

## Re-provision of Open Cycle Gas Turbines at Lamma Power Station

### Project Profile

8 June 2020

#### Environmental Resources Management

2507, 25/F One Harbourfront

18 Tak Fung Street

Hung Hom, Kowloon

Hong Kong

Telephone 2271 3000

Facsimile 2723 5660

[www.erm.com](http://www.erm.com)





# Re-provision of Open Cycle Gas Turbines at Lamma Power Station

## Project Profile

### Environmental Resources Management

2507, 25/F One Harbourfront  
 18 Tak Fung Street  
 Hung Hom, Kowloon  
 Hong Kong  
 Telephone: (852) 2271 3000  
 Facsimile: (852) 2723 5660  
 E-mail: post.hk@erm.com  
 http://www.erm.com

Client: HK Electric		Project No: 0516390			
Summary:  This document is the Project Profile for Application for an EIA Study Brief for the Re-provision of Open Cycle Gas Turbines at Lamma Power Station.		Date: 8 June 2020			
		Approved by:    Mr Frank Wan Project Director			
0	Project Profile	Var	CH	FW	08/06/20
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> <p>This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.</p>		<p>Distribution</p> <p><input checked="" type="checkbox"/> Government</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			



## CONTENTS

1	INTRODUCTION	1
1.1	BACKGROUND	1
1.2	PURPOSE OF THIS PROJECT PROFILE	1
2	BASIC INFORMATION	2
2.1	PROJECT TITLE	2
2.2	NAME OF PROJECT PROPONENT	2
2.3	PURPOSE & NATURE OF PROJECT	2
2.4	LOCATION OF PROJECT	2
2.5	NAME AND TELEPHONE NUMBERS OF CONTACT PERSONS	2
2.6	PROPOSED ADDITION, MODIFICATION AND ALTERATION	2
2.7	NUMBER AND TYPE OF DESIGNATED PROJECT TO BE COVERED BY THIS PROJECT PROFILE	3
3	OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME	4
3.1	PROJECT PLANNING & IMPLEMENTATION	4
3.2	INDICATIVE PROJECT PROGRAMME	4
3.3	INTERACTIONS WITH OTHER SURROUNDING PROJECTS	4
4	POTENTIAL IMPACTS ON THE ENVIRONMENT	6
4.1	MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT	6
4.2	OVERVIEW OF POTENTIAL ENVIRONMENTAL IMPACTS	6
4.3	AIR QUALITY	7
4.4	NOISE	8
4.5	NIGHT-TIME OPERATION	9
4.6	TRAFFIC GENERATION	9
4.7	WATER QUALITY	9
4.8	DISRUPTION OF WATER MOVEMENT OR BOTTOM SEDIMENT	10
4.9	TERRESTRIAL ECOLOGY	10
4.10	MARINE ECOLOGY & FISHERIES	10
4.11	WASTE MANAGEMENT	11
4.12	LAND CONTAMINATION	12
4.13	LANDSCAPE AND VISUAL	12
4.14	CULTURAL HERITAGE	12
4.15	HAZARD TO LIFE	13
5	DESCRIPTION OF ENVIRONMENTAL PROTECTION MEASURES	14
5.1	AIR QUALITY	14
5.2	NOISE	15
5.3	WATER QUALITY	15
5.4	MARINE ECOLOGY & FISHERIES	16
5.5	WASTE MANAGEMENT	16
5.6	LAND CONTAMINATION	17
5.7	HAZARD TO LIFE	17
6	USE OF PREVIOUSLY APPROVED EIA REPORTS	18

# 1 INTRODUCTION

## 1.1 BACKGROUND

The Hongkong Electric Co., Ltd (HK Electric) operates the Lamma Power Station (LPS) with a number of power generating units currently in active operation, including six coal-fired units (i.e. L2, L4 to L8), three gas-fired combined cycle gas turbine units (CCGTs) (i.e. L9, L10 and GT57) and five oil-fired open cycle gas turbine units (OCGTs) (i.e. GT1 to GT4, GT6).

