



Application No. : VEP-548/2018  
Reference No. :  
(For official use)

FORM 5  
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE  
(CHAPTER 499)  
SECTION 13(1)

Application for Variation of an Environmental Permit

PART A PREVIOUS APPLICATIONS

No previous application for variation of an environmental permit.  
 The environmental permit was previously amended.  
Application No. : VEP-532/2017

PART B DETAILS OF APPLICANT

B1. Name : (person or company)  
Director of Environmental Protection  
[Note : In accordance with section 13(1) of the Ordinance, the person holding an environmental permit or a person who assumes responsibility for the designated project may apply for variation of the environmental permit.]  
B2. Business Registration No. : [Redacted]  
(if applicable)  
B3. Correspondence Address : [Redacted]  
B4. Name of Contact Person : [Redacted] B5. Position of Contact Person : [Redacted]  
B6. Telephone No. : [Redacted] B7. Fax No. : [Redacted]  
B8. E-mail Address : (if any) [Redacted]

PART C DETAILS OF CURRENT ENVIRONMENTAL PERMIT

C1. Name of the Current Environmental Permit Holder :  
ENVIRONMENTAL PROTECTION DEPARTMENT - Waste Reduction and Recycling Group  
C2. Application No. of the Current Environmental Permit : VEP-532/2017  
C3. The Current Environmental Permit was Issued in : month / year  
09 | 20 | 17

Important Notes : Please submit the application together with  
(a) 3 copies of this completed form; and  
(b) appropriate fee as stipulated in the Environmental Impact Assessment (Fees) Regulation  
to the Environmental Protection Department at the following address :  
The EIA Ordinance Register Office,  
27th floor, Southorn Centre, 130 Hennessy Road,  
Wan Chai, Hong Kong.

Tick (✓) the appropriate box  
EPD185



**PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT**

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
<p>Part C, "Permit Conditions"</p> <p>"4.4 To minimize the air quality impact, no chimney emissions associated with the operation of the Project shall be allowed between 19:00 and 07:00 hours daily."</p>	<p>Part C, "Permit Conditions"</p> <p>"4.4 Unless otherwise approved by the Director upon the submission of a detailed proposal, no chimney emissions associated with the operation of the Project shall be allowed between 19:00 and 07:00 hours daily."</p>	<p>To allow for flexibility in operational hours for the various Ecopark tenants where extension of chimney emissions hours may be required.</p>	<p>The proposed variation of condition 4.4 itself does not cause environmental changes. The associated air quality impacts will be demonstrated by the detailed proposals under Condition 4.4. Please also see the attached submission of the detailed proposal for Lot P4 of EcoPark.</p>	<p>The proposed variation of condition 4.4 itself does not affect the environment and the community. Under condition 4.4, detailed proposals are required to assess how the environment and the community might be affected if there is change to existing operation hours. In addition, the detailed proposals will recommend any required mitigation measures to ensure that the relevant EIAO-TM requirements will be met, therefore no adverse impacts is anticipated. Please also see the attached submission of the detailed proposal for Lot P4 of EcoPark.</p>	<p>The proposed variation of condition 4.4 itself does not affect the environmental performance requirement set out in the EIA report previously approved for this project.</p>	<p>This section is not applicable to the variation of condition 4.4.</p> <p>The detailed proposals required under Condition 4.4 will describe any additional measures proposed to eliminate, reduce or control any adverse environmental impacts to meet the requirements in the Technical Memorandum on EIA Process as required in due course. Please also see the attached submission of the detailed proposal for Lot P4 of EcoPark.</p>

**PART E DECLARATION BY APPLICANT**

E1. I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental permit may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

  
\_\_\_\_\_  
Signature Applicant

  
\_\_\_\_\_  
Full Name in Block Letters

  
\_\_\_\_\_  
Position



on behalf of EPD - Waste Reduction and Recycling Group 11 September 2018  
Company Name and Chop (as appropriate) Date

**NOTES :**

1. A person who constructs or operates a designated project in Part I of Schedule 2 of the Ordinance or decommissions a designated project listed in Part II of Schedule 2 of the Ordinance without an environmental permit or contrary to the permit conditions commits an offence under the Ordinance and is liable to a maximum fine of \$5,000,000 and to a maximum imprisonment for 2 years.
2. A person for whom a designated project is constructed, operated or decommissioned and who permits the carrying out of the designated project in contravention of the Ordinance commits an offence and is liable to a maximum fine of \$5,000,000 and to a maximum imprisonment for 2 years.

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7076612 Technical Note – FINAL

## Extension of Boiler Operation Hours at Lot P4 at EcoPark

Reference No. 7076612  
Prepared for Lot P4 of EcoPark  
September 2018

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# 1 INTRODUCTION

## 1.1 Background and Purpose

- 1.1.1 EcoPark has been developed in Tuen Mun Area 38 (see **Figure 1.1**) in two phases (Phase 1 and Phase 2) with a total area of around 20ha, of which 14ha of land can be rented to tenants to carry out recycling and related activities. EcoPark aims to support the local recycling industry by providing long-term land at affordable rents, thereby encouraging investment in advanced technology and value-added recycling processes.
- 1.1.2 EcoPark has been in operation since 2007. Currently, 12 tenants are carrying out the recycling of waste cooking oil, waste metals, waste wood, Waste Electrical and Electronic Equipment (WEEE), waste plastics, waste batteries, Construction and Demolition (C&D) waste, waste glass, waste rubber tyres, and food waste.
- 1.1.3 EcoPark is a Designated Project (DP) under Schedule 2 of the *Environmental Impact Assessment Ordinance* (EIAO) and an Environmental Impact Assessment (EIA) Report together with an Environmental Monitoring and Audit (EM&A) Manual were prepared for EcoPark in 2005. EcoPark is governed under Environmental Permit (EP) No. EP-226/2005/F, which was issued to the Director of Environmental Protection (the Director, or the Permit Holder). Therefore, all recycling facilities in EcoPark are subject to this EcoPark EP.
- 1.1.4 A diesel fuel boiler has been installed by the operator at Lot P4 of EcoPark to provide process steam for one of the recycling processes being carried out at the premises. The diesel fuel boiler was not specifically assessed in the original EIA Report and the exhaust vent parameters and fuel combustion emissions deviate from the “base case” assumption listed in Table 13.1 of the EIA Report and in Annex A of the EP. In order to review the environmental impacts, particularly air quality arising from the use of this boiler, SMEC Asia Limited (SMEC) was engaged to prepare “Supporting Information” (SMEC’s ref. 7076 7076449 | D01/01 – Revision 3.2, dated October 2017) for the Process Review Checklist (PRC) and the Design Audit (DA) carried by the EcoPark Environmental Team (ET) under the mechanism set out in the EIA Report and EM&A Manual.
- 1.1.5 In order to increase the handling capacity of the processing line, the operator of the Lot P4 of EcoPark proposes to extend the operation hours of the boiler and associated treatment lines from the 0700 to 1900 period stated in the EP to 24 hours per day operation, 7 days a week.
- 1.1.6 As stipulated in EP-226/2005/F, Part C, Condition 4.4, a detailed proposal shall be submitted for approval by the Director of the Environmental Protection for any chimney emissions outside the 0700 hrs to 1900 period. This technical note is submitted with the intention to request for approval of night-time emission from boiler at Lot P4 of EcoPark from the approval date of this application until 30 June 2019.
- 1.1.7 SMEC has been engaged by the operator of the Lot P4 of EcoPark to prepare this Technical Note to be submitted under Condition 4.4 of the above EP and shall be taken into consideration for the approval by the Director.

## 1.2 Proposed Boiler Installation

- 1.2.1 The location of the Lot P4 of EcoPark and its environs is shown on **Figure 1.1**. The plant has a nominal capacity of 30,000 tonnes/year (i.e. 2,500 tonnes/month). The existing boiler in Lot P4 is located indoors, and its location is shown in **Figure 1.2** with the photo showing its condition.
- 1.2.2 Specifications of the existing boiler are provided in **Appendix A** and summarised in **Table 1.1**, below.



Table 1.1 Diesel Fuel Boiler Parameters

PARAMETER	DESCRIPTION
Manufacturer	CERTUSS Dampfautomaten GmbH, Model Junior 500 SC
Fuel	Ultra-Low Sulphur Diesel (ULSD) $\leq 0.005\%$ sulphur by weight
Fuel Storage	Underground ULSD Storage Tank to the south of the Lot P4 building
Fuel Consumption	37 $\ell$ /h
Steam Capacity	500kg/h
Existing Operating Hours	0700 to 1900 Daily (intermittent – as needed)
Proposed Operating Hours	0000 to 2400, 7 days per week

1.2.3 The boiler, shown on **Figure 1.2**, is located immediate outside the “Chimney Restricted Area” as shown on **Figure 1.3**, within which no chimney could be installed as per the approved EIA report. Hence, the existing chimney of the boiler is in compliance with EP Condition 4.3. In addition, the underground storage tank for ULSD with a maximum capacity of 10,000 litres is located around 47m from the EcoPark site boundary and therefore complies with EP Condition 4.9, which prohibits dangerous goods, including diesel, to be stored within 10m from the EcoPark boundary. The underground storage tank for ULSD is also located >15m from the nearest adjacent tenant lot and therefore complies with paragraph 10.3.4 of the EIA.

