



Capco 青山發電有限公司
Castle Peak Power Co. Ltd.

Installation of Additional Gas-fired Generation Units (CCGT Units No.1 and No.2)

Annual EM&A Report No. 5

19 January 2022

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**Installation of Additional Gas-fired Generation Units at the Black Point
Power Station (CCGT Units No. 1 and No. 2)**

Environmental Certification Sheet

EP-507/2016/C, EP-507/2016/D, FEP-03/507/2016/C, FEP-04/507/2016/C and FEP-04/507/2016/D


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EM&A Manual (AEIAR-197/2016):	Sections 15.1 & 15.6
Content:	<i>Annual EM&A Reports</i>
In accordance with Annex 21 of the EIAO-TM, a copy of the monthly, quarterly, annual and final review EM&A reports will be made available to the Director of Environmental Protection.	
An annual EM&A report will be prepared by the ET at the end of each construction year during the course of the Project.	

ET Certification

I hereby certify that the above referenced document/ plan complies with the above referenced requirement of EM&A Manual (AEIAR-197/2016).	
Dr Jasmine Ng, Environmental Team Leader:	
Date:	19 January 2022

IEC Verification


I hereby verify that the above referenced document/ plan complies with the above referenced requirement of EM&A Manual (AEIAR-197/2016).	
Mr Thomas Chan, Independent Environmental Checker:	
Date:	24 January 2022

Signature Page

19 January 2022

Installation of Additional Gas-fired Generation Units (CCGT Units No.1 and No.2)

Annual EM&A Report No.5



Dr Jasmine Ng
Partner

ERM-Hong Kong, Limited
2509, 25/F One Harbourfront
18 Tak Fung Street
Hung Hom, Kowloon
Hong Kong

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EXECUTIVE SUMMARY

The construction works of CCGT Units No. 1 and No. 2 of the **Additional Gas-fired Generation Units Project at the Black Point Power Station** commenced on 5 December 2016 and 4 June 2020 respectively. This is the 5th Annual Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 January to 31 May 2021 for CCGT Unit No. 1 and from 1 January to 31 December 2021 for CCGT Unit No. 2 in accordance with the EM&A Manual and the requirements of EP-507/2016/C, EP-507/2016/D, FEP-03/507/2016/C, FEP-04/507/2016/C and FEP-04/507/2016/D.

Summary of the Construction Works undertaken during the Reporting Period

The major construction works undertaken during the reporting period include testing and commissioning for CCGT Unit No.1, and land-based civil works for CCGT Unit No.2 within the BPPS. Details of the construction activities within the reporting period are presented in *Section 2*.

Environmental Site Inspection

During the reporting period, weekly joint environmental site inspections/ audits were carried out by the representatives of the Contractors, the Environmental Team (ET), CLP and the Independent Environmental Checker (IEC). Environmental performance complied with the environmental requirements and all necessary mitigation measures were properly implemented.

Waste Management

CAPCO and the Contractors have followed the Waste Management Plan (WMP) for the handling and disposal of construction and demolition (C&D) materials (inert public fill and non-inert construction wastes), chemical wastes, recyclable materials, and sewage.

Environmental Exceedance/Non-conformance/Complaint/Summons and Prosecution

For both CCGT Units No.1 and No.2:

- No non-compliance event was recorded during the reporting period.
- No complaint was received during the reporting period.
- No summon or prosecution was received in this reporting period.

The EM&A requirements have been reviewed and were considered as adequate and effective. No change to the requirements was considered to be necessary. The recommended environmental mitigation measures are also considered to be effective and efficient in reducing the potential environmental impacts associated with the construction of the Project. No change was thus considered necessary.

Overall, the EM&A results indicated that the Project has not caused unacceptable environmental impacts. This is in agreement with the assessment presented in the EIA Report.

1. INTRODUCTION

The Castle Peak Power Company Limited (CAPCO) is a joint venture between CLP Power Hong Kong Limited (CLP) and China Southern Power Grid Company Limited with CLP as the operator. ERM-Hong Kong, Limited (ERM) and Mott MacDonald Hong Kong Limited were appointed by CAPCO as the Environmental Team (ET) and the Independent Environmental Checker (IEC), respectively, to undertake the Environmental Monitoring and Audit (EM&A) activities for the installation of CCGT Units No.1 and No. 2 of the Additional Gas-fired Generation Units Project at the Black Point Power Station (BPPS) ("the Project").

1.1 Purpose of the Report

This is the fifth Annual EM&A report which summarises the audit findings during the reporting period from 1 January to 31 May 2021 for CCGT Unit No. 1 and from 1 January to 31 December 2021 for CCGT Unit No. 2.

1.2 Structure of the Report

Following this introductory section, the remainder of this *Annual EM&A Report* is organised as follows:

- Section 2: Project Information

It summarises the background and scope of the project, site description, project organisation and contact details, construction programme, construction works undertaken and status of the Environmental Permits/Licenses during the reporting period;

- Section 3: Environmental Monitoring Requirement

It presents the environmental monitoring requirements for the Project;

- Section 4: Implementation Status of the Environmental Protection Requirements

It summarises the implementation of environmental protection measures during the reporting period;

- Section 5: EM&A Results

It summarises the EM&A results obtained in the reporting period;

- Section 6: Environmental Non-conformance

It summarises any monitoring exceedance, environmental complaints and summons within the reporting period;

- Section 7: Review of EM&A Programme

It reviews the success of the EM&A programme, including the effectiveness and efficiency of the mitigation measures and recommendations for any improvements in the EM&A Programme;

- Section 8: Conclusions

2. PROJECT INFORMATION

2.1 Background

The scope of the Project involves the phased construction and operation of up to two additional combined cycle gas turbine (CCGT) units (with an installed capacity of up to 1,200 MW) at the BPPS. The additional generation units will be of CCGT configuration using natural gas as the primary fuel. It is a Designated Project under the *Environmental Impact Assessment Ordinance* (Cap. 499) (EIAO). The construction of CCGT Unit No. 1 was completed on 31 May 2021. The current EM&A Programme includes CCGT Unit No. 2.

An EIA of the Additional Gas-fired Generation Units Project was prepared in accordance with the *EIA Study Brief* (No. ESB-286/2015) and the *Technical Memorandum of the Environmental Impact Assessment Process (EIAO-TM)* and submitted under the EIAO in February 2016. Subsequent to the approval of the EIA (*EIAO Register Number AEIAR-197/2016*), an Environmental Permit (EP-507/2016) (EP) for CCGT Unit No. 1 was granted by the Director of Environmental Protection (DEP) on 14 June 2016.

An application for Variation of Environmental Permit (No. VEP-575/2020) was submitted to EPD on 30 March 2020 to include CCGT Unit No. 2 and the Variation of Environmental Permit (EP-507/2016/C) was granted on 27 April 2020.

Application for Further Environmental Permit (FEP-201/2020) was submitted to EPD on 3 August 2020 and the Further Environmental Permit (FEP-03/507/2016/C) was granted to the Contractor, Gammon Engineering & Construction Company Limited, of the CCGT Unit No. 2 on 28 August 2020. Further Environmental Permit (FEP-04/507/2016/C) was granted to the Contractor, Siemens Energy Limited, of the CCGT Unit No. 2 on 6 August 2021. The Contractor, Gammon Engineering & Construction Company Limited, had completed the early civil works, and the application for surrender of FEP (FEP-03/507/2016/C) was submitted to EPD on 25 November 2021 and approved on 30 November 2021.

Applications for Variation of Environmental Permits were submitted to EPD on 30 November 2021 to cater for the proposed changes of Project site area and cooling tower. The Variation of Environmental Permit (EP-507/2016/D) was granted on 21 December 2021 and the Further Environmental Permit (FEP-04/507/2016/D) was granted to the Contractor, Siemens Energy Limited, of the CCGT Unit No. 2 on 21 December 2021.

2.2 General Site Description

The proposed location for the Project is within the existing boundaries of the BPPS site. The size of the land reserved for the additional generation units and the associated facilities (the Project Site) is about 58,860 m². Commissioning works for CCGT Unit No.1 was completed on 31 May 2021. Construction works for CCGT Unit No.2 are currently ongoing at the Project Site.

The location plan of key Project components for CCGT Units No. 1 and No. 2 is shown in **Appendix A**.

2.3 Construction Programme and Activities

The construction of CCGT Unit No. 1 was completed on 31 May 2021. A summary of the major construction activities undertaken in this reporting period is shown in **Table 2.1**. The construction programme for CCGT Units No. 1 and No. 2 is presented in **Appendices B1 and B2**, respectively.

Table 2.1 Summary of the Construction Activities Undertaken during the Reporting Period

INSTALLATION OF ADDITIONAL GAS-FIRED GENERATION UNITS
(CCGT UNIT NO.1 AND NO.2) AT THE BLACK POINT POWER STATION

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CCGT Unit No. 1

Month	Construction Activities undertaken
January 2021	■ Testing and commissioning.
February 2021	■ Testing and commissioning.
March 2021	■ Testing and commissioning.
April 2021	■ Testing and commissioning.
May 2021	■ Testing and commissioning.

