on Ozone Limited Method (OLM) and were added with the predicted NO₂ concentrations to determine the total predicted NO₂ concentrations at the ASRs. The total predicted NO₂ concentrations were calculated as follows:

$$[\text{NO}_2]_{\text{pred total}} = [\text{NO}_2]_{\text{pred}} + \text{MIN} \{ [\text{NO}]_{\text{pred}}, \text{or } (46/48) \times [\text{O}_3]_{\text{bkgd}} \}$$

where

$[\text{NO}_2]_{\text{pred total}}$ = the total predicted NO₂ concentration

$[\text{NO}_2]_{\text{pred}}$ = the predicted NO₂ concentration directly emitted from tailpipe emissions

$[\text{NO}]_{\text{pred}}$ = the predicted NO concentration

MIN means the minimum of the two values within the brackets

$[\text{O}_3]_{\text{bkgd}}$ = the representative O₃ background concentration; (46/48) is the molecular weight of NO₂ divided by the molecular weight of O₃



- 3.1.6 Predicted ozone concentrations in 2019 obtained from the PATH-2016 model re-run were used for the conversion of NO_x to NO_2 in OLM.

Air Dispersion Model and Meteorological Data

- 3.1.7 With reference to Guidelines on Choice of Models and Model Parameters published by EPD in January 2016 (hereinafter refer as “the Model Guideline”), the steady-state Gaussian dispersion model United States Environmental Protection Agency (USEPA) AERMOD model was adopted for assessing the potential air quality impact arising from the chimneys. The study area falls under PATH-2016 Grids (15,38), (15,39), (16,38) and (16,39). Meteorological data from the concerned grids were adopted in the model run. Dominant or representative land use 3km upwind in the vicinity of the study area was identified with aerial map. Details of land use for AERMOD inputs are provided in **Appendix C**.

Conversion of NO_x to NO_2

- 3.1.8 For the conversion of NO_x to NO_2 , OLM was adopted based on the hourly O_3 concentrations predicted by PATH model, assuming the NO_2 to be 10% for chimneys.

Cumulative Impacts of AQO pollutants

- 3.1.9 The background values were extracted from the PATH-2016 model outputs based on Year 2020 emission inventories at Grids (15,38), (15,39), (16,38) and (16,39). Emission from Castle Peak Power Station is also included as a far-field emission source for the estimation of Tier 3 background contributions. At each ASR, the model results and backgrounds were added on an hour-by-hour basis to derive the corresponding averages for each air pollutant. The results were then compared with the respective AQOs or reference concentrations.

3.2 REPRESENTATIVE AIR SENSITIVE RECEIVERS

- 3.2.1 The latest Outline Zoning Plans (OZP), Outline Development Plan (ODP) and relevant land use plans published by Lands Department have been reviewed. The representative Air Sensitive Receivers (ASRs) in the study area of this review are shown in **Exhibit 3-6** and **Exhibit 3-7**. Detail locations are presented in **Appendix D**.



Exhibit 3-6 Indicative Locations of Air Quality Sensitive Receivers

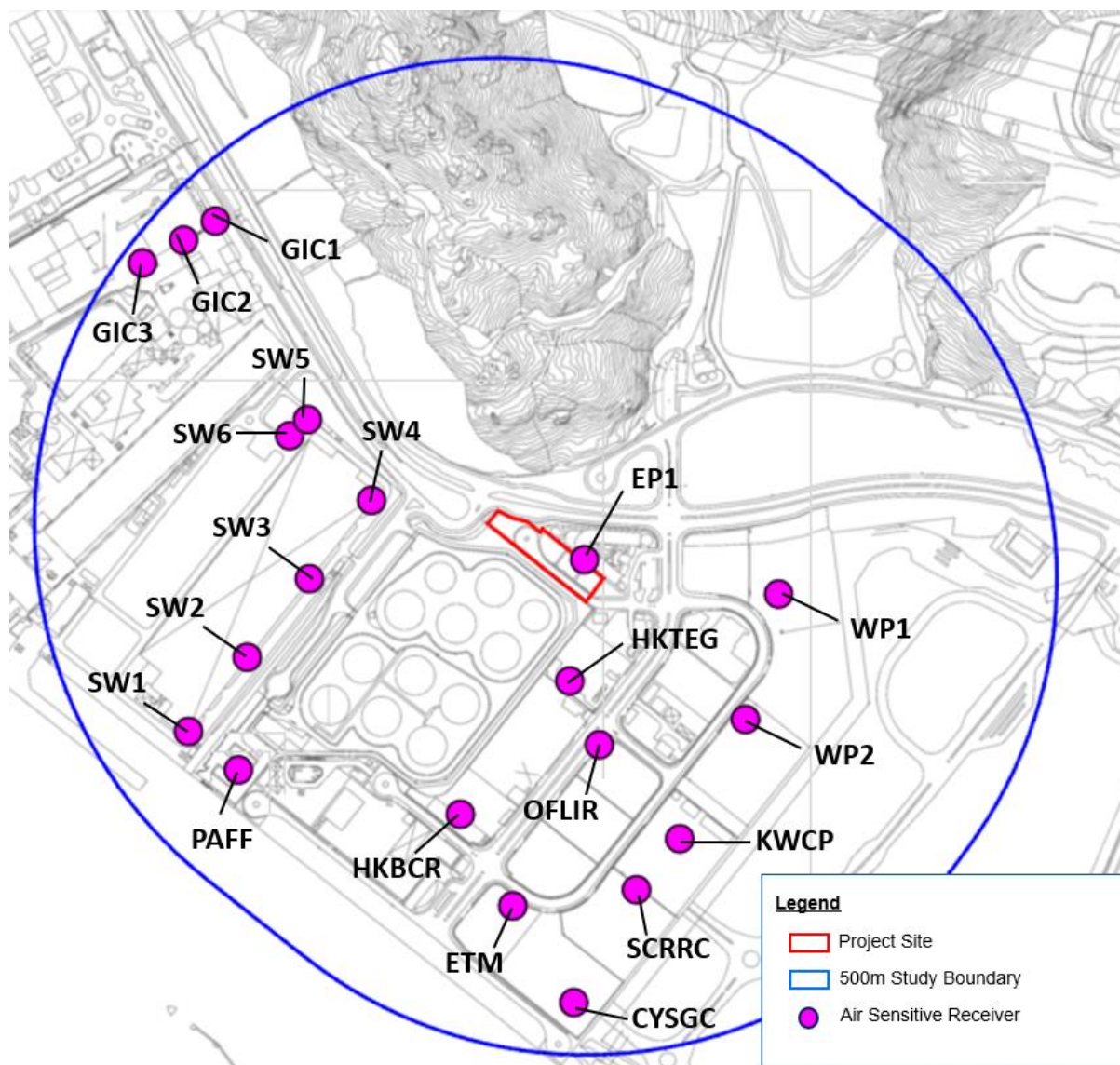


Exhibit 3-7 Identified Representative Air Sensitive Receivers

ASR	DESCRIPTION	TYPE OF USE	GROUND LEVEL (mPD)	ASSESSMENT HEIGHT (mAG)
EP1	EcoPark	Office	5.5	1.5, 4.5, 7.5
HKTEG	Hong Kong Telford Envirotech Group Ltd	Industrial	6.1	1.5
OFLIR	On Fat Lung Innovative Resources Limited	Industrial	6.1	1.5
HKBCR	Hong Kong Biomass (Wood) Collected and Recycle Limited	Industrial	6.3	1.5
PAFF	Permanent Aviation Fuel Facility (PAFF)	Industrial	6.1	1.5



ASR	DESCRIPTION	TYPE OF USE	GROUND LEVEL (mPD)	ASSESSMENT HEIGHT (mAG)
SW1	Shiu Wing Steel Mill	Industrial	5	1.5
SW2	Shiu Wing Steel Mill	Industrial	5.6	1.5
SW3	Shiu Wing Steel Mill	Industrial	6.5	1.5
SW4	Shiu Wing Steel Mill	Industrial	6.7	1.5
SW5	Shiu Wing Steel Mill	Office	6.8	1.5, 4.5, 7.5, 10.5, 13.5, 16.5, 16.5, 19.5, 22.5
SW6	Shiu Wing Steel Mill	Office	6.8	1.5, 4.5, 7.5, 10.5, 13.5, 16.5, 16.5, 19.5, 22.5
GIC1	Green Island Cement	Industrial	7	1.5
GIC2	Green Island Cement	Industrial	7	1.5
GIC3	Green Island Cement	Industrial	7	1.5
WP1	WEEE Park	Industrial	7	1.5
WP2	WEEE Park	Industrial	7	1.5
KWCP	K. Wah Construction Products Limited	Industrial	6.1	1.5
SCRRC	South China Reborn Resources (Zhongshan) Company Limited	Industrial	5.7	1.5
ETM	E. Tech Management (HK) limited	Industrial	5.3	1.5
CYSGC	Chung Yue Steel Group Company Limited	Industrial	5.3	1.5

3.3 EVALUATION OF IMPACTS

3.3.1 The proposed process equipment in the PBPP will compose of the pyrolysis process equipment, which is the main process unit, along with other ancillary pieces of equipment including doser, after burning chamber, air pollution control and bagging system. The process begins with pre-dried woody waste being fed into the doser. The doser would distribute and feed the feedstock into the pyrolysis process equipment. The pyrolysis process is being controlled at a pre-determined temperature likely in the range of 550°C to 800°C in the absence of oxygen. Under this condition, the feedstock (being woody waste in our case) would turn into char-like solids called “biochar”. There will be by-products in the form of liquid (bio-oils or vinegar) and gas (called “pyrolysis gas”). Pyrolysis gas is composed of chemicals with high calorific value and therefore will generate heat when burned. The emission from the PBPP will result from the burning of diesel fuel during the start-up of the pyrolysis process and the burning of pyrolysis gas during the pyrolysis process. The site for this Project has been formed and no major earthworks or site formation works will be required. Soil excavation,



materials handling, truck movements on unpaved roads and wind erosion from open stockpiling of dusty materials arising from the construction of the PBPP.

- 3.3.2 During operational phase, the potential sources of air quality impact will include the stack emissions from the operation of the PBPP. Based on the information provided by the design engineer, clean and mainly natural wood waste are fed into the plant, the key air pollutants of concern during operation (Pyrolysis gas combustion emission and fuel combustion) are respirable suspended particulates (PM₁₀), fine suspended particulates (PM_{2.5}) and nitrogen oxides (NO_x).
- 3.3.3 The design requirement for the combustion of the pyrolysis gas will ensure low level of CO, therefore potential air quality impact related to CO is not anticipated.
- 3.3.4 The startup process of the PBPP will require the use of diesel. Based on the design engineer's information, ultra-low sulphur diesel will be used and the required amount of diesel will be minimal. Since the startup process will last only for a short period and the expected number of startup process in a year will be about 5 times. Therefore, emission of sulphur dioxides (SO₂) due to the operation of PBPP is limited and potential air quality impact related to SO₂ is not anticipated. Other stack emissions from adjacent industrial facilities include:
- WEEE Park;
 - Shui Wing Steel Mill;
 - K. Wah Construction Products Limited;
 - Castle Peak Power Plant
 - SSK Metal Limited; and
 - Green Island Cement
- 3.3.5 The corresponding stack locations of air emission sources are shown in **Exhibit 3-3** and **Exhibit 3-4**.

3.4 ASSESSMENT RESULTS

Construction Air Quality Impact

- 3.4.1 The construction works of this Project include site clearance, site formation, structural works for roof, plant installation and stack installation. Since the excavated materials generated will be relatively small and the worksite is small, no adverse fugitive dust impact is envisaged. Dust control measures will be implemented during construction including watering frequently for dusty activities, covering of stockpile areas and use of electric power supply for on-site machinery as far as practicable. With the implementation of dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation together with proper site management and good housekeeping, it is anticipated that no adverse fugitive dust emission would be expected from these construction activities.



Operational Air Quality Impact

- 3.4.2 The maximum predicted cumulative NO₂, PM₁₀, PM_{2.5} concentrations at the identified ASRs are presented in **Exhibit 3-8** below. The detailed result is presented in **Appendix E**, **Appendix F** and **Appendix G** respectively.

Exhibit 3-8 Predicted cumulative concentration of air pollutants

POLLUTANT	AVERAGING TIME	DATA DESCRIPTION	PREDICTED CONCENTRATION (µg m ⁻³)	AQO
Respirable suspended Particulates, RSP (PM ₁₀)	24-hour	10 th highest	99.1	100
	Annual	Max.	46.8	50
Fine suspended Particulates, FSP (PM _{2.5})	24-hour	10 th highest	72.2	75
	Annual	Max.	30.8	35
Nitrogen dioxide, NO ₂	1-hour	19 th highest	152.8	200
	Annual	Max.	39.7	40

- 3.4.3 As shown in **Exhibit 3-8**, the predicted concentrations were all comply with AQO. Hence, no adverse impact was expected.

3.5 CONCLUSION

- 3.5.1 PM₁₀, PM_{2.5} and NO₂ are the key air pollutants of concern for the stack emissions from the PBPP. Based on the predicted results from dispersion modelling, no unacceptable cumulative air quality impact is anticipated upon the ASRs during the operational phase. It is therefore concluded that there is no adverse air quality impact due to the proposed 24 hours per day, seven days per week operation of the PBPP.