1.2.4 The parameters of fuel combustion are restricted by the approved EIA of EcoPark and those of the existing boiler are summarised in **Table 1.2**, below, and the detailed calculation of the maximum emission rates of different pollutants according to AP-42 of USEPA are shown in **Appendix B**.

Table 1.2 Parameters Restricted by the Approved EIA and Those of the Existing Boiler in Lot P4 of EcoPark

PHYSICAL PARAMETER	VALUES RESTRICTED BY APPROVED EIA	BOILER IN LOT P4
	Stack height ( meter above ground)	$\geq 30$
Stack diameter (mm)	$\geq 1,000$	150
Efflux velocity (m/s)	$\geq 9$	7.19
Exit temperature ( $^{\circ}\text{C}$ )	$\geq 80$	190
Sulphur content (% w/w)	$< 0.005$	$< 0.005$
ULSD ( $\ell$ /hr)	$\leq 7,500$	$\leq 37$
POLLUTANT IDENTIFIED IN THE EIA	EMISSIONS	
	LIMITED IN EIA (g/s)	BOILER IN LOT P4(g/s)
PM <sup>[Note 1]</sup>	0.5000	0.0025
SO <sub>2</sub>	0.1963	0.0009
NO <sub>x</sub>	6.0000	0.0296
CO	1.2500	0.0062

**Notes:**

1. Respirable Fine Particles (RSP) assumed to = TSP as a worst case scenario, with emission factor of FSP = 0.0025g/s
2. Fine Suspended Particles (FSP) assumed to = TSP x 15% = 0.00375g/s

### 1.3 Fuel Combustion Emission Identified in EIA

- 1.3.1 The exhaust vent and the fuel combustion of the boiler has, by strict interpretation of the EP conditions, deviated to some extent from the base case listed in Table 13.1 of the EIA Report and Annex A of the EP. Nevertheless, a PRC/DA mechanism certified by the EcoPark ET Leader and verified by the EcoPark Independent Environmental Checker (IEC) has been carried out to review the exhaust vent of the boiler before trial operation at Lot P4 of EcoPark in October 2017.
- 1.3.2 Owing to the further proposed extension of boiler operation from 0700 to 1900 to 24 hours per day operation, 7 days a week, a further air quality impact assessment is required. Hence, a quantitatively air quality assessment was carried out to determine if the proposed changes will cause any adverse impacts to the surrounding environment.

### 1.4 Review of Environmental Impacts

- 1.4.1 A number of environmental impacts were assessed in the approved EIA Report in 2005 (EIA Register No. AEIAR-086/2005), including air quality impact, noise impact, water quality impact, waste management, land contamination impact, landfill gas hazard assessment, landscape and visual issues and hazard to life assessment. For the proposed extension of boiler operation hours, air quality is the only concern and this is examined in detail in the remainder of this Technical Note. As the applicable change is for chimney emissions only, it is necessary for its air quality impact to be assessed to meet the following requirements:
- (a) There has been no material change to the environmental impact of the project with mitigation measures in place as approved under the EIA report; and
  - (b) The project complies with the requirements described in the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM).
- 1.4.2 The boiler at Lot P4 of EcoPark is located indoors in a roofed building sitting on a concrete slab as shown on **Figure 1.2**. There are also no noise sensitive receivers identified in proximity. There is no discharge during the operation of the boiler. Therefore, it could be concluded that the extended operation hours of the boiler would not cause additional adverse impacts in terms of noise pollution, water quality, land contamination, landfill gas and landscape and visual and hazard to life.
- 1.4.3 In order to evaluate the air quality impacts due to the proposed extension operation hours of the existing boiler of Lot P4 of EcoPark, the assessment results of the *Environmental Review Report for the Expansion and Extension of Tuen Mun Fill Bank* (the "TMFB ERR") dated August 2018, prepared for the Civil Engineering and Development Department (CEDD), has been referred to.
- 1.4.4 Other environmental impacts, including noise, water quality, waste management, land contamination, landfill gas hazard, landscape and visual issues and hazard to life will not be affected by the proposed extension of boiler operation hours. Therefore, such impacts are not required to be reviewed in this Technical Note.