CCGT Unit No. 2

Month	Construction Activities undertaken
January 2021	■ Auger Pressure Grouted (APG) works; ■ Piling works; ■ Removal of existing Underground Utilities (UU) diversion; ■ Excavation for service trench & high voltage cable; ■ Existing UU diversion; ■ Construction of new contractor office; and ■ Sheet piling.
February 2021	■ Piling works; ■ Excavation; ■ Pipe installation; ■ Construction of service trench; ■ Construction of new contractor office; ■ Prebored for sheet piling; and ■ Electric cable diversion.
March 2021	■ Piling works; ■ 1500mm drainage installation; ■ Sheetpiling; ■ Water main construction; ■ Service trench construction; ■ Construction of site office; and ■ Installation of cable.
April 2021	■ Piling works; ■ Pile tests; ■ Storm drain diversion; ■ Haul road and utility diversion; ■ Excavation and backfilling for trenches; and ■ Construction of site office.
May 2021	■ Pile tests; ■ Excavation and backfilling for trenches; ■ Hoarding relocation; ■ New site office construction; ■ Excavation and Lateral Support (ELS) for pits; ■ Electric cable installation; and ■ Pile cap excavation.
June 2021	■ Pile test; ■ Manhole construction; ■ Excavation and backfilling for trenches; ■ Hoarding relocation; ■ New haul road and new site office construction; ■ Excavation and Lateral Support (ELS) for pits; ■ Electric cable installation; and ■ Pile cap excavation.

July 2021	<ul style="list-style-type: none">■ Installation of site power;■ Site office erection;■ Pile trimming & plate welding;■ Base slab construction; and■ Backfilling.
August 2021	<ul style="list-style-type: none">■ Concreting for permanent structures concreted and base slabs;■ Rebar works and formwork installation and foundation;■ Pile head preparation for building slab;■ Blinding works;■ Backfilling of trench for pipe installation;■ Pipe laying activities; and■ Lamination works.
September 2021	<ul style="list-style-type: none">■ Site preparation and mobilisation;■ Concreting for permanent structures, foundation and base slabs;■ Rebar works, formwork installation and foundation works;■ Preparation for building slab;■ Blinding works;■ Backfilling of trench for pipe installation; and■ Pipe laying and lamination works.
October 2021	<ul style="list-style-type: none">■ Site preparation and mobilisation;■ Concreting for permanent structures, foundation, base slabs, pits and plinths;■ Rebar works and formwork installation;■ Blinding works;■ Backfilling of trench for pipe installation;■ Pipe laying and lamination works; and■ Permanent road construction.
November 2021	<ul style="list-style-type: none">■ Site preparation and mobilisation;■ Concreting for permanent structures, foundation, base slabs, pits and plinths;■ Rebar works and formwork installation;■ Blinding works;■ Backfilling of trench for pipe installation;■ Pipe laying and lamination works; and■ Permanent road construction.
December 2021	<ul style="list-style-type: none">■ Site preparation and mobilisation;■ Concreting for permanent structures and plinths;■ Rebar works and formwork installation;■ Blinding works;■ Backfilling of trench for pipe installation;■ Permanent road construction; and■ Pressure test for PAB pipe.

2.4 Project Organisation

The project organisational chart and contact details for CCGT Units No. 1 and No. 2 are shown in **Appendices C1 and C2**, respectively.

2.5 Status of Environmental Licenses, Notification and Permits

2.5.1 CCGT Unit No. 1

A summary of the valid permits, licences, and/or notifications on environmental protection for CCGT Unit No. 1 is presented in **Table 2.2**.

Table 2.2 Summary of the Status of Valid Environmental Licence, Notification, Permit and Documentations for CCGT Unit No. 1

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-507/2016	Throughout the Contract	Permit granted on 14 Jun 2016
Variation of Environmental Permit	EP-507/2016/C	Throughout the Contract	Permit granted on 27 Apr 2020
Notification Pursuant to Section 3(1) of the <i>Air Pollution Control (Construction Dust) Regulation</i>	417935	Throughout the Contract	Notification received on 14 Jun 2017
Billing Account for Disposal of Construction Waste	417676	Throughout the Contract	Notification received on 8 Jun 2017
Chemical Waste Producer Registration	5214-421-K3324-01	Throughout the Contract	Registration approved on 6 Jul 2018
Billing Account for Disposal of Construction Waste	7028380	Throughout the contract	Approved on 26 Jul 2017
	7029093	Throughout the contract	Approved on 19 Oct 2017
Application for Installation of Furnace, Chimney and Flue Premises	-	Throughout the contract	Approved on 3 Jun 2019 for steam cleaning of boiler

2.5.2 CCGT Unit No. 2

A summary of the valid permits, licences, and/or notifications on environmental protection for CCGT Unit No.2 is presented in **Table 2.3**.

Table 2.3 Summary of the Status of Valid Environmental Licence, Notification, Permit and Documentations for CCGT Unit No. 2

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	EP-507/2016	Throughout the Contract	Permit granted on 14 Jun 2016
Variation of Environmental Permit	EP-507/2016/C	Throughout the Contract	Permit granted on 27 Apr 2020
	EP-507/2016/D	Throughout the Contract	Permit granted on 21 Dec 2021
Further Environmental Permit	FEP-03/507/2016/C	Throughout the Contract	Permit granted on 28 Aug 2020 Application of surrender submitted on 25 Nov 2021 and approved on 30 Nov 2021
	FEP-04/507/2016/C	Throughout the Contract	Permit granted on 6 Aug 2021
	FEP-04/507/2016/D	Throughout the Contract	Permit granted on 21 Dec 2021
Notification Pursuant to Section 3(1) of the <i>Air Pollution Control (Construction Dust) Regulation</i>	458265	Throughout the Contract	EPD Acknowledgement of receipt dated 17 Jul 2020
	468383	Throughout the Contract	EPD Acknowledgement of receipt dated 9 Jun 2021
Chemical Waste Producer Registration	WPN5213-432-G2892-01	Throughout the Contract	Registration approved on 24 Aug 2020

INSTALLATION OF ADDITIONAL GAS-FIRED GENERATION UNITS
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Permit/ Licences/ Notification	Reference	Validity Period	Remarks
	WPN5213-432- H4284-01	Throughout the Contract	Registration approved on 30 December 2021
Billing Account for Disposal of Construction Waste	7037977	Throughout the Contract	Approved on 5 Aug 2020
	7039993	Throughout the Contract	Approved on 16 Mar 2021
Construction Noise Permit	GW-RW0371-20	24 Aug 2020 – 13 Feb 2021	Approved on 17 Aug 2020
	GW-RW0019-21	14 Feb 2021 – 13 Aug 2021	Approved on 22 Jan 2021
	GW-RW0341-21	25 Aug 2021 – 18 Feb 2022	Approved on 23 Aug 2021
Wastewater Discharge Licence	WT00037278- 2020	28 Jan 2021 – 31 Jan 2026	Licence granted on 28 Jan 2021

3. EM&A REQUIREMENTS

3.1 General

Potential environmental impacts, which were identified during the EIA process and are associated with the construction phase of the Project, will be addressed through the monitoring and controls specified in the EM&A Manual and in the construction contracts.

During the construction phase of the Project, air quality, hazard to life, noise, water quality, waste, land contamination, ecology, fisheries, landscape and visual and cultural heritage will be subjected to EM&A. Monitoring of the effectiveness of the mitigation measures will be achieved through site inspections.

3.2 SITE INSPECTIONS & AUDITS

The ET will undertake site inspections of on-site practices and procedures each week. The primary objective of the inspection programme will be to assess the effectiveness of the environmental controls established by the Contractor(s) and the implementation of the environmental mitigation measures recommended in the EIA Report. The IEC will undertake monthly site audits to assess the performance of the Contractor(s) and the effectiveness of the ET.

3.3 WATER QUALITY MONITORING

3.3.1 CCGT Unit No. 1

In accordance with the EM&A Manual, monitoring works is required at a frequency of once per week on the first year of commissioning of the CCGT Unit No.1. The monitoring details including monitoring requirement, locations of monitoring stations have been confirmed and approved by EPD before commissioning of the CCGT Unit No.1.

Baseline water quality monitoring has been conducted from 20 April 2020 to 15 May 2020. The Baseline Water Quality Monitoring Report has been submitted to EPD on 4 August 2020.

The construction of CCGT Unit No. 1 was completed on 31 May 2021 and the operation phase water quality monitoring was commenced in June 2021.

3.3.2 CCGT Unit No. 2

In accordance with the EM&A Manual, monitoring works are required at a frequency of once per week on the first year of commissioning of the CCGT Unit No.2. The monitoring details including monitoring requirement, locations of monitoring stations will be confirmed and approved by EPD before commissioning of the CCGT Unit No.2.

4. IMPLEMENTATION STATUS OF THE ENVIRONMENTAL PROTECTION REQUIREMENTS

4.1 Submissions under the Project

The Contractors have implemented all the environmental mitigation measures and requirements as stated in the EIA Report, Environmental Permit (EP) and EM&A Manual for the installation of CCGT Units No. 1 and No. 2.

4.1.1 CCGT Unit No. 1

The implementation status of the environmental mitigation measures for CCGT Unit No.1 during the reporting period is summarised in **Appendix D**. The status of the required submissions under the EP and EM&A Manual for the Project is presented in **Table 4.1**.