At LPS, there were originally seven OCGTs, GT1 to GT7, fully commissioned in 1991 prior to the enactment of the EIAO. Two of the OCGTs, namely GT5 and GT7, were later converted into a gas-fired combined cycle gas turbine unit (GT57) in 2008 with a total power generation capacity of 345 MW. A Project Profile for the conversion and operation of GT57 was prepared for application for permission to apply directly for an environmental permit and the associated Environmental Permit (EP-083/2000) was issued by EPD in 2000. The other five OCGTs, namely GT1 of 55 MW as well as GT2, GT3, GT4 and GT6 of 125 MW each, are used for peak-logging and provide back-up power supply in case of emergencies.

GT2, GT3, GT4, GT57 and GT6 are approaching the end of their service life and are planned to be retired sequentially from 2022 onwards. As a result of the planned retirement of these OCGTs and one CCGT, HK Electric proposes to demolish these retired units and to construct and commission up to four new OCGTs with capacity each up to 130 MW (hereafter referred to as “the Project”) in order to meet the peak-logging and emergency operational requirements.

## 1.2 PURPOSE OF THIS PROJECT PROFILE

This document, the Project Profile, is produced for the Project to obtain an EIA Study Brief under the EIAO. It includes a description of the potential environmental impacts associated with the demolition, construction and operation of the Project. The description presented herein has been prepared based on best available information compiled by HK Electric, including a description of the proposed construction activities and operational details. It also describes the baseline conditions of the Project site and the surrounding environment.

## 2 **BASIC INFORMATION**

### 2.1 **PROJECT TITLE**

Re-provision of Open Cycle Gas Turbines at Lamma Power Station

### 2.2 **NAME OF PROJECT PROPONENT**

The Hongkong Electric Co., Ltd (HK Electric)

### 2.3 **PURPOSE & NATURE OF PROJECT**

The scope of the Project includes the demolition of four retiring OCGT and one CCGT units, and the construction and operation of up to four new OCGTs each with a capacity up to 130 MW in order to meet the peak-opping and emergency operational requirements.

### 2.4 **LOCATION OF PROJECT**

The Project site is located within the existing Gas Turbine (GT) compound of the LPS (see *Figure 2.1*). The existing GT2, GT3, GT4, GT57 and GT6 would be demolished in phases, while the four new OCGTs of up to 130 MW each, namely GT8, GT9, GT10 and GT11, will be installed at the GT compound subsequently.

### 2.5 **NAME AND TELEPHONE NUMBERS OF CONTACT PERSONS**

Mr. Norman L.M. Chan  
Chief Mechanical Engineer  
Tel No.: 3143 3819

### 2.6 **PROPOSED ADDITION, MODIFICATION AND ALTERATION**

The existing GT2, GT3, GT4, GT57 and GT6 will be demolished for the installation of GT8, GT9, GT10 and GT11. The existing foundation piles and concrete structure will be reused to support the new OCGT units as far as practicable to minimise piling and civil works associated with the Project. Additional steel reinforcement will be installed and new concrete plinths will be constructed to suit the new OCGT footprints as necessary. All major equipment and piping will be fully assembled off-site as far as practicable to minimise assembly work on site. Similar to the existing OCGTs, each new OCGT will comprise a number of major components including a gas turbine, a generator and a generator transformer. Electrical works and Control & Instrumentation as well as building services works may be required at the existing GT compound including the Gas Turbine Equipment Building, Interbus Transformers and Gas Turbine 132 kV Switching Station. The existing GT57 Auxiliary Building will be converted to a new 132kV switching



station with new 132 kV cables and associated cable trenches for the new OCGT units when it is available for modification after retirement of GT57.