Figure 1.1 Site Location and Its Environs

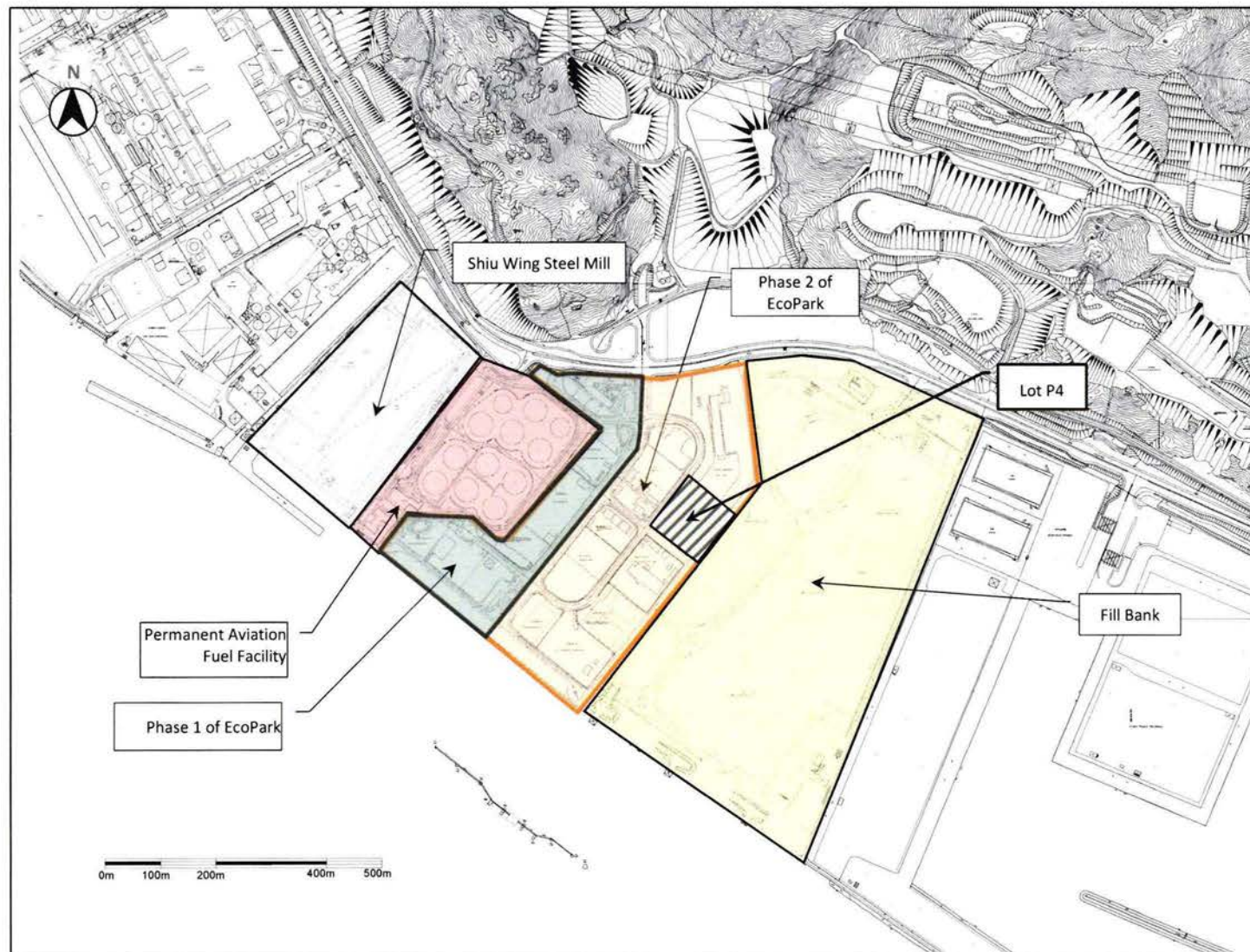


Figure 1.2 Location of the Existing Boiler of Lot P4

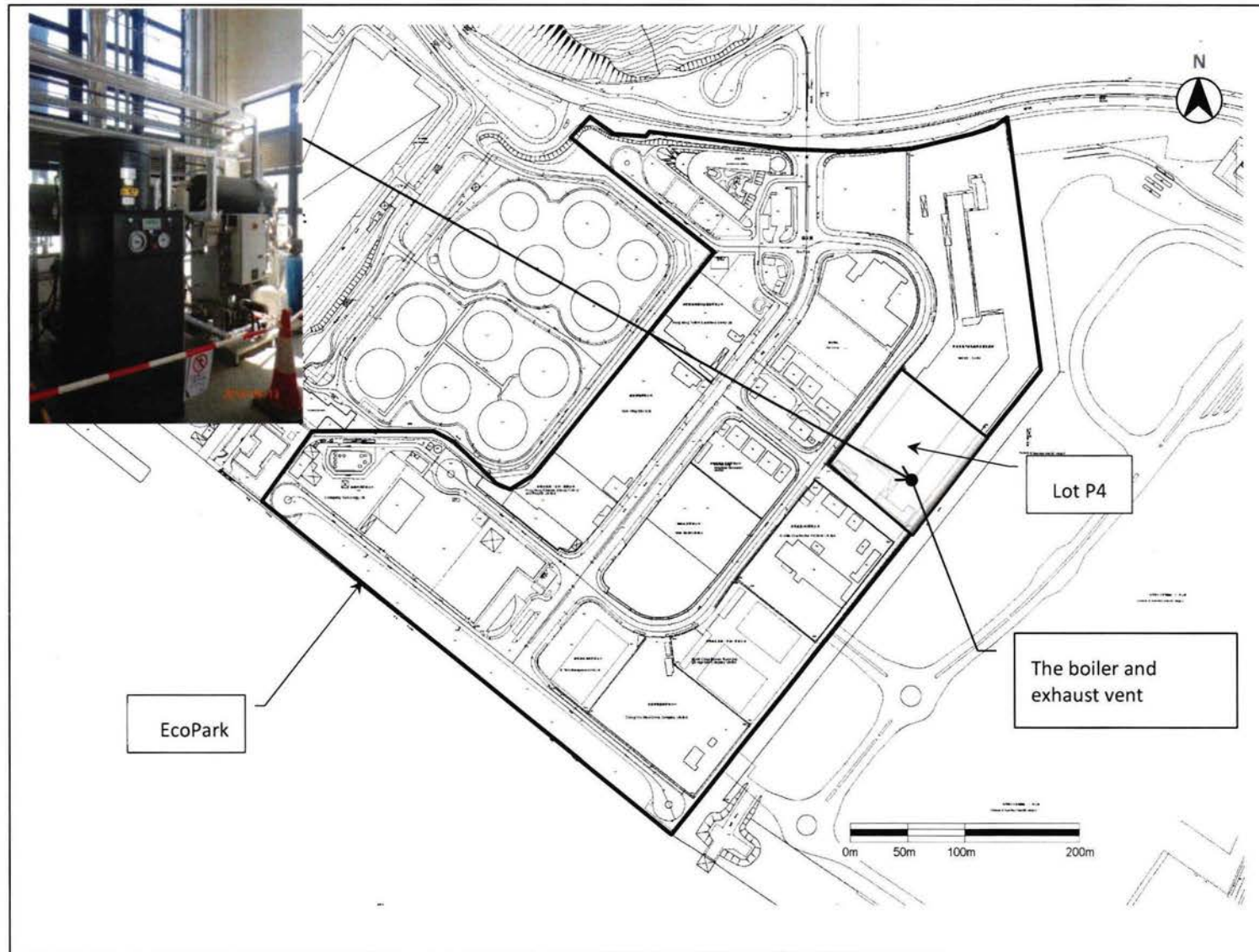
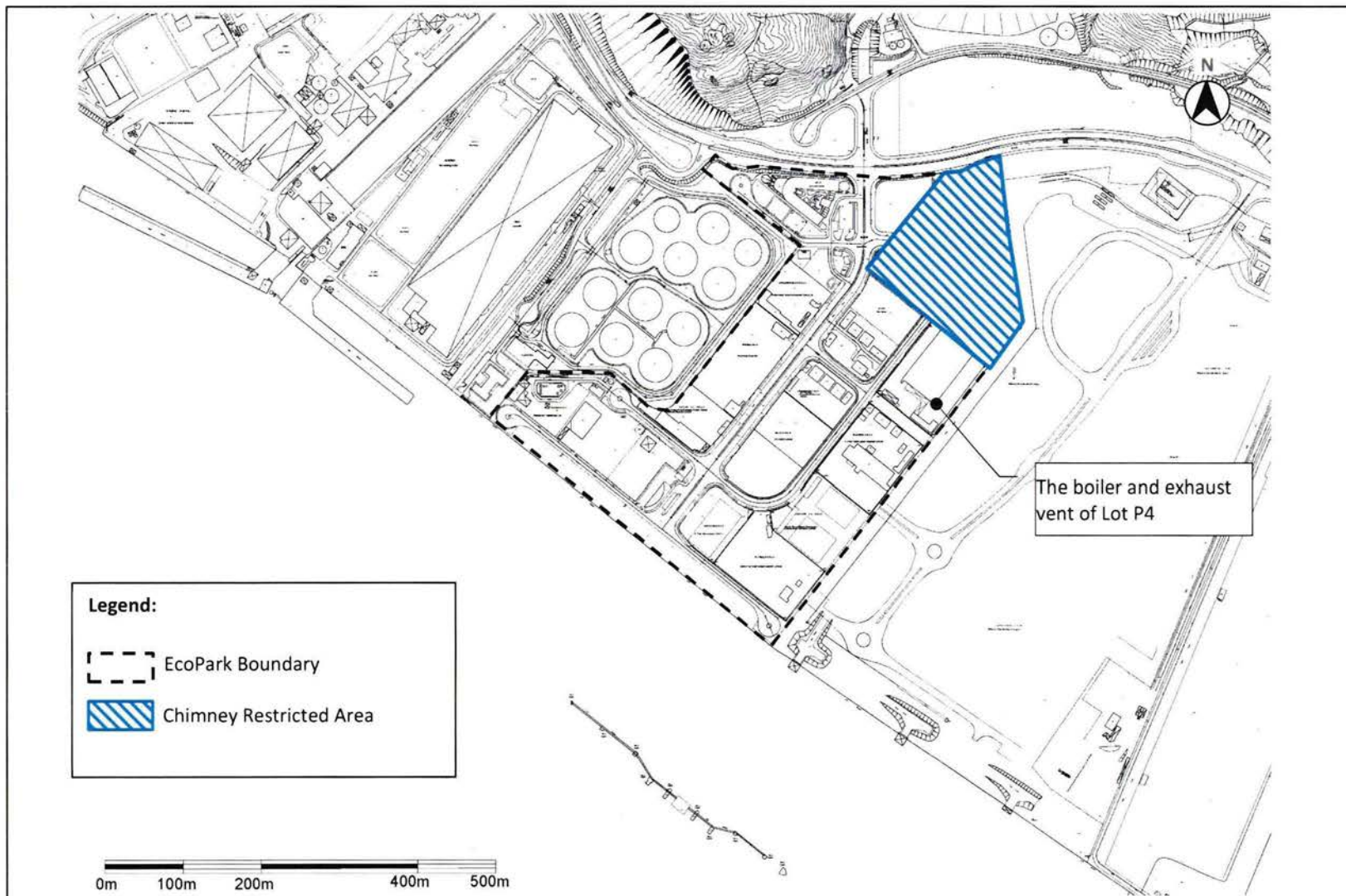


Figure 1.3 Chimney Restricted Area



Source: Re-provided in accordance with Figure 4 of EP-226/2005/F.

## 2 ASSESSMENT CRITERIA

### 2.1 Environmental Legislation and Standards

#### Air Pollution Control Ordinance

2.1.1 The Air Pollution Control Ordinance (APCO, Cap. 311) provides the statutory controls of air pollutants from a variety of stationary and mobile sources. It encompasses the Air Quality Objectives (AQOs) for seven air pollutants. The AQOs criteria are shown in **Table 2.1**.

Table 2.1 Hong Kong Air Quality Objectives

POLLUTANT	AVERAGING TIME	CONCENTRATION LIMIT, $\mu\text{G}/\text{M}^3$	NO. OF EXCEEDANCE ALLOWED
Sulphur Dioxide ( $\text{SO}_2$ )	10-minutes	500	3
	24-hour	125	3
Respirable Suspended Particulates (RSP) (PM10) <sup>[Note 2]</sup>	24-hour	100	9
	Annual	50	Not applicable
Fine Suspended Particulates (FSP) (PM2.5) <sup>[Note 3]</sup>	24-hour	75	9
	Annual	35	Not applicable
Nitrogen Dioxide ( $\text{NO}_2$ )	1-hour	200	18
	Annual	40	Not applicable
Ozone ( $\text{O}_3$ )	8-hour	160	9
Carbon Monoxide (CO) <sup>[Note 4]</sup>	1-hour	30,000	0
	8-hour	10,000	0
Lead (Pb)	Annual	0.5	Not applicable

**Notes:**

- All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.
- RSP means suspended particles in air with a nominal aerodynamic diameter of 10  $\mu\text{m}$  or less.
- FSP means suspended particles in air with a nominal aerodynamic diameter of 2.5  $\mu\text{m}$  or less.
- The 8-hour mean of CO concentration is calculated based on Item 9 of Schedule 5 of APCO. The maximum daily 8-hour mean concentration of CO in air is selected by examining 8-hour running averages, calculated from CO hourly data and updated each hour, that is:
  - the first calculation period for a day is the period from 5pm on previous day to 1 a.m. on that day.
  - the last calculation period for a day is the period from 4pm to 12 midnight on that day.