4 Overall Conclusion

- 4.1.1 The current Environment Permit (EP) for EcoPark (EP-226/2005/G), under Part C, Condition 4.4,a detailed proposal should be submitted for approval by the Director of the Environmental Protection for any chimney emissions outside the 0700 hrs to 1900 hrs period. This Technical Note has been prepared to address the potential environmental impacts arising from the Pilot Biochar Production Plant (PBPP) locating in Lot T8-T11, Phase 1 of EcoPark. The PBPP is designed to run 24 hours per day, 7 days per week.
- 4.1.2 For the air quality impact, the predicted cumulative impact from Jan 2022 to Dec 2023 on all ASRs would be in compliance with AQO requirement based on the best available information under worst case scenario. It is therefore concluded that there is no adverse air quality impact due to the proposed 24 hours, seven days per week operation of the PBPP.
- 4.1.3 Therefore, the technical requirements for the 24 hours per day, 7 days per week operation of the PBPP between Jan 2022 to Dec 2023 have been satisfied. In addition, all the relevant requirements listed in the Environmental Monitoring and Audit (EM&A) Manual will be followed by Lot T8-T11.



AGREEMENT NO. CE 9/2019 (EP) – DEVELOPMENT OF A PILOT PLANT FOR WOODY WASTE RECYCLING –
INVESTIGATION, DESIGN AND CONSTRUCTION

Appendix A Emission Inventory

Appendix A Emission Inventory

Appendix A-1 Emission inventory of the proposed biochar plant

Parameters		Value	Unit	Remarks
Exhaust flow rate		5100	m ³ /hr	The emission parameters are provided by Engineer The emission factors comply with the emission concentration limits as specified in EPD's Guidance note on the Best Practical Means (BPM) for Specified Process - Gas Works (Carbonization and Gasification of Plant Biomass) BPM 8/1 (2019)
no. of stack		1	-	
Stack diameter		0.3	m	
Stack height		13	m above ground	
Exit temperature		433	K	
Exit velocity		20	m/s	
Emission factor at exhaust ^[1]	RSP	10	mg/m ³	
	FSP	10	mg/m ³	
	NOx	120	mg/m ³	
Emission rate at exhaust ^[2]	RSP	0.01417	g/s	Emission rate = emission factor * exhaust flow rate
	FSP	0.01417	g/s	
	NOx	0.17000	g/s	

Remarks:

- [1] Expressed at 0 degrees Celsius temperature, 101.325 kPa pressure, dry and 11% oxygen content .
- [2] The emission rates adopted in the air dispersion model based on emission factors referenced to 0 degree C and exhaust flow rate based on stack temperature of 433 K represent a conservative scenario.

Appendix A Emission Inventory

Appendix A-2 Point Source Emission Summary

ID	Description	X	Y	Elevation (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Temperature (K)	NO _x (g/s)	RSP (g/s)	FSP (g/s)	Operating Hours	Note
BC	Biochar Plant	810773.7	825590.0	6.8	13	0.3	20	433	0.1700	0.01417	0.01417	24 hours	1
G1	Green Island Cement	810021.8	825547.4	7	17.2	1.95	6.5	ambient	-	0.1794	0.1794	24 hours	2
G2	Green Island Cement	810032.1	825542.4	7	17.2	1.95	6.5	ambient	-	0.1794	0.1794	24 hours	2
G3	Green Island Cement	810088.4	825511.2	7	16	0.44	16.8	ambient	-	0.0239	0.0239	24 hours	2
G4	Green Island Cement	810187.9	825609.7	7	30	0.6	18.1	ambient	-	0.0481	0.0481	24 hours	2
G5	Green Island Cement	810142.3	825556.0	7	32	0.67	14.9	ambient	-	0.0481	0.0481	24 hours	2
G6	Green Island Cement	810188.5	825602.5	7	39.1	0.75	21.4	ambient	-	0.0869	0.0869	24 hours	2
G7	Green Island Cement	810175.4	825610.7	7	32.8	0.34	17.9	ambient	-	0.0153	0.0153	24 hours	2
G8	Green Island Cement	810193.5	825587.0	7	17.6	0.39	10.6	ambient	-	0.0119	0.0119	24 hours	2
G9	Green Island Cement	810171.7	825752.4	7	59.8	0.58	19.2	343	-	0.0397	0.0397	24 hours	2
G10	Green Island Cement	810168.4	825764.6	7	17	0.22	13.6	343	-	0.0042	0.0042	24 hours	2
G11	Green Island Cement	810369.3	825839.0	7	24.5	0.34	21.9	ambient	-	0.0181	0.0181	24 hours	2
G12	Green Island Cement	810373.4	825838.0	7	39.2	0.39	19.9	ambient	-	0.0225	0.0225	24 hours	2
G13	Green Island Cement	810369.2	825864.0	7	61.1	0.34	17.3	ambient	-	0.0144	0.0144	24 hours	2
G14	Green Island Cement	810344.1	825880.2	7	61.1	0.6	20.8	ambient	-	0.0547	0.0547	24 hours	2
G15	Green Island Cement	810413.4	825873.1	7	24.5	0.86	34.3	366	-	0.1492	0.1492	24 hours	2
G16	Green Island Cement	810372.9	825862.8	7	34.4	0.6	24	366	-	0.0506	0.0506	24 hours	2
G17	Green Island Cement	810389.9	825914.8	7	25.5	0.86	34.3	366	-	0.1492	0.1492	24 hours	2
G18	Green Island Cement	810366.7	825873.4	7	34.4	0.6	22.8	366	-	0.0481	0.0481	24 hours	2
G19	Green Island Cement	810364.4	825877.3	7	25.5	0.21	20.6	343	-	0.0061	0.0061	24 hours	2
G20	Green Island Cement	810388.9	825914.2	7	24.5	0.86	34.3	366	-	0.1492	0.1492	24 hours	2
G21	Green Island Cement	810356.1	825891.6	7	34.4	0.6	22.8	366	-	0.0481	0.0481	24 hours	2
G22	Green Island Cement	810213.0	825975.3	7	85.7	0.68	22.7	333	-	0.0678	0.0678	24 hours	2
G23	Green Island Cement	810220.6	825966.7	7	85.7	0.68	19.6	333	-	0.0583	0.0583	24 hours	2
G24	Green Island Cement	810203.8	825973.9	7	85.7	0.68	19.6	333	-	0.0583	0.0583	24 hours	2
G25	Green Island Cement	810212.5	825950.6	7	85.7	0.68	19.6	333	-	0.0583	0.0583	24 hours	2
G26	Green Island Cement	810202.5	825971.4	7	85.7	0.41	18.2	333	-	0.0194	0.0194	24 hours	2
G27	Green Island Cement	810232.2	825930.9	7	30.3	0.6	18.4	333	-	0.0375	0.0375	24 hours	2
G28	Green Island Cement	810216.2	825921.7	7	30.3	0.6	18.4	333	-	0.0375	0.0375	24 hours	2
G29	Green Island Cement	810192.2	825962.5	7	13	0.54	10.3	333	-	0.0194	0.0194	24 hours	2
G30	Green Island Cement	810195.2	825957.4	7	13	0.54	10.3	333	-	0.0194	0.0194	24 hours	2
G31	Green Island Cement	810198.3	825951.9	7	13	0.54	19.4	333	-	0.0369	0.0369	24 hours	2
G32	Green Island Cement	810201.2	825947.0	7	13	0.54	19.4	333	-	0.0369	0.0369	24 hours	2
G33	Green Island Cement	809940.1	825669.1	7	16.9	0.33	20.7	333	-	0.0147	0.0147	24 hours	2
G34	Green Island Cement	809935.3	825692.2	7	29	0.54	18.7	333	-	0.0356	0.0356	24 hours	2
G35	Green Island Cement	810223.6	825926.0	7	30.2	0.6	19.2	333	-	0.0453	0.0453	24 hours	2
G36	Green Island Cement	810359.9	825885.2	7	20	0.42	11.7	366	-	0.0119	0.0119	24 hours	2
G39	Green Island Cement	810150.8	825630.4	7	28.6	0.36	16.8	ambient	-	0.0153	0.0153	24 hours	2
G40	Green Island Cement	810244.9	825722.8	7	57.6	0.29	17.6	ambient	-	0.0111	0.0111	24 hours	2
G41	Green Island Cement	810228.0	825742.9	7	40.3	0.56	19.9	343	-	0.0386	0.0386	24 hours	2
G42	Green Island Cement	810192.1	825701.2	7	45.7	0.61	17.9	343	-	0.0414	0.0414	24 hours	2
G43	Green Island Cement	810175.5	825730.0	7	53.3	0.45	18.3	343	-	0.0231	0.0231	24 hours	2
G44	Green Island Cement	810198.8	825745.2	7	53.8	0.76	18.1	343	-	0.0647	0.0647	24 hours	2
G45	Green Island Cement	810189.3	825704.2	7	35.5	0.26	19.1	343	-	0.0081	0.0081	24 hours	2
G47	Green Island Cement	810198.0	825722.5	7	19.5	0.5	18	343	-	0.0278	0.0278	24 hours	2
G48	Green Island Cement	810131.3	825558.0	7	17.4	0.59	14.4	ambient	-	0.0358	0.0358	24 hours	2
G50	Green Island Cement	810209.8	825977.3	7	24.7	0.29	9.3	343	-	0.0047	0.0047	24 hours	2
G51	Green Island Cement	810371.3	825809.0	7	26.4	1.2	13	ambient	-	0.1358	0.1358	24 hours	2
G52	Green Island Cement	810374.8	825838.8	7	30.9	0.7	10.1	ambient	-	0.0358	0.0358	24 hours	2
G56	Green Island Cement	810249.8	825775.5	7	72.2	1.6	5	338	-	0.0808	0.0808	24 hours	2
G57	Green Island Cement	810324.8	825844.4	7	31.2	1.59	26.9	561	-	0.3444	0.3444	24 hours	2
G58	Green Island Cement	810254.7	825771.9	7	113	3.1	20.6	383	111.7	5.5833	5.5833	24 hours	2

Appendix A-2 Point Source Emission Summary

ID	Description	X	Y	Elevation (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Temperature (K)	NO _x (g/s)	RSP (g/s)	FSP (g/s)	Operating Hours	Note
G60	Green Island Cement	810228.2	825768.7	7	113	1.19	14	338	-	0.1314	0.1314	24 hours	2
G61	Green Island Cement	810227.3	825940.6	7	32	0.8	13.3	ambient	-	0.0614	0.0614	24 hours	2
G62	Green Island Cement	809945.8	825584.7	7	17.2	1.95	6.5	ambient	-	0.1794	0.1794	24 hours	2
G63	Green Island Cement	809935.5	825589.8	7	17.2	1.95	6.5	ambient	-	0.1794	0.1794	24 hours	2
G66	Green Island Cement	810374.5	825853.2	7	63	0.57	14.2	ambient	-	0.0306	0.0306	24 hours	2
G67	Green Island Cement	810166.7	825747.9	7	27.8	0.6	12.7	343	-	0.0228	0.0228	24 hours	2
G68	Green Island Cement	810165.5	825695.2	7	29.8	0.6	12.7	343	-	0.0228	0.0228	24 hours	2
G69	Green Island Cement	810332.9	825821.6	7	15.5	0.28	30.3	383	-	0.0925	0.0925	24 hours	2
G70	Green Island Cement	809945.8	825703.8	7	25.9	0.6	10.5	333	-	0.0589	0.0589	24 hours	2
G71	Green Island Cement	809932.9	825674.1	7	24.2	0.6	5.3	333	-	0.0122	0.0122	24 hours	2
G72	Green Island Cement	810237.3	825945.6	7	16.9	0.6	13.8	333	-	0.0319	0.0319	24 hours	2
G73	Green Island Cement	810351.9	825859.6	7	78.8	1.85	2.3	363	-	0.0439	0.0439	24 hours	2
G75	Green Island Cement	810029.4	825616.1	7	2.9	0.23	39.7	333	-	0.0089	0.0089	24 hours	2
WEEE	EcoPark WEEE	810983.0	825412.0	5	13.2	0.15	7.19	463	0.0296	0.0025	0.0025	24 hours	3
SSK	EcoPark SSK	810768.0	825253.0	6	30	1.8	16.9	353	0.99	0.0340	0.0340	07:00-19:00	2
SW1	Shiu Wing Steel Mill	810243.3	825593.1	5	50	6.2	15.2	367	17.1	3.4194	3.4194	24 hours	2
SW2	Shiu Wing Steel Mill	810297.4	825653.9	5	35	2.6	15.7	325	0.4556	0.7000	0.7000	24 hours	2
SW3	Shiu Wing Steel Mill	810309.5	825446.3	5	50	1.85	10.3	813	3.717	0.4639	0.4639	24 hours	2
SW4	Shiu Wing Steel Mill	810270.3	825626.3	5	16	0.339	10.8	303	-	0.0088	0.0088	24 hours	2
SW5	Shiu Wing Steel Mill	810293.4	825601.8	5	16	0.339	5.9	303	-	0.0047	0.0047	24 hours	2
SW6	Shiu Wing Steel Mill	810336.7	825692.5	5	7	0.16	14.9	753	0.7194	0.0511	0.0511	24 hours	2
KW1	EcoPark K Wah	810880.6	825301.2	5	18	0.25	12.2	298	-	0.0061	0.0061	07:00-19:00	2
KW2	EcoPark K Wah	810890.4	825301.0	5	18	0.25	12.2	298	-	0.0061	0.0061	07:00-19:00	2
KW3	EcoPark K Wah	810894.6	825297.3	5	18	0.25	12.2	298	-	0.0061	0.0061	07:00-19:00	2
KW11	EcoPark K Wah	810883.8	825295.6	5	9.4	0.35	4.3	298	-	0.0042	0.0042	24 hours	2
KW12	EcoPark K Wah	810886.8	825293.1	5	9.4	0.35	4.3	298	-	0.0042	0.0042	24 hours	2
KW16	EcoPark K Wah	810929.3	825294.6	5	2.5	0.3	17.3	298	-	0.0122	0.0122	24 hours	2
TMFB Gen1	TMFB C&DMSF Generator	811165.8	824903.1	5	1.5	0.075	56.6	362	0.444	0.0222	0.0222	08:00-20:00	3
TMFB Gen2	TMFB C&DMCF	811192.7	825061.7	15	1.9	0.1	30.8	773	0.187	0.00933	0.00933	07:00-23:00	3