The existing stacks (80 m tall) serving the existing OCGTs will be retained for the new units. Minor repair and refurbishment works of the existing stacks will be carried out. The exhaust gas generated from the new GT8, GT9, GT10 and GT11 during their operation will be discharged to the atmosphere via the existing stacks.

## 2.7 *NUMBER AND TYPE OF DESIGNATED PROJECT TO BE COVERED BY THIS PROJECT PROFILE*

The following elements of the Project addressed in this Project Profile are classified as Designated Projects under the EIAO (*Cap. 499*):

- Demolition of four existing OCGTs and one existing CCGT at LPS (Schedule 2, Part II, Item 4 A public utility --- electricity power plant); and
- Installation of up to four new OCGTs at LPS (Schedule 2, Part I, Item D.1 Public utility electricity power plant).

### 3 *OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME*

#### 3.1 *PROJECT PLANNING & IMPLEMENTATION*

The Project Proponent (HK Electric) will have the overall responsibility for the planning, design, demolition, construction and operation of the Project. The Project Proponent will engage an Environmental Consultant to carry out an EIA Study and, if necessary, an Engineering Consultant to undertake preliminary engineering design works. It is envisaged that the Project will be constructed by Contractor(s) to be appointed at a subsequent stage. HK Electric will continue to operate the LPS, including the proposed new OCGTs.

#### 3.2 *INDICATIVE PROJECT PROGRAMME*

The planning stage of the Project, including the EIA, preliminary engineering design and statutory permitting, is anticipated to be completed by end of 2021. The targeted key dates for the demolition of OCGTs and CCGT, as well as the re-provision of new OCGTs are shown in *Table 3.1* and *Table 3.2* respectively.

*Table 3.1 Targeted Key Dates for Demolition of the OCGTs and CCGT*

Activities	Key Dates				
	GT2	GT3	GT4	GT6	GT57
Commencement of demolition works	January 2022	October 2023	January 2024	May 2025	January 2022

*Table 3.2 Targeted Key Dates for Re-provision of new OCGTs*

Activities	Key Dates			
	GT8	GT9	GT10	GT11
Commercial operation	January 2024	March 2025	March 2026	November 2027

It should be noted that the above demolition and re-provision programmes are indicative in nature. The actual work programme will be subject to further engineering review.

#### 3.3 *INTERACTIONS WITH OTHER SURROUNDING PROJECTS*

The following existing, committed or planned projects in the vicinity of the Project site may potentially interface with the construction and operation of this Project:

- *Lamma Power Station Units L4 & L5 Flue Gas Desulphurization Plant Retrofit Project (AEIAR-098/2006)*: This project involves retrofit the two existing 350MW coal-fired generating Units L4 and L5 of Lamma Power Station with Flue Gas Desulphurisation (FGD) plant for reducing sulphur dioxide emissions. The L5 FGD plant commenced operation in July 2009 followed by L4 FGD plant in April 2010.

- *1,800MW Gas-fired Power Station at Lamma Extension (AEIAR-010/1999):* This project includes the construction and operation of six new gas-fired CCGT units at the Lamma Extension. L9 and L10 have been constructed and are currently under operation. L11 and L12 are currently under construction and are scheduled for commercial operation in 2022 and 2023 respectively;
- *Hong Kong Offshore LNG Terminal (AEIAR-218/2018):* This project involves the construction and operation of an offshore liquefied natural gas (LNG) terminal that is to be located in the southern waters of Hong Kong, to the east of the Soko Islands. The offshore LNG terminal will supply natural gas to the gas receiving stations at the Black Point Power Station (BPPS) and the LPS via two subsea pipelines. The construction of the project will tentatively commence in the third quarter of 2020 and lasts for about 2 years.

## 4 POTENTIAL IMPACTS ON THE ENVIRONMENT

### 4.1 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

The Project site is located within the LPS at the western edge of Lamma Island. Major elements of the surrounding environment include the existing LPS, Hung Shing Ye to the east, Ko Long to the north, and country side conservation area, agricultural land and open space areas in various directions.