Table 4.1 Status of Required Submission under the CCGT Unit No. 1

EP Condition	Submission	Submission Date
Sections 15.1 & 15.5 of EM&A Manual (AEIAR-197/2016)	17 th Quarterly EM&A Report	31 March 2021
	18 th Quarterly EM&A Report	9 July 2021
Sections 15.1 & 15.6 of EM&A Manual (AEIAR-197/2016)	4 th Annual EM&A Report	18 February 2021
Condition 3.2 under Environmental Permit No. EP-507/2016/C	49 th Monthly EM&A Report	14 January 2021
	50 th Monthly EM&A Report	10 February 2021
	51 st Monthly EM&A Report	12 March 2021
	52 nd Monthly EM&A Report	13 April 2021
	53 rd Monthly EM&A Report	11 May 2021
	54 th Monthly EM&A Report	11 June 2021

4.1.2 CCGT Unit No. 2

The implementation status of the environmental mitigation measures for CCGT Unit No.2 during the reporting period is summarised in **Appendix D**. The status of the required submissions under the EP and EM&A Manual for the Project is presented in **Table 4.2**.

Table 4.2 Status of Required Submission under the CCGT Unit No. 2

EP Condition	Submission	Submission Date
Sections 15.1 & 15.6 of EM&A Manual (AEIAR-197/2016)	4 th Annual EM&A Report	18 February 2021
Sections 15.1 & 15.5 of EM&A Manual (AEIAR-197/2016)	17 th Quarterly EM&A Report	31 March 2021
	18 th Quarterly EM&A Report	9 July 2021
	19 th Quarterly EM&A Report	29 September 2021
	20 th Quarterly EM&A Report	23 December 2021
Condition 3.1 under Environmental Permit No. EP-507/2016/C and FEP-03/507/2016/C	Updated EM&A Manual	16 August 2021
	49 th Monthly EM&A Report	14 January 2021
	50 th Monthly EM&A Report	10 February 2021

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EP Condition	Submission	Submission Date
Condition 3.2 under Environmental Permit No. EP-507/2016/C and FEP-03/507/2016/C.	51 st Monthly EM&A Report	12 March 2021
	52 nd Monthly EM&A Report	13 April 2021
	53 rd Monthly EM&A Report	11 May 2021
	54 th Monthly EM&A Report	11 June 2021
	55 th Monthly EM&A Report	14 July 2021
	56 th Monthly EM&A Report	10 August 2021
	57 th Monthly EM&A Report	13 September 2021
	58 th Monthly EM&A Report	8 October 2021
	59 th Monthly EM&A Report	12 November 2021
	60 th Monthly EM&A Report	14 December 2021

5. EM&A RESULTS

5.1 Site Inspections & Audits

Joint site inspections were conducted by representatives of the Contractors, CAPCO Project Team and ET every week throughout the reporting period. The representative of the IEC joined the site inspections on a monthly basis in the reporting period. No non-compliance was recorded during the site inspections.

Environmental performance complied with environmental requirements and all necessary mitigation measures were properly implemented. The implementation status of the environmental mitigation measures for this Project during the reporting period is summarised in **Appendix D**. The ET will keep track of the construction activities to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

5.2 Waste Management

The waste generated from this Project includes inert construction and demolition (C&D) materials, and non-inert C&D materials. Non-inert C&D materials are made up of general refuse and recyclable wastes such as plastics and paper/cardboard packaging waste. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials.

5.2.1 CCGT Unit No. 1

With reference to relevant handling records and trip tickets of CCGT Unit No. 1, the quantities of different types of waste generated in the reporting period are summarised in **Table 5.1**. Details of waste management data are presented in **Appendix E1**.

Table 5.1 Quantities of Waste Generated from CCGT Unit No. 1

Reporting Month	Quantity					
	Inert C&D Materials ^{(a) (b)}	Chemical Waste ^(d)	Non-inert C&D Materials			
			General Refuse ^(c)	Recycled materials		
				Paper/card board	Plastics	Metals
(in '000m ³)	(in'000 kg)	(in '000m ³)	(in'000 kg)	(in'000 kg)	(in'000 kg)	
January 2021	0	0	0	0	0	0
February 2021	0	0	0	0	0	0
March 2021	0	0	0	0	0	0
April 2021	0	0	0	0	0	0
May 2021	0	0	0	0	0	0

Notes:

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil.
- (b) The inert C&D materials generated from the Project were sent to Tuen Mun Area 38 Fill Bank during the reporting period.
- (c) The general refuse generated from the Project was sent to WENT landfill during the reporting period.
- (d) Chemical waste includes waste oil and spent pipes with lubricating oil. It is assumed density of waste oil to be 0.8 kg/L.
- (e) The cut-off date for waste management data is 31 May 2021.

The estimated amount of waste generated from the Project predicted by EIA Report and the actual cumulative quantities of waste generated from the construction phase of the Project during the

reporting period are presented in **Table 5.2**. Mitigation measures recommended in EIA Report were implemented by the Contractor as far as practicable and were considered effective in reducing the total quantity of wastes generated during the reporting period.

Table 5.2 Comparison of Estimated Amount of Waste and Actual Amount Generated during the Reporting Period for CCGT Unit No. 1

Type of Material	Estimated Amount for Project	Actual Amount during Reporting Period	Cumulative Amount since Project's Commencement (December 2016)
Total Amount of Inert C&D Materials disposed as Public Fill ^(a) (in '000m ³)	80.96	0	132.308
Amount of Inert C&D Materials Reused in the Contract (in '000m ³)	8.89	0	6.892
Amount of Inert C&D Materials Reused in Other Projects (in '000m ³)	-	0	0.119
Total Amount of Non-Inert C&D Materials and General Refuse disposed at WENT Landfill ^(b) (in '000m ³)	1.525	0	4.425
Chemical Waste ^(c) (in '000kg)	10.20	0	3.680

Notes:

- (a) Inert C&D materials include site clearance waste, excavated materials, building works generated from construction of CCGT Unit No.1 for the entire project.
- (b) Non-inert C&D materials include site clearance waste, excavated materials, building works generated from construction period of CCGT Unit No.1 for the entire project. The amount of general refuse was estimated 780 kg per day for construction of CCGT Unit No.1. There are 119 working days in the reporting period.
- (c) Chemical waste includes waste oil and spent pipes with lubricating oil. Density of waste oil is assumed to be 0.8 kg/L. There are 5 months in the reporting period.

5.2.2 CCGT Unit No. 2

With reference to relevant handling records and trip tickets of CCGT Unit No. 2, the quantities of different types of waste generated in the reporting period are summarised in **Table 5.3**. Details of waste management data are presented in **Appendix E2**.

Table 5.3 Quantities of Waste Generated from CCGT Unit No. 2

Reporting Month	Quantity					
	Inert C&D Materials ^{(a) (b)}	Chemical Waste ^(d)	Non-inert C&D Materials			
			General Refuse ^(c)	Recycled materials		
				Paper/card board	Plastics	Metals
(in '000m ³)	(in'000 kg)	(in '000m ³)	(in'000 kg)	(in'000 kg)	(in'000 kg)	
January 2021	3.014	0	0.006	0	0	9.500
February 2021	5.791	0	0.016	0	0	0

Reporting Month	Quantity					
	Inert C&D Materials ^{(a) (b)}	Chemical Waste ^(d)	Non-inert C&D Materials			
			General Refuse ^(c)	Recycled materials		
				Paper/card board	Plastics	Metals
March 2021	1.387	1.120	0.072	0	0	0
April 2021	1.578	0	0.009	0	0	10.850
May 2021	1.512	0	0.023	0	0	0
June 2021	0.990	0	0.074	0	0	0
July 2021	1.368	0	0.072	0	0	0
August 2021	0.010	0	0.046	0	0	0
September 2021	0.048	0	0.028	0	0	10.920
October 2021	0.013	0	0.022	0.069	0	50.540
November 2021	0.088	0	0.039	0	0	46.840
December 2021	0.610	0	0.028	0	0	33.150

Notes:

- (a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil.
- (b) The inert C&D materials generated from the Project were sent to Tuen Mun Area 38 Fill Bank during the reporting period.
- (c) The general refuse generated from the Project was sent to WENT landfill during the reporting period.
- (d) Chemical waste includes waste oil and spent pipes with lubricating oil. It is assumed density of waste oil to be 0.8 kg/L.
- (e) The cut-off date for waste management data during the reporting period is 31 December 2021.

The estimated amount of waste generated from the Project predicted by EIA Report and the actual cumulative quantities of waste generated from the construction phase of the Project during the reporting period are presented in **Table 5.4**. Mitigation measures recommended in EIA Report were implemented by the Contractor as far as practicable and were considered effective in reducing the total quantity of wastes generated during the reporting period.

