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Castle Peak Power Company Limited

港燈
HK Electric

HKLTL

Hong Kong Offshore LNG Terminal Project

Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for October to December 2022

27 January 2023

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27 January 2023

Hong Kong Offshore LNG Terminal Project

Quarterly Environmental Monitoring and Audit (EM&A) Summary Report
for October to December 2022



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**Hong Kong Offshore LNG Terminal
Environmental Certification Sheet**
FEP-01/558/2018/A, FEP-02/558/2018/A and FEP-03/558/2018/B


Reference Document/Plan

Document/ Plan to be Certified/ Verified :	Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for October to December 2022
Date of Report:	27 January 2023
Date prepared by ET:	27 January 2023
Date received by IEC:	27 January 2023

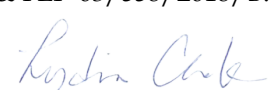
Reference EP Requirement

EP Condition:	Condition No. 5.1 of FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B
The Permit Holder shall implement the EM&A programme in accordance with the procedures and requirements as set out in the Updated EM&A Manual.	

ET Certification

I hereby certify that the above referenced document/ plan complies with the above referenced condition of FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B.	
Mr Raymond Chow, Environmental Team Leader:	 Date: 27 January 2023

IEC Verification

I hereby verify that the above referenced document/ plan complies with the above referenced condition of FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B.	
Ms Lydia Chak, Independent Environmental Checker:	 Date: 27 January 2023

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EXECUTIVE SUMMARY

To support the increased use of natural gas in Hong Kong from 2020 onwards, Castle Peak Power Company Limited (CAPCO) and The Hongkong Electric Co., Ltd. (HK Electric) have identified that the development of an offshore liquefied natural gas (LNG) receiving terminal in Hong Kong using Floating Storage and Regasification Unit (FSRU) technology ('the Project') presents a viable additional gas supply option that will provide energy security through access to competitive gas supplies from world markets. The Project will involve the construction and operation of an offshore LNG import facility to be located in the southern waters of Hong Kong, a double berth jetty, and subsea pipelines that connect to the gas receiving stations (GRS) at the Black Point Power Station (BPPS) and the Lamma Power Station (LPS). To demarcate the works between different parties, the following Further Environmental Permits (FEPs) were issued for the Project:

- the double berth jetty at LNG Terminal under the Hong Kong LNG Terminal Limited (HKLTL), joint venture between CAPCO and HK Electric (FEP-01/558/2018/A) – construction commenced on 27 November 2020;
- the subsea gas pipeline for the BPPS and the associated GRS in the BPPS under CAPCO (FEP-03/558/2018/B) – construction commenced on 23 September 2020; and
- the subsea gas pipeline for the LPS and the associated GRS in the LPS under HK Electric (FEP-02/558/2018/A) – construction commenced on 13 December 2020.

This is the Quarterly EM&A Summary Report presenting the EM&A works carried out during the period from 1 October to 31 December 2022 for the Project in accordance with the Updated EM&A Manual. A summary of monitoring and audit activities conducted in the reporting period is listed below:

Activities	Number of Sessions
For FEP-01/558/2018/A	
Environmental Site Inspection	4
For FEP-02/558/2018/A	
Environmental Site Inspection	1
Marine Water Quality Monitoring for Hydrotesting for the LPS Pipeline	2
For FEP-03/558/2018/B	
Environmental Site Inspection	1
Marine Water Quality Monitoring for Hydrotesting for the BPPS Pipeline	8

Environmental auditing works, including regular site inspections of construction works conducted by the Environmental Team (ET), audit of implementation of Waste Management Plan, and review of the acceptability of operating speeds and marine travel routes of working vessels, including checking of compliance with the approval conditions given by the Director of Environmental Protection for the entry of working vessels within marine parks, in pursuant to Condition 3.1 of FEP-01/558/2018/A, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B, were conducted in the reporting period, as appropriate. No non-compliance of environmental statutory requirements was identified.

Breaches of Action and Limit Levels

There were no Project-related Action and Limit Level exceedances for marine water quality monitoring for hydrotesting for the BPPS Pipeline and LPS Pipeline in the reporting period.

Since construction phase marine mammal monitoring was completed in November 2021, there were no breaches of Action and Limit Levels for marine mammal monitoring in the reporting period.

Environmental Complaints, Notification of Summons and Successful Prosecution

There were no environmental complaints, notification of summons and successful prosecutions recorded in the reporting period.

Reporting Changes

There were no reporting changes in the reporting period.

Comments, Recommendations and Conclusions for the Quarter

The recommended environmental mitigation measures for the Project were effectively implemented and the EM&A programme undertaken by the ET has effectively monitored the construction activities as well as ensured proper implementation of mitigation measures in the reporting period.

1. INTRODUCTION

1.1 Background

To support the increased use of natural gas in Hong Kong from 2020 onwards, Castle Peak Power Company Limited (CAPCO) and The Hongkong Electric Co., Ltd. (HK Electric) have identified that the development of an offshore liquefied natural gas (LNG) receiving terminal in Hong Kong using Floating Storage and Regasification Unit (FSRU) technology ('the Project') presents a viable additional gas supply option that will provide energy security through access to competitive gas supplies from world markets. The Project will involve the construction and operation of an offshore LNG import facility to be located in the southern waters of Hong Kong, a double berth jetty, and subsea pipelines that connect to the gas receiving stations (GRS) at the Black Point Power Station (BPPS) and the Lamma Power Station (LPS).

The Environmental Impact Assessment (EIA) Report for the Project was submitted to the Environmental Protection Department (EPD) of the HKSAR Government in May 2018. The EIA Report (EIAO Register No. AEIAR-218/2018) was approved by EPD and the associated Environmental Permit (EP) (EP-558/2018) was issued in October 2018.

An application for Further Environmental Permits (FEPs) were made on 24 December 2019 to demarcate the works between the different parties. The following FEPs were issued on 17 January 2020 and the EP under EP-558/2018 was surrendered on 5 March 2020.

- the double berth jetty at LNG Terminal under the Hong Kong LNG Terminal Limited (HKLTL), joint venture between CAPCO and HK Electric (FEP-01/558/2018/A)⁽¹⁾ – construction commenced on 27 November 2020;
- the subsea gas pipeline for the BPPS and the associated GRS in the BPPS under CAPCO (FEP-03/558/2018/B)⁽²⁾ – construction commenced on 23 September 2020; and
- the subsea gas pipeline for the LPS and the associated GRS in the LPS under HK Electric (FEP-02/558/2018/A)⁽³⁾ – construction commenced on 13 December 2020.

The location of these components is shown in **Figures 1.1, 1.2** and **1.3**.

1.2 Scope of the EM&A Report

This is the Quarterly EM&A Summary Report for the Project which summarises the key findings of the EM&A programme during the reporting period from 1 October to 31 December 2022 for the construction works for the Project in accordance with the Updated EM&A Manual and the requirements of the Further Environmental Permits (FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B).

1.3 Organisation Structure

The organisation structure of the Project is shown in **Annex A**. The key personnel and contact details are summarised in **Table 1.1** below.

-
- (1) Application for variation of an environmental permit for FEP-01/558/2018 was undertaken and the latest FEP (FEP-01/558/2018/A) was issued on 6 November 2020.
 - (2) Application for variation of an environmental permit for FEP-03/558/2018/A was undertaken and the latest FEP (FEP-03/558/2018/B) was issued on 25 August 2021.
 - (3) Application for variation of an environmental permit for FEP-02/558/2018 was undertaken and the latest FEP (FEP-02/558/2018/A) was issued on 22 December 2020.

Legend

- Boundary of HKSAR
- Proposed GRS Location at BPPS
- Proposed GRS Location at LPS
- Proposed Route of BPPS Pipeline
- Proposed Route of LPS Pipeline
- Proposed Site for LNG Terminal
- Proposed LNG Terminal Safety Zone

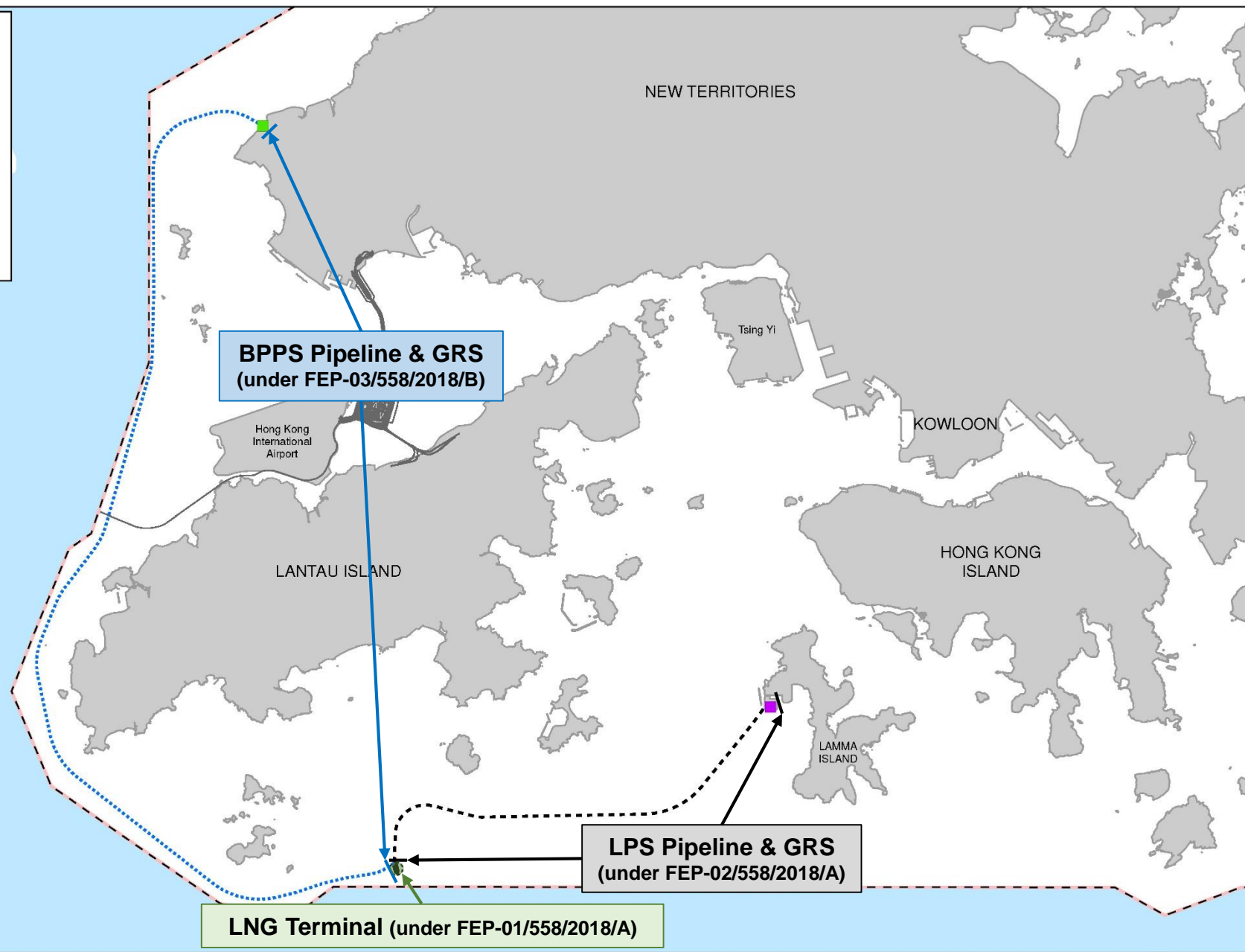
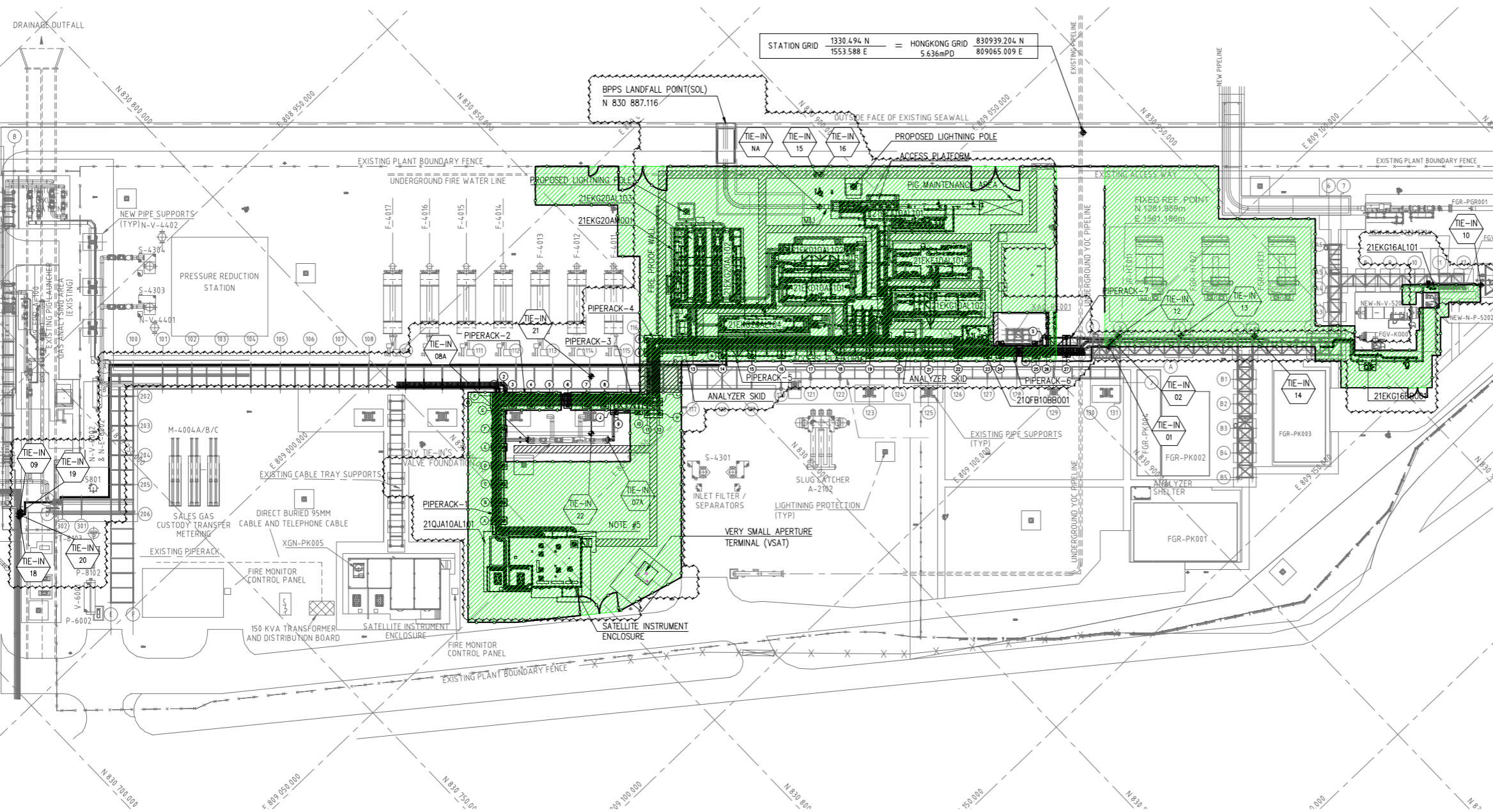
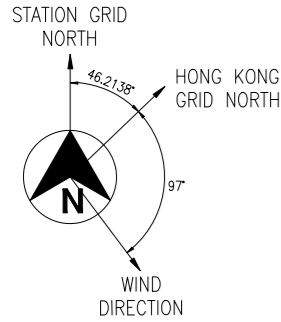