Existing, committed and planned developments (e.g. industrial, commercial and residential buildings, educational institutions, health care facilities) are regarded as potential environmental sensitive receivers (SRs). A number of representative SRs in the vicinity of the Project site have been identified as presented in *Table 4.1* and their locations are shown in *Figure 4.1*. Additional SRs may be identified for assessment as necessary during the EIA study.

**Table 4.1** Existing, Committed and Planned Environmental Sensitive Receivers in the Vicinity of the Project Site

SR ID	SR Description	Nature of SR	Type of Use	Approximate Separation Distance from the Project Site Boundary (m)
SR1	Ko Long Village	Air, noise	Residential	810
SR2	Hung Shing Ye Village	Air, noise	Residential	1,420
SR3	Hung Shing Ye Beach	Water	Recreational	1,435
SR4	Po Wah Yuen	Air, noise	Residential	1,320
SR5	Pak Kok San Tsuen	Air, noise	Residential	2,320
SR6	South Lamma Public Library	Air, noise	GIC	2,935
SR7	Lo So Shing Beach	Water	Recreational	2,230
SR8	LPS Seawater Intake	Water	Industrial	400
SR9	North Lamma Public Library	Air, noise	GIC	1,160

**Note:**  
(a) GIC = Government, Institution or Community

### 4.2 OVERVIEW OF POTENTIAL ENVIRONMENTAL IMPACTS

The potential environmental impacts arising from the demolition, construction and operation of the Project have been investigated and discussed in this *Section*. An overview of the potential environmental impacts associated with the Project have been identified and summarised in *Table 4.2*.

### Legend 圖例

- Project Site Location  
項目位置
- Air Sensitive Receivers  
空氣敏感受體
- ▲ Noise Sensitive Receivers  
噪音敏感受體
- Gazetted Beach  
已刊憲的泳灘
- ✕ Seawater Intake  
海水進水口

SRID	SR Description
SR1	Ko Long Village
SR2	Hung Shing Yeh Village
SR3	Hung Shing Yeh Beach
SR4	Po Wah Yuen
SR5	Pak Kok San Tsuen
SR6	South Lamma Public Library
SR7	Lo So Shing Beach
SR8	LPS Seawater Intake
SR9	North Lamma Public Library