Table 5.4 Comparison of Estimated Amount of Waste and Actual Amount Generated during the Reporting Period for CCGT Unit No. 2

Type of Material	Estimated Amount for Project	Actual Amount during Reporting Period	Cumulative Amount since Project's Commencement (June 2020)
Total Amount of Inert C&D Materials disposed as Public Fill ^(a) (in '000m ³)	85.050	7.670	8.913
Amount of Inert C&D Materials Reused in the Contract (in '000m ³)	12.010	8.188	13.438
Amount of Inert C&D Materials Reused in Other Projects (in '000m ³)	-	0.551	0.552

INSTALLATION OF ADDITIONAL GAS-FIRED GENERATION UNITS
(CCGT UNIT NO.1 AND NO.2) AT THE BLACK POINT POWER STATION

Annual EM&A Report No.5

Type of Material	Estimated Amount for Project	Actual Amount during Reporting Period	Cumulative Amount since Project's Commencement (June 2020)
Total Amount of Non-Inert C&D Materials and General Refuse disposed at WENT Landfill ^(b) (in '000m ³)	1.525	0.435	0.464
Chemical Waste ^(c) (in '000kg)	10.20	1.120	1.120

Notes:

- (a) Inert C&D materials include site clearance waste, excavated materials, building works generated from construction of CCGT Unit No.2 for the entire project.
- (b) Non-inert C&D materials include site clearance waste, excavated materials, building works generated from construction period of CCGT Unit No.2 for the entire project. The amount of general refuse was estimated 780 kg per day for construction of CCGT Unit No.2. There are 296 working days in the reporting period.
- (c) Chemical waste includes waste oil and spent pipes with lubricating oil. Density of waste oil is assumed to be 0.8 kg/L. There are 12 months in the reporting period.

6. ENVIRONMENTAL NON-CONFORMANCE

6.1 Summary of Monitoring Exceedance

No environmental monitoring is required during construction of CCGT Units No.1 and No.2.

6.2 Summary of Environmental Non-compliance

No non-compliance event was recorded during the reporting period for CCGT Units No.1 and No.2.

6.3 Summary of Environmental Compliant

No environmental complaint was received during the reporting period for CCGT Units No.1 and No.2.

6.4 Summary of Environmental Summon and Successful Prosecution

No summon or prosecution was received during the reporting period for CCGT Units No.1 and No.2.

7. REVIEW OF EM&A PROGRAMME

7.1 SITE INSPECTIONS & AUDITS

Weekly joint environmental site inspections by ET and monthly joint environmental site inspections with IEC have been conducted in the reporting period to assess the effectiveness of the environmental controls established by the Contractor(s) and the implementation of the environmental mitigation measures recommended in the EIA Report. Findings of the site inspections confirmed that the predictions in EIA Report are valid and environmental mitigation measures recommended in the EIA Report were properly implemented by the Contractor, and the recommended mitigation measures have been working effectively. There was no non-compliance recorded during the site inspections and environmental performance complied with environmental requirements.

The requirements for site inspections and audits have been reviewed and were considered as adequate. No change to the requirements was considered to be necessary.

The recommended environmental mitigation measures are also considered to be effective and efficient in reducing the potential environmental impacts associated with the construction of Project. No change was thus considered necessary.

7.2 WASTE MANAGEMENT

The waste inspection and audit programme has been implemented during this reporting period. Wastes generated from construction activities have been managed in accordance with the recommendations in the EIA Report, the EM&A Manual, the WMP and other relevant legislative requirements.

The requirements for construction waste management have been reviewed and were considered as adequate. No change to the requirements was considered to be necessary.

7.3 SUMMARY OF RECOMMENDATIONS

Findings of the EM&A programme indicate that the recommended mitigation measures have been properly implemented and working effectively. The EM&A programme has been reviewed and was considered as adequate and effective. No change to the EM&A programme was considered to be necessary.

The EM&A programme will be evaluated as appropriate in the next reporting period and improvements in the EM&A programme will be recommended if deemed necessary.

8. CONCLUSIONS

This fifth Annual Environmental Monitoring and Audit (EM&A) Report presents the EM&A works carried out during the period from 1 January to 31 May 2021 for CCGT Unit No. 1 and from 1 January to 31 December 2021 for CCGT Unit No. 2 in accordance with the EM&A Manual and the requirements of EP-507/2016/C, EP-507/2016/D, FEP-03/507/2016/C, FEP-04/507/2016/C and FEP-04/507/2016/D.

Weekly joint environmental site inspections by ET and monthly joint environmental site inspections with IEC were conducted in the reporting period. It confirmed that the environmental mitigation measures recommended in the EIA Report were properly implemented by the Contractor and were working effectively.

The Contractors have followed the Waste Management Plan (WMP) for handling and disposal of construction and demolition (C&D) materials (inert public fill and non-inert construction wastes), chemical wastes, recyclable materials, and sewage generated from the Project. No non-compliance event was recorded during the reporting period.

No environmental complaint, summon or prosecution was received during the reporting period. The EM&A programme was considered effective in reflecting the environmental conditions at the site. The site inspection results also indicated that the Project has not caused unacceptable environmental impacts and the mitigation measure were effectively implemented. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

The EM&A programme has been reviewed and was considered as adequate and effective. No change to the EM&A programme was considered to be necessary. The EM&A programme will be evaluated as appropriate in the next reporting period.

APPENDIX A WORKS AREA FOR CCGT UNITS NO. 1 AND NO. 2 AT THE BLACK POINT POWER STATION

Legend 圖例

- Indicative Location
初步位置
- CCGT Unit No.1**
- 1 號聯合循環燃氣渦輪發電機組**
- Cooling Water Intake Facility
冷卻水進水設施
- Cooling Water Discharge Facility
冷卻水排放設施
- 400kV Connection to Substation
400kV電纜與變電站的連接
- ⊕ Stack Location
煙囪位置
- CCGT Unit No.2**
- 2 號聯合循環燃氣渦輪發電機組**
- Cooling Water Intake Facility
冷卻水進水設施
- Cooling Water Discharge Facility
冷卻水排放設施
- Cooling Tower
冷卻塔
- 400kV Cable Connection to Substation
400kV電纜與變電站的連接
- ⊕ Stack Location
煙囪位置

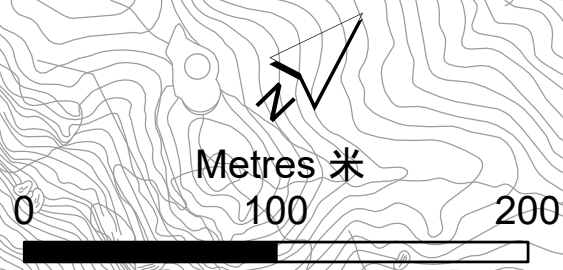
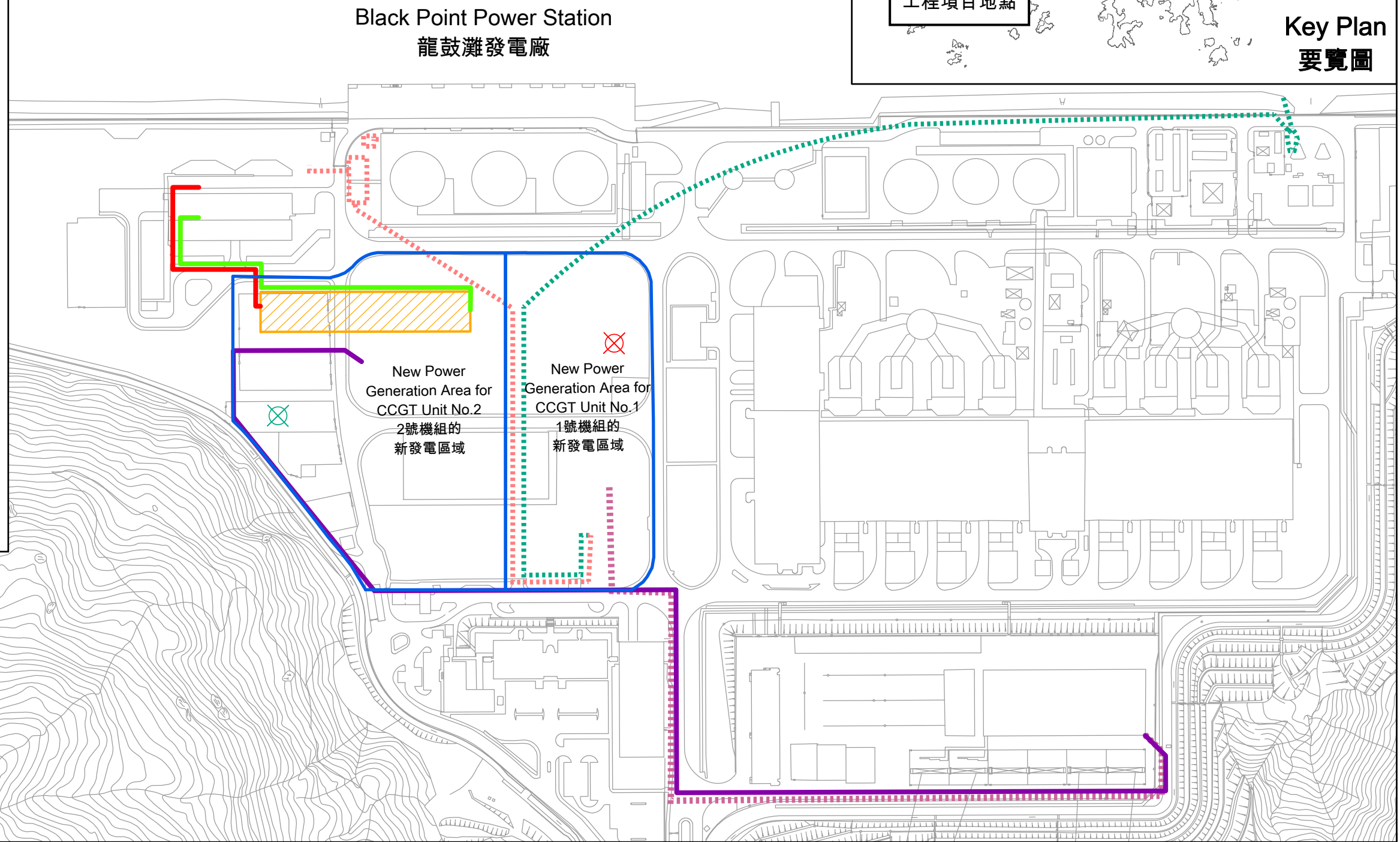
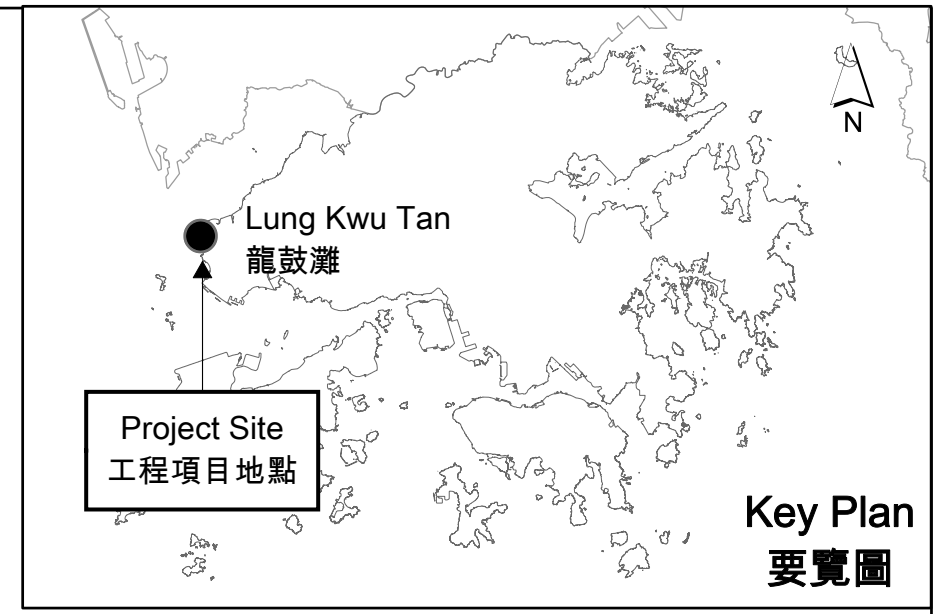