### 3 AIR QUALITY ASSESSMENT

#### 3.1 Assessment Methodology & Emission Inventory

3.1.1 Reference is made to the TMFB ERR cumulative pollutants results associated with the extension of operation of TMFB from 31 December 2018 to decommissioning on 31 December 2023.

3.1.2 Tuen Mun Fill Bank (TMFB) serves as a temporary stockpiling area for public fill generated from construction works and is one of the Designated Waste Disposal Facilities under the *Waste Disposal Ordinance* (WDO). As stated in the TMFB ERR, the continuing shortfall of reclamation projects in Hong Kong and has led to an insufficiency of storage areas for surplus public fill, and so it is proposed to slightly realign/expand the boundary of TMFB and extend its operation period from the end of 2018 to the end of 2023.

3.1.3 The assumptions made in the TMFB ERR included the cumulative air quality impacts arising from the changes of concurrent projects of TMFB as follows:

- Extend the operation and decommissioning of TMFB to 31 December 2023
- Minor realignment of TMFB site boundary
- Include one additional construction and demolition material sorting facility (NSA) at TMFB during the 5-year extended period

3.1.4 The cumulative impacts included emissions sources within EcoPark and other concurrent projects, which includes the following:

*Within TMFB:*

- Sorting activities from NSA.
- Operation activities of TMFB, which includes:
  - Fill material handling at stockpiling areas and barging points.
  - Operation of material sorting facilities.
  - Truck movements on major haul roads.
  - Wind erosion from stockpiling area.

*In the Vicinity of TMFB:*

- Stack emissions from nearby industrial sites including Green Island Cement (GIC), Shiu Wing Steel Mill (SWSM) and EcoPark.
- Vehicular emissions from external roads within 500m Study Area of TMFB.
- Operation of the existing Construction & Demolition Materials Sorting Facility (C&DMSF) and emissions from marine vessels during berthing and manoeuvring of material transport.

3.1.5 **Figure 3.1** shows the emission sources that were included in the air quality assessment in the TMFB ERR.

3.1.6 The air quality cumulative results assessed in 2019 in the TMFB ERR was considered as the worst case scenario during the 2019-2023 period, and the results were extracted and summarized in **Table 3.3**.

3.1.7 The air quality impact arising from the extension of operation hours of the boiler at Lot P4 have been assessed in the TMFB ERR, which supported the Variation of EP (VEP) Application No. 545/2018 submitted on 9 August 2018. According to Chapter 3 and Annex 2 of the TMFB ERR, the existing and the assumed chimney emissions source at EcoPark based on various tenants' project programmes in 2019 were included in the assessment.

3.1.8 The air quality impact arising from potential emissions inventory from EcoPark in 2019 was also taken into account. There are two cases for the air quality assessment conducted for 2019, with

their differences presented in **Table 3.1**. The two cases involved the assessments of potential air quality impacts arising from the proposed waste paper recycling facility located at either Lot P1 or P6 & P7 of EcoPark. Both cases assumed that the boiler at Lot P4 of EcoPark operates for 24 hours per day. The results of 2019 scenario were extracted from TMFB ERR.

**Table 3.1** Two Cases of EcoPark Emissions

EMISSION SOURCE	CASE 1	CASE 2
Lot P4 <sup>(a)(c)</sup>	YES	YES
K. Wah Recycled Concrete Block Manufacturing Plant <sup>(a)</sup>	YES	YES
SSK Metal Ltd. <sup>(a)</sup>	YES	YES
South China Reborn Resources (Zhongshan) Company Ltd <sup>(a)</sup>	YES	YES
E2_3 at Lot P6 and P7 <sup>(b)</sup>	YES	NO
E2_5 at Lot P1 <sup>(b)</sup>	NO	YES

**Notes:**

- a) Existing EcoPark emissions.
- b) Potential future stack of the proposed waste paper recycling facility.
- c) Boiler at Lot P4 is assumed to be operating 24 hours.

## 3.2 Representative Air Sensitive Receivers

3.2.1 There were totally eight existing and planned ASRs identified within the 500m Study Area of TMFB, and out of these eight ASRs, three ASRs, namely A11, A12, A13, will not have population intake in 2018 and also 2019 based on the TMFB ERR and they are not further assessed in this assessment. The ASRs being assessed are listed in **Table 3.2**, and the locations of these ASRs are shown on **Figure 3.2**.

**Table 3.2** Identified Representative ASRs

ASR ID	DESCRIPTION	TYPE OF USE	APPROX. DISTANCE FROM SITE BOUNDARY (m)	APPROX. BASE ELEVATION (m)	HEIGHT ABOVE GROUND (mAG)
A3	Eco Park Tenant: Lot P4	Industrial	30	5	4.5
A4	Eco Park Tenant: South China	Industrial	25	5	4.5
A5	EcoPark Tenant: Chung Yue	Industrial	20	5	4.5
A9	Eco Park Administration Building	Industrial	255	6	4.5
A10	PAFF Office	Industrial	465	5	4.5

## 3.3 Evaluation of Impacts

3.3.1 The predicted cumulative impacts of TSP, RSP, FSP, SO<sub>2</sub> and NO<sub>2</sub> concentrations with reference to latest TMFB ERR Report for scenario in 2019 indicated that all pollutants levels at ASRs would comply with the relevant AQO criteria.

3.3.2 As stated in **paragraph 1.1.6**, cumulative air quality impacts in Sept - Dec 2018 for TSP, RSP, FSP, SO<sub>2</sub> and NO<sub>2</sub> were also assessed. Cumulative results of different pollutants in 2018 were estimated based on the cumulative results in 2019 by subtracting the corresponding background concentrations of PATH in 2019 and adding back those from PATH in 2018. This methodology is considered as a conservative approach as the cumulative 2018 results for most pollutants already indicate the compliance of AQOs without taking into account the reduced emission inventory of EcoPark and TMFB in 2018 versus 2019, although PATH background concentrations of different pollutants in 2018 are generally larger than that in 2019.



- 3.3.3 For NO<sub>2</sub> assessment, the actual emission inventory from 2018 covering EcoPark, TMFB and the nearby emissions was also considered. The proposed waste paper recycling facility and SSK Metals in EcoPark, and the NSAs in TMFB were not included in the 2018 emission inventory because they were confirmed either not in operation or not in place. The detailed emission inventory is summarised in **Appendix B**.
- 3.3.4 The assessment results summarised in **Table 3.3**, below, indicate that the cumulative impacts of all pollutants at ASRs in 2018 are in compliance with their corresponding AQO criteria.
- 3.3.5 Given that the ambient levels of Carbon Monoxide (CO) in Hong Kong are in general recorded to be very low compared with the AQO criteria according to EPD's air quality monitoring stations and the minimal emissions by the boiler emission at Lot P4, adverse impact due to CO is not anticipated and so CO is not assessed in this technical note.
- 3.3.6 Air modelling assessment of annual NO<sub>2</sub> in 2018 was conducted based on the emission inventory as shown in **Appendix B**. The comparison of cumulative annual average NO<sub>2</sub> results in 2018 and 2019 for cases 1 and 2 are also presented for reference and comparison in **Appendix C**.

### 3.4 Assessment Results

- 3.4.1 The cumulative air quality assessment has demonstrated that all ASRs within 500m of the project are able to meet the AQOs in 2018 considering the actual emission inventory in place and the air quality cumulative results assessed in 2019 in the TMFB ERR also demonstrated compliance with the AQOs, thereby meeting the requirements described in the EIAO-TM. In addition, the total emission rates of EcoPark are still within the limits of Annex A of the EP-226/2005/F, i.e. no material change to the environmental impact of EcoPark as assessed in the EIA Report approved under the EIAO.

### 3.5 Conclusion

- 3.5.1 All air quality impacts associated with chimney emissions from the existing diesel fuel boiler at Lot P4 due to the proposed extension of operation hours of the boiler have been assessed. As such, the air quality impacts in 2018 and 2019 are within the relevant environmental standards set out in the approved EIA report and the EIAO-TM. Therefore, there will be no adverse air quality impact due to the proposed 24 hours per day, 7 days per week operation of the existing boiler at Lot P4 from the date of approval of this technical note to June 2019.