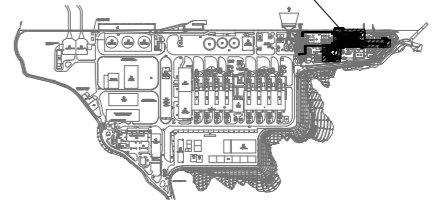
Figure 1.1

Indicative Location of Key Project Components



KEY PLAN

THIS DRAWING



GENERAL NOTES

1. ALL DIMENSIONS ARE IN mm, ELEVATIONS & COORDINATES ARE IN m.
2. NOMINAL GRADE (PIPING DATUM) 0.000m = NOMINAL GRADE (HONG KONG DATUM) 5.700m.
3. RELATIONSHIP OF HONG KONG GRID TO STATION GRID.
H.K. GRID 808 950.493 E = STATION GRID 0.000 E
828 896.966 N = STATION GRID 0.000 N
4. PIG RECEIVER DESIGNED FOR INTELLIGENT PIGGING.
5. EXISTING HOSE REEL CABINET AT NEW SIE BUILDING SHALL BE RELOCATED.

LEGEND

- ESCAPE /ACCESS CLEAR WIDTH OF NOT LESS THAN 1.525m AND CLEAR HEIGHT OF 2.3m.
- NEW BPPS GRS SCOPE OF WORK
- SITE BOUNDARY AT THE BPPS GRS

HKOLNG-COEEC-21EKG-MPD010-9101 HKOLNG GRS - EQUIPMENT LIST
DWG. NO. DRAWING TITLE

REFERENCE DOCUMENTS

REVISION	No.	DATE	DESCRIPTION	BY	CHK.	APP'D	CLP
C	03JUN2020	ISSUED FOR REVIEW		AKR	ASD	MF	
B	17APR2020	INTERNALLY APPROVED		AKR	ASD	MF	
A	21FEB2020	DISCIPLINE INTERNAL CHECK		AKR	ASD	MF	

CLIENT	Capco 香港中華煤氣有限公司 Cable Peak Power Co. Ltd.	Offshore Oil Engineering Co., Ltd.	JOB No. 20ZB-DD02
SIGNATURE	DATE	PROJECT: HONG KONG OFFSHORE LNG TERMINAL PROJECT PACKAGE B	CERTIF. No. A112002816
DRAWN	SGB	20AUG2020	SCALE (A3) 1 : 1000
DESIGNED	AKR	20AUG2020	
CHECKED	ASD	20AUG2020	Figure 1.2
REVIEWED	TWC	20AUG2020	
EXAMINED	TWC	20AUG2020	REV. C
APPROVED	MF	20AUG2020	

DWG No. HKOLNG-COEEC-21EKG-MLDO20-9112

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone
CAPCO / HKLTL (For FEP-01/558/2018/A and FEP-03/558/2018/B)	Senior Manager - Environmental	Karen Lui	2678 8282
HK Electric / HKLTL (For FEP-01/558/2018/A and FEP-02/558/2018/A)	Head of Mechanical Engineering, Projects Division	Norman Chan	3143 3819
Environmental Team (ET) (ERM-Hong Kong, Limited)	ET Leader	Raymond Chow	2271 3281
Independent Environmental Checker (IEC) (Mott MacDonald Hong Kong Limited)	IEC	Lydia Chak	2585 8473
Contractor (CNOOC Offshore Oil Engineering Co. Ltd.)	Environmental Manager	H Y Tang	6111 5789
	Environmental Supervisor	Steven Fung	6237 5272

1.4 Contact Information for the Project

The contact information for the Project is provided in **Table 1.2**. The public can contact the project proponents through the following channel for any enquiries and comments on the environmental monitoring data and related information of the Project.

Table 1.2 Contact Information for the Project

Channel	Contact Information
Email	enquiry@env.hkolng.com

1.5 Summary of Construction Activities

The programme of the construction is shown in **Annex B**.

As informed by the Contractor, details of the major construction activities undertaken in the reporting period are listed in **Table 1.3** below:

Table 1.3 Major Construction Activities Undertaken in the Reporting Period

FEP	Land-based Works	Marine-based Works
FEP-01/558/2018/A	<ul style="list-style-type: none"> ▪ Topside installation works ▪ Piping installation works ▪ System commissioning 	<ul style="list-style-type: none"> ▪ Nil
FEP-02/558/2018/A	<ul style="list-style-type: none"> ▪ System commissioning 	<ul style="list-style-type: none"> ▪ Final hydrotest
FEP-03/558/2018/B	<ul style="list-style-type: none"> ▪ System commissioning 	<ul style="list-style-type: none"> ▪ Final hydrotest

1.6 Summary of EM&A Programme Requirements

The status of EM&A Programme for all environmental aspects required under the Updated EM&A Manual are presented in **Table 1.4**. The requirements of relevant environmental monitoring, including monitoring parameters, Action and Limit Levels, Event and Action Plan(s), environmental mitigation measures, etc. are presented in *Section 2*.

Table 1.4 Summary of Status for the EM&A Programme under the Updated EM&A Manual

Aspects	Relevant FEP(s)	Status
Water Quality		
Baseline Monitoring	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> ■ Completed
Efficiency of Silt Curtain System	FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> ■ Completed for cage-type silt curtain for dredging operation (under FEP-02/558/2018/A and FEP-03/558/2018/B) ■ Completed for cage-type silt curtain for jetting operation (under FEP-02/558/2018/A and FEP-03/558/2018/B) ■ Completed for floating silt curtain for jetting operation (under FEP-02/558/2018/A and FEP-03/558/2018/B)
Construction Phase Monitoring	FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> ■ Completed for FEP-02/558/2018/A and FEP-03/558/2018/B
Post-Construction Monitoring	FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> ■ Completed for FEP-02/558/2018/A and FEP-03/558/2018/B
Monitoring for Hydrotesting for the Subsea Gas Pipelines	FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> ■ Completed for FEP-02/558/2018/A and FEP-03/558/2018/B
First-year of LNG Terminal Operation	FEP-01/558/2018/A	<ul style="list-style-type: none"> ■ To be implemented during LNG Terminal operation
Maintenance Dredging	FEP-01/558/2018/A	<ul style="list-style-type: none"> ■ To be implemented during maintenance dredging
Waste Management		
Audit of Waste Management Practice	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> ■ On-going
Ecology		
Baseline Monitoring (Vessel-based Line Transect Survey and Passive Acoustic Monitoring)	FEP-01/558/2018/A	<ul style="list-style-type: none"> ■ Completed
Construction Phase Monitoring (Vessel-based Line Transect Survey and Passive Acoustic Monitoring)	FEP-01/558/2018/A	<ul style="list-style-type: none"> ■ Completed
Post-Construction Monitoring (Vessel-based Line Transect Survey and Passive Acoustic Monitoring)	FEP-01/558/2018/A	<ul style="list-style-type: none"> ■ On-going

Aspects	Relevant FEP(s)	Status
Marine Mammal Exclusion Zone Monitoring	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> Completed for FEP-01/558/2018/A (marine mammal exclusion zone with 500m radius) and FEP-02/558/2018/A and FEP-03/558/2018/B (marine mammal exclusion zone with 250m radius)
Environmental Site Inspection		
Regular Site Inspection	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> On-going
Records of Operating Speeds and Marine Travel Routes for Working Vessels	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> On-going
Environmental Log Book	FEP-01/558/2018/A FEP-02/558/2018/A FEP-03/558/2018/B	<ul style="list-style-type: none"> On-going

1.7 Status of Statutory Environmental Requirements and Compliance with Further Environmental Permit Conditions

The environmental licenses and permits, including further environmental permits, registration as chemical waste producer, construction noise permits, wastewater discharge license, marine dumping permits, etc., which were valid in the reporting period. No non-compliance with environmental statutory requirements, including FEP conditions (status of submission) under the EIA Ordinance was identified. The status of statutory environmental requirements is presented in **Annex D**.