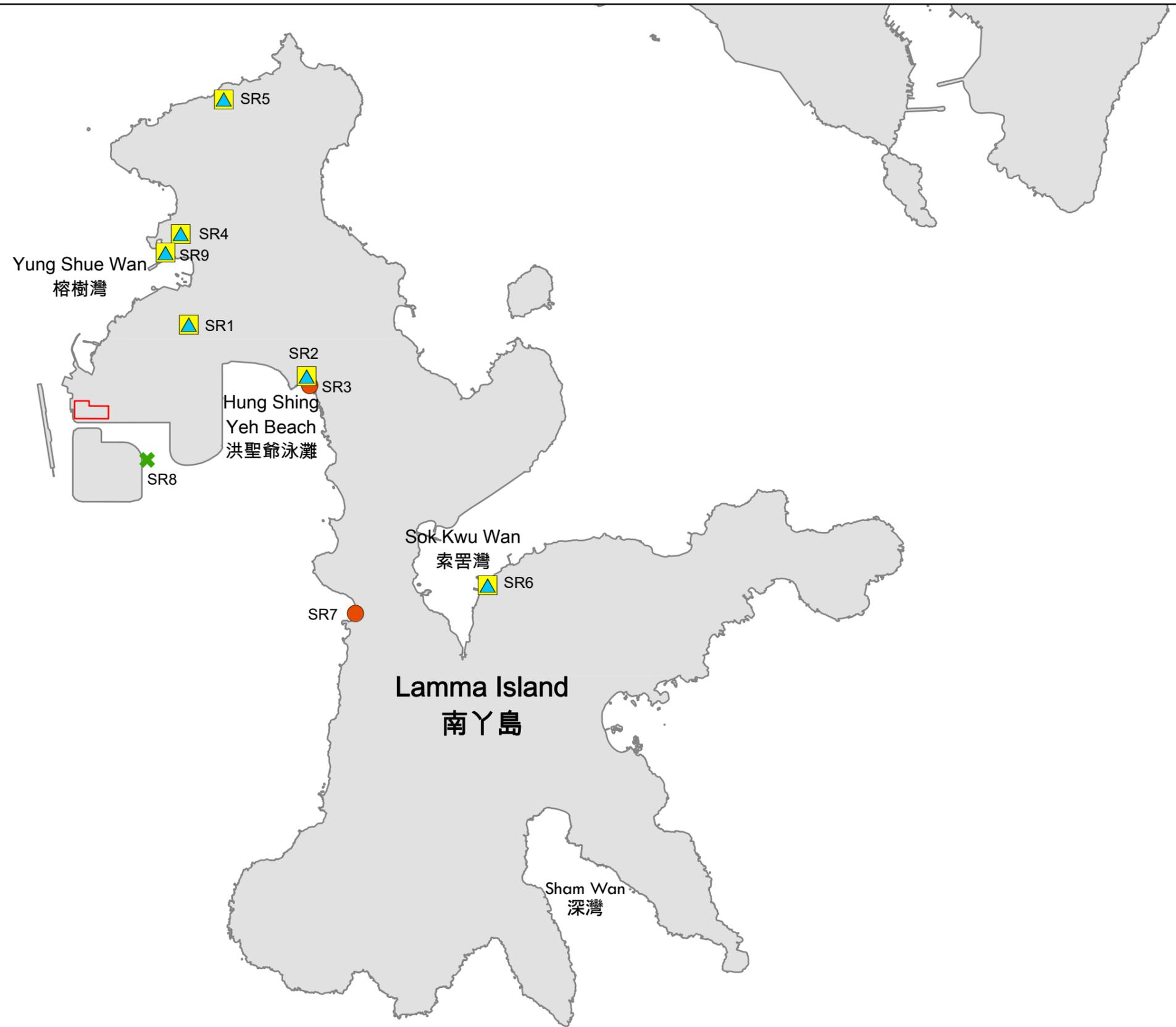


Figure 4.1  
圖 4.1

Locations of Environmentally Sensitive Receivers in the Vicinity of the Project  
項目附近的環境敏感受體位置

**Table 4.2** *Potential Environmental Impacts Arising from the Project during Demolition, Construction and Operation Phases*

Potential Impact	Demolition/ Construction Phase <sup>(a)</sup>	Operation Phase <sup>(a)</sup>
• Air Quality		
- Construction dust	✓	—
- Gaseous emissions	✓	✓
- Odour	—	—
• Noise	✓	✓
• Night-time Operations	—	✓
• Traffic Generation	—	—
• Liquid Effluents & Discharges	✓	—
• Generation of Waste or By-products	✓	✓
• Manufacturing, Storage, Use, Handling, Transport, or Disposal of Dangerous Goods	✓	✓
• Hazard to Life	✓	✓
• Disposal of Spoil Material, including Potentially Contaminated Materials	✓	✓
• Disruption of Water Movement or Bottom Sediment	—	—
• Change in Visual Appearance	—	—
• Cultural & Heritage	—	—
• Terrestrial Ecology	—	—
• Marine Ecology & Fisheries	—	—
<b>Notes:</b>		
(a) ✓ = Possible      '—' = Not Expected		

### 4.3 AIR QUALITY

#### 4.3.1 Demolition and Construction Phase

Site clearance, demolition of the existing OCGTs, CCGT and subsequent installation of the new OCGTs will all be carried out within the existing LPS site. The existing foundation piles and concrete structure will be reused to support the new OCGT equipment as far as practicable to minimise piling and civil works. Therefore, no major site formation or excavation works will be required. All major equipment and piping will be fully assembled off-site as far as practicable to minimise assembly works to be carried out on-site. Given the nature of the demolition and construction works, fugitive dust emissions are expected to be minimal. As the Project site is relatively small and the number of construction equipment to be used concurrently will be limited, gaseous emissions arising from the on-site construction equipment are expected to be minimal.