Notes:

1. Emission parameters refers to Appendix B1
2. Emission parameters reference from corresponding SP license
3. Emission parameters referenced from <https://www.epd.gov.hk/eia/register/english/permit/vep5772020/documents/SAAQIAR/pdf/SAAQIAR.pdf>

Appendix A-3 Area Source Emission Summary

ID	Description	X	Y	Elevation (m)	Emission Height (m)	X-length	Y-length	Angle	NO _x (g/sec-m ²)	RSP (g/sec-m ²)		FSP (g/sec-m ²)		Operating hour	Note
										Working Hours	Non-Working Hours/Nighttime Working Hours	Working Hours	Non-Working Hours/Nighttime Working Hours		
KW4	EcoPark_K_Wah	810919.8	825269.8	5	5.5	4.8	25	38.1	-	2.16E-05	1.08E-05	6.68E-06	3.34E-06	07:00-19:00 (100%) 19:00-07:00 (50%)	1
KW5	EcoPark_K_Wah	810926.5	825297.1	5	3	2.3	3.6	38.1	-	3.14E-06	1.57E-06	1.02E-06	5.10E-07	07:00-19:00 (100%) 19:00-07:00 (50%)	1
KW8	EcoPark_K_Wah	810901.0	825323.0	5	0	4.3	11.3	38.1	-	2.26E-05	1.13E-05	6.17E-06	3.09E-06	07:00-19:00 (100%) 19:00-07:00 (50%)	1
KW9	EcoPark_K_Wah	810910.9	825314.7	5	0	13	18.5	38.1	-	1.75E-05	8.75E-06	5.41E-06	2.71E-06	07:00-19:00 (100%) 19:00-07:00 (50%)	1
KW10_1	EcoPark_K_Wah	810854.0	825319.0	5	3.5	3.5	26.3	68.7	-	8.04E-06	2.41E-06	1.94E-06	5.82E-07	07:00-19:00 (100%) 19:00-07:00 (30%)	1
KW10_2	EcoPark_K_Wah	810877.9	825325.2	5	50	50	3.5	37.8	-	8.04E-06	2.41E-06	1.94E-06	5.82E-07	07:00-19:00 (100%) 19:00-07:00 (30%)	1
KW13	EcoPark_K_Wah	810927.5	825301.0	5	0	13.3	5.3	38.14	-	1.19E-04	5.95E-05	1.80E-05	9.00E-06	07:00-19:00 (100%) 19:00-07:00 (50%)	1
KW14	EcoPark_K_Wah	810933.8	825304.8	5	0	13.3	5.3	38.14	-	1.19E-04	5.95E-05	1.80E-05	9.00E-06	07:00-19:00 (100%) 19:00-07:00 (50%)	1
KW15	EcoPark_K_Wah	810926.5	825286.5	5	3	3	3	38.1	-	3.53E-04	1.77E-04	1.09E-04	5.45E-05	07:00-19:00 (100%) 19:00-07:00 (50%)	1
TMFB_A003	TMFB_Wind_erosion	811092.5	824888.4	5	0.5	78.6	169.5	33.45	-	1.27E-06	1.27E-06	1.93E-07	1.93E-07	24 hours	2
TMFB_SP3a	TMFB_Material_Handling	811069.7	825108.6	5	20	10	10	0	-	4.96E-05	-	7.52E-06	-	08:30-19:00	2
TMFB_SP3b	TMFB_Material_Handling	811046.5	825108.2	5	0.5	10	10	0	-	2.63E-05	2.63E-05	3.98E-06	3.98E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_SP3c	TMFB_Material_Handling	811232.8	825217.3	5	30	10	10	0	-	3.82E-07	-	5.78E-08	-	08:30-19:00	2
TMFB_SP3d	TMFB_Material_Handling	810991.5	825201.1	5	0.5	10	10	0	-	1.60E-05	1.60E-05	2.43E-06	2.43E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_SP3e	TMFB_Material_Handling	811217.6	825200.0	5	15	10	10	90	-	1.40E-06	-	2.12E-07	-	07:00-23:00	2
TMFB_SP3f	TMFB_Material_Handling	811065.3	824990.6	5	10	10	10	90	-	1.40E-06	-	2.12E-07	-	07:00-23:00	2
TMFB_C&DMSF_S	TMFB_Material_Handling	811165.8	824903.1	5	5	10	10	0	-	6.00E-05	-	4.05E-06	-	08:00-20:00	2
TMFB_C&DMSF_H	TMFB_Material_Handling	811165.8	824903.1	5	0.5	10	10	0	-	1.64E-06	-	2.48E-07	-	08:00-20:00	2
TMFB_NSA_S	TMFB_Material_Screening	810860.3	825087.9	5	5	10	10	0	-	5.88E-04	5.88E-04	3.97E-05	3.97E-05	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_NSA_H	TMFB_Material_Handling	810860.3	825087.9	5	0.5	10	10	0	-	1.60E-05	1.60E-05	2.43E-06	2.43E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_C&DMCF_C	TMFB_Material_Crushing	811192.7	825061.7	5	10	10	10	90	-	7.50E-05	-	1.39E-05	-	07:00-23:00	2
TMFB_C&DMCF_H	TMFB_Material_Handling	811192.7	825061.7	5	10	10	10	90	-	2.80E-06	-	4.25E-07	-	07:00-23:00	2
TMFB_IB1	TMFB_Material_Handling	810853.6	824979.3	5	0.5	10	10	124.37	-	3.50E-06	-	5.31E-07	-	07:00-23:00	2
TMFB_IB2	TMFB_Material_Handling	810989.7	824887.2	5	0.5	10	10	124.37	-	3.50E-06	-	5.31E-07	-	07:00-23:00	2

Appendix A-3 Area Source Emission Summary

ID	Description	X	Y	Elevation (m)	Emission Height (m)	X-length	Y-length	Angle	NO _x (g/sec-m ²)	RSP (g/sec-m ²)		FSP (g/sec-m ²)		Operating hour	Note
										Working Hours	Non-Working Hours/Nighttime Working Hours	Working Hours	Non-Working Hours/Nighttime Working Hours		
TMFB_B1	TMFB_Material_Handling	811057.5	824841.8	5	0.5	10	10	124.37	-	1.45E-05	1.31E-05	2.20E-06	1.99E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_B2	TMFB_Material_Handling	810921.9	824932.6	5	0.5	10	10	124.37	-	1.45E-05	1.31E-05	2.20E-06	1.99E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_B3	TMFB_Material_Handling	810785.3	825025.9	5	0.5	10	10	124.37	-	1.60E-05	1.60E-05	2.43E-06	2.43E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_R1	TMFB_Road_Dust	811291.1	825571.1	5	0.5	8	67.67	65	-	2.69E-05	-	6.51E-06	-	08:30-19:00	2
TMFB_R2	TMFB_Road_Dust	811183.1	825621.3	5	0.5	8	122	114	-	2.69E-05	-	6.51E-06	-	08:30-19:00	2
TMFB_R3	TMFB_Road_Dust	811088.2	825614.2	5	0.5	8	93.05	85	-	2.69E-05	-	6.51E-06	-	08:30-19:00	2
TMFB_R4	TMFB_Road_Dust	811092.5	825610.7	5	0.5	8	149	174	-	2.69E-05	-	6.51E-06	-	08:30-19:00	2
TMFB_R5	TMFB_Road_Dust	811105.7	825466.1	5	10	8	123.1	120.7802	-	2.69E-05	-	6.51E-06	-	08:30-19:00	2
TMFB_R6	TMFB_Road_Dust	811111.3	825207.1	5	20	8	216.7	25.9608	-	2.69E-05	-	6.51E-06	-	08:30-19:00	2
TMFB_R7	TMFB_Road_Dust	811069.3	825120.8	5	20	8	96.33	25.9608	-	2.67E-05	-	6.46E-06	-	08:30-19:00	2
TMFB_R8	TMFB_Road_Dust	810950.4	824972.6	5	0.5	8	173.14	35	-	1.39E-05	1.39E-05	3.37E-06	3.37E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_R9	TMFB_Road_Dust	811116.0	825209.2	5	30	8	131.7	105.9422	-	2.02E-07	-	4.90E-08	-	08:30-19:00	2
TMFB_R11	TMFB_Road_Dust	810897.5	825096.4	5	0.5	8	140.4686	38	-	8.50E-06	8.50E-06	2.06E-06	2.06E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_R14	TMFB_Road_Dust	810922.7	824932.1	5	0.5	8	49.07642	35	-	7.82E-06	6.97E-06	1.89E-06	1.69E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_R15	TMFB_Road_Dust	811058.3	824841.3	5	0.5	8	50.3578	35	-	7.82E-06	6.97E-06	1.89E-06	1.69E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_R17	TMFB_Road_Dust	810955.9	824973.7	5	0.5	8	163.201	123	-	7.82E-06	6.97E-06	1.89E-06	1.69E-06	07:00-23:00 (daytime) 23:00-07:00 (nighttime)	2
TMFB_R18	TMFB_Road_Dust	811229.2	825194.0	5	10	8	41.87426	114.5278	-	8.50E-07	-	2.06E-07	-	07:00-23:00	2
TMFB_R19	TMFB_Road_Dust	811194.5	825059.0	5	5	8	134.2315	30.1578	-	8.50E-07	-	2.06E-07	-	07:00-23:00	2
TMFB_R20	TMFB_Road_Dust	811077.2	824983.7	5	5	8	49.95577	122.0265	-	8.50E-07	-	2.06E-07	-	07:00-23:00	2
TMFB_R21	TMFB_Road_Dust	811114.1	824956.0	5	5	8	127.2184	33.4836	-	8.50E-07	-	2.06E-07	-	07:00-23:00	2
TMFB_R22	TMFB_Road_Dust	811077.2	824889.1	5	0.5	8	206.7675	34.6216	-	1.70E-06	-	4.11E-07	-	07:00-23:00	2
TMFB_R25	TMFB_Road_Dust	811175.0	824926.1	5	0.5	8	64.56	27	-	1.77E-06	-	4.28E-07	-	08:00-20:00	2
TMFB_R26	TMFB_Road_Dust	811210.1	824984.9	5	0.5	8	38.37	117	-	1.77E-06	-	4.28E-07	-	08:00-20:00	2
TMFB_R27	TMFB_Road_Dust	811238.6	824965.2	5	0.5	8	291	22	-	1.77E-06	-	4.28E-07	-	08:00-20:00	2
TMFB_R28	TMFB_Road_Dust	811349.8	825234.0	5	0.5	8	355.3	22	-	1.77E-06	-	4.28E-07	-	08:00-20:00	2

Notes:

1. Emission parameters reference from corresponding SP license
2. Emission parameters referenced from <https://www.epd.gov.hk/eia/register/english/permit/vep5772020/documents/SAAQIAR/pdf/SAAQIAR.pdf>

Appendix A Emission Inventory

Appendix A-4 Polygon Source Emission Summary

ID	Description	X	Y	Elevation (m)	Stack Height (m)	NO _x (g/sec-m ²)	RSP (g/sec-m ²)		FSP (g/sec-m ²)		Operating hour
							Working Hours	Non-Working Hours/Nighttime Working Hours	Working Hours	Non-Working Hours/Nighttime Working Hours	
TMFB_A001	TMFB_Wind_Erosion	811209.5	825399.6	5	15	-	1.06E-07	1.27E-06	1.60E-08	1.93E-07	08:00-19:00
		811114.9	825205.4								
		811241.7	825169.2								
		811195.4	825072.0								
		811075.5	824890.2								
		811052.9	824902.7								
		810815.3	825064.7								
		810945.7	825233.7								
TMFB_A002	TMFB_Wind_Erosion	811137.1	825442.7	5	15	-	1.06E-07	1.27E-06	1.60E-08	1.93E-07	0800-1900
		811362.8	825421.5								
		811241.7	825169.2								
		811114.9	825205.4								
		811209.5	825399.6								
		811137.1	825442.7								
		811207.0	825494.2								

Notes:

Emission parameters referenced from <https://www.epd.gov.hk/eia/register/english/permit/vep5772020/documents/SAAQIAR/pdf/SAAQIAR.pdf>

Appendix A Emission Inventory

Appendix A-5 Emission inventory of Castle Peak Power Station (far-field emission source for the estimation of Tier 3 Background contributions)

Parameters		Value	Unit	Remarks
Annual Emission	RSP	246	Mt/year	Seventh Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences ^[1]
	FSP	246	Mt/year	
	NOx	9237	Mt/year	
Emission rate at exhaust	RSP	3.9003	g/s	Assume CPA and CPB share of the annual emission evenly
	FSP	3.9003	g/s	
	NOx	146.4517	g/s	

Remarks: Nox

[1] Seventh Technical Memorandum for Allocation of Emission Allowances In Respect of Specified Licences <https://www.gld.gov.hk/egazette/pdf/20172141/es5201721412.pdf>

ID	Description	X	Y	Elevation (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Temperature (K)	NO _x (g/s)	RSP (g/s)	FSP (g/s)	Operating Hours
CPA	Castle Peak Power Station	809780.3	826410.2	7.4	215	10.8	17	383	146.4517	3.9003	3.9003	24 hours
CPB	Castle Peak Power Station	809975.8	826085.4	7.4	250	13.2	17	383	146.4517	3.9003	3.9003	24 hours