1.8 Impact Prediction Review

The potential environmental impacts arising from the major construction activities undertaken in the reporting period provided in **Table 1.3** were mainly associated with dust emission from construction activities, waste management, and disturbance to marine mammals due to marine-based works. There were no Project-related Action and Limit Level exceedances and no non-compliance of environmental statutory requirements identified for the environmental monitoring and auditing works conducted in the reporting period, including regular site inspections of construction works conducted by the ET, audit of implementation of Waste Management Plan, review of the acceptability of operating speeds and marine travel routes of working vessels, and checking of compliance with the approval conditions given by EPD for allowing the entry of working vessels within marine parks in pursuant to Condition 3.1 of FEP-01/558/2018/A, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B, as appropriate. The recommended environmental mitigation measures were properly implemented in the reporting period. Excessive variation between the EIA study predictions and the EM&A monitoring results was not found and therefore no investigation and follow-up procedures were considered necessary.

The environmental mitigation implementation schedule (EMIS) is presented in **Annex C**.

2. SUMMARY OF EM&A RESULTS

The EM&A programme for the Project required environmental monitoring for marine water quality and marine mammals as well as environmental site inspections for air quality, construction noise, water quality, waste management, marine ecology, landscape and visual, and hazard to life impacts. As presented in *Section 1.6*, environmental site inspections, audit on waste management practice and marine water quality monitoring for hydrotesting for the LPS Pipeline and BPPS Pipeline were conducted during the reporting period, and the findings are presented below. In addition, as marine-based construction activities were completed in October 2022, the post-construction monitoring for marine water quality was conducted between 7 November and 2 December 2022 in accordance with the Updated EM&A Manual and the results are reported in the post-construction water quality monitoring report. The post-construction monitoring for marine mammals has been conducted since November 2022 in accordance with the Updated EM&A Manual and the results will be reported in the post-construction marine mammal monitoring reports upon completion of the monitoring.

2.1 Environmental Site Inspection

Regular environmental site inspections were carried out with the Contractor and Project Proponents to confirm the implementation of appropriate environmental protection and pollution control mitigation measures for air quality, construction noise, water quality, waste management, marine ecology, landscape and visual, and hazard to life impacts under the Project. In the reporting period, environmental site inspections were carried out on 5, 12, 26 October, 9 November and 20 December 2022. The Independent Environmental Checker (IEC) attended the environmental site inspections as the IEC audits on 5, 26 October, 9 November and 20 December 2022 during the reporting period. The environmental protection and pollution control mitigation measures were implemented properly. There were no key observations from site inspections and thus no Contractor's follow-up actions were necessary for the reporting period. The environmental mitigation implementation schedule (EMIS) is presented in **Annex C**.

2.2 Waste Management Status

Waste management audits were performed with reference to the Waste Management Checklists for the corresponding Waste Management Plans detailed in *Annex E of the associated Monthly EM&A Reports* during the regular environmental site inspections carried out in the reporting period. No non-compliance for Contractor's waste management practices was identified during the audits.

The quantities of different types of waste and marine sediment generated for the three FEPs are summarised in **Tables 2.1, 2.2 and 2.3** with reference to the waste flow tables prepared by the Contractor. General refuse was generated under FEP-01/558/2018/A and FEP-03/558/2018/B, and inert C&D materials (public fill) were also generated under FEP-03/558/2018/B in the reporting period. Detailed waste flow tables can be referred to *Annex F of the associated Monthly EM&A Reports* for the reporting period.

Table 2.1 Quantities of Waste Generated for FEP-01/558/2018/A

Inert C&D Materials Generated (in '000kg)						
Month/Year	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill
Oct 2022	0	0	0	0	0	0
Nov 2022	0	0	0	0	0	0
Dec 2022	0	0	0	0	0	0

C&D Wastes Generated

Month/Year	Metals (in '000kg ³)	Paper / Cardboard Packaging (in '000kg ³)	Plastics (in '000kg ³)	Chemical Waste		Other (e.g. general refuse) (in '000kg)
				(in '000kg ³)	(in '000L)	
Oct 2022	0	0	0	0	0	33.44
Nov 2022	0	0	0	0	0	20.09
Dec 2022	0	0	0	0	0	21.33

Table 2.2 Quantities of Waste and Marine Sediment Generated for FEP-02/558/2018/A

Inert C&D Materials Generated (in '000kg)

Month/Year	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill
Oct 2022	0	0	0	0	0	0
Nov 2022	0	0	0	0	0	0
Dec 2022	0	0	0	0	0	0

C&D Wastes Generated

Month/Year	Metals (in '000kg ³)	Paper / Cardboard Packaging (in '000kg ³)	Plastics (in '000kg ³)	Chemical Waste		Other (e.g. general refuse) (in '000kg)
				(in '000kg ³)	(in '000L)	
Oct 2022	0	0	0	0	0	0
Nov 2022	0	0	0	0	0	0
Dec 2022	0	0	0	0	0	0

Marine Sediment Generated (in '000m³)

Month/Year	Total Quantity of Type L Generated	Total Quantity of Type M Generated	Reused in the Contract	Reused in other Projects	Open Sea Disposal
Oct 2022	0	0	0	0	0
Nov 2022	0	0	0	0	0
Dec 2022	0	0	0	0	0

Table 2.3 Quantities of Waste and Marine Sediment Generated for FEP-03/558/2018/B

Inert C&D Materials Generated (in '000kg)

Month/Year	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill
Oct 2022	0	0	0	0	0	0
Nov 2022	0	0	0	0	0	0
Dec 2022	0	0	0	0	0	0

C&D Wastes Generated

Month/Year	Metals (in '000kg ³)	Paper / Cardboard Packaging (in '000kg ³)	Plastics (in '000kg ³)	Chemical Waste		Other (e.g. general refuse) (in '000kg ³)
				(in '000kg ³)	(in '000L)	
Oct 2022	0	0	0	0	0	2.13
Nov 2022	0	0	0	0	0	0
Dec 2022	0	0	0	0	0	1.06

Marine Sediment Generated (in '000m³)

Month/Year	Total Quantity of Type L Generated	Total Quantity of Type M Generated	Reused in the Contract	Reused in other Projects	Open Sea Disposal
Oct 2022	0	0	0	0	0
Nov 2022	0	0	0	0	0
Dec 2022	0	0	0	0	0

2.3 Marine Water Quality Monitoring for Hydrotesting for the Subsea Gas Pipelines

2.3.1 Monitoring Requirements

In accordance with the Updated EM&A Manual, water quality monitoring for hydrotesting for the subsea gas pipelines would be conducted before, during and after discharge of hydrotest water for the two subsea gas pipelines at the nearest sensitive receiver (i.e. IM6) and nearby control station(s) (i.e. E2 and / or F3 depending on the tidal state) as shown in **Figure 2.1** and **Table 2.4**. As agreed with IEC, one water quality monitoring event would be conducted within one week prior to hydrotesting discharge for each pipeline the monitoring, water quality monitoring would be conducted at a frequency of three times per week capturing the timing of hydrotesting discharge as far as practicable, and only one water quality monitoring event would be conducted after one week of completion of hydrotesting discharge for both pipelines. For a single water quality monitoring event, two rounds of measurement would be conducted during flood tide and two rounds of measurement would be conducted during ebb tide and each round of monitoring for each tide would be separated by at least an hour. Two replicates of *in-situ* measurements and samples would be collected at each monitored water depth of each monitoring stations. Levels of dissolved oxygen (DO), pH value, salinity, temperature and turbidity would be measured *in-situ*.

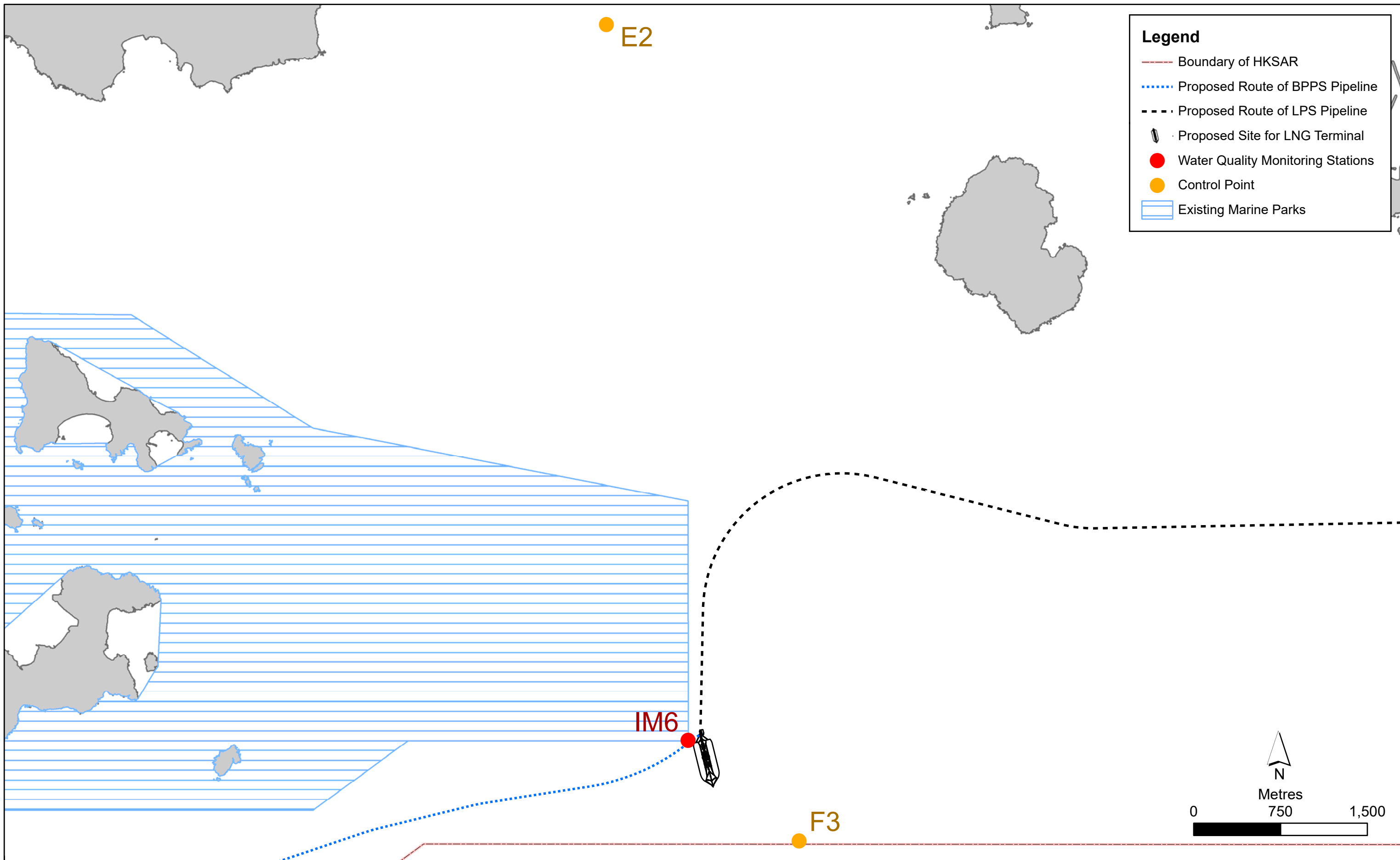


Figure 2.1

Water Quality Monitoring Locations for Hydrotesting for the Subsea Gas Pipelines

Table 2.4 Location of Water Quality Monitoring Station for Hydrotesting for the Subsea Gas Pipelines

Station	Easting	Northing	Description
IM6	814073	802029	Boundary of Existing South Lantau MP
F3	815032	801161	Control Station for Flood Tide
E2	813367	808213	Control Station for Ebb Tide

2.3.2 Action and Limit Levels for Marine Water Quality Monitoring for Hydrotesting for the Subsea Gas Pipelines

As predicted in the water quality modelling, there would be depletion of DO due to hydrotest discharge and thus the Action and Limit Levels of DO were established based on the baseline marine water quality monitoring data. The Action and Limit Levels of DO are presented in **Table 2.5**.