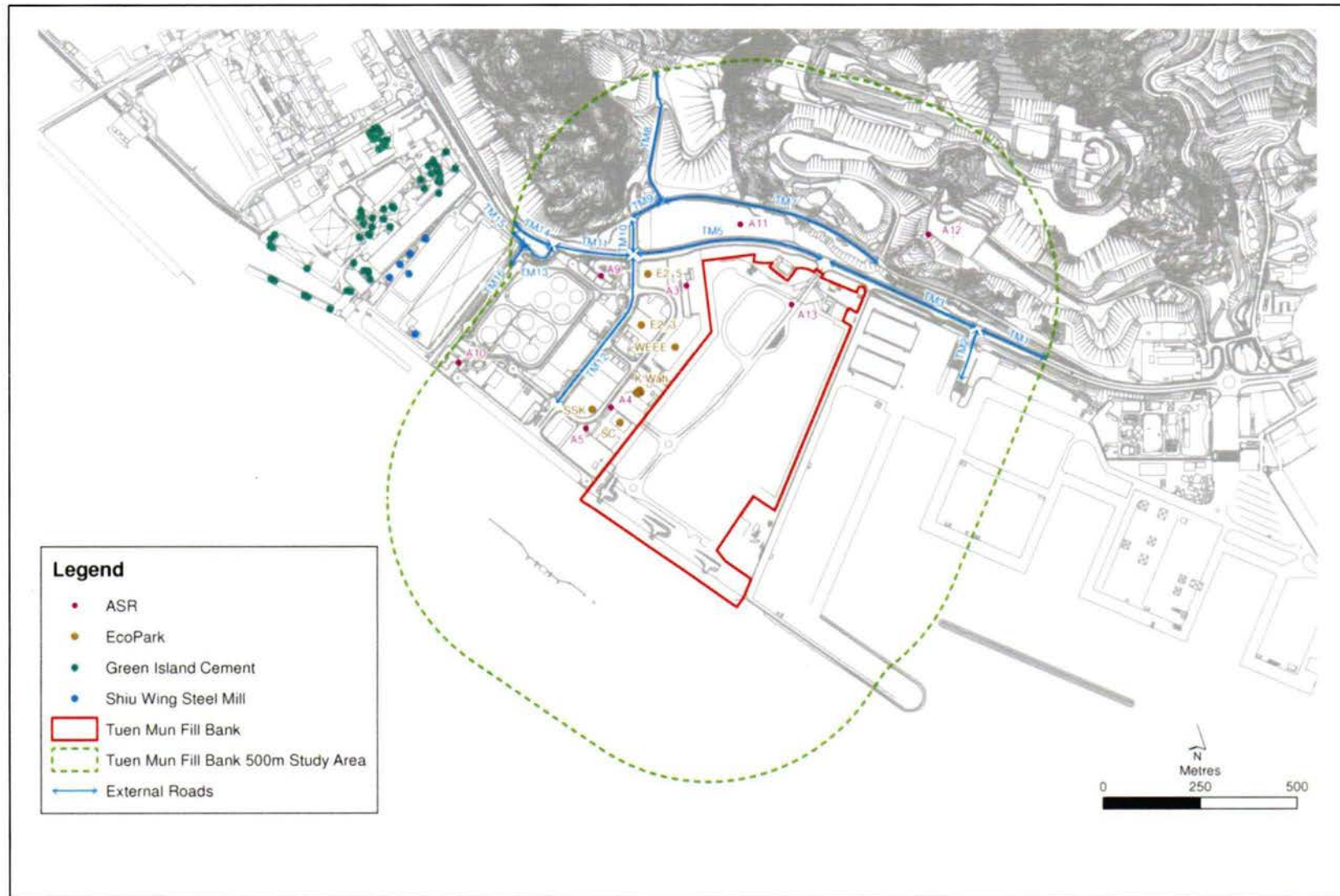
Table 3.3 Cumulative Relevant Pollutants Results in 2018

ASR ID	DESCRIPTION	HEIGHT ABOVE GROUND (mAG)	ANNUAL NO <sub>2</sub>			19TH HIGHEST HOURLY NO <sub>2</sub>			MAX 1-HOUR TSP			10TH HIGHEST DAILY RSP			ANNUAL RSP			10TH HIGHEST DAILY FSP			ANNUAL FSP			4TH HIGHEST 10-MIN SO <sub>2</sub>			4TH HIGHEST DAILY SO <sub>2</sub>		
			2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018	2019	2018-2019 PATH DIFFERENCE	2018
A3	Eco Park Tenant: Lot P4	1.5	38.7	1.47	38.8	154.4	8.76	163.1	349.0	4.74	353.8	86.8	2.74	89.5	38.8	0.41	39.2	65.3	2.05	67.4	27.3	0.29	27.6	210.3	38.97	249.3	37.0	3.60	40.6
		4.5	38.4	1.47	38.5	154.6	8.76	163.3	368.1	4.74	372.8	86.7	2.74	89.5	38.7	0.41	39.1	65.2	2.05	67.3	27.3	0.29	27.5	212.8	38.97	251.8	37.0	3.60	40.6
A4	Eco Park Tenant: South China	1.5	38.7	1.67	39.4	145.2	8.37	153.6	366.2	5.11	371.3	94.3	2.98	97.2	42.8	0.46	43.3	69.5	2.24	71.7	30.3	0.32	30.6	223.9	25.66	249.6	41.7	2.66	44.3
		4.5	38.4	1.67	39.1	145.1	8.37	153.4	329.0	5.11	334.1	94.8	2.98	97.8	43.1	0.46	43.6	69.9	2.24	72.1	30.3	0.32	30.7	223.9	25.66	249.6	41.4	2.66	44.1
A5	EcoPark Tenant: Chung Yue	1.5	38.9	1.67	39.4	145.3	8.37	153.6	453.7	5.11	458.8	92.4	2.98	95.4	42.3	0.46	42.8	68.3	2.24	70.5	29.4	0.32	29.8	220.8	25.66	246.5	41.1	2.66	43.7
		4.5	38.5	1.67	39.2	147.2	8.37	155.5	418.5	5.11	423.6	92.2	2.98	95.2	42.5	0.46	42.9	68.3	2.24	70.5	29.4	0.32	29.7	220.8	25.66	246.5	41.1	2.66	43.7
A9	Eco Park Administration Building	1.5	37.1	1.47	37.1	141.0	8.65	149.6	202.3	4.59	206.9	84.8	2.85	87.6	37.8	0.41	38.2	63.7	2.14	65.8	26.9	0.29	27.2	208.5	35.98	244.4	37.8	2.71	40.5
		4.5	36.7	1.47	36.7	141.4	8.65	150.1	202.3	4.59	206.9	84.6	2.85	87.4	37.8	0.41	38.2	63.6	2.14	65.7	26.9	0.29	27.2	208.3	35.98	244.3	37.8	2.71	40.5
A10	PAFF Office	1.5	37.7	1.67	38.2	141.7	8.37	150.0	203.6	5.11	208.7	89.6	2.98	92.6	40.8	0.46	41.3	68.1	2.24	70.3	29.4	0.32	29.7	208.7	25.66	234.4	40.7	2.66	43.3
		4.5	37.4	1.67	38.0	139.0	8.37	147.3	203.5	5.11	208.7	89.6	2.98	92.6	40.8	0.46	41.2	68.0	2.24	70.2	29.4	0.32	29.7	208.6	25.66	234.3	40.7	2.66	43.3
AQO Standard / EIAO-TM			40			200			500			100			50			75			35			500			125		