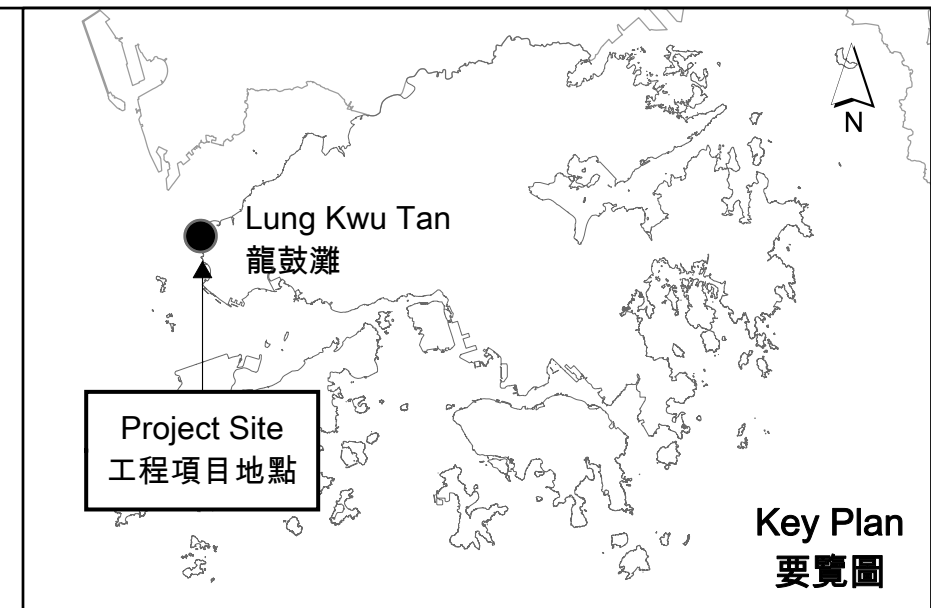
Figure 1
圖 1 **Indicative Location of Key Project Components for CCGT Units No. 1 and No.2 (EP No.: EP-507/2016/C)**
1號以及2號聯合循環燃氣渦輪發電機組主要工程項目組成部份的初步位置圖

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Date: 8/4/2020

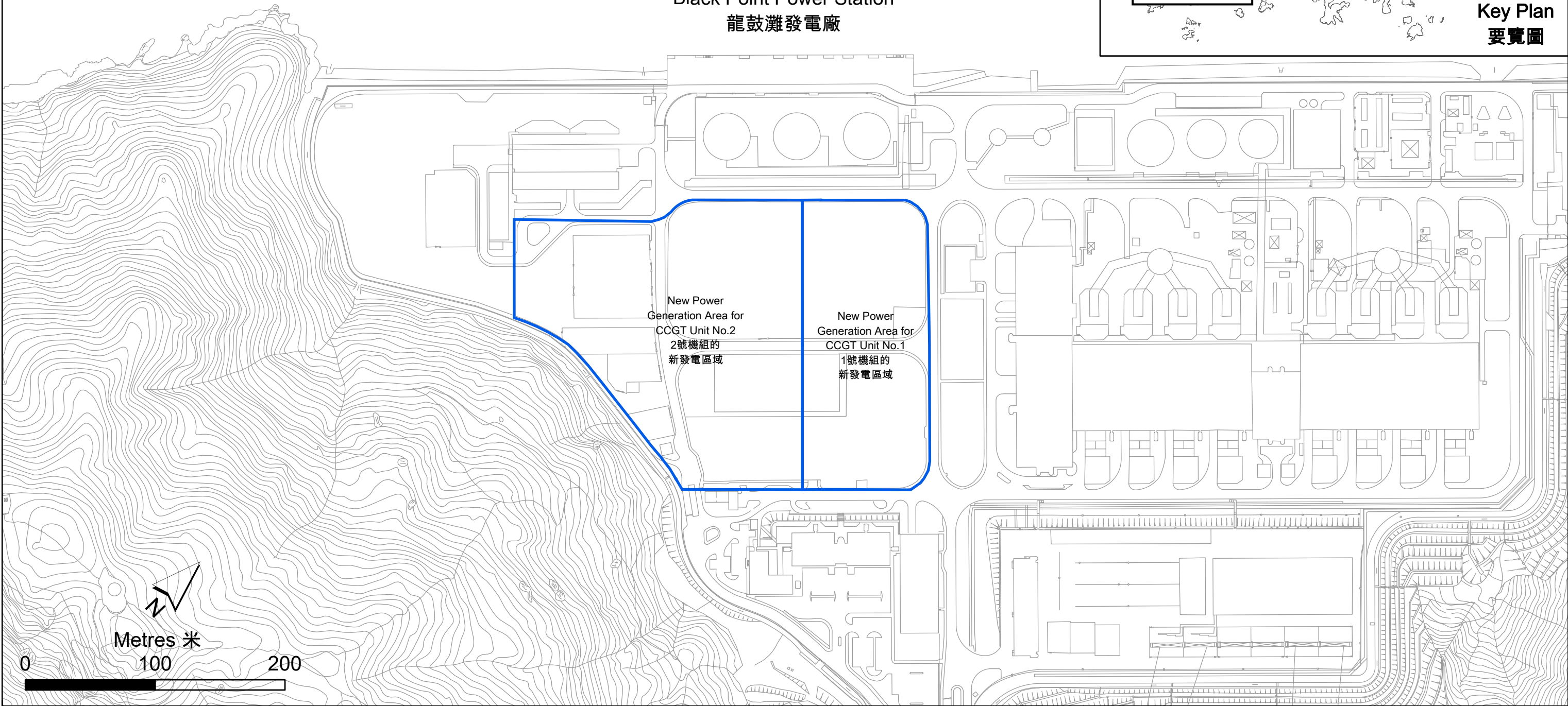
**Environmental
Resources
Management**

Legend 圖例

Project Location
項目位置



Black Point Power Station
龍鼓灘發電廠



New Power
Generation Area for
CCGT Unit No.2
2號機組的
新發電區域

New Power
Generation Area for
CCGT Unit No.1
1號機組的
新發電區域

Metres 米

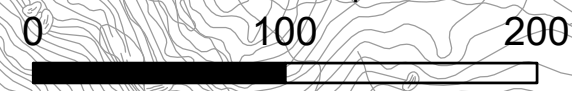


Figure 2
圖 2

Location of CCGT Unites No.1 and No.2 (EP No.: EP-507/2016/D)
1號以及2號聯合循環燃氣渦輪發電機組的項目位置圖