Table 2.5 Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Action Level	Limit Level
<i>During operation phase</i>		
DO in mg L ⁻¹ ^a	<u>Surface and Middle</u> 4.1 mg L ⁻¹	<u>Surface and Middle</u> 3.0 mg L ⁻¹
	<u>Bottom</u> 2.7 mg L ⁻¹	<u>Bottom</u> 2.0 mg L ⁻¹

Note:

- a. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

The Event and Action Plan for marine water quality monitoring can be referred to *the Updated EM&A Manual*.

2.3.3 Monitoring Results

A total of 8 monitoring events for marine water quality monitoring for hydrotesting for the BPPS and LPS Pipelines during discharge were conducted in the reporting period. One water quality monitoring event was conducted on 29 October 2022 after one week of completion of hydrotesting discharge for both pipelines. The monitoring results were presented in the respective *Monthly EM&A Reports*. There were no Project-related Action and Limit Level exceedances for marine water quality monitoring for hydrotesting for the BPPS and LPS Pipelines in the reporting period. The results of water quality monitoring after completion of hydrotesting discharge for both pipelines also indicated that there was no unacceptable change on the levels of DO and thus the hydrotest discharges for both pipelines did not result in unacceptable change in water quality.

2.4 Records of Operating Speeds and Marine Travel Routes of Working Vessels

The operating speeds and marine travel routes of working vessels for construction of the Project within the reporting period were checked and reviewed for the reporting period. All the working vessels were operated at a speed lower than 10 knots when moving within the areas frequented by marine mammals, including the waters near Sha Chau and Lung Kwu Chau Marine Park, the waters at the west of Lantau Island and the waters between Soko Islands and Shek Kwu Chau, and followed the relevant marine travel requirements stipulated in the FEP. No non-compliance on the operating speeds and marine travel routes of working vessels was identified. Records of operating speeds and

marine travel routes of working vessels for construction of the Project provided by the Contractor can be referred to the *relevant Annexes of the associated Monthly EM&A Reports* for the reporting period.

The compliance status on approval conditions given by the Director of Environmental Protection for the entry of working vessels (i.e. anchor handling tugs (AHTs)) within marine parks in pursuant to Condition 3.1 of FEP-01/558/2018/A for anchoring activities for construction of the Jetty, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B for anchoring activities for pipelaying and/or post-trenching processes for construction of LPS and BPPS Pipelines, respectively, as appropriate within the reporting period was checked. No non-compliance on the approval conditions was identified. Records of entry events of working vessels within the marine parks for construction of the Project provided by the Contractor can be referred to *relevant Annexes of the associated Monthly EM&A Reports for the reporting period*.

2.5 Implementation Status of Environmental Mitigation Measures

A summary of the Environmental Mitigation Implementation Schedule (EMIS) is presented in **Annex C**. The necessary mitigation measures were implemented properly for the Project.

2.6 Summary of Exceedances of the Environmental Quality Performance Limit

There were no Project-related Action and Limit Level exceedances for marine water quality monitoring for hydrotesting for the BPPS Pipeline and LPS Pipeline in the reporting period.

Since construction phase marine mammal monitoring was completed in November 2021, there were no breaches of Action and Limit Levels for marine mammal monitoring in the reporting period.

Cumulative statistics on exceedance is provided in **Annex E**.

2.7 Summary of Environmental Complaints, Notification of Summons and Successful Prosecutions

There were no environmental complaints, notification of summons and successful prosecutions recorded in the reporting period.

Statistics on environmental complaints, notification of summons and successful prosecutions are summarised in **Annex E**.

3. CONCLUSION AND RECOMMENDATIONS

This Quarterly EM&A Summary Report presents the key findings of the EM&A works during the reporting period from 1 October to 31 December 2022 for the construction works for the Project in accordance with the Updated EM&A Manual and the requirements of the Further Environmental Permits (FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B).

Environmental auditing works, including regular site inspections of construction works conducted by the ET, audit of implementation of Waste Management Plan, and review of the acceptability of operating speeds and marine travel routes of working vessels, including checking of compliance with the approval conditions given by EPD for allowing the entry of working vessels within marine parks in pursuant to Condition 3.1 of FEP-01/558/2018/A, Condition 3.4 of FEP-02/558/2018/A and Condition 3.4 of FEP-03/558/2018/B, were conducted in the reporting period, as appropriate. No non-compliance of environmental statutory requirements was identified.

Marine water quality monitoring for hydrotesting for the BPPS Pipeline and LPS Pipeline were conducted during the reporting period in accordance with the Updated EM&A Manual. No Project-related Action and Limit Level exceedances were recorded.

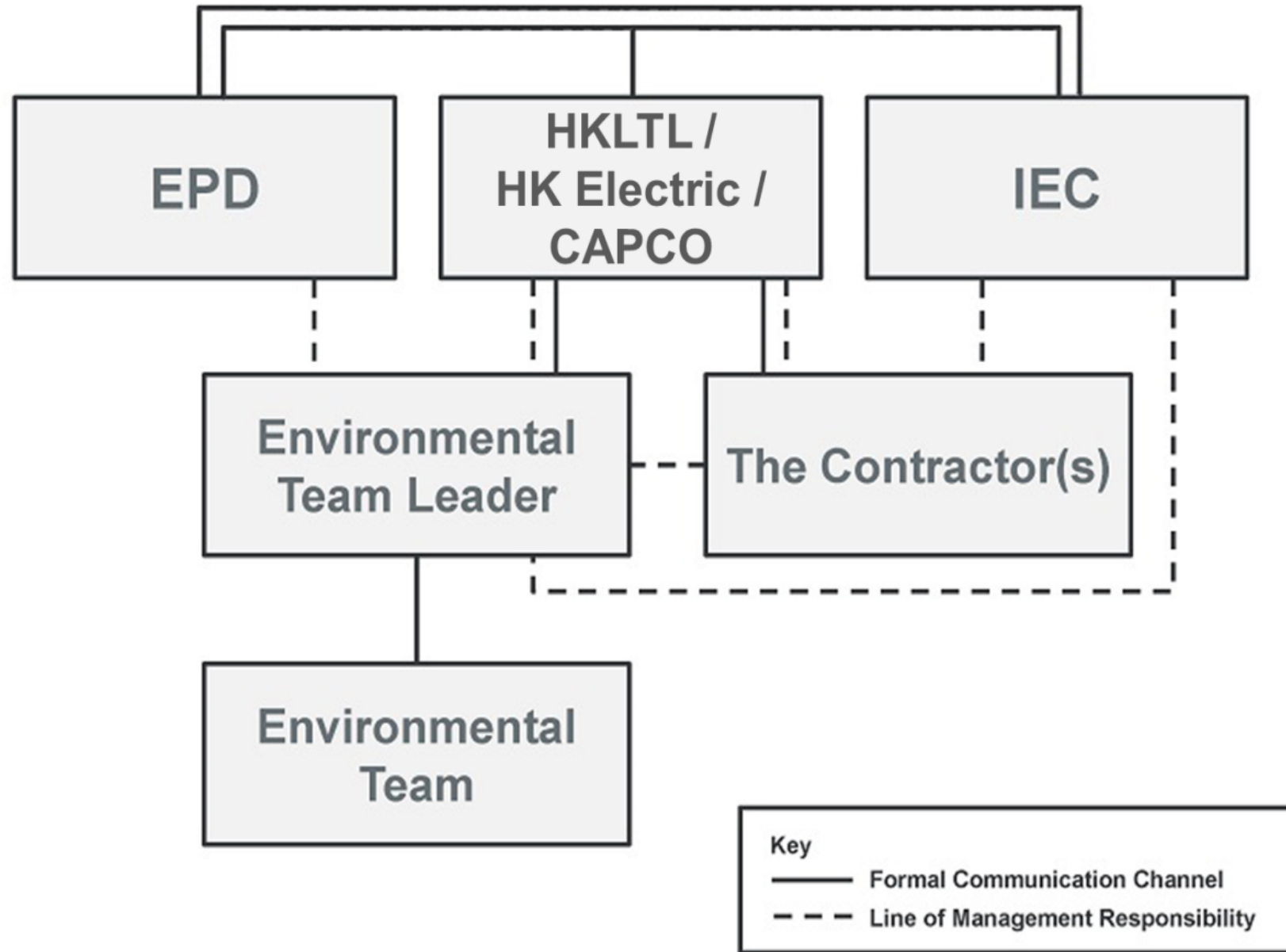
Since construction phase marine mammal monitoring was completed in November 2021, no breaches of Action and Limit Levels were recorded.

There were no environmental complaints, notification of summons and successful prosecutions recorded in the reporting period.

The recommended environmental mitigation measures for the Project were effectively implemented and the EM&A programme undertaken by the ET has effectively monitored the construction activities as well as ensured proper implementation of mitigation measures in the reporting period.

ANNEX A

PROJECT ORGANISATION



ANNEX B

CONSTRUCTION PROGRAMME

Schedule of Works associated with the double berth jetty at LNG Terminal

WORK	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Preparation Phase												
Pre-survey	█											
Construction Phase												
Jacket Installation		█			█							
Topsides Construction / Installation						█						
System commissioning and start up									█			

Schedule of Works for Jetty

Schedule of the works associated with the subsea gas pipeline for Lamma Power Station (LPS)

WORK	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Preparation Phase												
Pre-survey	■											
Removal of obstructions			■									
Construction Phase												
Pre-trenching including Deployment of Silt Curtain and Pilot Test			■									
De-burial of pre-installed pipeline by Mass Flow Excavator			■									
Pipeline Laying			■									
Intermediate Hydrotesting for Pipeline				■								
Post-trenching including Deployment of Silt Curtain and Pilot Test					■	■	■	■	■			
Rock Armour Placement						■	■	■	■	■		
Final Hydrotesting for Pipeline									■	■		
Gas Receiving Station (GRS) including pipe rack construction, preparation works at the vent header for tie-in of the new GRS, fencing, new gas receiving facility and new pipeline connection			■	■	■	■	■	■	■	■		
Gas Receiving Station (GRS) pre-commissioning, commissioning and start up									■	■	■	■

Schedule of Works for LPS Pipeline

Schedule of the works associated with the subsea gas pipeline for Black Point Power Station (BPPS) and the associated Gas Receiving Station (GRS) in BPPS

WORK	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Preparation Phase												
Pre-survey	█											
Removal of obstructions	█											
Construction Phase												
Pre-trenching including Deployment of Silt Curtain and Pilot Test				█	█	█						
Cofferdam and Sheet Pile Construction				█	█							
Pipeline Laying				█	█	█	█	█	█			
Post-trenching including Deployment of Silt Curtain and Pilot Test					█	█	█	█	█	█		
Rock Armour Placement						█	█	█	█	█		
Intermediate and Final Hydrotesting for Pipeline							█	█	█	█		
Gas Receiving Station (GRS) including pipe rack construction, preparation works at the vent header for tie-in of the new GRS, fencing, new gas receiving facility and new pipeline connection	█	█	█	█	█	█	█	█	█	█		
Gas Receiving Station (GRS) pre-commissioning, commissioning and start up									█	█	█	█

Schedule of Works for BPPS Pipeline and GRS

ANNEX C

ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

TABLE C.1 IMPLEMENTATION SCHEDULE OF RECOMMENDED MITIGATION MEASURES

EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage ⁽¹⁾			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Air Quality									
S4.10.1	S2.1	Impervious sheet will be provided for skip hoist for material transport.	Land sites for GRSs within BPPS and LPS / During construction, particularly dry season	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	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.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	All dusty materials should be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	Dropping heights for excavated materials should be controlled to a practical height to minimise the fugitive dust arising from unloading.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS

⁽¹⁾ D = Design Phase; C = Construction Phase; O = Operational Phase

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					D	C	O		
S4.10.1	S2.1	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.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A
S4.10.1	S2.1	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.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	Road sections between vehicle-wash areas and vehicular entrance will be paved.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	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.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	Temporary stockpiles of dusty materials will be either covered entirely by impervious sheets or	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS

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					D	C	O		
		sprayed with water to maintain the entire surface wet all the time.							
S4.10.1	S2.1	Stockpiles of more than 20 bags of cement and dusty construction materials will be covered entirely by impervious sheeting sheltered on top and 3-sides.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A
S4.10.1	S2.1	All exposed areas will be kept wet to minimise dust emission.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	Ultra-low-sulphur diesel (ULSD), defined as diesel fuel containing not more than 0.005% sulphur by weight, will be used for all construction plant on-site.	Land sites for GRSs within BPPS and LPS / During construction/ During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	<i>Environment, Transport and Works Bureau Technical Circular (ETWB-TC(W)) No 19/2005 on Environmental Management on Construction Sites</i>	N/A for GRS in BPPS ✓ for GRS in LPS
S4.10.1	S2.1	The engine of the construction equipment during idling will be switched off.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	N/A for GRS in BPPS N/A for GRS in LPS

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					D	C	O		
S4.10.1	S2.1	Regular maintenance of construction equipment deployed on-site will be conducted to prevent black smoke emission.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>Air Pollution Control (Construction Dust) Regulation</i>	✓ for BPPS Pipeline, LPS Pipeline and LNG Terminal N/A for GRS in LPS and GRS in BPPS
S4.10.1	S2.1	All marine vessels fuelled in Hong Kong are required to operate using marine light diesel with sulphur content lower than 0.05%.	Marine sites for the LNG Terminal, the BPPS Pipeline and the LPS Pipeline / During construction/ During operation	Contractor(s) / Project Proponents		✓	✓	<i>Air Pollution Control (Marine Light Diesel) Regulation</i>	✓ for BPPS Pipeline, LPS Pipeline and LNG Terminal
S4.10.1	S2.1	Non-road mobile machinery (NRMMs), e.g. mobile generator and air compressor, shall comply with the prescribed emission standards and approved with a proper label by EPD.	Land sites for GRSs within BPPS and LPS and marine sites for the LNG Terminal, the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		<i>Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation</i>	✓ for GRS in LPS N/A for GRS in BPPS, LNG Terminal, BPPS Pipeline and LPS Pipeline
S4.10.1	S2.1	To ensure proper implementation of the recommended dust mitigation measures and good construction site practices during the construction phase of the GRSs and the BPPS and the LPS,	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS

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					D	C	O		
		environmental site audits on monthly basis is recommended throughout the construction period.							
S4.10.2	S2.2	LNGCs shall comply with the fuel restriction requirement under the <i>Air Pollution Control (Ocean Going Vessels) (Fuel at berth) Regulation</i> .	Marine site for the LNG Terminal / During operation	HKLTL			✓	<i>Air Pollution Control (Ocean Going Vessels) (Fuel at berth) Regulation</i>	N/A
Hazard to Life									
S5.3.3	S3	All personnel within the BPPS shall comply with CLP safety policy and requirements.	Land site for the GRS within BPPS / During construction / During operation	Contractor(s) / CAPCO		✓	✓	-	✓
S5.3.3	S3	All personnel within the LPS shall comply with HK Electric safety policy and requirements.	Land site for the GRS within LPS / During construction / During operation	Contractor(s) / HK Electric		✓	✓	-	N/A
S5.3.3	S3	All operation work procedures shall be complied with the operating plant procedures or guidelines and regulatory requirements.	Land sites for GRSs within BPPS and LPS / During construction / During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	N/A for GRS in BPPS ✓ for GRS in LPS

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					D	C	O		
S5.3.3	S3	All personnel shall be equipped with appropriate personal protective equipment (PPE) when working at the BPPS and LPS facilities.	Land sites for GRSs within BPPS and LPS / During construction / During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	N/A for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Safety training and briefings shall be provided to all personnel.	Land sites for GRSs within BPPS and LPS / During construction / During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	N/A for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Regular site safety inspections/ audits shall be conducted.	Land sites for GRSs within BPPS and LPS / During construction/ During operation	Contractor(s) / CAPCO / HK Electric		✓	✓	-	N/A for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Method statements and risk assessments shall be prepared and safety control measures shall be in place before commencement of work.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS
S5.3.3	S3	Work permit system, on-site pre-work risk assessment and emergency response procedure shall be in place before commencement of work.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS

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					D	C	O		
S5.3.3	S3	All construction workers shall be under close site supervision during the construction phase of the GRSs.	Land sites for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS
S5.4.1	S3	An emergency response plan will be put in place which fully documents the procedures to be followed in the event of an emergency.	Transit of the LNGC and FSRU Vessel under Emergency Situation / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Method statements and risk assessments shall be prepared and safety control measures should be in place before the commencement of construction works.	LNG Terminal / During construction	Contractor(s)		✓		-	✓
S5.3.3	S3	Work permit system, on-site pre-work risk assessment and emergency response procedure shall be in place before commencement of construction works.	LNG Terminal / During construction	Contractor(s)		✓		-	✓
S5.3.3	S3	All construction workers shall be under close site supervision during the construction phase of the LNG Terminal.	LNG Terminal / During construction	Contractor(s)		✓		-	✓

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					D	C	O		
S5.3.3	S3	All personnel within the LNG Terminal shall comply with relevant safety policy and requirements.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	All operation work procedures shall be complied with relevant codes and standards (e.g. SIGTTO) and regulatory requirements.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Work permit system and emergency response procedure shall be in place.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Robust and extended process control system, safety control system, fire-fighting system and security system shall be provided.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Sufficient and trained / competent staff shall be provided to operate the LNG Terminal.	LNG Terminal / During operation	HKLTL			✓	-	N/A
S5.3.3	S3	Regular safety inspections/audits shall be conducted.	LNG Terminal / During operation	HKLTL			✓	-	N/A
Noise									

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					D	C	O		
S6.7	S4	N/A						N/A	
Water Quality									
S7.9.1	S5	A detailed hydrotesting procedure for subsea pipelines will be developed that will detail how the process will be carried out, how it will be carefully controlled and monitored, and how the intake and subsequent discharge of the seawater will be managed. Water quality monitoring for commissioning hydrotest for the subsea pipelines is presented in Section 5.3.5 of the Updated EM&A Manual.	LNG Terminal / During construction	Contractor(s)		✓		TM Standard under the WPCO, WPCO license requirements, WQO	✓
S7.9.1	S5	Adoption of appropriate dredging and jetting rates, plant numbers and silt curtains at the plant and WSRs, where applicable (Table 7.18 of the EIA Report, reprovided as Table A.2 below).	Marine Dredging & Jetting for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	Grab dredging can be conducted concurrently with one TSHD.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	N/A for BPPS Pipeline and LPS Pipeline

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					D	C	O		
S7.9.1	S5	One jetting machine will be working on each pipeline. No more than two jetting machines will be working on BPPS Pipeline.	Marine Jetting for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	Cofferdam construction and removal at landfalls of BPPS and LPS (where required) should not be conducted concurrently with the nearby pipeline dredging sections (BPPS KP44.9 - 45.0 and LPS KP17.4-18.2). Silt curtain surrounding the works areas for cofferdam construction and removal at pipeline landfalls of the BPPS and the LPS should also be implemented.	Pipeline landfalls for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1/ S7.9.2	S5	The following measures shall be followed for provision of silt curtain: <ul style="list-style-type: none"> The silt curtain shall be formed and installed in such a way that tidal rise and fall are accommodated, with the silt curtains always extending from the surface to the bottom of the water column and held with anchor blocks. 	Marine Dredging & Jetting for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline

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EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage ⁽¹⁾			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		<ul style="list-style-type: none"> Schematic diagrams on silt curtain deployment are provided in Figures 7.4 and 7.5 of the EIA Report. 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. 	Terminal) / During operation						
S7.9.1 / S7.9.2	S5	All vessels should be well maintained and inspected before use to limit any potential discharges to the marine environment.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline

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					D	C	O		
			Terminal) / During operation						
S7.9.1	S5	All vessels must have a clean ballast system.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)		✓		-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1 / S7.9.2	S5	No overflow is permitted from the trailing suction hopper dredger and the Lean Mixture Overboard (LMOB) system will only be in operation at the beginning and end of the dredging cycle when the drag head is being lowered and raised.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1 / S7.9.2	S5	Dredged marine mud will be disposed of in a gazetted marine disposal area in accordance with the Dumping at Sea Ordinance (DASO) permit conditions.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline

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					D	C	O		
			Terminal) / During operation						
S7.9.1 / S7.9.2	S5	Dredgers will maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operations speed to ensure that excessive turbidity is not generated by turbulence from vessel movement or propeller wash.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1 / S7.9.2	S5	Marine works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 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.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction / During operation	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline

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					D	C	O		
S7.9.1 / S7.9.2	S5	No solid waste is allowed to be disposed overboard.	Marine Dredging for the BPPS Pipeline and the LPS Pipeline / During construction / During operation	Contractor(s)		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline
S7.9.1	S5	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.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS
S7.9.1	S5	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.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		<i>ProPECC PN 1/94, TM Standard under the WPCO</i>	N/A for GRS in BPPS ✓ for GRS in LPS

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					D	C	O		
		Deposited silt and grit will be removed regularly.							
S7.9.1	S5	Earthworks to form the final surfaces will be followed up with surface protection and drainage works to prevent erosion caused by rainstorms.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		- N/A for GRS in BPPS ✓ for GRS in LPS	
S7.9.1	S5	Appropriate surface drainage will be designed and provided where necessary.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		- N/A for GRS in BPPS ✓ for GRS in LPS	
S 7.9.1	S5	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.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓	<i>ProPECC PN 1/94</i>	N/A for GRS in BPPS N/A for GRS in LPS	
S7.9.1	S5	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	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		- N/A for GRS in BPPS ✓ for GRS in LPS	

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					D	C	O		
		drainage system after accidental spillages.							
S7.9.1	S5	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.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS N/A for GRS in LPS
S7.9.1	S5	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.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A
S7.9.1	S5	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. No onsite discharge from these chemical toilets would be allowed.	Land sites & drainages for GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS
S 7.9.2	S5	Mitigation measures for maintenance dredging at the LNG Terminal in form of controlled dredging rate (maximum of	Marine Maintenance Dredging (LNG	Contractor(s) / HKLTL			✓	-	N/A

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					D	C	O		
		5,500m ³ day ⁻¹) as well as silt curtain should be implemented for the control of sediment dispersion and the protection of the nearby WSRs.	Terminal) / During operation						
S 7.9.2 / S9.11.3	S5 / S7	A project-specific contingency plan (including protocols for avoidance, containment, remediation and reporting accidental fuel spill event) will be prepared and implemented to contain and clean up the spilled or leaked fuels or chemicals at the LNG Terminal, surrounding waters and marine parks.	Fuel spillage for the LNG Terminal / During operation	Contractor(s) / HKLTL			✓		N/A
S7.12.1	S5.2-S5.5	Marine water quality monitoring at selected WSRs is recommended for marine dredging and jetting works for the pipeline construction.	Designated monitoring stations as defined in EM&A Manual / During marine construction period	Environmental Team (ET)		✓		-	N/A
S7.12.1	S5.2-S5.5	To ensure proper implementation of the recommended mitigation measures and good construction site practices during marine-based construction works, environmental site audits on a regular basis is	Marine sites for the LNG Terminal, the BPPS Pipeline and the LPS Pipeline / During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		-	✓