Appendix B Roads configuration and Traffic emission data

Appendix B Roads Configuration and Traffic Emission Data

Segment No.	Starting Co		Width	Base Elevation	Height of Road from Ground	Model Height (a)	Ending Co		Road type (c)
	X-co	Y-co					X-co	Y-co	
S1	810380.3	826050.5	15.3	16.8	0.0	10.0	810566.1	825736.7	1
S2	810566.1	825736.7	15.3	16.8	0.0	10.0	810666.1	825674.9	1
S3	810566.1	825736.7	14.7	16.8	0.0	10.0	810561.5	825711.1	1
S4	810561.5	825711.1	17.2	10.7	0.0	5.7	810593.1	825678.5	1
S5	810593.1	825678.5	17.2	10.7	0.0	5.7	810638.7	825642.1	1
S6	810638.7	825642.1	17.3	7.1	0.0	2.1	810666.1	825674.9	1
S7	810593.1	825678.5	16.3	10.7	0.0	5.7	810555.7	825623.9	1
S8	810555.7	825623.9	16.3	10.7	0.0	5.7	810418.1	825454.3	1
S9	810666.1	825674.9	21.8	6.9	0.0	1.9	810874.4	825651.2	1
S10	810418.1	825454.3	25.1	6.5	0.0	1.5	810872.3	825515.9	1
S11	810872.3	825515.9	19.0	6.1	0.0	1.1	810675.0	825270.3	1
S12	810874.4	825651.2	22.1	7.7	0.0	2.7	810867.0	825744.0	1
S13	810867.0	825744.0	15.2	8.5	0.0	3.5	810950.8	825786.9	1
S14	810950.8	825786.9	12.9	9.1	0.0	4.1	810916.5	825859.8	1
S15	810916.5	825859.8	12.4	17.5	0.0	10.0	810946.0	826040.8	1
S16	810946.0	826040.8	12.2	23.1	0.0	10.0	810939.2	826093.9	1
S17	810950.8	825786.9	13.3	12.4	0.0	7.4	811051.3	825800.3	1
S18	811051.3	825800.3	13.3	14.8	0.0	9.8	811207.6	825773.5	1
S19	811207.6	825773.5	13.5	15.0	0.0	10.0	811275.9	825748.4	1
S20	810874.4	825651.2	20.2	6.8	0.0	1.8	811113.5	825689.6	1
S21	811113.5	825689.6	13.4	7.1	0.0	2.1	811234.7	825684.3	1
S22	811234.7	825684.3	13.4	7.4	0.0	2.4	811297.3	825662.5	1
S23	810984.8	825206.5	8.0	5.0	8.5	8.5	810900.7	825094.0	1
S24	811094.3	825163.5	14.0	5.0	20.0	10.0	811114.9	825205.4	3
S25	811114.9	825205.4	14.0	5.0	30.0	10.0	811134.9	825199.1	1
S26	811114.9	825205.4	14.0	5.0	20.0	10.0	811209.5	825399.6	1
S27	811209.5	825399.6	14.0	5.0	10.0	10.0	811103.7	825462.6	1
S28	811103.7	825462.6	8.0	5.0	5.0	5.0	811088.5	825610.3	3
S29	811088.5	825610.3	14.0	5.0	0.0	0.0	811181.4	825617.6	1
S30	811181.4	825617.6	14.0	5.0	0.0	0.0	811292.7	825567.5	1
S31	811292.7	825567.5	14.0	5.0	0.0	0.0	811305.8	825573.9	1

- (a)The lowest road elevation is 5m. All road heights were subtracted by 5m for input in the model such that the lowest road elevation is 0m. For road heights that were greater than 10m, they were inputted as 10m due to model limitation as a conservative assessment. The elevations of ASRs were subtracted by 5m as well for input in the model to ensure consistency.
- (b)A 5m vertical barrier is proposed to be erected along the west side of R4 and R11. In order to model the effect of the presence of the physical barrier, the road height of S24 and S28 was increased by 5m assuming the emissions would be at the top of the barrier and that the road type is set to "fill". 6m mixing distance not included.
- (c)According to the CALINE4 user guide, road type “1” stands for at-grade road; road type “3” stands for fill road.

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	00:00-01:00					01:00-02:00					02:00-03:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	28	2.70	3.15	0.10	0.10	17	2.09	2.40	0.07	0.07	17	2.10	2.42	0.06	0.07
S2	28	2.70	3.15	0.10	0.10	17	2.09	2.40	0.07	0.07	17	2.10	2.42	0.06	0.07
S3	5	0.55	0.59	0.01	0.01	2	0.90	0.99	0.02	0.02	2	0.43	0.44	0.00	0.00
S4	7	0.57	0.60	0.01	0.01	4	0.74	0.79	0.01	0.01	2	0.48	0.49	0.00	0.00
S5	7	0.57	0.60	0.01	0.01	4	0.74	0.79	0.01	0.01	2	0.48	0.49	0.00	0.00
S6	7	0.57	0.60	0.01	0.01	4	0.74	0.79	0.01	0.01	2	0.48	0.49	0.00	0.00
S7	2	0.44	0.45	0.00	0.00	2	0.44	0.45	0.00	0.00	0	0.00	0.00	0.00	0.00
S8	2	0.44	0.45	0.00	0.00	2	0.44	0.45	0.00	0.00	0	0.00	0.00	0.00	0.00
S9	35	2.26	2.62	0.08	0.08	21	1.81	2.07	0.05	0.06	19	1.93	2.21	0.06	0.06
S10	5	0.25	0.25	0.01	0.01	4	0.29	0.30	0.00	0.01	4	0.51	0.52	0.00	0.00
S11	5	0.25	0.25	0.01	0.01	4	0.29	0.30	0.00	0.01	4	0.51	0.52	0.00	0.00
S12	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S13	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S14	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S15	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S16	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S17	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S18	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S19	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S20	40	2.00	2.32	0.07	0.07	25	1.56	1.78	0.05	0.05	23	1.66	1.90	0.05	0.05
S21	40	2.00	2.32	0.07	0.07	25	1.56	1.78	0.05	0.05	23	1.66	1.90	0.05	0.05
S22	40	2.00	2.32	0.07	0.07	25	1.56	1.78	0.05	0.05	23	1.66	1.90	0.05	0.05
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S25	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S26	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S27	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S28	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S29	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S30	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S31	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	03:00-0400					04:00-05:00					05:00-06:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	15	2.17	2.54	0.07	0.07	17	1.87	2.16	0.06	0.06	33	1.56	1.81	0.04	0.05
S2	15	2.17	2.54	0.07	0.07	17	1.87	2.16	0.06	0.06	33	1.56	1.81	0.04	0.05
S3	2	0.90	0.99	0.02	0.02	0	0.00	0.00	0.00	0.00	3	0.62	0.68	0.01	0.01
S4	2	1.01	1.10	0.02	0.02	0	0.00	0.00	0.00	0.00	4	0.54	0.59	0.01	0.01
S5	2	1.01	1.10	0.02	0.02	0	0.00	0.00	0.00	0.00	4	0.54	0.59	0.01	0.01
S6	2	1.01	1.10	0.02	0.02	0	0.00	0.00	0.00	0.00	4	0.54	0.59	0.01	0.01
S7	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	1	0.06	0.07	0.00	0.00
S8	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	1	0.06	0.07	0.00	0.00
S9	17	2.01	2.35	0.06	0.07	17	1.87	2.16	0.06	0.06	37	1.44	1.67	0.04	0.04
S10	4	0.29	0.30	0.00	0.01	4	0.29	0.30	0.00	0.01	7	1.08	1.24	0.03	0.03
S11	4	0.29	0.30	0.00	0.01	4	0.29	0.30	0.00	0.01	7	1.08	1.24	0.03	0.03
S12	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S13	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S14	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S15	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S16	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S17	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S18	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S19	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S20	21	1.67	1.95	0.05	0.05	21	1.56	1.80	0.05	0.05	44	1.34	1.56	0.04	0.04
S21	21	1.67	1.95	0.05	0.05	21	1.56	1.80	0.05	0.05	44	1.34	1.56	0.04	0.04
S22	21	1.67	1.95	0.05	0.05	21	1.56	1.80	0.05	0.05	44	1.34	1.56	0.04	0.04
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S25	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S26	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S27	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S28	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S29	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S30	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S31	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	06:00-07:00					07:00-08:00					08:00-09:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	54	1.76	2.03	0.05	0.06	158	1.23	1.37	0.04	0.04	426	2.46	3.02	0.08	0.08
S2	54	1.76	2.03	0.05	0.06	158	1.23	1.37	0.04	0.04	426	2.46	3.02	0.08	0.08
S3	19	1.17	1.36	0.03	0.03	46	1.55	1.81	0.04	0.05	114	2.15	2.54	0.07	0.07
S4	31	1.46	1.68	0.04	0.04	70	1.83	2.14	0.05	0.06	169	2.60	3.07	0.08	0.09
S5	31	1.46	1.68	0.04	0.04	70	1.83	2.14	0.05	0.06	169	2.60	3.07	0.08	0.09
S6	31	1.46	1.68	0.04	0.04	70	1.83	2.14	0.05	0.06	169	2.60	3.07	0.08	0.09
S7	12	1.42	1.62	0.04	0.04	24	1.53	1.81	0.04	0.05	55	2.20	2.60	0.07	0.08
S8	12	1.42	1.62	0.04	0.04	24	1.53	1.81	0.04	0.05	55	2.20	2.60	0.07	0.08
S9	85	1.55	1.79	0.04	0.05	228	1.39	1.59	0.04	0.04	595	2.49	3.02	0.08	0.08
S10	10	1.18	1.34	0.03	0.03	35	2.10	2.41	0.06	0.07	88	3.29	3.75	0.11	0.12
S11	10	1.18	1.34	0.03	0.03	35	2.10	2.41	0.06	0.07	88	3.29	3.75	0.11	0.12
S12	2	0.47	0.48	0.00	0.00	23	2.74	3.33	0.09	0.10	58	2.53	3.04	0.08	0.09
S13	2	0.47	0.48	0.00	0.00	23	2.74	3.33	0.09	0.10	58	2.53	3.04	0.08	0.09
S14	0	0.00	0.00	0.00	0.00	2	3.60	4.35	0.12	0.13	11	2.14	2.55	0.06	0.07
S15	0	0.00	0.00	0.00	0.00	2	3.60	4.35	0.12	0.13	11	2.14	2.55	0.06	0.07
S16	0	0.00	0.00	0.00	0.00	2	3.60	4.35	0.12	0.13	11	2.14	2.55	0.06	0.07
S17	2	0.46	0.47	0.00	0.00	21	2.59	3.15	0.08	0.09	47	2.55	3.06	0.08	0.09
S18	2	0.46	0.47	0.00	0.00	21	2.59	3.15	0.08	0.09	47	2.55	3.06	0.08	0.09
S19	2	0.46	0.47	0.00	0.00	21	2.59	3.15	0.08	0.09	47	2.55	3.06	0.08	0.09
S20	97	1.46	1.68	0.04	0.04	286	1.58	1.82	0.05	0.05	741	2.58	3.10	0.08	0.09
S21	97	1.46	1.68	0.04	0.04	286	1.58	1.82	0.05	0.05	741	2.58	3.10	0.08	0.09
S22	97	1.46	1.68	0.04	0.04	286	1.58	1.82	0.05	0.05	741	2.58	3.10	0.08	0.09
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	137	11.72	13.28	0.45	0.49
S25	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	2	12.76	14.21	0.49	0.53
S26	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	139	11.73	13.30	0.45	0.49
S27	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	139	11.73	13.30	0.45	0.49
S28	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	139	11.73	13.30	0.45	0.49
S29	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	139	11.73	13.30	0.45	0.49
S30	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	139	11.73	13.30	0.45	0.49
S31	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	139	11.73	13.30	0.45	0.49

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	09:00-10:00					10:00-11:00					11:00-12:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	500	2.56	3.16	0.08	0.09	602	2.14	2.62	0.06	0.07	597	1.78	2.18	0.05	0.06
S2	500	2.56	3.16	0.08	0.09	602	2.14	2.62	0.06	0.07	597	1.78	2.18	0.05	0.06
S3	125	2.17	2.57	0.07	0.07	58	2.48	2.97	0.08	0.09	50	2.38	2.85	0.08	0.08
S4	184	2.62	3.09	0.08	0.09	118	2.44	2.90	0.08	0.08	103	2.39	2.85	0.07	0.08
S5	184	2.62	3.09	0.08	0.09	118	2.44	2.90	0.08	0.08	103	2.39	2.85	0.07	0.08
S6	184	2.62	3.09	0.08	0.09	118	2.44	2.90	0.08	0.08	103	2.39	2.85	0.07	0.08
S7	59	2.20	2.60	0.07	0.08	60	1.62	1.91	0.05	0.05	53	1.65	1.94	0.05	0.05
S8	59	2.20	2.60	0.07	0.08	60	1.62	1.91	0.05	0.05	53	1.65	1.94	0.05	0.05
S9	684	2.57	3.13	0.08	0.09	720	2.19	2.67	0.07	0.07	700	1.82	2.22	0.05	0.06
S10	94	3.36	3.83	0.12	0.13	76	2.75	3.13	0.09	0.10	72	2.77	3.16	0.09	0.10
S11	94	3.36	3.83	0.12	0.13	76	2.75	3.13	0.09	0.10	72	2.77	3.16	0.09	0.10
S12	67	2.43	2.93	0.08	0.08	36	2.34	2.86	0.07	0.08	29	2.61	3.17	0.08	0.09
S13	67	2.43	2.93	0.08	0.08	36	2.34	2.86	0.07	0.08	29	2.61	3.17	0.08	0.09
S14	12	1.99	2.41	0.06	0.07	5	1.45	1.88	0.04	0.04	5	2.15	2.65	0.06	0.07
S15	12	1.99	2.41	0.06	0.07	5	1.45	1.88	0.04	0.04	5	2.15	2.65	0.06	0.07
S16	12	1.99	2.41	0.06	0.07	5	1.45	1.88	0.04	0.04	5	2.15	2.65	0.06	0.07
S17	55	2.45	2.96	0.08	0.08	31	2.43	2.95	0.08	0.08	24	2.63	3.19	0.08	0.09
S18	55	2.45	2.96	0.08	0.08	31	2.43	2.95	0.08	0.08	24	2.63	3.19	0.08	0.09
S19	55	2.45	2.96	0.08	0.08	31	2.43	2.95	0.08	0.08	24	2.63	3.19	0.08	0.09
S20	845	2.63	3.18	0.08	0.09	832	2.25	2.72	0.07	0.08	801	1.89	2.28	0.06	0.06
S21	845	2.63	3.18	0.08	0.09	832	2.25	2.72	0.07	0.08	801	1.89	2.28	0.06	0.06
S22	845	2.63	3.18	0.08	0.09	832	2.25	2.72	0.07	0.08	801	1.89	2.28	0.06	0.06
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	288	11.72	13.29	0.45	0.49	270	11.75	13.32	0.45	0.49	250	11.72	13.29	0.45	0.49
S25	2	12.76	14.21	0.49	0.53	2	12.76	14.21	0.49	0.53	2	12.76	14.21	0.49	0.53
S26	290	11.73	13.29	0.45	0.49	272	11.76	13.32	0.45	0.49	252	11.73	13.30	0.45	0.49
S27	290	11.73	13.29	0.45	0.49	272	11.76	13.32	0.45	0.49	252	11.73	13.30	0.45	0.49
S28	290	11.73	13.29	0.45	0.49	272	11.76	13.32	0.45	0.49	252	11.73	13.30	0.45	0.49
S29	290	11.73	13.29	0.45	0.49	272	11.76	13.32	0.45	0.49	252	11.73	13.30	0.45	0.49
S30	290	11.73	13.29	0.45	0.49	272	11.76	13.32	0.45	0.49	252	11.73	13.30	0.45	0.49
S31	290	11.73	13.29	0.45	0.49	272	11.76	13.32	0.45	0.49	252	11.73	13.30	0.45	0.49