APPENDIX B CONSTRUCTION PROGRAMME FOR THE REPORTING PERIOD AND COMING MONTHS

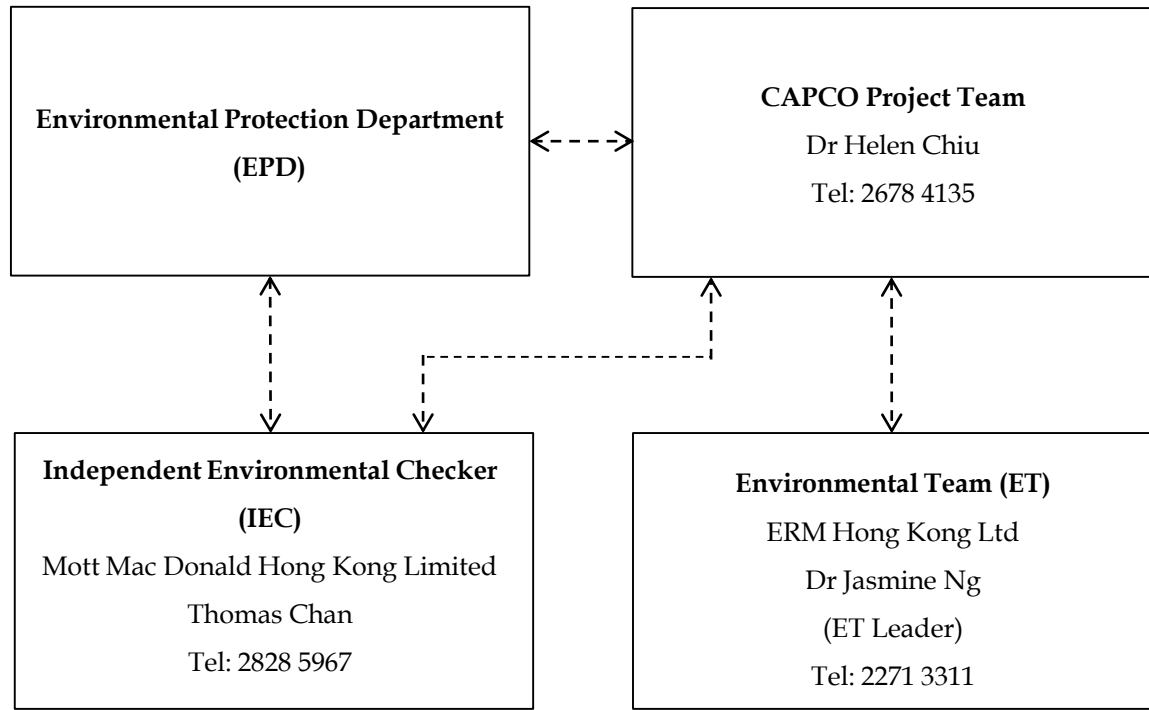
APPENDIX B1 CONSTRUCTION PROGRAMME OF CCGT UNIT NO. 1 FOR THE REPORTING PERIOD AND COMING MONTHS

	Year 2019												Year 2020												Year 2021								
CCGT Unit No.1	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5						
Civil Works	█																																
Equipment Supply & Installation, Commissioning	█																																

**APPENDIX B2 CONSTRUCTION PROGRAMME OF CCGT UNIT NO. 2 FOR
THE REPORTING PERIOD AND COMING MONTHS**

APPENDIX C PROJECT ORGANISATION FOR EM&A IMPLEMENTATION

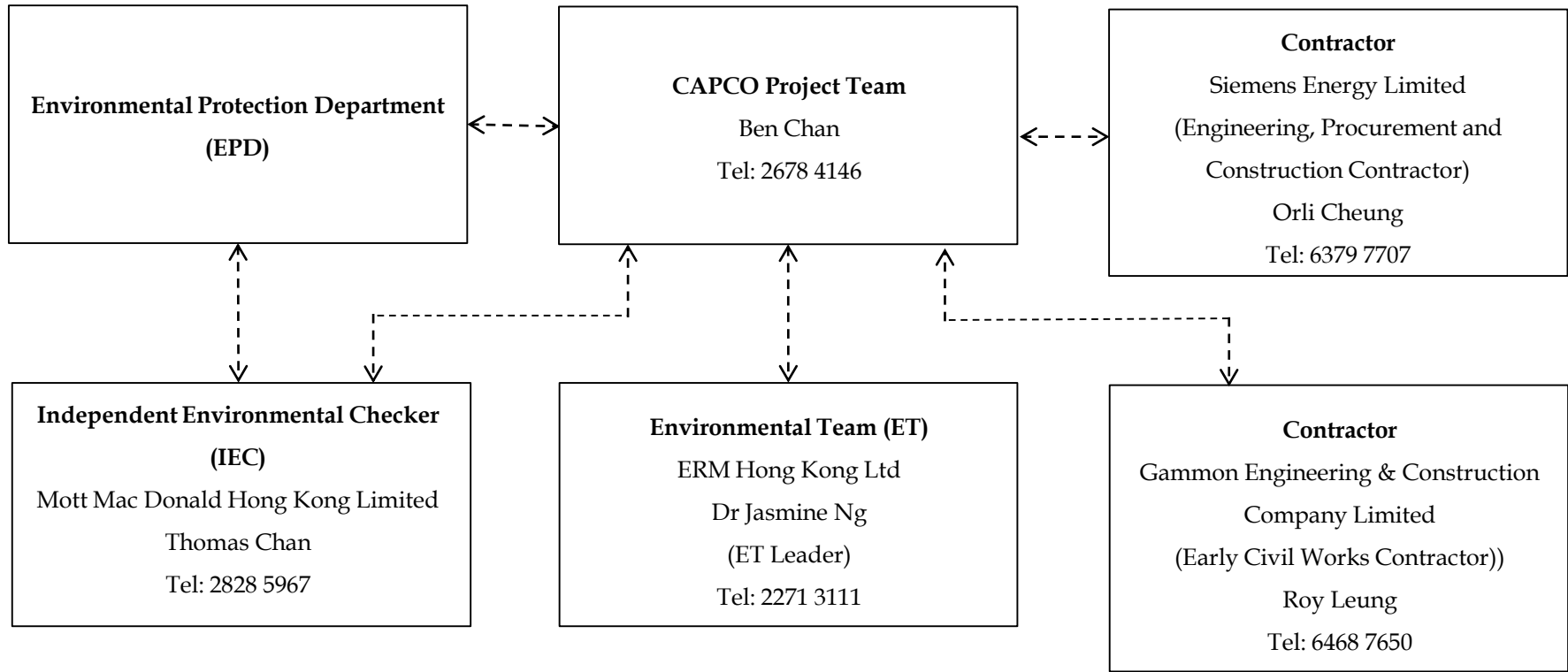
APPENDIX C1 PROJECT ORGANISATION OF CCGT UNIT NO. 1 FOR EM&A IMPLEMENTATION



Key
 ----- Line of Communication



APPENDIX C2 PROJECT ORGANISATION OF CCGT UNIT NO. 2 FOR EM&A IMPLEMENTATION



Key
 ----- Line of Communication

APPENDIX D SUMMARY OF IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION

Appendix D - Environmental Mitigation Implementation Status for Additional CCGT Units Project at BPPS

Note:

- ✓ Compliance of Mitigation Measures
- <> Compliance of Mitigation but need improvement
- x Non-compliance of Mitigation Measures
- ▲ Non-compliance of Mitigation Measures but rectified by the Contractor
- △ Deficiency of Mitigation Measures but rectified by the Contractor
- N/A Not Applicable in Reporting Period

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Who to implement the measures?	When to implement the measures?	Implementation Status (Year 2021)							
					Jan to Mar 2021		Apr to Jun 2021		Jul to Sep 2021		Oct to Dec 2021	
					CCGT Unit No. 1	CCGT Unit No. 2	CCGT Unit No. 1	CCGT Unit No. 2	CCGT Unit No. 1	CCGT Unit No. 2	CCGT Unit No. 1	CCGT Unit No. 2
Air Quality												
S4.10.1	S3.1	Impervious dust screen or sheeting will be provided to enclose scaffolding from the ground floor level of building for construction of superstructure of the new buildings.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Impervious sheet will be provided for skip hoist for material transport.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	The area where dusty work takes place should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after dusty activities as far as practicable.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	<>	N/A	✓
S4.10.1	S3.1	All dusty materials should be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation.	Contractor	Construction Stage	✓	✓	✓	<>	N/A	✓	N/A	✓
S4.10.1	S3.1	Dropping heights for excavated materials should be controlled to a practical height to minimise the fugitive dust arising from unloading.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

S4.10.1	S3.1	During transportation by truck, materials should not be loaded to a level higher than the side and tail boards, and should be dampened or covered before transport.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Wheel washing device should be provided at the exits of the work sites. Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty material from its body and wheels as far as practicable.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Road sections between vehicle-wash areas and vehicular entrance will be paved.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Hoarding of not less than 1.8m high from ground level will be provided along the length of the Project Site boundary.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Haul roads will be kept clear of dusty materials and will be sprayed with water so as to maintain the entire road surface wet at all times.	Contractor	Construction Stage	✓	<>	✓	<>	N/A	<>	N/A	<>
S4.10.1	S3.1	Temporary stockpiles of dusty materials will be either covered entirely by impervious sheets or sprayed with water to maintain the entire surface wet all the time.	Contractor	Construction Stage	✓	<>	✓	✓	N/A	<>	N/A	<>
S4.10.1	S3.1	Stockpiles of more than 20 bags of cement, dry pulverised fuel ash and dusty construction materials will be covered entirely by impervious sheeting sheltered on top and 3-sides.	Contractor	Construction Stage	✓	<>	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	All exposed areas will be kept wet always to minimise dust emission.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Ultra-low-sulphur diesel (ULSD) will be used for all construction plant on-site, as defined as diesel fuel containing not more than 0.005% sulphur by weight) as stipulated in <i>Environment, Transport and Works Bureau Technical Circular (ETWB-TC(W)) No 19/2005</i> on Environmental Management on Construction Sites.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	The engine of the construction equipment during idling will be switched off.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S4.10.1	S3.1	Regular maintenance of construction equipment deployed on-site will be conducted to prevent black smoke emission.	Contractor	Construction Stage	✓	<>	✓	✓	N/A	✓	N/A	✓
S4.11.2	S3.2	It is recommended to continuously monitor and record the levels of air pollutants of the exhaust gas streams emitted from the stacks of the additional CCGT units by means of CEMS per the licence requirements. Continuous monitoring of ambient concentrations of SO ₂ ,	CAPCO	Operational Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NO and NO₂ will be continued at the current CLP's AQMSs.