## Notes:

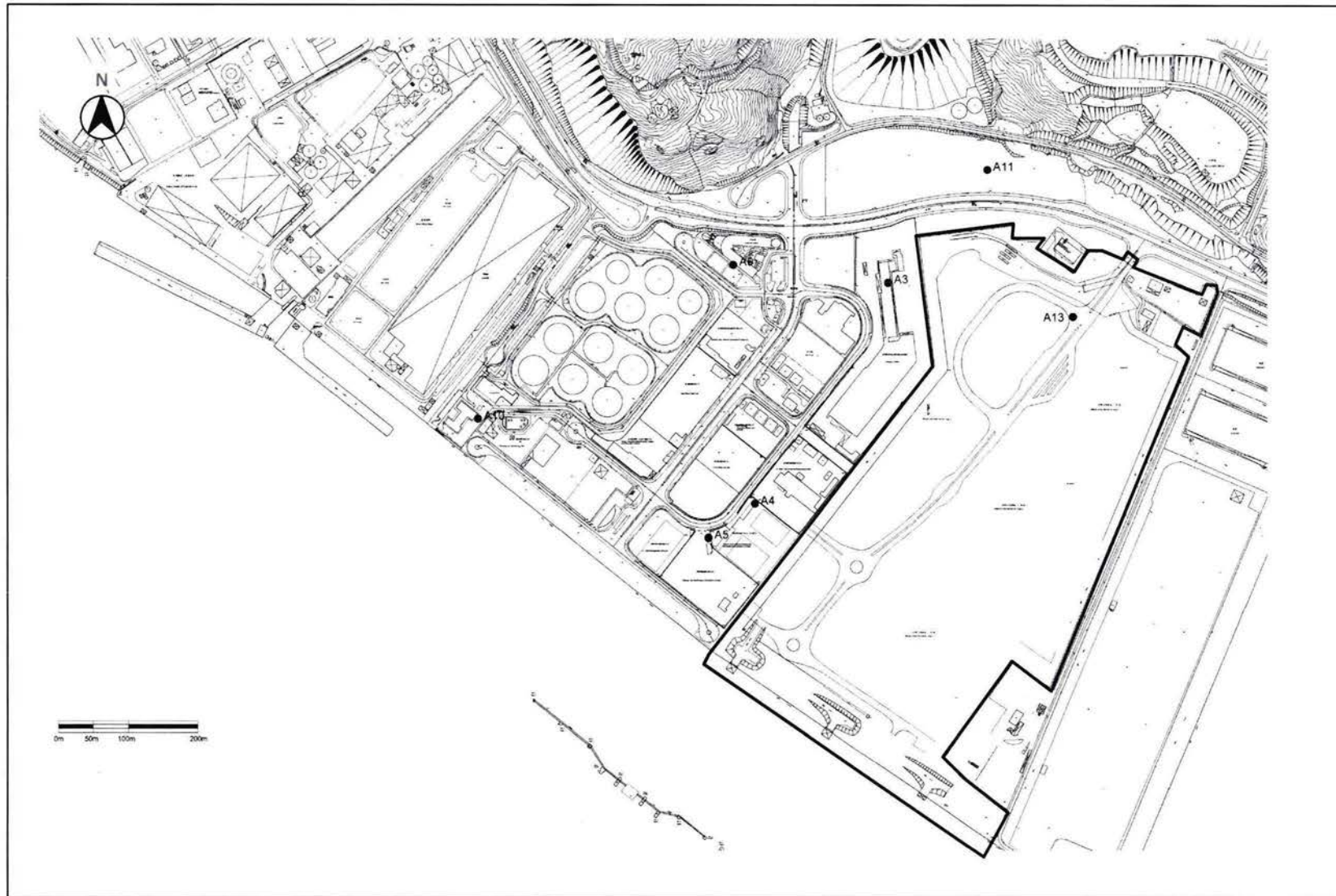
1. The cumulative 2018 results for annual NO<sub>2</sub> takes into account the reduced emission inventory of EcoPark and TMFB in 2018 versus 2019.
2. The cumulative 2018 results for other parameters already indicate compliance with the respective AQOs without taking into account the reduced emission inventory of EcoPark and TMFB in 2018 versus 2019.
3. For annual NO<sub>2</sub>, RSP and FSP, the difference in PATH means the difference of annual average of PATH background between 2018 and 2019.
4. For 10-min, daily SO<sub>2</sub>, hourly NO<sub>2</sub>, hourly TSP, daily RSP and FSP, the difference in PATH means the maximum difference of PATH background data averaging at the respective time interval between 2018 and 2019. Conversion factor of 2.45 is applied to convert hourly SO<sub>2</sub> to 10-min SO<sub>2</sub>.
5. The higher result of Case 1 and Case 2 is taken in calculating the 2019 result.

Figure 3.1 Emission Sources of Cumulative Assessment of TMFB ERR



Source: Extracted from TMFB ERR (August 2018)

Figure 3.2 Locations of Representative Air Sensitive Receivers (ASRs) of TMFB ERR



## 4 OVERALL CONCLUSION

- 4.1.1 Pursuant to Condition 4.4 of EP-226/2005/F for EcoPark, this Technical Note has been prepared to address the potential environmental impacts arising from proposed extension of operation hours, from 0700 to 1900 to 24 hours per day 7 days per week, for an existing diesel fuelled boiler in Lot P4 from September 2018 to June 2019.
- 4.1.2 After reviewing the environmental impacts, there is no change of environmental impacts with respect to noise, water quality, landfill gas, land contamination, landscape and visual and hazard to life due to the proposed extension of boiler operation hour, and in particular the key impact relating to air quality. It has been concluded that there will be no unacceptable environmental impacts or material change to the EcoPark project resulting from the proposed extension of boiler operation hours.
- 4.1.3 Therefore, the technical requirements for the proposed 24 hours per day 7 days per week boiler operation have been satisfied, subject to the approval by the Director under EP Condition 4.4 of EP-226/2005/F.

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## Appendix A **MANUFACTURER'S DETAILS OF PROPOSED BOILER**

Junior SC  
with CERTOMAT



Steam generators UNIVERSAL 700 – 1800 SC series		
Size	Steam capacity kg/h	Method of combustion
5	700 – 850	Oil, gas or combination
6	1000 – 1200	Oil, gas or combination
7	1500 – 1800	Oil, gas or combination

Steam generators ELEKTRO E 6 – 72 M series		
Size	Steam capacity kg/h	Method of heating
One size	6 – 97	Electrical 6 – 72 kW

Steam generators ELEKTRO E 100 series		
Size	Steam capacity kg/h	Method of heating
One size	135 / 160	Electrical 100 / 120 kW



**CONTAINER Steam System**  
Completely equipped and ready to operate



**CVE**  
Supply unit as complete ready-to-operate boiler housing installation.  
In addition: Water softening equipment, treatment equipment



**CERTECON**  
Exhaust gas heat exchangers for Junior  
In addition: exhaust gas heat exchangers for other Certuss



**DESALINATION HEAT EXCHANGER**  
Heat recycling from the desalination condensate to heat feed water  
Reduction of the amount of cooling water at steam systems with mixing heat exchangers when waste water cooling is required



**PARCOVAP®**  
Condensate Heat Recovery



**Junior 80 – 600 SC at a glance**

**Junior 80 – 600 SC in detail**

**Efficiency**

- + Extremely high degree of efficiency (with exhaust gas heat exchanger up to 98% achieved through the 3-fold air insulation with simultaneous preheating of combustion air at very low emission losses)
- + Short heat-up time: full steam output is reached after a maximum of 5 minutes
- + Immediate output adjustment to the respective steam requirements which saves energy and thus costs
- + Low-emission burner developed specially to latest European standards for all sizes

**User friendliness**

- + "Thermostat" for fully automatic operation\*
- + Optionally "C.V.E." supply unit as complete boiler housing installation of boiler feed pump, steam dryer, water conditioning and waste-water mixing heat exchanger

**Operation and installation**

- + Secure installation without foundation at low space requirements
- + Can be installed in work areas, no boiler housing required
- + No permit required for installation and use in Germany

**Safety and quality**

- + Can be remotely programmed and read out or controlled via Ethernet, CAN bus, PROFIBUS or GSMUMTS modem\*
- + Customer service standby 24 hours a day, 365 days a year
- + Spare parts supply guaranteed for 20 years
- + Function and error messages as well as service instructions through clear text display in many languages

**Advantages of our technology**

- + Robust all-steel design with double-shell air cooling without insulation materials
- Air intake from above, trapped heat in boiler house extracted, floor dust remains
- + Noise and vibration damping, elastic aggregate fastening
- + Flue-gas recycling (NO<sub>x</sub> reduction)\*
- + Vertical tension-free central mounting of the heating system with low-point clarifying filtration
- + Recognized exemplary service
- + Can optionally be equipped with burners for EL heating oil, natural gas or liquid gas, tested and approved by the TÜV-Rheinland-Berlin/ Brandenburg in accordance with the latest EU regulations for burners

**The generation of a proven series**

The steam generators CERTUSS Junior SC are characterized by the immediate output adjustment and the simplified operation

**Complete and safe**

The Junior 80 – 600 SC series encompasses completely equipped, ready-to-operate, steam generators with all safety devices for burner technology, pressure and temperature

**CERTOMAT-Display**

modul with indication of all operation and fault messages in plain text with operator guidance

**Storage module**

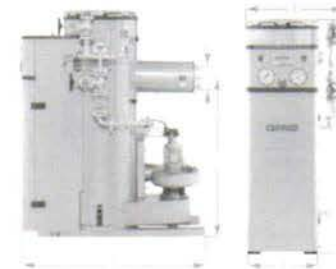
The long-term recording of the boiler and operating states that can be read out per computer via the existing RS 232 interface

**Switch module**

Dry contact for central fault indication to connect a signalling device or for further processing by central control technology systems (configurable with the CERTUSS software Konfigurator Basic) extension modules for detailed transmission of operation and fault messages

**External modem\***

Transmission of operating and fault messages to the CERTUSS server via phone lines for storage and system queries through phone line assigned to the system and automatic transmission of the due date for service intervals to a central control center



**Automatic desliming and start dewatering**

The Junior 80 – 600 SC steam generators can be equipped additionally with an automatic desliming and start dewatering in connection with the "Thermostat" automatic system