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	12:00-13:00					13:00-14:00					14:00-15:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	547	1.89	2.30	0.06	0.06	503	1.86	2.26	0.06	0.06	581	1.96	2.37	0.06	0.06
S2	547	1.89	2.30	0.06	0.06	503	1.86	2.26	0.06	0.06	581	1.96	2.37	0.06	0.06
S3	53	2.56	3.07	0.08	0.09	49	2.53	3.04	0.08	0.09	56	2.64	3.18	0.09	0.09
S4	102	2.51	2.99	0.08	0.09	97	2.49	2.97	0.08	0.09	112	2.51	2.99	0.08	0.09
S5	102	2.51	2.99	0.08	0.09	97	2.49	2.97	0.08	0.09	112	2.51	2.99	0.08	0.09
S6	102	2.51	2.99	0.08	0.09	97	2.49	2.97	0.08	0.09	112	2.51	2.99	0.08	0.09
S7	49	1.60	1.89	0.04	0.05	48	1.62	1.91	0.05	0.05	56	1.55	1.82	0.04	0.05
S8	49	1.60	1.89	0.04	0.05	48	1.62	1.91	0.05	0.05	56	1.55	1.82	0.04	0.05
S9	649	1.93	2.35	0.06	0.06	600	1.91	2.31	0.06	0.06	693	2.00	2.41	0.06	0.07
S10	67	2.79	3.17	0.09	0.10	64	2.74	3.12	0.09	0.10	74	2.74	3.13	0.09	0.10
S11	67	2.79	3.17	0.09	0.10	64	2.74	3.12	0.09	0.10	74	2.74	3.13	0.09	0.10
S12	28	2.56	3.13	0.08	0.09	29	2.50	3.06	0.08	0.08	36	2.34	2.86	0.07	0.08
S13	28	2.56	3.13	0.08	0.09	29	2.50	3.06	0.08	0.08	36	2.34	2.86	0.07	0.08
S14	4	1.79	2.33	0.04	0.05	5	1.60	2.03	0.03	0.04	5	1.45	1.88	0.04	0.04
S15	4	1.79	2.33	0.04	0.05	5	1.60	2.03	0.03	0.04	5	1.45	1.88	0.04	0.04
S16	4	1.79	2.33	0.04	0.05	5	1.60	2.03	0.03	0.04	5	1.45	1.88	0.04	0.04
S17	24	2.63	3.19	0.08	0.09	24	2.63	3.19	0.08	0.09	31	2.43	2.95	0.08	0.08
S18	24	2.63	3.19	0.08	0.09	24	2.63	3.19	0.08	0.09	31	2.43	2.95	0.08	0.08
S19	24	2.63	3.19	0.08	0.09	24	2.63	3.19	0.08	0.09	31	2.43	2.95	0.08	0.08
S20	744	1.98	2.39	0.06	0.07	693	1.96	2.36	0.06	0.06	803	2.04	2.45	0.06	0.07
S21	744	1.98	2.39	0.06	0.07	693	1.96	2.36	0.06	0.06	803	2.04	2.45	0.06	0.07
S22	744	1.98	2.39	0.06	0.07	693	1.96	2.36	0.06	0.06	803	2.04	2.45	0.06	0.07
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	242	11.75	13.31	0.45	0.49	216	11.75	13.32	0.45	0.49	262	11.72	13.29	0.45	0.49
S25	2	12.76	14.21	0.49	0.53	2	12.76	14.21	0.49	0.53	2	12.76	14.21	0.49	0.53
S26	244	11.76	13.32	0.45	0.49	218	11.76	13.32	0.45	0.49	264	11.73	13.30	0.45	0.49
S27	244	11.76	13.32	0.45	0.49	218	11.76	13.32	0.45	0.49	264	11.73	13.30	0.45	0.49
S28	244	11.76	13.32	0.45	0.49	218	11.76	13.32	0.45	0.49	264	11.73	13.30	0.45	0.49
S29	244	11.76	13.32	0.45	0.49	218	11.76	13.32	0.45	0.49	264	11.73	13.30	0.45	0.49
S30	244	11.76	13.32	0.45	0.49	218	11.76	13.32	0.45	0.49	264	11.73	13.30	0.45	0.49
S31	244	11.76	13.32	0.45	0.49	218	11.76	13.32	0.45	0.49	264	11.73	13.30	0.45	0.49

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	15:00-16:00					16:00-17:00					17:00-18:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	595	1.87	2.28	0.06	0.06	567	2.13	2.61	0.06	0.07	536	2.08	2.53	0.06	0.07
S2	595	1.87	2.28	0.06	0.06	567	2.13	2.61	0.06	0.07	536	2.08	2.53	0.06	0.07
S3	56	2.50	3.00	0.08	0.09	56	2.50	3.00	0.08	0.09	54	2.61	3.14	0.09	0.09
S4	109	2.50	2.97	0.08	0.09	109	2.54	3.03	0.08	0.09	110	2.52	3.00	0.08	0.09
S5	109	2.50	2.97	0.08	0.09	109	2.54	3.03	0.08	0.09	110	2.52	3.00	0.08	0.09
S6	109	2.50	2.97	0.08	0.09	109	2.54	3.03	0.08	0.09	110	2.52	3.00	0.08	0.09
S7	53	1.65	1.94	0.05	0.05	53	1.65	1.94	0.05	0.05	56	1.55	1.82	0.04	0.05
S8	53	1.65	1.94	0.05	0.05	53	1.65	1.94	0.05	0.05	56	1.55	1.82	0.04	0.05
S9	704	1.91	2.31	0.06	0.06	676	2.19	2.66	0.07	0.07	646	2.14	2.60	0.06	0.07
S10	72	2.77	3.16	0.09	0.10	65	2.57	2.93	0.08	0.09	74	2.74	3.13	0.09	0.10
S11	72	2.77	3.16	0.09	0.10	65	2.57	2.93	0.08	0.09	74	2.74	3.13	0.09	0.10
S12	28	2.70	3.28	0.09	0.09	27	2.32	2.87	0.07	0.08	35	2.41	2.94	0.07	0.08
S13	28	2.70	3.28	0.09	0.09	27	2.32	2.87	0.07	0.08	35	2.41	2.94	0.07	0.08
S14	4	2.67	3.30	0.08	0.09	5	1.60	2.03	0.03	0.04	4	1.79	2.33	0.04	0.05
S15	4	2.67	3.30	0.08	0.09	5	1.60	2.03	0.03	0.04	4	1.79	2.33	0.04	0.05
S16	4	2.67	3.30	0.08	0.09	5	1.60	2.03	0.03	0.04	4	1.79	2.33	0.04	0.05
S17	24	2.63	3.19	0.08	0.09	24	2.63	3.19	0.08	0.09	31	2.43	2.95	0.08	0.08
S18	24	2.63	3.19	0.08	0.09	24	2.63	3.19	0.08	0.09	31	2.43	2.95	0.08	0.08
S19	24	2.63	3.19	0.08	0.09	24	2.63	3.19	0.08	0.09	31	2.43	2.95	0.08	0.08
S20	804	1.95	2.36	0.06	0.06	768	2.22	2.69	0.07	0.07	755	2.21	2.67	0.07	0.07
S21	804	1.95	2.36	0.06	0.06	768	2.22	2.69	0.07	0.07	755	2.21	2.67	0.07	0.07
S22	804	1.95	2.36	0.06	0.06	768	2.22	2.69	0.07	0.07	755	2.21	2.67	0.07	0.07
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	256	11.75	13.31	0.45	0.49	280	11.74	13.30	0.45	0.49	246	11.71	13.28	0.45	0.49
S25	2	12.76	14.21	0.49	0.53	2	12.76	14.21	0.49	0.53	2	12.76	14.21	0.49	0.53
S26	258	11.76	13.32	0.45	0.49	282	11.75	13.31	0.45	0.49	248	11.72	13.28	0.45	0.49
S27	258	11.76	13.32	0.45	0.49	282	11.75	13.31	0.45	0.49	248	11.72	13.28	0.45	0.49
S28	258	11.76	13.32	0.45	0.49	282	11.75	13.31	0.45	0.49	248	11.72	13.28	0.45	0.49
S29	258	11.76	13.32	0.45	0.49	282	11.75	13.31	0.45	0.49	248	11.72	13.28	0.45	0.49
S30	258	11.76	13.32	0.45	0.49	282	11.75	13.31	0.45	0.49	248	11.72	13.28	0.45	0.49
S31	258	11.76	13.32	0.45	0.49	282	11.75	13.31	0.45	0.49	248	11.72	13.28	0.45	0.49

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	18:00-19:00					19:00-20:00					20:00-21:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	576	2.23	2.67	0.07	0.08	414	1.76	2.05	0.05	0.06	385	1.78	2.07	0.05	0.06
S2	576	2.23	2.67	0.07	0.08	414	1.76	2.05	0.05	0.06	385	1.78	2.07	0.05	0.06
S3	54	2.46	2.96	0.08	0.09	22	1.11	1.29	0.03	0.03	12	1.42	1.68	0.04	0.05
S4	112	2.46	2.93	0.08	0.08	64	1.37	1.59	0.04	0.04	35	1.51	1.76	0.04	0.05
S5	112	2.46	2.93	0.08	0.08	64	1.37	1.59	0.04	0.04	35	1.51	1.76	0.04	0.05
S6	112	2.46	2.93	0.08	0.08	64	1.37	1.59	0.04	0.04	35	1.51	1.76	0.04	0.05
S7	58	1.61	1.90	0.04	0.05	42	1.21	1.40	0.03	0.03	23	1.20	1.40	0.03	0.03
S8	58	1.61	1.90	0.04	0.05	42	1.21	1.40	0.03	0.03	23	1.20	1.40	0.03	0.03
S9	688	2.26	2.70	0.07	0.08	478	1.71	1.98	0.05	0.06	420	1.76	2.04	0.05	0.06
S10	74	2.74	3.13	0.09	0.10	57	2.37	2.69	0.08	0.08	45	2.21	2.51	0.07	0.08
S11	74	2.74	3.13	0.09	0.10	57	2.37	2.69	0.08	0.08	45	2.21	2.51	0.07	0.08
S12	36	2.34	2.86	0.07	0.08	17	1.89	2.18	0.06	0.06	3	3.31	3.69	0.13	0.14
S13	36	2.34	2.86	0.07	0.08	17	1.89	2.18	0.06	0.06	3	3.31	3.69	0.13	0.14
S14	5	1.45	1.88	0.04	0.04	3	0.89	0.95	0.01	0.01	0	0.00	0.00	0.00	0.00
S15	5	1.45	1.88	0.04	0.04	3	0.89	0.95	0.01	0.01	0	0.00	0.00	0.00	0.00
S16	5	1.45	1.88	0.04	0.04	3	0.89	0.95	0.01	0.01	0	0.00	0.00	0.00	0.00
S17	31	2.43	2.95	0.08	0.08	14	2.07	2.39	0.07	0.07	3	3.25	3.62	0.13	0.14
S18	31	2.43	2.95	0.08	0.08	14	2.07	2.39	0.07	0.07	3	3.25	3.62	0.13	0.14
S19	31	2.43	2.95	0.08	0.08	14	2.07	2.39	0.07	0.07	3	3.25	3.62	0.13	0.14
S20	798	2.31	2.75	0.07	0.08	552	1.77	2.05	0.05	0.06	468	1.80	2.09	0.05	0.06
S21	798	2.31	2.75	0.07	0.08	552	1.77	2.05	0.05	0.06	468	1.80	2.09	0.05	0.06
S22	798	2.31	2.75	0.07	0.08	552	1.77	2.05	0.05	0.06	468	1.80	2.09	0.05	0.06
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	87	11.74	13.31	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S25	2	12.76	14.21	0.49	0.53	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S26	89	11.77	13.33	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S27	89	11.77	13.33	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S28	89	11.77	13.33	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S29	89	11.77	13.33	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S30	89	11.77	13.33	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S31	89	11.77	13.33	0.45	0.49	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00