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					D	C	O		
		recommended throughout the construction period.							
S7.12.2	S5.2-S5.5	Water quality monitoring at the selected nearby WSRs is recommended for first year of operation of the LNG Terminal.	During operation for the LNG Terminal	Environmental Team (ET)/ HKLTL			✓	TM Standard under the WPCO, WPCO license requirements, WQO	N/A
S7.12.2	S5.2-S5.5	During maintenance dredging at the LNG Terminal, water quality monitoring at the selected nearby WSRs would be required.	Marine Maintenance Dredging (LNG Terminal) / During operation	Contractor(s) / HKLTL			✓	TM Standard under the WPCO, WPCO license requirements, WQO	N/A
Waste Management									
S8.5	S6.2	The contractor(s) will nominate approved personnel to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S8.5	S6.2	Good waste management practices should be implemented: <ul style="list-style-type: none"> Training of site personnel in proper waste management and chemical handling procedures; 	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓ for 1 st , 3 th , 6 th and 7 th bullet points for GRS in LPS ✓ for 1 st bullet point for BPPS

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					D	C	O		
		<ul style="list-style-type: none"> Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre; Encourage collection of aluminium cans and waste paper by individual collectors during construction with separate labelled bins provided to segregate these wastes from other general refuse by the workforce; Any unused chemicals, and those with remaining functional capacity, be recycled as far as possible; Prior to disposal of C&D materials, wood, steel and other metals will be separated, to the extent practical for re-use and/or recycling to reduce the quantity of waste to be disposed in a landfill; Proper storage and site practices to reduce the potential for damage or contamination of construction materials; and Plan and stock construction materials carefully to reduce 						Pipeline, LPS Pipeline and LNG Terminal N/A for 2 nd , 4 th and 5 th bullet points for GRS in LPS N/A for 2 nd to 7 th bullet points for BPPS Pipeline, LPS Pipeline and LNG Terminal N/A for GRS in BPPS	

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					D	C	O		
		amount of waste generated and avoid unnecessary generation of waste.							
S8.5	Table 6.1	The contractor(s) must provide sufficient waste disposal points. Wastes will be collected and removed from site in a timely manner.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S8.5	Table 6.1	The contractor(s) will have appropriate measures to reduce windblown/ floating litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	N/A
S8.5	Table 6.1	The contractor(s) will take and keep records of quantities of wastes generated, recycled and disposed of and the disposal sites.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S8.5	Table 6.1	The contractor(s) must segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse and recycling of material and proper disposal of waste.	All areas / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓ for GRS in LPS N/A for GRS in BPPS, BPPS Pipeline, LPS Pipeline and LNG Terminal

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					D	C	O		
S8.5	S6.2	The contractor(s) will use reusable non-timber formwork to reduce the amount of C&D materials.	All areas / During construction	Contractor(s)		✓		-	✓ for GRS in LPS N/A for GRS in BPPS, BPPS Pipeline, LPS Pipeline and LNG Terminal
S8.5	Table 6.1	The contractor(s) must ensure that all the necessary waste disposal and marine dumping permits or licences are obtained prior to the commencement of the construction works.	During construction	Contractor(s)		✓		-	✓
S8.5	S6.2	The contractor will open a billing account with EPD in accordance with the <i>Waste Disposal (Charges for Disposal of Construction Waste) Regulation</i> for the payment of disposal charges.	During construction	Contractor(s)		✓		<i>Cap 354N Waste Disposal (Charges for Disposal of Construction Waste) Regulation</i>	✓
S8.5	S6.2	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 waste and general refuse at transfer facilities/ landfills, and to control fly-tipping.	During construction	Contractor(s)		✓		<i>DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials</i>	✓ N/A for LNG Terminal

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					D	C	O		
S8.5	S6.2	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.	All areas / During construction	Contractor(s)		✓		<i>PNAP ADV-19</i>	✓
S8.5	Table 6.1	The management of dredged marine sediment requirement from <i>PNAP ADV-21</i> will be incorporated in the Contract for the construction and maintenance dredging during the operation of the Project.	Marine works / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	<i>PNAP ADV-21</i> and <i>Dumping at Sea Ordinance (DASO)</i>	N/A
S8.5/ S7.9	S6.2 / S5	Disposal vessels will be fitted with tight bottom seals in order to prevent leakage of material during transport.	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓		<i>Dumping at Sea Ordinance (DASO)</i>	N/A
S8.5/ S7.9	S6.2 / S5	Barges will be filled to a level, which ensures that of marine sediment and marine sediment laden water does not spill over	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓		<i>Dumping at Sea Ordinance (DASO)</i>	N/A

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					D	C	O		
		during loading or transport to the disposal site and that adequate freeboard is maintained to ensure that the decks are not washed by wave action.							
S8.5/ S7.9	S6.2 / S5	After dredging, any excess materials will be cleaned from decks and exposed fittings before the vessel is moved from the dredging area.	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓		<i>Dumping at Sea Ordinance (DASO)</i>	N/A
S8.5/ S7.9	S6.2 / S5	When the dredged material has been unloaded at the disposal areas, any material that has accumulated on the deck or other exposed parts of the vessel will be removed and placed in the hold or a hopper. Under no circumstances will decks be washed clean in a way that permits material to be released overboard.	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓			N/A
S8.5	S6.2	Dredgers will maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operations speed to ensure that excessive turbidity is not generated by turbulence from	Dredged areas / During construction	Contractor(s)/ Project Proponents		✓			N/A

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					D	C	O		
		vessel movement or propeller wash.							
S8.5	Table 6.1	C&D materials will be segregated on-site into public fill and non-inert C&D materials 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 land and marine-based construction sites 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.	During construction	Contractor(s)		✓		-	✓ for GRS in LPS
S8.5	Table 6.1	The contractor(s) will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> .	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	<i>Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>	✓

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					D	C	O		
S8.5	Table 6.1	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. 	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	<i>Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>	✓ for GRS in LPS N/A for BPPS Pipeline, LPS Pipeline, GRS in BPPS and LNG Terminal
S8.5	Table 6.1	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 	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	<i>Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>	✓ for GRS in LPS N/A for BPPS Pipeline, LPS Pipeline, GRS in BPPS and LNG Terminal

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					D	C	O		
		<p>of the chemical waste stored in that area, whichever is the greatest;</p> <ul style="list-style-type: none"> • 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. 							
S8.5	Table 6.1	<p>Chemical waste will be disposed of:</p> <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. 	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	<i>Waste Disposal (Chemical Waste) (General) Regulation; Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>	N/A

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					D	C	O		
S8.5	Table 6.1	General refuse (including the floating refuse collected) will be stored in enclosed bins separately from C&D materials and chemical wastes. Floating refuse will be collected on an 'as needed' basis for disposal as general refuse. Workers will be prohibited from throwing rubbish into the sea and adequate bins will be provided on both land and marine-based sites and marine vessels. General refuse will be delivered separately from C&D materials and chemical wastes for offsite disposal on a regular basis to reduce odour, pest and litter impacts. General refuse from the marine vessels will be collected and disposed on shore.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S8.5	Table 6.1	Recycling bins will be provided at strategic locations within the land and marine-based construction site and marine vessels 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.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓ for GRS in LPS and BPPS Pipeline N/A for LPS Pipeline and LNG Terminal

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					D	C	O		
									N/A for material recovered being sold for recycling
S8.5	S6.2	To avoid any odour and litter impact, appropriate number of portable toilets will be provided for workers on-site.	All areas / During construction / During operation	Contractor(s)		✓	✓	-	✓
S8.5	S6.2	At the commencement of the construction works and operations, training will be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling. In particular, the training will emphasize no dumping of waste into the sea is allowed, particularly at marine-based work sites and on marine vessels.	All areas / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓
S8.5	S6.2	Industrial waste arising from maintenance activities will be segregated. Scrap metals and recyclables will be sent for recycling to reduce the overall	All areas / During operation	Project Proponents			✓	-	N/A

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					D	C	O		
		quantity of waste disposed from these activities.							
S8.7	S6.1	It is recommended that monthly audits of the waste management practices be carried out during the construction phase land-based work sites (at the GRSs at the BPPS and the LPS), and at marine-based work sites (on marine vessels and Jetty) to determine if wastes are being managed in accordance with the recommended good site practices and WMP. The audits will include all aspects of waste management including waste generation, storage, handling, recycling, transportation and disposal, to prevent any dumping of waste into the sea or malpractice of waste disposal.	All areas / During construction	Contractor(s)/ Environmental Team (ET) & Independent Environmental Checker (IEC)		✓		-	✓
Ecology									
S9.11.2	S7	The vessel operators will be required to control and manage all effluent from vessels. These kinds of wastewater shall be brought back to port where possible and discharged at appropriate collection and treatment system to	Marine works / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓

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					D	C	O		
		prevent avoidable water quality impact.							
S9.11.2	S7	A policy of no dumping of rubbish, food, oil, or chemicals will be strictly enforced. This will also be covered in the contractor briefings.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S9.11.2	S7	Only well-maintained and inspected vessels would be used to limit any potential discharges to the marine environment.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S9.11.2	S7	Standard site practices outlined in <i>ProPECC PN 1/94 "Construction Site Drainage"</i> will be followed as far as practicable in order to reduce surface runoff, minimise erosion, and also to retain and reduce any SS prior to discharge.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	<i>ProPECC PN 1/94</i>	✓
S9.11.3	S7	Pipeline dredging/ jetting works between North of Tai O and Fan Lau (BPPS KP21.3 to 15.6) will avoid the peak months of Chinese White Dolphin (CWD) calving (May and June).	Marine works (Dredging/ jetting works between North of Tai O and Fan Lau along the BPPS Pipeline) / During construction	Contractor(s)		✓		-	N/A

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EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage ⁽¹⁾			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
S9.11.3	S7	Pipeline dredging/ jetting works between South of Soko Islands and the LNG Terminal (BPPS KP8.9 to 0.0) will be restricted to a daily maximum of 12 hours with daylight (0700 – 1900) operations.	Marine works (Dredging/ jetting works between South of Soko Islands and the LNG Terminal along the BPPS Pipeline) / During construction	Contractor(s)		✓		-	N/A
S9.11.3	S7	Pipeline dredging/ jetting from LNG Terminal to South of Shek Kwu Chau (LPS KP0.0 to 5.0) will be restricted to a daily maximum of 12 hours with daytime (0700 – 1900) operations.	Marine works (Dredging/ jetting works between from LNG Terminal to South of Shek Kwu Chau along the LPS Pipeline) / During construction	Contractor(s)		✓		-	N/A
S9.11.3	S7	Use of vibratory/ hydraulic pushing method to vibrate / push the open-ended steel tubular pile for the upper layer of the seabed and only use hydraulic hammer (if needed) to install the remainder of the pile length through the lower layer of the seabed. During underwater percussive piling works:	Marine works (Piling at the LNG Terminal) / During construction	Contractor(s)		✓		-	N/A

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					D	C	O		
		<ul style="list-style-type: none"> Quieter hydraulic hammers should be used instead of the noisier diesel hammers; Use of Noise Reduction System for hydraulic hammering; Acoustic decoupling of noisy equipment on work barges should be undertaken; Using ramp-up piling procedures. This comprises of low energy driving for a period of time prior to commencement of full piling. This will promote avoidance of the area by marine mammals when sounds levels are not injurious. Blow frequency during this ramping up period should replicate the intensity that would be undertaken during full piling (e.g. one blow every two seconds) to provide cues for marine mammals to localize the sound source. Pile blow energy should be ramped up gradually over the 'soft start' period. Activities will be continuous without short-breaks and avoiding sudden 							