Hazard to Life												
S5.6	S4	All construction workers shall comply with CLP's safety policy and requirements.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	Method statements and risk assessments shall be prepared and safety control measures shall be in place before commencement of work.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	All work procedures shall be complied with the operating plant procedures or guidelines and regulatory requirements.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	Work permit system, on-site pre-work risk assessment and emergency response procedure shall be in place before commencement of work.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	All construction workers shall equip with appropriate PPE when working at the Project Site.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	Safety training and briefings shall be provided to all construction workers.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	All construction workers shall be under close site supervision.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.6	S4	Regular site safety inspections shall be conducted during the construction phase of the Project.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Ensure speed limit enforcement is specified in the contractor's method statement to limit the speed of construction vehicles on-site.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Conduct speed checks to ensure enforcement of speed limits and to ensure adequate site access control.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Provide escort for hydrogen and CO ₂ delivery vehicle drivers to ensure the right access route is used during the construction phases of the Project.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	A lifting plan, with detailed risk assessment, should be prepared and endorsed for heavy lifting of large equipment.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

S5.13	S4	Vehicle crash barrier, designed for the specific speed limit at the BPPS, should be provided between the construction site and the distillate oil storage facilities during 1 st CCGT unit construction phase. Also, a vehicle crash barrier is to be provided between the construction site and the 1 st CCGT unit during 2 nd CCGT unit construction phase.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Any lifting operation near or over live equipment should be strictly minimised. If such operation cannot be avoided, lifting activities should be assessed, controlled and supervised. Adequate protection covers should also be provided on the existing BPPS facilities in case the operation of lifting equipment has a potential to impact live equipment at BPPS. Process isolation should be achieved in case that live equipment protection becomes impractical.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	The hydrogen road trailer and carbon dioxide road tanker delivery should follow alternative route, which is further from the construction site, during crane operation and movement of construction vehicles in the vicinity.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Ensure that a hazardous area classification study is conducted and hazardous area maps are updated before the start of the construction activities to ensure ignition sources are controlled during both construction and operation phases.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Ensure work permit system for hot work activities within the Project Site is specified in the contractor's method statement to minimise/control ignition sources during construction phase.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Ensure effective communication system/protocol is in place between the construction contractors and operation staff.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Ensure the Project Construction Emergency Response Plan is integrated with the Emergency Response Plan for the BPPS during construction phases. The plan should address stop work instructions to be promptly communicated to all construction workers performing hot works in case a confirmed flammable gas (natural gas and hydrogen) detection at the BPPS.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

S5.13	S4	Ensure that construction activities do not impede the functions of fire and gas detection system, fire protection system, muster areas, fire-fighting vehicle access and escape routes.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S5.13	S4	Ensure a Job Safety Analysis is conducted for construction activities of the Project during the construction phases, to identify and analyse hazards associated with the construction activities (e.g. lifting operations by cranes) onto the existing plant facilities and operations. Potential risks of the construction activities shall be assessed, and risk precautionary measures shall be implemented in Contractor's works procedures.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

Water Quality

S 7.9	S6.5	Reduction of dredging rate from 4,000 m ³ per day to 740 m ³ per day for dredging at the seawater intake and discharge outfall	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	Deploy floating type silt curtain around grab dredger	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	Deploy single layer of floating type silt curtain surrounding coral colonies identify at dive survey Transect C (SR18). The silt curtain surrounding SR18 should provide sufficient clearance to the coral colonies such that no direct impact from the installation and anchoring of silt curtain would be inflicted on the coral colonies.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	The contractor shall regularly inspect the silt curtains and check that they are moored and marked to avoid danger to marine traffic. Regular inspection on the integrity of the silt curtain should be carried out by the contractor and any damage to the silt curtain shall be repaired by the contractor promptly. Relevant marine works shall only be undertaken when the repair is fixed to the satisfaction of the engineer.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	Construction of intake and outfall structure shall be conducted behind drained cofferdam.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	All vessels should be well maintained and inspected before use to limit any potential discharges to the marine environment.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	All vessels must have a clean ballast system.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

S 7.9	S6.5	No discharge of sewage/grey wastewater should be allowed. Wastewater from potentially contaminated area on working vessels should be minimised and collected. These kinds of wastewater should be brought back to port and discharged at appropriate collection and treatment system.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	No soil waste is allowed to be disposed overboard.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S 7.9	S6.5	Silt removal facilities such as silt traps or sedimentation facilities will be provided to remove silt particles from runoff to meet the requirements of the TM standard under the WPCO. The design of silt removal facilities will be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures will be inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit will be removed regularly.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	<>	N/A	✓
S 7.9	S6.5	Appropriate surface drainage will be designed and provided where necessary.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	The precautions to be taken at any time of year when rainstorms are likely together with the actions to be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	Oil interceptors will be provided in the drainage system where necessary and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	Temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge, if any, will be adequately designed for the controlled release of storm flows.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	<>	N/A	✓
S 7.9	S6.5	The temporary diverted drainage, if any, will be reinstated to the original condition when the construction work has finished or when the temporary diversion is no longer required.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

S 7.9	S6.5	Appropriate infiltration control, such as cofferdam wall, should be adopted to limit groundwater inflow to the excavation works areas in the Project site. Groundwater pumped out from excavation area should be discharged into the storm system via silt removal facilities.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	The contingency plan for the existing operation of the BPPS is considered sufficient for directing immediate response to any accidental spillage event.	CAPCO	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S 7.9	S6.5	Mitigation measures required for maintenance dredging at seawater intake and discharge outfall would be the same as that recommended for construction phase dredging operation	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S7.9 and S6.2-S6.5 S7.12	S6.5	A water quality monitoring programme shall be implemented for the construction phase.	ET	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S7.9 and S6.2-S6.5 S7.12	S6.5	To ensure compliance to the effluent standard, regular monitoring of effluent quality is recommended during normal operation. Furthermore, marine water monitoring at selected nearby WSRs during the first year of project commission are recommended to ensure compliance to WQO or other water quality criteria.	ET/ CAPCO	Operational Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Waste Management

S8.5.1	Table 7.1	The Contractor must ensure that all the necessary waste disposal and marine dumping permits or licences are obtained prior to the commencement of the construction works.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	The contractor will open a billing account with EPD in accordance with the Waste Disposal (Charges for Disposal of Construction Waste) Regulation for the payment of disposal charges.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	A trip-ticket system will be established in accordance with <i>DEVB TC(W) No. 6/2010</i> to monitor the reuse of surplus excavated materials off-site and disposal of construction	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

waste and general refuse at transfer facilities/landfills, and to control fly-tipping.

S8.5.1	S7.2	A WMP as stated in the <i>PNAP ADV-19</i> for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established and implemented during the construction phase as part of the Environmental Management Plan (EMP). The Contractor will be required to prepare the EMP and submits it to the Architect/ Engineer under the Contract for approval prior to implementation.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	Table 7.1	The management of dredged/ excavated sediment management requirement from <i>PNAP ADV-21</i> will be incorporated in the Specification of the Contract Documents.	CAPCO/ Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S8.5.1	S7.2	C&D materials will be segregated on-site into public fill and construction waste and stored in different containers or skips to facilitate reuse of the public fill and proper disposal of the construction waste. Specific areas of the Site will be designated for such segregation and storage if immediate use is not practicable. Prefabrication will be adopted as far as practicable to reduce the construction waste arisings.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	The Contractor will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	Containers used for storage of chemical wastes will: <ul style="list-style-type: none"> • Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; • Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations. 	Contractor	Construction Stage	✓	✓	✓	✓	N/A	<>	N/A	✓

S8.5.1	S7.2	The storage area for chemical wastes will: <ul style="list-style-type: none"> • Be clearly labelled and used solely for the storage of chemical waste; • Be enclosed on at least 3 sides; • Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; • Have adequate ventilation; • Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and • Be arranged so that incompatible materials are appropriately separated. 	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	Chemical waste will be disposed of: <ul style="list-style-type: none"> • Via a licensed waste collector; and • To a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers. 	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	General refuse will be stored in enclosed bins separately from construction and chemical wastes. The general refuse will be delivered to the WENT Landfill, separately from construction and chemical wastes, on a daily basis to reduce odour, pest and litter impacts.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	Recycling bins will be provided at strategic locations within the Project Site to facilitate recovery of recyclable materials (including aluminium can, waste paper, glass bottles and plastic bottles) from the Project Site. Materials recovered will be sold for recycling.	Contractor	Construction Stage	✓	<>	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	To avoid any odour and litter impact, appropriate number of portable toilets will be provided for workers on-site.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S8.5.1	S7.2	At the commencement of the construction works, training will be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling.	Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