Appendix B Roads Configuration and Traffic Emission Data

Segment ID	21:00-22:00					2200-23:00					23:00-24:00				
	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10	Traffic Flow	NO	NOx	PM2.5	PM10
	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(veh/hr)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)	(g/mile/veh)
S1	152	2.14	2.49	0.07	0.08	78	2.86	3.35	0.10	0.11	65	2.97	3.49	0.11	0.12
S2	152	2.14	2.49	0.07	0.08	78	2.86	3.35	0.10	0.11	65	2.97	3.49	0.11	0.12
S3	5	1.23	1.43	0.03	0.03	10	0.85	0.97	0.02	0.02	4	1.28	1.52	0.03	0.04
S4	16	1.62	1.88	0.04	0.05	13	0.84	0.95	0.02	0.02	4	1.44	1.70	0.04	0.04
S5	16	1.62	1.88	0.04	0.05	13	0.84	0.95	0.02	0.02	4	1.44	1.70	0.04	0.04
S6	16	1.62	1.88	0.04	0.05	13	0.84	0.95	0.02	0.02	4	1.44	1.70	0.04	0.04
S7	11	1.46	1.70	0.04	0.04	3	0.31	0.32	0.00	0.00	0	0.00	0.00	0.00	0.00
S8	11	1.46	1.70	0.04	0.04	3	0.31	0.32	0.00	0.00	0	0.00	0.00	0.00	0.00
S9	168	2.06	2.40	0.07	0.07	91	2.55	2.98	0.09	0.10	69	2.87	3.37	0.10	0.11
S10	17	0.71	0.76	0.02	0.02	13	0.41	0.42	0.00	0.00	2	0.07	0.08	0.01	0.01
S11	17	0.71	0.76	0.02	0.02	13	0.41	0.42	0.00	0.00	2	0.07	0.08	0.01	0.01
S12	1	0.07	0.07	0.01	0.01	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S13	1	0.07	0.07	0.01	0.01	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S14	1	0.06	0.07	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S15	1	0.06	0.07	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S16	1	0.06	0.07	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S17	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S18	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S19	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S20	186	1.91	2.22	0.06	0.07	104	2.27	2.65	0.08	0.08	71	2.79	3.27	0.10	0.11
S21	186	1.91	2.22	0.06	0.07	104	2.27	2.65	0.08	0.08	71	2.79	3.27	0.10	0.11
S22	186	1.91	2.22	0.06	0.07	104	2.27	2.65	0.08	0.08	71	2.79	3.27	0.10	0.11
S23	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21	80	9.82	11.34	0.19	0.21
S24	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S25	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S26	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S27	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S28	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S29	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S30	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00
S31	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00



Appendix C Details of Surface Characteristics

Appendix C-1 Details of Surface Characteristics

Number	Type (USEPA)	Albedo (a) (Seasonal Average) ⁽¹⁾	Bowen Ratio (b) (Seasonal Average) ⁽¹⁾	No. of grid (n) ⁽²⁾
11	Open Water	0.1	0.1	666574
21	Low Intensity Residential	0.165	0.9	3460
22	High Intensity Residential	0.18	1.5	17518
23a	Commercial/Industrial/Transp (Site at Airport)	0.18	1.5	0
23b	Commercial/Industrial/Transp (Not at Airport)	0.18	1.5	70484
31a	Bare Rock/ Sand/ Clay (Arid Region)	0.2	4.75	413
33	Transitional	0.18	1	10864
41	Deciduous Forest	0.1625	0.75	34816
51a	Shrubland (Arid Region)	0.25	4.75	8998
51b	Shrubland (Non-arid Region)	0.18	1.25	37580
71	Grassland	0.185	0.8	147257
82	Row Crops	0.18	0.55	2026
91	Woody Wetland	0.14	0.225	10
Mean ⁽³⁾		0.127	0.219	

- Note:
- Reference from Tables A-1 and A-2 from AERSURFACE User's Guide, USEPA.
 - Each grid of size 10m x 10m for the 10km x 10km domain. There are 1.00E+06 grids, and the representative land use type was determined for each grid.
 - Simple unweighted arithmetic mean for Albedo = $S(a \times n) / S_n$; simple unweighted geometry m\
 - The albedo and bowen ratio are calculated according to the latest AERMOD Implementation Guide.

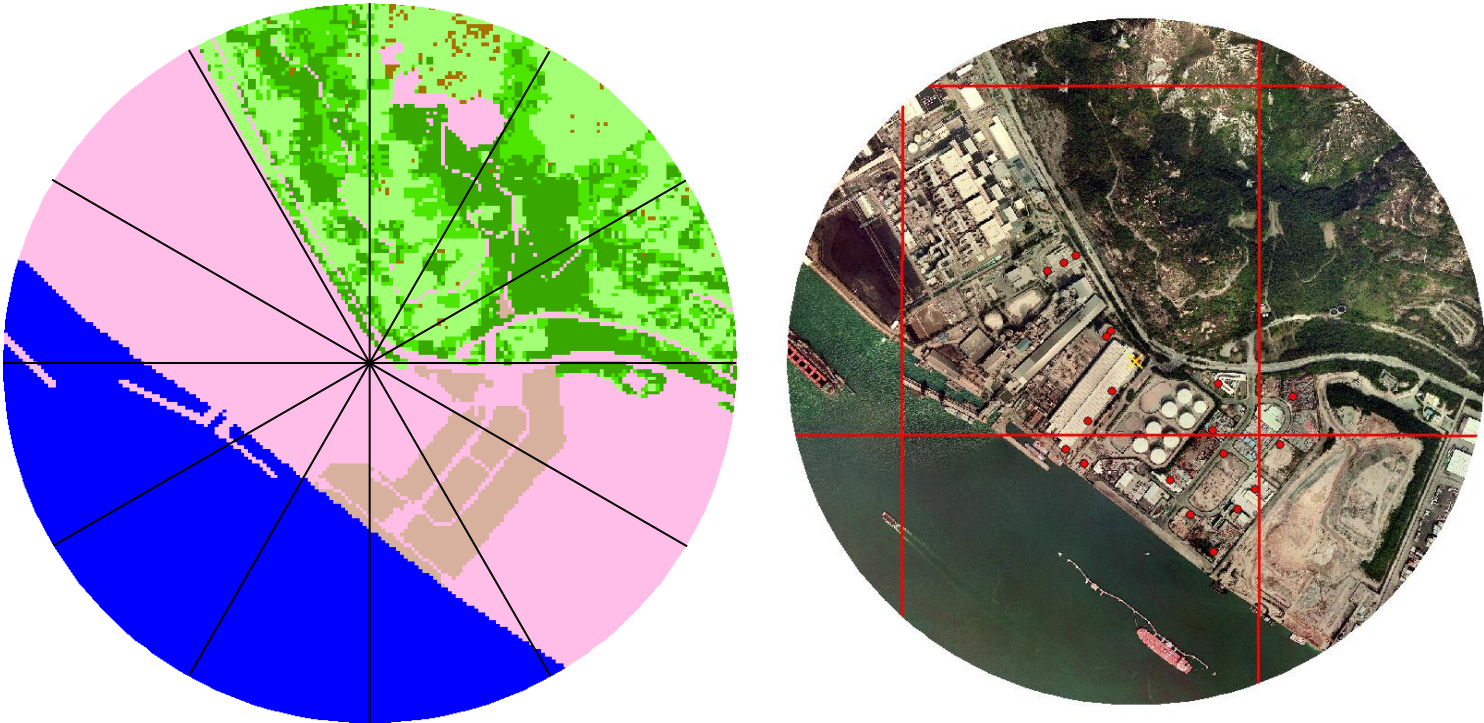


- Legend**
- 11 Open Water
 - 21 Low Intensity Residential
 - 22 High Intensity Residential
 - 23b Commercial/Industrial/Transp (Not at Airport)
 - 31a Bare Rock/ Sand/ Clay (Arid Region)
 - 33 Transitional
 - 41 Deciduous Forest
 - 51a Shrubland (Arid Region)
 - 51b Shrubland (Non-arid Region)
 - 71 Grassland
 - 82 Row Crops
 - 91 Woody Wetland
 - Project Site

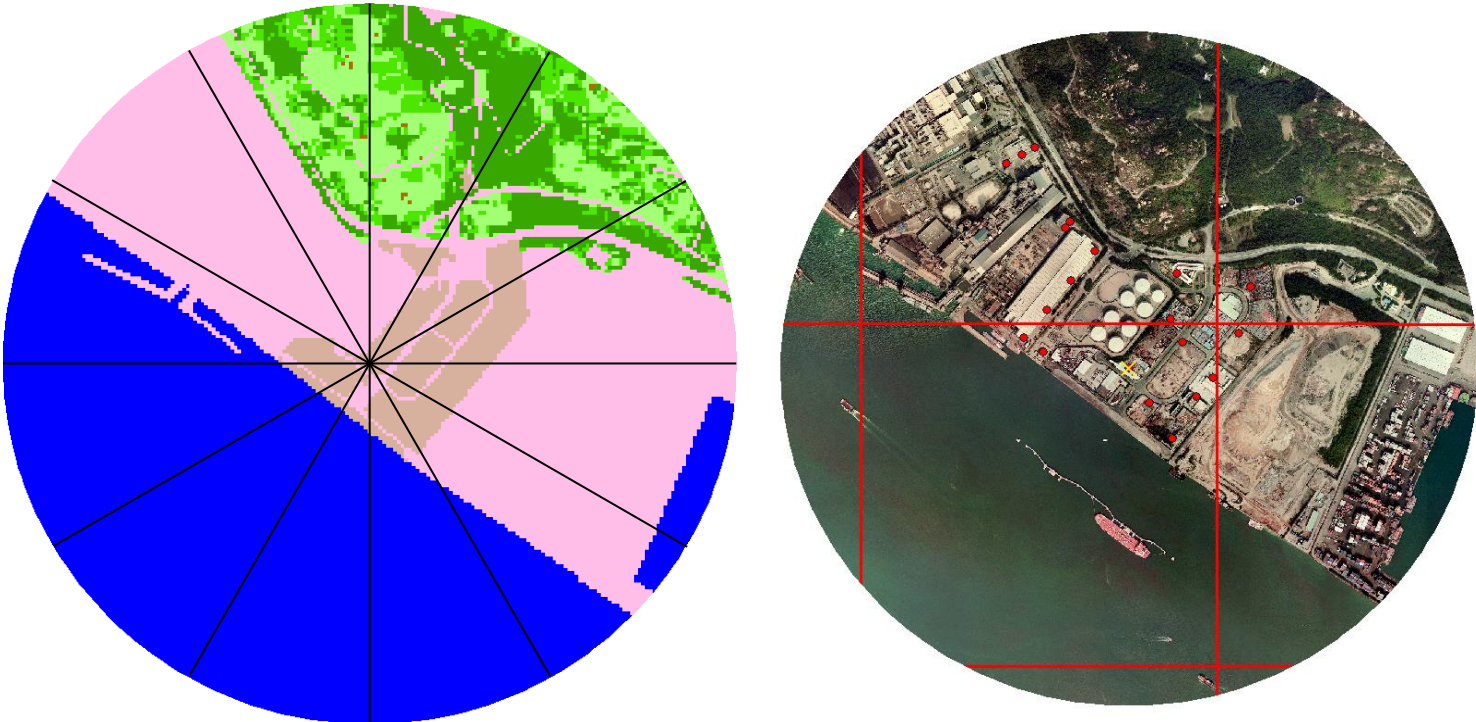
Appendix C-2 Details of Surface Characteristics

	0-30	30-60	60-90	90-120	120-150	150-180	180-210	210-240	240-270	270-300	300-330	330-360
1538	0.49816	0.58734	0.68294	0.40200	0.14356	0.00533	0.00279	0.00295	0.00330	0.02493	0.70000	0.48578
1539	0.26879	0.31291	0.45013	0.69320	0.68595	0.06186	0.01320	0.01273	0.02623	0.31553	0.70000	0.37297