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					D	C	O		
		random loud sound emissions; <ul style="list-style-type: none"> Underwater percussive piling should be conducted inside a bubble curtain so as to ameliorate underwater sound level transmission; The percussive pile driving will be conducted during the daytime (0700 – 1900) for a maximum of 12 hours, avoiding generation of underwater sounds at night time; and Underwater percussive piling works for the Jetty construction will avoid the peak season of FP (December to May). 							
S9.11.3	S7	The vessel operators of this Project will be required to use predefined and regular routes (that do not encroach into existing and proposed marine parks), make use of designated fairways to access the works areas, and would avoid traversing sensitive habitats such as existing and proposed marine parks (with the exception of the FSRU Vessel which will need to transit through	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓

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					D	C	O		
		the proposed SLMP during manoeuvring to the Jetty and after typhoon event due to its safe operational requirement).							
S9.11.3	S7	Any anchoring/ anchor spread requirements during Project construction will avoid encroachment into the existing and proposed marine parks, unless otherwise agreed by the Director of Environmental Protection.	Marine works (on existing, planned and potential marine parks) / During construction	Contractor(s)/ Project Proponents		✓		-	✓
S9.11.3	S7	Silt curtain deployment during Project construction and maintenance dredging will avoid encroachment into the existing and proposed marine parks, unless otherwise agreed by the Director of Environmental Protection.	Marine works (on existing, planned and potential marine parks) / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	N/A
S9.11.3	S7	No stopping over or anchoring activity of vessels related to the Project should be conducted within existing and proposed marine parks, even before, during and after typhoon, unless	Marine works (on existing, planned and potential marine parks) / During construction / During operation	Contractor(s)/ Project Proponents		✓	✓	-	✓

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EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage ⁽¹⁾			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		otherwise agreed by the Director of Environmental Protection.							
S9.11.3	S7	Use of appropriate dredging and jetting rates with the use of silt curtain where needed as recommended in the Water Quality section (Section 7 of the EIA Report) to reduce potential water quality impacts from elevated suspended solids (SS) due to the proposed marine works.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	N/A
S9.11.3	S7	Silt curtain will be checked and maintained to ensure its effectiveness in mitigating water quality impacts on existing, planned and potential marine parks.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline
S9.11.3	S7	All vessel operators working on the Project will be given a briefing, alerting them to the locations of the existing, proposed and potential marine parks and the regulations for marine parks, the possible presence of dolphins and porpoises in the marine works areas, and the guidelines for safe vessel operation in the presence of cetaceans. The vessels will	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓

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EIA Reference	EM&A Reference	Recommended Environmental Protection Measures/ Mitigation Measures	Location/ duration of recommended measures & timing of completion of recommended measures	Implementation Agent	Implementation Stage ⁽¹⁾			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
		avoid using high speed as far as possible. By observing the guidelines, vessels will be operated in an appropriate manner so that marine mammals will not be subject to undue disturbance or harassment.							
S9.11.3	S7	All vessels used in this Project will be required to slow down to 10 knots around the Project's marine works areas and areas with high dolphin and porpoise usage, including existing and proposed marine parks. With implementation of this measure, the chance of vessel strike resulting in physical injury or mortality of marine mammals will be extremely unlikely.	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	✓
S9.11.3	S7	During underwater percussive piling works, a marine mammal exclusion zone within a radius of 500m radius will be implemented during underwater percussive piling works. Qualified observer(s) will scan an exclusion zone of 500m radius around the work area for at least 30 minutes prior to the start of piling. If a marine mammal is observed in the	Marine works / During construction	Contractor(s) / Project Proponents		✓		-	N/A

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					D	C	O		
		exclusion zone, piling will be delayed until they have left the area. This measure will ensure the area in the vicinity of the underwater percussive piling work is clear of marine mammals prior to the commencement of works and will serve to reduce any disturbance to marine mammals. When a marine mammal is spotted by qualified personnel within the exclusion zone, piling works will cease and will not resume until the observer confirms that the zone has been continuously clear of the marine mammal for a period of 30 minutes. This measure will ensure the area in the vicinity of the piling is clear of the marine mammal during works and will serve to reduce any disturbance to marine mammals.							
S9.11.3	S7	During marine dredging or jetting operations, a marine mammal exclusion zone within a radius of 250m from dredger or jetting machine will be implemented. Qualified observer(s) will scan an exclusion zone of 250m radius around the work area for at least	Marine works / During construction / During operation	Contractor(s) / Project Proponents		✓	✓	-	N/A for BPPS Pipeline and LPS Pipeline

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					D	C	O		
		30 minutes prior to the start of dredging or jetting. If cetaceans or other megafauna are observed in the exclusion zone, dredging or jetting will be delayed until they have left the area. This measure will ensure the area in the vicinity of the dredging or jetting work is clear of marine mammals prior to the commencement of works and will serve to reduce any disturbance to marine mammals. When a marine mammal is spotted by qualified personnel within the exclusion zone, dredging or jetting works will cease and will not resume until the observer confirms that the zone has been continuously clear of the marine mammal for a period of 30 minutes. This measure will ensure the area in the vicinity of the works is clear of the marine mammal during works and will serve to reduce any disturbance to marine mammals. If necessary, for night-time works, exclusion zone monitoring for FP by underwater acoustic means would be explored to supplement the exclusion zone monitoring by trained observers. A site trial will							

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					D	C	O		
		be conducted to demonstrate its practicability/ effectiveness before actual implementation during the night-time works.							
S9.11.3	S7	Implementation of a contingency plan to contain and clean up the spilled or leaked fuels or chemicals at the LNG Terminal, surrounding waters and marine parks.	Marine site for the LNG Terminal / During operation	Contractor(s) / HKLTL			✓	-	N/A
S9.15.1	S7	Baseline, impact and post-construction monitoring of marine mammal using vessel-based line transect surveys and passive acoustic monitoring (PAM) will be undertaken to keep track of potential changes in the usage of waters in the vicinity of the Project's works areas by FP. Prior to the commencement of monitoring, methods will be agreed with the AFCD.	Marine site / During construction	Contractor(s) / ET/ Project Proponents		✓		-	✓
Fisheries									
S10.8	S8	The mitigation measures designed to mitigate impacts to water quality to acceptable levels (compliance with assessment criteria) and marine ecological	During construction and operation	Contractor(s) / Project Proponents / Environmental Team (ET) & Independent		✓	✓	-	✓

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					D	C	O		
		impacts are expected to mitigate impacts to fisheries resources.		Environmental Checker (IEC)					
S10.8	S8	Impingement and entrainment of fisheries resources will be reduced through appropriate design of the intake screens on the cooling water intake.	During operation for the LNG Terminal	Contractor(s) / HKLTL			✓	-	N/A
Visual									
S11.8	S9	Sensitive architectural design of the new facilities. This should take into account material texture, colour, finished to structure and the context of the site to ensure the GRSs at the BPPS and LPS blend into the existing context, cause least disturbance to the existing land. LNG Terminal will be designed for marine safety and operations, in accordance with relevant standards and regulations and sensitive architectural design will be considered where practicable.	All areas / Detailed design / During construction / During operation	Design Contractor / Project Proponents	✓	✓	✓	-	✓
S11.8	S9	Pre-construction and construction period for the GRSs and LNG Terminal should be reduced as far as practical to lower visual impact.	All areas / During construction	Contractor(s)		✓		-	✓ for GRS in LPS and LNG Terminal

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					D	C	O		
S11.8	S9	Following construction, land areas temporarily affected by the construction works, will be reinstated to their former state.	Land sites for the GRSs within BPPS and LPS / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS
S11.8	S9	Light intensity and beam directional angle should be controlled at the GRSs and the LNG Terminal at the design stage to reduce light pollution and glare (e.g. hooded lights, specific directional focus, etc.).	All areas / Detailed design / During operation	Design Contractor / Project Proponents	✓		✓	-	N/A
S11.8	S9	Any plants to be affected by the GRSs at the BPPS and the LPS should be preserved and care taken to ensure the existing health status of the vegetation is maintained or enhanced after construction.	All areas / During construction	Contractor(s)		✓		-	N/A for GRS in BPPS ✓ for GRS in LPS
Cultural Heritage									
S12.7	S10	N/A							N/A

TABLE C.2 SUMMARY OF MITIGATION MEASURES FOR PIPELINE CONSTRUCTION WORKS

Work Location	Plants Involved	Allowed Maximum Work Rate	Silt Curtain at Plants	Silt Curtain at Water Sensitive Receivers	Other Measures	Implementation Status
LPS Pipeline (under FEP-02/558/2018/A)						
Pipeline shore approach at LPS (KP17.4 - 18.2)	1 Grab Dredger	1,600m ³ day ⁻¹ for 24 hours each day	Yes	Not required		N/A
West Lamma Channel (KP14.5 - 17.4)	1 Jetting Machine	1,000m day ⁻¹ for 24 hours each day	Yes	Not required		N/A
South of Shek Kwu Chau to West Lamma Channel (KP5.0 - 14.5)	1 Jetting Machine	7,000m day ⁻¹ for 24 hours each day	Yes	Not required		N/A
Double Berth Jetty to South of Shek Kwu Chau (KP0.1 - 5.0)	1 Jetting Machine	720m day ⁻¹ for 24 hours each day	Yes	Two layers at Eastern Boundary of the Proposed South Lantau Marine Park (KP0.1 - 5.0)	Daily maximum of 12 hours with daylight (0700 – 1900)	N/A
Pipeline Riser Sections at Double Berth Jetty (under FEP-02/558/2018/A and FEP-03/558/2018/B)						
Pipeline Riser (KP0.0 - 0.1 for both pipelines)	1 Grab Dredger	8,000m ³ day ⁻¹ for 24 hours each day	Yes	Not required	Daily maximum of 12 hours with daylight (0700 – 1900)	N/A
BPPS Pipeline (under FEP-03/558/2018/B)						
Jetty Approach (KP0.1 - 5.0), excluding Subsea Cable Sterile Corridors	1 Jetting Machine (Note 1)	1,000m day ⁻¹ for 24 hours each day	Yes	Not required for grab dredging; Two layers at Southern Boundary of the Proposed South Lantau Marine Park (KP0.1 - 8.9) for jetting	Daily maximum of 12 hours with daylight (0700 – 1900)	N/A
Subsea Cable Sterile Corridors (KP1.49 - 2.75 & KP3.55 - 4.43)	2 Grab Dredgers, followed by 1 Jetting Machine	8,000m ³ day ⁻¹ for 24 hours each day for each dredger 720m day ⁻¹ for 24 hours each day jetting machine	Yes			N/A

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Work Location	Plants Involved	Allowed Maximum Work Rate	Silt Curtain at Plants	Silt Curtain at Water Sensitive Receivers	Other Measures	Implementation Status
South of Soko Islands (KP5.0 - 8.9)	1 Jetting Machine (Note 1)	1,000m day ⁻¹ for 24 hours each day	Yes			N/A
Southwest of Soko Islands (KP8.9 - 12.1)	1 Jetting Machine (Note 1)	1,000m day ⁻¹ for 24 hours each day	Yes	Not required		N/A
Adamasta Channel (KP12.1 - 15.6)	1 Jetting Machine (Note 1)	1,000m day ⁻¹ for 24 hours each day	Yes	Not required		N/A
Southwest Lantau (KP15.6 - 21.3)	1 Jetting Machine (Note 1)	1,500 m day ⁻¹ for 24 hours each day	Yes	Not required	Avoid the peak months of Chinese White Dolphin (CWD) calving (May and June)	N/A
West of Tai O to West of HKIA (KP21.3 - 31.5)	1 Jetting Machine (Note 1)	1,500m day ⁻¹ for 24 hours each day from KP KP26.2 to 21.3 720m day ⁻¹ for 24 hours each day from KP31.5 to 26.2	Yes	Not required		N/A
Sha Chau to Lung Kwu Chau (KP31.5 - 36.0)	1 Jetting Machine (Note 1)	720m day ⁻¹ for 24 hours each day	Yes	Two layers at Western Boundary of the Sha Chau and Lung Kwu Chau Marine Park (KP31.5 - 36.0)		N/A
Sha Chau to Lung Kwu Chau (KP36.0 - 37.5)	1 Jetting Machine (Note 1)	720m day ⁻¹ for 24 hours each day	Yes	Two layers at Western Boundary of the Sha Chau and Lung Kwu Chau Marine Park (KP36.0 - 37.5)		N/A