Land Contamination

S9.8	S8	<p>During construction stage, good house-keeping practices shall be maintained by the Contractor to minimise the risk of land contamination due to construction activities, including but not limited to the followings:</p> <ul style="list-style-type: none"> • Minimise the chemical stock within Project Site, only store the amount of chemicals needed; • Designated chemical/ chemical waste storage shall be established on concrete paved ground, as far as practicable. Secondary containments shall be provided for storage of chemicals/ chemical wastes; • Conduct regular maintenance and inspection on plants and equipment, particularly those involve the use of fuel, hydraulic oil or any sort of chemicals; and • Divert rainfall and surface run-off around construction areas. 	Contractor	Construction Stage	✓	<>	✓	✓	N/A	<>	N/A	✓
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Ecology

S10.9.2	S9.1	The vessel operators will be required to control and manage all effluent from vessels to prevent avoidable water quality impacts.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S10.9.2	S9.1	A policy of no dumping of rubbish, food, oil, or chemicals will be strictly enforced. This will also be covered in the contractor briefings.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S10.9.2	S9.1	The effects of construction of the Project on the water quality of the area will be reduced with the implementation of mitigation measures as described in the Water Quality Impact Assessment.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S10.9.3	S9.1	All vessel operators working on the Project construction will be given a briefing, alerting them to the possible presence of dolphins in the marine works areas, and the guidelines for safe vessel operation in the presence of cetaceans. The use of high-speed vessels will be avoided as far as possible. All vessels used in this Project will be required to slow to 10 knots around the Project's marine works areas and area with high dolphin usage.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S10.9.3	S9.1	The vessel operators of this Project will be required to use predefined and regular routes.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

S10.9.3	S9.2.1	A marine mammal exclusion zone within a radius of 250 m from dredger will be implemented during the construction phase. Qualified observer(s) will scan an exclusion zone of 250 m radius around the work area for at least 30 minutes prior to the start of dredging. If cetaceans are observed in the exclusion zone, dredging will be delayed until they have left the area.	Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S10.9.4	S9.1	Structures will utilise appropriate design to complement the surrounding landscape wherever possible. Materials and finishes will be considered during detailed design.	CAPCO	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S10.9.4	S9.1	All of the major lighting sources will be pointed inward and downwards to avoid disturbances to wildlife.	CAPCO	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S10.9.4	S9.1	Good site practices and precautionary measures are recommended to be implemented to avoid encroachment onto the nearby natural habitats, minimise disturbance to wildlife, and ensure air and water quality is maintained. Mitigations measures as mentioned in the air quality (Section 4 in Approved EIA Report ref. no. AEIAR-197/2016) and water quality (Section 7 in Approved EIA Report ref. no. AEIAR-197/2016) assessments will be consequently instigated to minimise dust and surface runoff to adjacent wildlife and natural habitats during construction activities.	CAPCO/ Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S10.9.4	S9.1	Erect fences or demarcate along the boundary of the works area before the commencement of works to prevent vehicle movements, and encroachment of staffs, onto adjacent areas.	CAPCO/ Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S10.9.4	S9.1	Avoid any damage and unnecessary disturbance to the surrounding natural habitats.	CAPCO/ Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓

Landscapes & Visual

S12.8	S11	Sensitive architectural design of the new facilities. This should take into account material texture, colour, finished to structure and the context of the site.	CAPCO/ Design Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S12.8	S11	Reinstatement. Following construction, areas temporarily affected by the construction works, will be reinstated to their former state. This will include the artificial shoreline as well as parts of some roads.	CAPCO/ Contractor	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

S12.8	S11	Preservation of vegetation. Plants affected by the proposed Project are all within movable planters. Prior to construction, these affected moveable planters should be re-located to a suitable area, still within the BPPS, taking care to ensure the existing health status of the vegetation is maintained or enhanced at the new location. Once construction is complete the final location of the moveable planters should be integrated into the LMP.	CAPCO/ Contractor	Construction Stage	✓	✓	✓	✓	N/A	✓	N/A	✓
S12.8	S11	Update Landscape Master Plan (LMP) to take account of the changes brought about by the Project and explore suitable areas where soft landscaping may be installed amongst the new facilities. The LMP should give due consideration to the possibility of re-provisioning of disturbed lands and provision of screen planting within the facility boundaries as far as practicable.	Qualified Landscape Professional employed by Project Proponent	Construction Stage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX E WASTE FLOW TABLE

APPENDIX E1 WASTE FLOW TABLE FOR CCGT UNIT NO. 1

Appendix E1 - Waste Flow Table for CCGT Unit No. 1

Monthly Summary Waste Flow Table for 2021

Month	Actual Quantities of Inert C&D Materials Generated Monthly ⁽¹⁾					Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete ⁽⁵⁾	Reused in the Contract	Reused in other Projects	Disposed as Public Fill ⁽³⁾	Metals	Paper/ cardboard packaging	Plastics ⁽²⁾	Chemical Waste ⁽⁴⁾	Others, e.g. general refuse ⁽³⁾
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000 kg)	(in '000m ³)
Jan-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jun-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jul-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oct-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nov-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dec-21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total (2021)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2017	29.871	0.554	0.048	0.000	29.269	200.162	0.004	0.750	0.180	0.303
2018	33.640	0.000	2.000	0.119	31.522	316.251	0.000	0.000	0.000	0.992
2019	72.722	0.000	4.844	0.000	67.878	730.260	0.000	0.000	0.400	2.137
2020	3.640	0.000	0.000	0.000	3.640	0.000	0.000	0.000	3.100	0.992
Cumulative	139.873	0.554	6.892	0.119	132.308	1246.673	0.004	0.750	3.680	4.425

Notes:

- (1) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil.
- (2) Plastics refer to plastic bottles/containers, plastic sheets/foam form packaging material.
- (3) Density Assumption: 1.6(kg/l) for Public Fill and 0.9(kg/l) for General Refuse.
- (4) Chemical waste includes waste oil and spent pipes with lubricating oil. Density of waste oil is assumed to be 0.8 kg/L.
- (5) Density of broken concrete is assumed to be 2.5 ton/m³.
- (6) The cut-off data for waste management data is 31 May 2021.
- (7) The waste flow data for January 2020 has been updated based on Contractor's revised waste flow information.

APPENDIX E2 WASTE FLOW TABLE FOR CCGT UNIT NO. 2

Appendix E2 - Waste Flow Table for CCGT Unit No. 2

Monthly Summary Waste Flow Table for 2021

Month	Actual Quantities of Inert C&D Materials Generated Monthly ⁽¹⁾					Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete ⁽⁵⁾	Reused in the Contract	Reused in other Projects	Disposed as Public Fill ⁽³⁾	Metals	Paper/ cardboard packaging	Plastics ⁽²⁾	Chemical Waste ⁽⁴⁾	Others, e.g. general refuse ⁽³⁾
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in'000 kg)	(in '000m ³)
Jan-21	3.014	0.000	1.856	0.000	1.158	9.500	0.000	0.000	0.000	0.006
Feb-21	5.791	0.000	4.641	0.000	1.150	0.000	0.000	0.000	0.000	0.016
Mar-21	1.387	0.000	0.338	0.000	1.049	0.000	0.000	0.000	1.120	0.072
Apr-21	1.578	0.000	0.000	0.000	1.578	10.850	0.000	0.000	0.000	0.009
May-21	1.512	0.000	0.000	0.000	1.512	0.000	0.000	0.000	0.000	0.023
Jun-21	0.990	0.000	0.000	0.000	0.990	0.000	0.000	0.000	0.000	0.074
Sub-total	14.272	0.000	6.835	0.000	7.437	20.350	0.000	0.000	1.120	0.200
Jul-21	1.368	0.000	1.337	0.000	0.031	0.000	0.000	0.000	0.000	0.072
Aug-21	0.010	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.046
Sep-21	0.048	0.000	0.000	0.000	0.048	10.920	0.000	0.000	0.000	0.028
Oct-21	0.013	0.000	0.008	0.000	0.005	50.540	0.069	0.000	0.000	0.022
Nov-21	0.088	0.000	0.005	0.000	0.083	46.840	0.000	0.000	0.000	0.039
Dec-21	0.610	0.000	0.003	0.551	0.056	33.150	0.000	0.000	0.000	0.028
Total (2021)	16.409	0.000	8.188	0.551	7.670	161.800	0.069	0.000	1.120	0.435
2020	7.095	0.602	5.250	0.001	1.243	226.030	0.000	0.000	0.000	0.029
Cumulative	23.504	0.602	13.438	0.552	8.913	387.830	0.069	0.000	1.120	0.464

Notes:

- (1) Inert C&D materials include bricks, concrete, building debris, rubble and excavated spoil.
- (2) Plastics refer to plastic bottles/containers, plastic sheets/foam form packaging material.
- (3) Density Assumption: 1.6(kg/l) for Public Fill and 0.9(kg/l) for General Refuse.
- (4) Chemical waste includes waste oil. Density of waste oil is assumed to be 0.8 kg/L.
- (5) Density of broken concrete is assumed to be 2.5 ton/m³.
- (6) The waste management data in June 2021 have been updated according to the latest information from the Contractor in August 2021.
- (7) The cut-off date for waste management data is 31 December 2021.