Size	Capacities			Levels	Pressures		Consumption			Dimensions (- mm)			Weight (- kg)	Connections										
	Steam capacity l/h	Heating capacity kW	Nominal load kW		Max. operating pressure MPa (bar)	Max. permissible overpressure MPa (bar)	Heating oil (EL) l/h	Natural gas m <sup>3</sup> /h	Liquid gas m <sup>3</sup> /h	Height A	Width B	Depth C		Boiler Ø D	Flue gas pipe Ø E	Flue gas (center) F	Electrical connection load kVA	Oil connection DN	Natural gas DN	Liquid gas DN	Feed water DN	Steam connection DN	Safety valve DN	Start-up line DN
1	80	53	58	1	0.8-1.4-2.2-2.9 (8-14-22-29)	1.0-1.6-2.5-3.2 (10-16-25-32)	4.9	5.8	2.2	1500	650	1210	500	180	1050	320	1.75	1/2"	20	20	1 1/2"	15	1"	1/2"
	120	79	87				7.4	8.7	3.4								1.9	3/8"	32	20	40	1"		
2	150	99	109	1	0.8-1.4-2.2-2.9 (8-14-22-29)	1.0-1.6-2.5-3.2 (10-16-25-32)	9.2	10.9	4.2	1580	725	1375	560	200	1120	420	1.9	1/2"	32	20	1 1/2"	20	40	1/2"
	200	131	145				12.3	14.5	5.6								2.0	3/8"	40	20	40	1"		
3	250	164	182	1	0.8-1.4-2.2-2.9 (8-14-22-29)	1.0-1.6-2.5-3.2 (10-16-25-32)	15.3	18.2	7.1	1850	805	1510	640	250	1360	520	2.0	3/8"	40	20	1 1/2"	25	40	1"
	300	196	218				18.4	21.8	8.4								2.5	1/2"	50	25	40	1 1/2"		
4	350	230	255	1	0.8-1.4-2.2-2.9 (8-14-22-29)	1.0-1.6-2.5-3.2 (10-16-25-32)	21.5	25.5	9.9	1980	870	1630	700	250	1460	950	3.6	1/2"	50	25	1 1/2"	32	40	1/2"
	400	262	291				24.5	29.1	11.3								3.6	1/2"	50	25	40	1 1/2"		
4	500	328	364	2	0.8-1.4-1.8-2.2-2.9 (8-14-18-22-29)	1.0-1.6-2.0-2.5-3.2 (10-16-20-25-32)	30.6	36.4	14.1	1980	870	1630	700	250	1460	950	3.6	1/2"	50	25	1 1/2"	32	40	1/2"
	600	393	436				36.8	43.6	16.9								3.6	1/2"	50	25	40	1 1/2"		

Reference values: Natural gas at 10 kW/Nm<sup>3</sup> - 8600 kcal/Nm<sup>3</sup>, liquid gas at 25.8 kW/Nm<sup>3</sup> - 22200 kcal/Nm<sup>3</sup>  
 Measurements and weights are rounded up or off. MPa and bar are overpressure values  
 For positioning purposes lateral fittings are detachable. **Delivery complete with water pump**  
 Output values stated are related to 100°C feed water temperature with 1 MPa (10 bar) steam overpressure.  
 CERTUSS burner with flue gas return (NO<sub>x</sub> reduction)\*

\* Supplementary equipment.

**We reserve the right to make technical modifications.**

1 MPa (10 bar) = 145 psi  
 10 psi = 0.689 MPa (10.09 bar)

1 kW = 3413 BTU  
 1000 BTU = 0.293 kW



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## Appendix B EMISSION SUMMARY TABLE

## Emission Summary from Boiler of Lot P4 of EcoPark

### Emissions from Fuel Combustion in Boiler

ULSD Consumption Rate	=	37.00	L/hour	
Sulphur Content	=	0.005	%	
Emission factor of PM	=	2	lb/1000 gallon	[Note 1]
	=	0.24	kg/1000 L	[Note 2]
	=	0.24	g/L	
	=	8.88	g/hour	
	=	<b>0.0025</b>	<b>g/s</b>	
Emission factor of NO <sub>x</sub>	=	24	lb/1000 gallon	[Note 1]
	=	2.88	kg/1000 L	[Note 2]
	=	2.88	g/L	
	=	106.56	g/hour	
	=	<b>0.0296</b>	<b>g/s</b>	
Emission factor of SO <sub>2</sub>	=	1425	lb/1000 gallon	[Note 1]
	=	0.71	lb/1000 gallon	
	=	0.0852	kg/1000 L	[Note 2]
	=	0.0852	g/L	
	=	3.1524	g/hour	
	=	<b>0.00088</b>	<b>g/s</b>	
Emission factor of CO	=	5	lb/1000 gallon	[Note 1]
	=	0.6	kg/1000 L	[Note 2]
	=	0.6	g/L	
	=	22.2	g/hour	
	=	<b>0.0062</b>	<b>g/s</b>	

#### Note

1. Emission factor made reference to Table 1.3-1 of AP-42 of USEPA for No. 2 oil fired.
2. Conversion of lb/1000 gallon by multiplying 0.12 as per AP42

#### Emission Summary

No.	Plant	Plant Type	Emission Sources	Pollutants during Operation	Operation Hours	ID	X	Y	Ground mPD	Type of Source	Stack Diameter (m)	Stack Height (mAG)	Exit Temperature (C)	Gas Flow Rate (m <sup>3</sup> /hr)	Exhaust Gas Exit Velocity (m/s)	NO <sub>x</sub> Emission Rate (g/s)	TSP Emission Rate (g/s)	RSP Emission Rate (g/s)	FSP Emission Rate (g/s)	CO Emission Rate (g/s)	SO <sub>2</sub> Emission Rate (g/s)
1	Lot P4 of EcoPark	WEEE Treatment Facility	Diesel Fuel Boiler	RSP, SO <sub>2</sub> , NO <sub>2</sub> , CO	24	EP	810967.2	825350.9	7	Point	0.15	13.2	190	-	7.19	0.0296	0.0025	0.0025	0.00038	0.0062	0.0009

### Emission Inventory for Stack Emission Sources in EcoPark

CHIMNEY	LOT	NO <sub>x</sub> EMISSIONS	OPERATION PERIOD	OPERATION HOURS
WEEE Park	Lot P4	0.0294 g/s	8 March 2018 to 31 Aug 2018	07:00 to 19:00
WEEE Park	Lot P4	0.0294 g/s	1 Sep 2018 to 31 Dec 2018	24 hours
South China Reborn Resources (Zhongshan) Co Ltd	Lot P12	0.0078 g/s	1 Jan 2018 to 31 Dec 2018	07:00 to 19:00
Others	Other locations in EcoPark	N/A	No operation in 2018	N/A