1539



1538



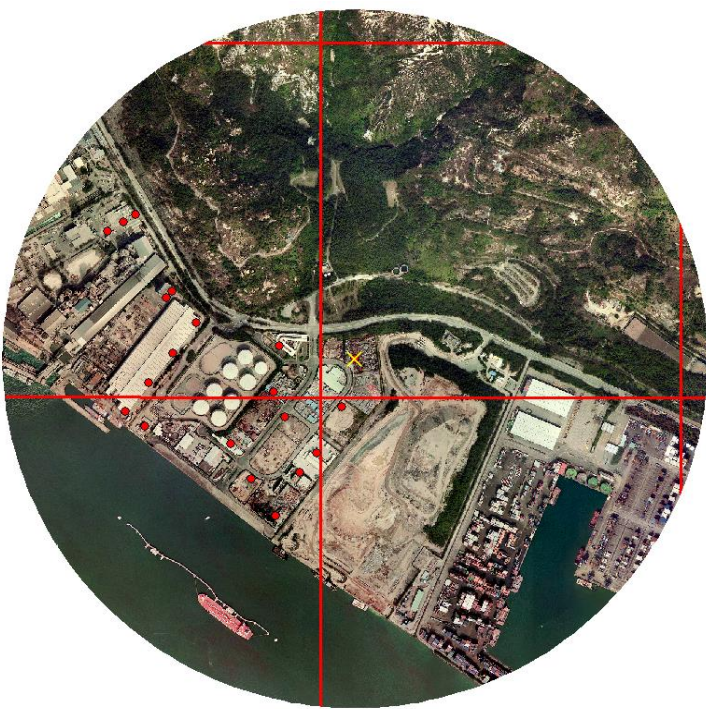
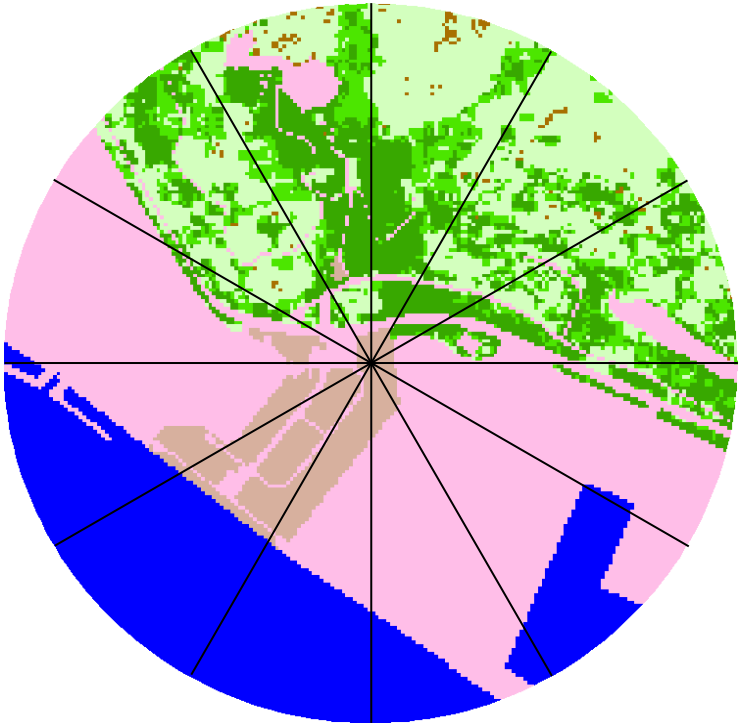
Legend

- 11 Open Water
- 21 Low Intensity Residential
- 22 High Intensity Residential
- 23b Commercial/Industrial/Transp (Not at Airport)
- 31a Bare Rock/ Sand/ Clay (Arid Region)
- 33 Transitional
- 41 Deciduous Forest
- 51a Shrubland (Arid Region)
- 51b Shrubland (Non-arid Region)
- 71 Grassland
- 82 Row Crops
- 91 Woody Wetland

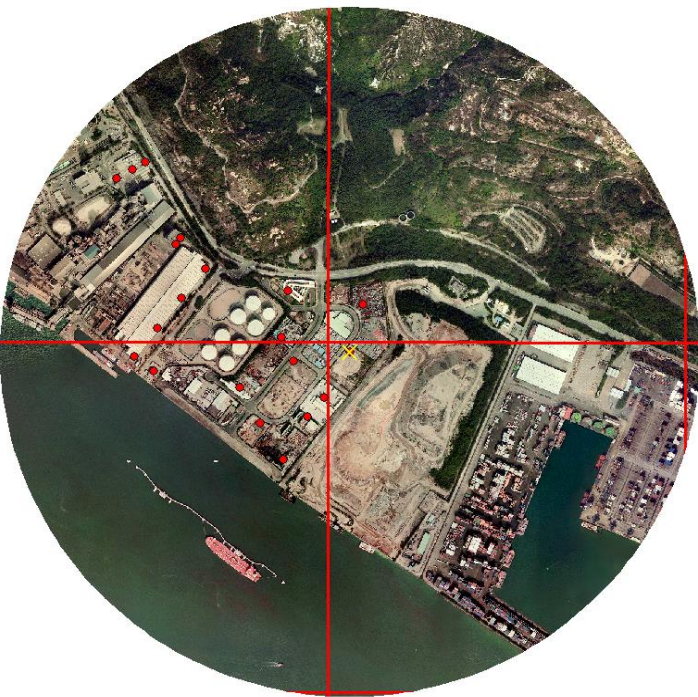
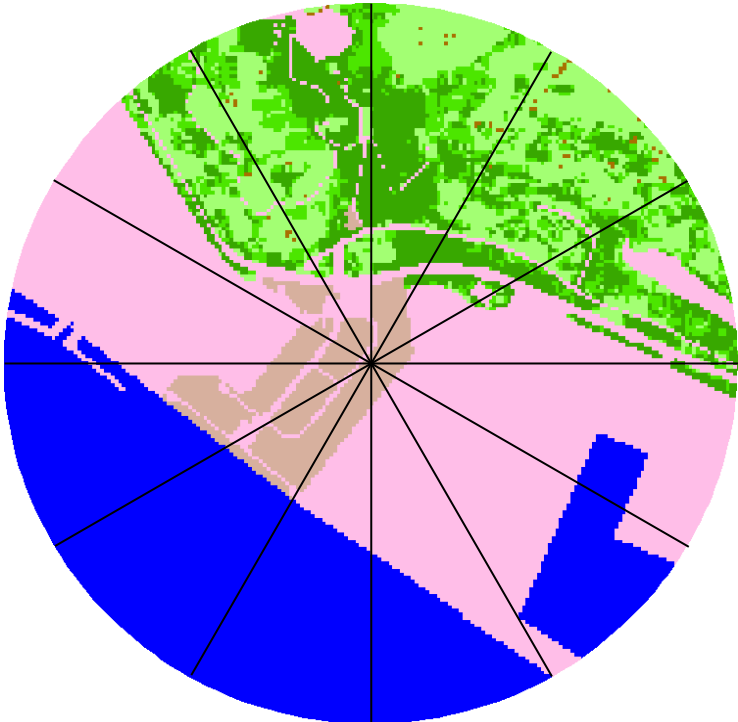
Appendix C-3 Details of Surface Characteristics

	0-30	30-60	60-90	90-120	120-150	150-180	180-210	210-240	240-270	270-300	300-330	330-360
1638	0.46157	0.41859	0.60903	0.47178	0.14331	0.09426	0.02030	0.01846	0.03595	0.47224	0.47984	0.45532
1639	0.36110	0.31671	0.51933	0.67806	0.18534	0.24538	0.05110	0.04246	0.11431	0.64651	0.34678	0.43409

1639



1638



Legend

11	Open Water
21	Low Intensity Residential
22	High Intensity Residential
23b	Commercial/Industrial/Transp (Not at Airport)
31a	Bare Rock/ Sand/ Clay (Arid Region)
33	Transitional
41	Deciduous Forest
51a	Shrubland (Arid Region)
51b	Shrubland (Non-arid Region)
71	Grassland
82	Row Crops
91	Woody Wetland



Appendix D Selected Air Sensitive Receivers

Appendix D Selected Air Sensitive Receivers

ID	Coordinates		Ground Level (mPD)	Assessment Height (m)	Grid	Description
	X-co	Y-co				
OFLIR	810798.8	825398.0	6.1	1.5	1538	On Fat Lung Innovative Resources Limited
HKBCR	810645.5	825321.4	6.3	1.5	1538	Hong Kong Biomass (Wood) Collected and Recycle Limited
PAFF	810400.6	825370.3	6.1	1.5	1538	Permanent Aviation Fuel Facility (PAFF)
SW1	810345.5	825412.8	5.0	1.5	1538	Shiu Wing Steel Mill
KWCP	810890.0	825281.0	6.1	1.5	1538	K. Wah Construction Products Limited
SCRRC	810839.7	825238.1	5.7	1.5	1538	South China Reborn Resources (Zhongshan) Company Limited
ETM	810703.3	825220.3	5.3	1.5	1538	E. Tech Management (HK) limited
CYSGC	810770.7	825113.6	5.3	1.5	1538	Chung Yue Steel Group Company Limited
EP1	810782.5	825602.3	5.5	1.5	1539	Ecopark
EP1	810782.5	825602.3	5.5	4.5	1539	Ecopark
EP1	810782.5	825602.3	5.5	7.5	1539	Ecopark
SW2	810410.3	825494.6	5.6	1.5	1539	Shiu Wing Steel Mill
SW3	810479.0	825581.3	6.5	1.5	1539	Shiu Wing Steel Mill
SW4	810547.4	825667.7	6.7	1.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	1.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	4.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	7.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	10.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	13.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	16.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	19.5	1539	Shiu Wing Steel Mill
SW5	810476.8	825756.8	6.8	22.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	1.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	4.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	7.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	10.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	13.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	16.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	19.5	1539	Shiu Wing Steel Mill
SW6	810463.0	825738.9	6.8	22.5	1539	Shiu Wing Steel Mill
GIC1	810375.2	825975.8	7.0	1.5	1539	Green Island Cement
GIC2	810340.1	825954.8	7.0	1.5	1539	Green Island Cement
GIC3	810294.8	825929.5	7.0	1.5	1539	Green Island Cement
HKTEG	810766.2	825468.4	6.1	1.5	1539	Hong Kong Telford Envirotech Group Ltd
WP2	810960.0	825426.0	7.0	1.5	1638	WEEE Park
WP1	810996.6	825564.3	7.0	1.5	1639	WEEE Park



Appendix E Detailed Modeling Result (Nitrogen Dioxide)

Appendix E Detailed Modeling Result (Nitrogen Dioxide)

ID	X	Y	Ground Level (mPD)	Assessment Height (m)	Grid	Description	Annual average NO ₂ (mg/m ³)		19th Highest Hourly average NO ₂	
							Project Alone	Cumulative	Project Alone*	Cumulative
OFLIR	810798.78	825398.01	6.1	1.5	1538	On Fat Lung Innovative Resources Limited	0.56	39.7	11.82 (0)	143.5 (0)
HKBCR	810645.50	825321.38	6.3	1.5	1538	Hong Kong Biomass (Wood) Collected and Recycle Limited	0.37	38.5	8.94 (0)	140.3 (0)
PAFF	810400.57	825370.30	6.1	1.5	1538	Permanent Aviation Fuel Facility (PAFF)	0.28	38.4	7.55 (0)	141.7 (0)
SW1	810345.52	825412.76	5	1.5	1538	Shiu Wing Steel Mill	0.28	38.8	6.68 (0)	141.9 (0)
KWCP	810890.00	825281.00	6.1	1.5	1538	K. Wah Construction Products Limited	0.23	39.0	8.22 (0)	145.0 (0)
SCRRRC	810839.72	825238.07	5.7	1.5	1538	South China Reborn Resources (Zhongshan) Company Limited	0.24	39.0	7.73 (0)	145.8 (0)
ETM	810703.33	825220.25	5.3	1.5	1538	E. Tech Management (HK) limited	0.25	38.4	7.82 (0)	142.0 (0)
CYSGC	810770.74	825113.62	5.3	1.5	1538	Chung Yue Steel Group Company Limited	0.17	38.6	6.78 (0)	145.6 (0)
EP1	810782.45	825602.26	5.5	1.5	1539	Ecopark	0.00	34.9	0.06 (0)	141.8 (0)
EP1	810782.45	825602.26	5.5	4.5	1539	Ecopark	0.00	34.6	0.24 (0)	140.4 (0)
EP1	810782.45	825602.26	5.5	7.5	1539	Ecopark	0.01	34.1	1.31 (0)	138.6 (0)
SW2	810410.29	825494.55	5.6	1.5	1539	Shiu Wing Steel Mill	0.32	34.3	8.94 (0)	134.4 (0)
SW3	810478.96	825581.25	6.5	1.5	1539	Shiu Wing Steel Mill	0.66	34.2	9.18 (0)	133.3 (0)
SW4	810547.43	825667.70	6.7	1.5	1539	Shiu Wing Steel Mill	1.29	35.7	10.56 (0)	137.4 (0)
SW5	810476.82	825756.79	6.8	1.5	1539	Shiu Wing Steel Mill	0.76	36.2	7.70 (0)	137.5 (0)
SW5	810476.82	825756.79	6.8	4.5	1539	Shiu Wing Steel Mill	0.76	36.0	7.69 (0)	136.5 (0)
SW5	810476.82	825756.79	6.8	7.5	1539	Shiu Wing Steel Mill	0.76	35.9	7.76 (0)	135.5 (0)
SW5	810476.82	825756.79	6.8	10.5	1539	Shiu Wing Steel Mill	0.76	35.9	8.75 (0)	138.9 (0)
SW5	810476.82	825756.79	6.8	13.5	1539	Shiu Wing Steel Mill	0.77	35.7	12.76 (0)	146.8 (3)
SW5	810476.82	825756.79	6.8	16.5	1539	Shiu Wing Steel Mill	0.78	35.3	20.13 (0)	149.5 (4)
SW5	810476.82	825756.79	6.8	19.5	1539	Shiu Wing Steel Mill	0.79	34.7	33.46 (0)	149.4 (1)
SW5	810476.82	825756.79	6.8	22.5	1539	Shiu Wing Steel Mill	0.80	34.1	50.71 (0)	137.5 (0)
SW6	810462.98	825738.92	6.8	1.5	1539	Shiu Wing Steel Mill	0.78	36.0	7.80 (0)	133.8 (0)
SW6	810462.98	825738.92	6.8	4.5	1539	Shiu Wing Steel Mill	0.79	35.8	7.82 (0)	132.9 (0)
SW6	810462.98	825738.92	6.8	7.5	1539	Shiu Wing Steel Mill	0.79	35.7	7.86 (0)	133.4 (0)
SW6	810462.98	825738.92	6.8	10.5	1539	Shiu Wing Steel Mill	0.79	35.7	8.66 (0)	138.3 (1)
SW6	810462.98	825738.92	6.8	13.5	1539	Shiu Wing Steel Mill	0.80	35.5	12.08 (0)	149.8 (5)
SW6	810462.98	825738.92	6.8	16.5	1539	Shiu Wing Steel Mill	0.81	35.2	17.90 (0)	152.8 (4)
SW6	810462.98	825738.92	6.8	19.5	1539	Shiu Wing Steel Mill	0.83	34.7	31.62 (0)	152.0 (3)
SW6	810462.98	825738.92	6.8	22.5	1539	Shiu Wing Steel Mill	0.84	34.1	49.88 (0)	142.0 (0)
GIC1	810375.20	825975.79	7	1.5	1539	Green Island Cement	0.24	33.6	5.69 (0)	132.7 (0)
GIC2	810340.13	825954.79	7	1.5	1539	Green Island Cement	0.26	33.2	5.67 (0)	132.0 (0)
GIC3	810294.76	825929.53	7	1.5	1539	Green Island Cement	0.29	32.9	6.06 (0)	132.8 (0)
HKTEG	810766.23	825468.37	6.1	1.5	1539	Hong Kong Telford Envirotech Group Ltd	0.92	35.0	13.70 (0)	141.9 (0)
WP2	810960.03	825426.00	7	1.5	1638	WEEE Park	0.20	38.6	10.10 (0)	142.7 (0)
WP1	810996.63	825564.30	7	1.5	1639	WEEE Park	0.22	35.5	9.78 (0)	147.7 (1)
Maximum Exceedance							1.29	39.7	50.71 (0)	152.8 (5)
							0	0	0	0

Notes:

Numbers in blanket () denotes the number of hours exceed the AQO (The allowed number of hours is 18).