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Work Location	Plants Involved	Allowed Maximum Work Rate	Silt Curtain at Plants	Silt Curtain at Water Sensitive Receivers	Other Measures	Implementation Status
Lung Kwu Chau to Urmston Anchorage (KP37.5 - 41.1)	1 Jetting Machine (Note 1)	1,000m day ⁻¹ for 24 hours each day	Yes	Two layers at Northwestern corner of Sha Chau and Lung Kwu Chau Marine Park (KP37.5 - 41.1)		N/A
Urmston Road (KP41.1 - 42.9)	1 Grab Dredger	8,000m ³ day ⁻¹ for 24 hours each day	Yes	Not required		N/A
West of BPPS (KP42.9 - 44.9)	1 Jetting Machine (Note 1)	1,000m day ⁻¹ for 24 hours each day	Yes	Two layers at CR1, CR2 (Note 2)		N/A
Pipeline shore approach at BPPS (KP44.9 - 45.0)	1 Grab Dredger	1,500m ³ day ⁻¹ for 24 hours each day	Yes	Two layers at CR1, CR2 (Note 2)		N/A

Notes:

(1) No more than two jetting machines will be used for the construction of the subsea gas pipeline of the Project. In addition to existing relevant mitigation measures, the minimum separation distance between the two jetting machines for avoiding cumulative impact is 5km for most of the pipeline sections, except when one jetting machine is working at the subsea cable sterile corridors (i.e. KP1.49 – KP2.75 and KP3.55 – KP4.43). When one jetting machine is working at the subsea cable sterile corridors, no other jetting machine will work concurrently within KP0.0-KP14.25, i.e., between the Jetty and Adamasta Channel.

(2) CR1 and CR2 denote the coral colonies identified at the artificial seawall at BPPS.

ANNEX D

STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS

TABLE D.1 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR WHOLE PROJECT (FEP-01/558/2018/A, FEP-02/558/2018/A & FEP-03/558/2018/B)

Item	Description	Ref. No.	Date of Expiry	Status
1	Notification Pursuant to Section 3(1) of <i>Air Pollution Control (Construction Dust) Regulation</i>	481861	N/A	Valid
2	Billing Account under <i>Waste Disposal (Charges for Disposal of Construction Waste) Regulation</i>	7037035	N/A	Valid
3	Registration as Chemical Waste Producer under <i>Waste Disposal (Chemical Waste) (General) Regulation</i>	WPN 5213-912-C4445-01 (Note 1)	N/A	Registration completed on 12 May 2020
4	Registration as Chemical Waste Producer under <i>Waste Disposal (Chemical Waste) (General) Regulation</i>	WPN 5218-934-C4445-03 (Note 2)	N/A	Registration completed on 22 July 2021
5	Construction Noise Permit (for construction site for the Hong Kong Offshore LNG Terminal Project) under <i>Noise Control Ordinance</i>	GW-RS0774-22	31 Mar 2023	Validity until 31 March 2023

Notes:

(1) The location/premises where the waste is produced (i.e. Working Vessel – Lan Jiang, Lan Jing, Hai Yang Shi You 202) as per the registration.

(2) The location/premises where the waste is produced (i.e. Working Vessel – Mencast Offshore 1, Bin Hai 109, Coastal Supreme, CPOE-101) as per the registration.

TABLE D.2 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR FEP-01/558/2018/A

Item	Description	Ref. No.	Date of Expiry	Status
1	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-01/558/2018	N/A	Issued on 17 Jan 2020
2	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-01/558/2018/A	N/A	Issued on 6 Nov 2020
3	Certificate of Approval on Installation of Chimneys/Flues connected to Emergency Generator under <i>Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration Regulations)</i>	(7) in 475740 (Note 1)	N/A	Approval issued on 6 Jan 2022

Notes:

(1) The location/premises where the chimney/flue is installed (i.e. The Offshore LNG Terminal) as per the certificate.

TABLE D.3 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR FEP-02/558/2018/A

Item	Description	Ref. No.	Date of Expiry	Status
1	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-02/558/2018	N/A	Issued on 17 Jan 2020
2	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-02/558/2018/A	N/A	Issued on 22 Dec 2020
3	Wastewater Discharge License under <i>Water Pollution Control Ordinance</i>	WT00039668-2021 (Note 1)	31 Jan 2024	Validity from 17 Jan 2022 to 31 Jan 2024

Notes:

(1) The location/premises where the industrial trade effluent is discharged into marine water (i.e. Jetty Platform (MD1) of offshore LNG Terminal located at about 936m distance from South-West Hong Kong Water Boundary) as per the license.

TABLE D.4 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS FOR FEP-03/558/2018/B

Item	Description	Ref. No.	Date of Expiry	Status
1	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-03/558/2018	N/A	Issued on 17 Jan 2020
2	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-03/558/2018/A	N/A	Issued on 22 Jan 2021
3	Further Environmental Permit under <i>EIA Ordinance</i>	FEP-03/558/2018/B	N/A	Issued on 25 Aug 2021
4	Registration as Chemical Waste Producer under <i>Waste Disposal (Chemical Waste) (General) Regulation</i>	WPN 5293-431-P2781-26 (Note 1)	N/A	Registration completed on 1 Dec 2020
5	Wastewater Discharge License under <i>Water Pollution Control Ordinance</i>	WT00037473-2021 (Note 2)	31 Mar 2026	Validity from 9 Mar 2021 to 31 Mar 2026
6	Wastewater Discharge License under <i>Water Pollution Control Ordinance</i>	WT00040543-2022 (Note 3)	31 May 2024	Validity from 4 May 2022 to 31 May 2024
7	Construction Noise Permit (for construction site near Eastern Road, BPPS, Yung Long Road, Tuen Mun) under <i>Noise Control Ordinance</i>	GW-RW0293-22	9 Nov 2022	Validity from 10 Jun 2022 to 9 Nov 2022
8	Construction Noise Permit (for offshore construction site near Urmston Road, Tuen Mun) under <i>Noise Control Ordinance</i>	GW-RW0543-22	31 Mar 2023	Validity until 31 Mar 2023

Notes:

(1) The location/premises where the waste is produced (i.e. Black Point Power Station) as per the registration.

(2) The location/premises where the industrial trade effluent is discharged into communal storm water drain (i.e. construction site at Black Point Power Station, Tuen Mun) as per the license.

(3) The location/premises where the industrial trade effluent is discharged into marine water (i.e. Jetty Platform (MD1) of offshore LNG Terminal located at about 936m distance from South-West Hong Kong Water Boundary) as per the license.

TABLE D.5 STATUS OF SUBMISSIONS UNDER FURTHER ENVIRONMENTAL PERMITS

EP Condition	Submission	Status
FEP-01/558/2018/A		
2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 4.6 4.8 4.10 5.3	Management Organization Updated EM&A Manual Location Plan Construction Works Schedule Piling Installation Plan Review Report on Finless Porpoise Peak Occurrence Season Baseline Study Report on Phytoplankton, Zooplankton and Benthic Organisms Waste Management Plan Design Plan of the FSRU Seawater Intake Mitigation Proposal for Emergency Gas Discharge and Accidental Spillage Environmental Enhancement Plan Baseline Monitoring Report	Accepted / approved by EPD
5.4 4.2 4.4 4.9	Monthly EM&A Reports Safety Management Plan Marine Routing Plan of the FSRU Vessel Emergency Response Plan	Submitted to EPD
4.11	Maintenance Dredging Plan	To be submitted no later than 6 months before the commencement of maintenance dredging works for the Project
FEP-02/558/2018/A		
2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 4.6 5.3	Management Organization Updated EM&A Manual Location Plan Construction Works Schedule Pipeline Construction Plan Pipeline Laying Method Plan Silt Curtain Deployment Plan Waste Management Plan Environmental Enhancement Plan Baseline Monitoring Report	Accepted / approved by EPD
4.2 4.5 5.4	Safety Management Plan Emergency Response Plan Monthly EM&A Reports	Submitted to EPD
FEP-03/558/2018/B		
2.4 2.5 2.6 2.7 2.8 2.9 2.10 2.11 4.2 4.5 4.6 5.3	Management Organization Updated EM&A Manual Location Plan Construction Works Schedule Pipeline Construction Plan Pipeline Laying Method Plan Silt Curtain Deployment Plan Waste Management Plan Safety Management Plan Emergency Response Plan Environmental Enhancement Plan Baseline Monitoring Report	Accepted / approved by EPD

HONG KONG OFFSHORE LNG TERMINAL PROJECTQuarterly Environmental Monitoring and Audit (EM&A) Summary Report
for October to December 2022

EP Condition	Submission	Status
5.4	Monthly EM&A Reports	Submitted to EPD

ANNEX E

CUMULATIVE STATISTICS ON EXCEEDANCES, ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

TABLE E.1 CUMULATIVE STATISTICS ON EXCEEDANCES FOR FEP-01/558/2018/A

Monitoring Parameter	Level of Exceedance	Total no. recorded in this reporting period ⁽¹⁾	Total no. recorded since project commencement
Marine Mammal (STG & ANI) (running quarterly)	Action	0	0
	Limit	0	0

TABLE E.2 CUMULATIVE STATISTICS ON ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS FOR FEP-01/558/2018/A

Reporting Period	Cumulative Statistics		
	Environmental Complaints	Notification of Summons	Successful Prosecutions
This Reporting Period (1 Oct to 31 Dec 2022)	0	0	0
Total no. recorded since project commencement	1	0	0

⁽¹⁾ Exceedances, which are non-project related, are not shown in this table.

TABLE E.3 CUMULATIVE STATISTICS ON EXCEEDANCES FOR FEP-02/558/2018/A

Monitoring Parameter	Level of Exceedance	Total no. recorded in this reporting period ⁽¹⁾	Total no. recorded since project commencement
Marine Water Quality (DO) (surface & middle)	Action	0	0
	Limit	0	0
Marine Water Quality (DO) (bottom)	Action	0	0
	Limit	0	0
Marine Water Quality (Turbidity) (depth-averaged)	Action	0	0
	Limit	0	0
Marine Water Quality (SS) (depth-averaged)	Action	0	0
	Limit	0	0

TABLE E.4 CUMULATIVE STATISTICS ON ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS FOR FEP-02/558/2018/A

Reporting Period	Cumulative Statistics		
	Environmental Complaints	Notification of Summons	Successful Prosecutions
This Reporting Period (1 Oct to 31 Dec 2022)	0	0	0
Total no. recorded since project commencement	3	0	0

⁽¹⁾ Exceedances, which are non-project related, are not shown in this table.

TABLE E.5 CUMULATIVE STATISTICS ON EXCEEDANCES FOR FEP-03/558/2018/B

Monitoring Parameter	Level of Exceedance	Total no. recorded in this reporting period ⁽¹⁾	Total no. recorded since project commencement
Marine Water Quality (DO) (surface & middle)	Action Limit	0 0	0 0
Marine Water Quality (DO) (bottom)	Action Limit	0 0	0 0
Marine Water Quality (Turbidity) (depth-averaged)	Action Limit	0 0	0 0
Marine Water Quality (SS) (depth-averaged)	Action Limit	0 0	0 0

TABLE E.6 CUMULATIVE STATISTICS ON ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS FOR FEP-03/558/2018/B

Reporting Period	Cumulative Statistics		
	Environmental Complaints	Notification of Summons	Successful Prosecutions
This Reporting Period (1 Oct to 31 Dec 2022)	0	0	0
Total no. recorded since project commencement	1	0	0

⁽¹⁾ Exceedances, which are non-project related, are not shown in this table.