Emission Inventory for Stack Emission Sources in the Vicinity of TMFB

Sources	Model Input ID	X	Y	Elevation m	RSP Emission g/s	FSP Emission g/s	NOx Emission g/s	SO2 Emission g/s	Discharge Height m	Temp K	Exit Velocity m/s	Diameter m	Operation Hour
Green Island Cement	G1	810021.8	825547.4	0	0.17944	0.17944			17.2	0	6.5	1.95	24 hours
Green Island Cement	G2	810032.1	825542.4	0	0.17944	0.17944			17.2	0	6.5	1.95	24 hours
Green Island Cement	G3	810088.4	825511.2	0	0.02389	0.02389			16	0	16.8	0.44	24 hours
Green Island Cement	G4	810187.9	825609.7	0	0.04806	0.04806			30	0	18.1	0.60	24 hours
Green Island Cement	G5	810142.3	825556.0	0	0.04806	0.04806			32	0	14.9	0.67	24 hours
Green Island Cement	G6	810188.5	825602.5	0	0.08694	0.08694			39.1	0	21.4	0.75	24 hours
Green Island Cement	G7	810175.4	825610.7	0	0.01528	0.01528			32.8	0	17.9	0.34	24 hours
Green Island Cement	G8	810193.5	825587.0	0	0.01194	0.01194			17.6	0	10.6	0.39	24 hours
Green Island Cement	G9	810171.7	825752.4	0	0.03972	0.03972			59.8	343	19.2	0.58	24 hours
Green Island Cement	G10	810168.4	825764.6	0	0.00417	0.00417			17	343	13.6	0.22	24 hours
Green Island Cement	G11	810369.3	825839.0	0	0.01806	0.01806			24.5	0	21.9	0.34	24 hours
Green Island Cement	G12	810373.4	825838.0	0	0.02250	0.02250			39.2	0	19.9	0.39	24 hours
Green Island Cement	G13	810369.2	825864.0	0	0.01444	0.01444			61.1	0	17.3	0.34	24 hours
Green Island Cement	G14	810344.1	825880.2	0	0.05472	0.05472			61.1	0	20.8	0.60	24 hours
Green Island Cement	G15	810413.4	825873.1	0	0.14917	0.14917			24.5	366	34.3	0.86	24 hours
Green Island Cement	G16	810372.9	825862.8	0	0.05056	0.05056			34.4	366	24.0	0.60	24 hours
Green Island Cement	G17	810389.9	825914.8	0	0.14917	0.14917			25.5	366	34.3	0.86	24 hours
Green Island Cement	G18	810366.7	825873.4	0	0.04806	0.04806			34.4	366	22.8	0.60	24 hours
Green Island Cement	G19	810364.4	825877.3	0	0.00611	0.00611			25.5	343	20.6	0.21	24 hours
Green Island Cement	G20	810388.9	825914.2	0	0.14917	0.14917			24.5	366	34.3	0.86	24 hours
Green Island Cement	G21	810356.1	825891.6	0	0.04806	0.04806			34.4	366	22.8	0.60	24 hours
Green Island Cement	G22	810213.0	825975.3	0	0.06778	0.06778			85.7	333	22.7	0.68	24 hours
Green Island Cement	G23	810220.6	825966.7	0	0.05833	0.05833			85.7	333	19.6	0.68	24 hours
Green Island Cement	G24	810203.8	825973.9	0	0.05833	0.05833			85.7	333	19.6	0.68	24 hours
Green Island Cement	G25	810212.5	825950.6	0	0.05833	0.05833			85.7	333	19.6	0.68	24 hours
Green Island Cement	G26	810202.5	825971.4	0	0.01944	0.01944			85.7	333	18.2	0.41	24 hours
Green Island Cement	G27	810232.2	825930.9	0	0.03750	0.03750			30.3	333	18.4	0.60	24 hours
Green Island Cement	G28	810216.2	825921.7	0	0.03750	0.03750			30.3	333	18.4	0.60	24 hours
Green Island Cement	G29	810192.2	825962.5	0	0.01944	0.01944			13	333	10.3	0.54	24 hours
Green Island Cement	G30	810195.2	825957.4	0	0.01944	0.01944			13	333	10.3	0.54	24 hours
Green Island Cement	G31	810198.3	825951.9	0	0.03694	0.03694			13	333	19.4	0.54	24 hours
Green Island Cement	G32	810201.2	825947.0	0	0.03694	0.03694			13	333	19.4	0.54	24 hours
Green Island Cement	G33	809940.1	825669.1	0	0.01472	0.01472			16.9	333	20.7	0.33	24 hours
Green Island Cement	G34	809935.3	825692.2	0	0.03556	0.03556			29	333	18.7	0.54	24 hours
Green Island Cement	G35	810223.6	825926.0	0	0.04528	0.04528			30.2	333	19.2	0.60	24 hours
Green Island Cement	G36	810359.9	825885.2	0	0.01194	0.01194			20	366	11.7	0.42	24 hours
Green Island Cement	G39	810150.8	825630.4	0	0.01528	0.01528			28.6	0	16.8	0.36	24 hours
Green Island Cement	G40	810244.9	825722.8	0	0.01111	0.01111			57.6	0	17.6	0.29	24 hours
Green Island Cement	G41	810228.0	825742.9	0	0.03861	0.03861			40.3	343	19.9	0.56	24 hours
Green Island Cement	G42	810192.1	825701.2	0	0.04139	0.04139			45.7	343	17.9	0.61	24 hours
Green Island Cement	G43	810175.5	825730.0	0	0.02306	0.02306			53.3	343	18.3	0.45	24 hours
Green Island Cement	G44	810198.8	825745.2	0	0.06472	0.06472			53.8	343	18.1	0.76	24 hours
Green Island Cement	G45	810189.3	825704.2	0	0.00806	0.00806			35.5	343	19.1	0.26	24 hours
Green Island Cement	G47	810198.0	825722.5	0	0.02778	0.02778			19.5	343	18.0	0.50	24 hours
Green Island Cement	G48	810131.3	825558.0	0	0.03583	0.03583			17.4	0	14.4	0.59	24 hours
Green Island Cement	G50	810209.8	825977.3	0	0.00472	0.00472			24.7	343	9.3	0.29	24 hours
Green Island Cement	G51	810371.3	825809.0	0	0.13583	0.13583			26.4	0	13.0	1.20	24 hours
Green Island Cement	G52	810374.8	825838.8	0	0.03583	0.03583			30.9	0	10.1	0.70	24 hours
Green Island Cement	G56	810249.8	825775.5	0	0.08083	0.08083			72.2	338	5.0	1.60	24 hours
Green Island Cement	G57	810324.8	825844.4	0	0.34444	0.34444			31.2	561	26.9	1.59	24 hours
Green Island Cement	G58	810254.7	825771.9	0	2.22222	2.22222	111.6667	27.78	113	383	20.6	3.10	24 hours
Green Island Cement	G60	810228.2	825768.7	0	0.13139	0.13139			113	338	14.0	1.19	24 hours
Green Island Cement	G61	810227.3	825940.6	0	0.06139	0.06139			32	0	13.3	0.80	24 hours
Green Island Cement	G62	809945.8	825584.7	0	0.17944	0.17944			17.2	0	6.5	1.95	24 hours
Green Island Cement	G63	809935.5	825589.8	0	0.17944	0.17944			17.2	0	6.5	1.95	24 hours
Green Island Cement	G66	810374.5	825853.2	0	0.03056	0.03056			63	0	14.2	0.57	24 hours
Green Island Cement	G67	810166.7	825747.9	0	0.02278	0.02278			27.8	343	12.7	0.60	24 hours
Green Island Cement	G68	810165.5	825695.2	0	0.02278	0.02278			29.8	343	12.7	0.60	24 hours
Green Island Cement	G69	810332.9	825821.6	0	0.09250	0.09250			15.5	383	30.3	0.28	24 hours
Green Island Cement	G70	809945.8	825703.8	0	0.05889	0.05889			25.9	333	10.5	0.60	24 hours
Green Island Cement	G71	809932.9	825674.1	0	0.01222	0.01222			24.2	333	5.3	0.60	24 hours
Green Island Cement	G72	810237.3	825945.6	0	0.03194	0.03194			16.9	333	13.8	0.60	24 hours
Green Island Cement	G73	810351.9	825859.6	0	0.04389	0.04389			78.8	363	2.3	1.85	24 hours
Green Island Cement	G75	810029.4	825616.1	0	0.00889	0.00889			2.9	333	39.7	0.23	24 hours
Shiu Wing Steel Mill	SW1	810243.3	825593.1	5	3.4194	3.4194	17.1		50	367	15.2	6.2	24 hours
Shiu Wing Steel Mill	SW2	810297.4	825653.9	5	0.7	0.7	0.4556	0.000161	35	325	15.7	2.6	24 hours
Shiu Wing Steel Mill	SW3	810309.5	825446.3	5	0.4639	0.4639	3.717	0.1222	50	813	10.3	1.85	24 hours
Shiu Wing Steel Mill	SW4	810270.3	825626.3	5	0.0088	0.0088			16	303	10.8	0.339	24 hours
Shiu Wing Steel Mill	SW5	810293.4	825601.8	5	0.0047	0.0047			16	303	5.9	0.339	24 hours
Shiu Wing Steel Mill	SW6	810336.7	825692.5	5	0.0511	0.0511	0.7194	0.04806	7	753	14.9	0.16	24 hours

Note:

- (a) Emissions for Green Island Cement and Shiu Wing Steel Mill are referenced from the Approved Additional Gas-fired Generation Units Project (AEIAR-197/2016)
- (b) Emissions for SSK and South China at EcoPark are referenced from the relevant Environmental Permit (EP-226/2005/E)

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## Appendix C ANNUAL NO<sub>2</sub> RESULT FOR CASES 1 AND 2

## NO<sub>2</sub> Annual Cumulative Results for Cases 1 and 2

ASR ID	DESCRIPTION	HEIGHT ABOVE GROUND (mAG)	GRID	CASE 1		CASE 2	
				2019	REDUCTION IN 2018 VS 2019	2019	REDUCTION IN 2018 VS 2019
A3	Eco Park Tenant: Lot P4	1.5	1639	38.68	1.41	37.96	0.69
		4.5	1639	38.40	1.42	37.68	0.70
A4	Eco Park Tenant: South China	1.5	1538	38.68	1.02	38.47	0.81
		4.5	1538	38.38	0.97	38.19	0.78
A5	EcoPark Tenant: Chung Yue	1.5	1538	38.85	1.13	38.7	0.97
		4.5	1538	38.54	1.08	38.4	0.94
A9	Eco Park Administration Building	1.5	1539	37.06	1.43	36.35	0.73
		4.5	1539	36.67	1.48	35.97	0.78
A10	PAFF Office	1.5	1538	37.66	1.14	37.47	0.95
		4.5	1538	37.43	1.11	37.24	0.92

local people  
global experience

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