*Highest hourly averaged instead of 19th hourly averaged NO₂ is presented.



Appendix F Detailed Modeling Result (PM₁₀)

Appendix F Detailed Modeling Result (PM10)

ID	X	Y	Ground Level (mPD)	Assessment Height (m)	Grid	Description	Annual average PM10 (mg/m ³)		10th Highest Daily average PM10	
							Project Alone	Cumulative	Project Alone*	Cumulative
OFLIR	810798.78	825398.01	6.1	1.5	1538	On Fat Lung Innovative Resources Limited	0.05	40.7	0.44 (0)	89.8 (5)
HKBCR	810645.50	825321.38	6.3	1.5	1538	Hong Kong Biomass (Wood) Collected and Recycle Limited	0.03	40.1	0.22 (0)	90.1 (5)
PAFF	810400.57	825370.30	6.1	1.5	1538	Permanent Aviation Fuel Facility (PAFF)	0.02	40.1	0.18 (0)	89.5 (5)
SW1	810345.52	825412.76	5	1.5	1538	Shiu Wing Steel Mill	0.02	40.3	0.15 (0)	89.5 (5)
KWCP	810890.00	825281.00	6.1	1.5	1538	K. Wah Construction Products Limited	0.02	46.8	0.17 (0)	99.0 (8)
SCRRC	810839.72	825238.07	5.7	1.5	1538	South China Reborn Resources (Zhongshan) Company Limited	0.02	42.1	0.22 (0)	91.4 (6)
ETM	810703.33	825220.25	5.3	1.5	1538	E. Tech Management (HK) limited	0.02	41.0	0.19 (0)	91.0 (5)
CYSGC	810770.74	825113.62	5.3	1.5	1538	Chung Yue Steel Group Company Limited	0.01	45.4	0.12 (0)	99.1 (8)
EP1	810782.45	825602.26	5.5	1.5	1539	Ecopark	0.00	37.0	0.00 (0)	83.8 (4)
EP1	810782.45	825602.26	5.5	4.5	1539	Ecopark	0.00	36.9	0.00 (0)	83.7 (4)
EP1	810782.45	825602.26	5.5	7.5	1539	Ecopark	0.00	36.7	0.01 (0)	83.7 (4)
SW2	810410.29	825494.55	5.6	1.5	1539	Shiu Wing Steel Mill	0.03	37.8	0.16 (0)	84.9 (4)
SW3	810478.96	825581.25	6.5	1.5	1539	Shiu Wing Steel Mill	0.06	37.4	0.26 (0)	84.6 (4)
SW4	810547.43	825667.70	6.7	1.5	1539	Shiu Wing Steel Mill	0.11	37.2	0.36 (0)	84.4 (4)
SW5	810476.82	825756.79	6.8	1.5	1539	Shiu Wing Steel Mill	0.06	37.3	0.21 (0)	84.1 (4)
SW5	810476.82	825756.79	6.8	4.5	1539	Shiu Wing Steel Mill	0.07	37.2	0.22 (0)	83.9 (4)
SW5	810476.82	825756.79	6.8	7.5	1539	Shiu Wing Steel Mill	0.07	37.2	0.22 (0)	83.7 (4)
SW5	810476.82	825756.79	6.8	10.5	1539	Shiu Wing Steel Mill	0.07	37.3	0.23 (0)	83.7 (4)
SW5	810476.82	825756.79	6.8	13.5	1539	Shiu Wing Steel Mill	0.07	37.8	0.23 (0)	85.0 (5)
SW5	810476.82	825756.79	6.8	16.5	1539	Shiu Wing Steel Mill	0.07	38.7	0.25 (0)	89.0 (7)
SW5	810476.82	825756.79	6.8	19.5	1539	Shiu Wing Steel Mill	0.07	38.4	0.31 (0)	89.2 (6)
SW5	810476.82	825756.79	6.8	22.5	1539	Shiu Wing Steel Mill	0.07	37.9	0.43 (0)	84.7 (5)
SW6	810462.98	825738.92	6.8	1.5	1539	Shiu Wing Steel Mill	0.07	37.3	0.21 (0)	84.1 (4)
SW6	810462.98	825738.92	6.8	4.5	1539	Shiu Wing Steel Mill	0.07	37.3	0.22 (0)	84.0 (4)
SW6	810462.98	825738.92	6.8	7.5	1539	Shiu Wing Steel Mill	0.07	37.3	0.22 (0)	84.0 (4)
SW6	810462.98	825738.92	6.8	10.5	1539	Shiu Wing Steel Mill	0.07	37.4	0.23 (0)	83.9 (4)
SW6	810462.98	825738.92	6.8	13.5	1539	Shiu Wing Steel Mill	0.07	37.8	0.24 (0)	85.2 (4)
SW6	810462.98	825738.92	6.8	16.5	1539	Shiu Wing Steel Mill	0.07	38.8	0.26 (0)	89.7 (7)
SW6	810462.98	825738.92	6.8	19.5	1539	Shiu Wing Steel Mill	0.07	38.5	0.28 (0)	89.1 (6)
SW6	810462.98	825738.92	6.8	22.5	1539	Shiu Wing Steel Mill	0.08	38.1	0.36 (0)	85.3 (5)
GIC1	810375.20	825975.79	7	1.5	1539	Green Island Cement	0.02	37.3	0.11 (0)	83.3 (4)
GIC2	810340.13	825954.79	7	1.5	1539	Green Island Cement	0.02	37.4	0.11 (0)	83.4 (4)
GIC3	810294.76	825929.53	7	1.5	1539	Green Island Cement	0.02	37.9	0.10 (0)	83.5 (4)
HKTEG	810766.23	825468.37	6.1	1.5	1539	Hong Kong Telford Envirotech Group Ltd	0.08	37.4	0.76 (0)	84.4 (4)
WP2	810960.03	825426.00	7	1.5	1638	WEEE Park	0.02	40.4	0.18 (0)	88.2 (5)
WP1	810996.63	825564.30	7	1.5	1639	WEEE Park	0.02	38.3	0.17 (0)	86.3 (4)
Maximum							0.11	46.8	0.76 (0)	99.1 (8)
Exceedance							0	0	0	0

Notes:

Numbers in blanket () denotes the number of days exceed the AQO (The allowed number of days is 10).

*Highest hourly averaged instead of 10th daily averaged PM10 is presented.



Appendix G Detailed Modeling Result (PM_{2.5})

Appendix G Detailed Modeling Result (PM2.5)

ID	X	Y	Ground Level (mPD)	Assessment Height (m)	Grid	Description	Annual average PM2.5 (mg/m ³)		10th Highest Daily average PM2.5	
							Project Alone	Cumulative	Project Alone*	Cumulative
OFLIR	810798.78	825398.01	6.1	1.5	1538	On Fat Lung Innovative Resources Limited	0.05	28.5	0.44 (0)	65.8 (5)
HKBCR	810645.50	825321.38	6.3	1.5	1538	Hong Kong Biomass (Wood) Collected and Recycle Limited	0.03	28.2	0.22 (0)	66.3 (5)
PAFF	810400.57	825370.30	6.1	1.5	1538	Permanent Aviation Fuel Facility (PAFF)	0.02	28.7	0.18 (0)	66.9 (5)
SW1	810345.52	825412.76	5	1.5	1538	Shiu Wing Steel Mill	0.02	29.1	0.15 (0)	67.0 (5)
KWCP	810890.00	825281.00	6.1	1.5	1538	K. Wah Construction Products Limited	0.02	30.8	0.16 (0)	70.3 (6)
SCRRC	810839.72	825238.07	5.7	1.5	1538	South China Reborn Resources (Zhongshan) Company Limited	0.02	28.8	0.22 (0)	67.0 (5)
ETM	810703.33	825220.25	5.3	1.5	1538	E. Tech Management (HK) limited	0.02	28.2	0.19 (0)	65.8 (5)
CYSGC	810770.74	825113.62	5.3	1.5	1538	Chung Yue Steel Group Company Limited	0.01	28.4	0.12 (0)	66.6 (5)
EP1	810782.45	825602.26	5.5	1.5	1539	Ecopark	0.00	26.2	0.00 (0)	62.7 (4)
EP1	810782.45	825602.26	5.5	4.5	1539	Ecopark	0.00	26.2	0.00 (0)	62.6 (4)
EP1	810782.45	825602.26	5.5	7.5	1539	Ecopark	0.00	26.1	0.01 (0)	62.6 (4)
SW2	810410.29	825494.55	5.6	1.5	1539	Shiu Wing Steel Mill	0.03	27.4	0.16 (0)	64.3 (4)
SW3	810478.96	825581.25	6.5	1.5	1539	Shiu Wing Steel Mill	0.06	27.0	0.26 (0)	64.0 (4)
SW4	810547.43	825667.70	6.7	1.5	1539	Shiu Wing Steel Mill	0.11	26.8	0.36 (0)	63.4 (4)
SW5	810476.82	825756.79	6.8	1.5	1539	Shiu Wing Steel Mill	0.07	26.9	0.21 (0)	62.9 (4)
SW5	810476.82	825756.79	6.8	4.5	1539	Shiu Wing Steel Mill	0.07	26.9	0.22 (0)	62.8 (4)
SW5	810476.82	825756.79	6.8	7.5	1539	Shiu Wing Steel Mill	0.07	26.9	0.22 (0)	62.9 (4)
SW5	810476.82	825756.79	6.8	10.5	1539	Shiu Wing Steel Mill	0.07	27.1	0.23 (0)	63.0 (5)
SW5	810476.82	825756.79	6.8	13.5	1539	Shiu Wing Steel Mill	0.07	27.5	0.23 (0)	64.4 (5)
SW5	810476.82	825756.79	6.8	16.5	1539	Shiu Wing Steel Mill	0.07	28.5	0.25 (0)	70.7 (9)
SW5	810476.82	825756.79	6.8	19.5	1539	Shiu Wing Steel Mill	0.07	28.2	0.31 (0)	68.4 (7)
SW5	810476.82	825756.79	6.8	22.5	1539	Shiu Wing Steel Mill	0.07	27.7	0.43 (0)	64.2 (5)
SW6	810462.98	825738.92	6.8	1.5	1539	Shiu Wing Steel Mill	0.07	27.0	0.21 (0)	63.2 (4)
SW6	810462.98	825738.92	6.8	4.5	1539	Shiu Wing Steel Mill	0.07	26.9	0.22 (0)	63.1 (4)
SW6	810462.98	825738.92	6.8	7.5	1539	Shiu Wing Steel Mill	0.07	27.0	0.22 (0)	63.1 (4)
SW6	810462.98	825738.92	6.8	10.5	1539	Shiu Wing Steel Mill	0.07	27.1	0.23 (0)	63.0 (4)
SW6	810462.98	825738.92	6.8	13.5	1539	Shiu Wing Steel Mill	0.07	27.6	0.24 (0)	64.5 (5)
SW6	810462.98	825738.92	6.8	16.5	1539	Shiu Wing Steel Mill	0.07	28.6	0.26 (0)	72.2 (9)
SW6	810462.98	825738.92	6.8	19.5	1539	Shiu Wing Steel Mill	0.07	28.3	0.28 (0)	67.8 (7)
SW6	810462.98	825738.92	6.8	22.5	1539	Shiu Wing Steel Mill	0.08	27.8	0.36 (0)	65.4 (5)
GIC1	810375.20	825975.79	7	1.5	1539	Green Island Cement	0.02	27.1	0.11 (0)	62.7 (4)
GIC2	810340.13	825954.79	7	1.5	1539	Green Island Cement	0.02	27.1	0.11 (0)	62.7 (4)
GIC3	810294.76	825929.53	7	1.5	1539	Green Island Cement	0.02	27.6	0.10 (0)	62.4 (4)
HKTEG	810766.23	825468.37	6.1	1.5	1539	Hong Kong Telford Envirotech Group Ltd	0.08	26.4	0.76 (0)	63.0 (4)
WP2	810960.03	825426.00	7	1.5	1638	WEEE Park	0.02	28.1	0.18 (0)	65.1 (5)
WP1	810996.63	825564.30	7	1.5	1639	WEEE Park	0.02	26.5	0.17 (0)	63.8 (4)
Maximum Exceedance							0.11	30.8	0.76 (0)	72.2 (9)
							0	0	0	0

Notes:

Numbers in blanket () denotes the number of days exceed the AQO (The allowed number of days is 10).

*Highest hourly averaged instead of 10th daily averaged PM2.5 is presented.