Provided that good construction site practices in accordance with the *Air Pollution Control (Construction Dust) Regulation* will be implemented and the requirements stipulated in the *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation* will be followed, no unacceptable air quality

impact arising from dust and gaseous emissions during the demolition and construction of the Project is anticipated.

#### 4.3.2 *Operation Phase*

The new OCGTs, using ultra-low sulphur diesel (ULSD) as fuel, will be used during peak-logging and emergency operation only (i.e. will be operated intermittently). The use of ULSD for the new OCGTs follows the existing practice at LPS. From 2020 onwards, natural gas will generate about half of electricity for Hong Kong. The LPS has maintained strategic storage of ULSD to warrant reliable supply of electricity in case of emergency situation such as gas interruption. Using ULSD for the new OCGTs can ensure the unfailing and swift electricity supply during peak-logging and emergency operation. As the new OCGTs would only be put in operation during peak-logging and emergency situation, the operation of the new OCGTs and the associated use of ULSD is expected to be infrequent.

Key air pollutants of concern during the operation of the new OCGTs will include NO<sub>x</sub>, SO<sub>2</sub> and particular matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Air emissions from the new OCGTs will be lower than those from the existing OCGTs which will be retired, and will comply with the emission limits as recommended in the latest *Guidance Note on the Best Practicable Means (BPM) for Electricity Works (BPM7/1(2018))*. The overall air emissions due to the operation of the new OCGTs are expected to be low. Therefore, no unacceptable air quality impact associated with the operation of the new OCGTs is anticipated.

#### 4.4 *NOISE*

##### 4.4.1 *Demolition and Construction Phase*

The demolition and construction works for the Project will involve the use of Powered Mechanical Equipment (PME), which have the potential to cause elevated noise levels. The works carried out on-site are expected to be relatively small-scale and do not require extensive concrete breaking and foundation works which are the noisier activities. Major components of the Project will be fully assembled off-site as far as practicable to minimise assembly works to be carried on-site. The closest Noise Sensitive Receivers (NSRs) are the Ko Long Village and Hung Shing Ye Village, which are about 810m to the north and 1,420m to east of the Project site, respectively.

It is not anticipated that construction works will be carried out during restricted hours (i.e. 1900 – 0700 hrs of the next day on any day, and anytime on Sundays or general holidays). If required, the contractor will obtain the necessary Construction Noise Permits in accordance with the requirements of the *Noise Control Ordinance (NCO)*.

Due to the large separation distance and barrier screening effect between the Project site and the identified NSRs, and the nature of the works, no unacceptable noise impact from the demolition and construction of the Project is expected.

#### 4.4.2 *Operation Phase*

Fixed plants with excessive noise will be enclosed in building structures as far as practicable such that noise emissions would be minimised. The operation of the new OCGTs will only be operated during peak-opping or emergency operation. It should also be noted that as the new OCGTs are installed to replace the existing OCGTs, the potential operation noise impacts will be similar to that of the existing operation. The closest NSRs are Ko Long and Hung Shing Ye villages, which are located more than 810m away from the Project site. With large separation distances and barrier screening effects between the Project site and the nearby NSRs, no unacceptable noise impact from fixed plant noise sources due to the operation of the Project is expected.

#### 4.5 *NIGHT-TIME OPERATION*

Night-time operation is not expected during the demolition and construction phases of the Project.

There may be night-time operation of the new OCGTs during the operation phase. The potential environmental impacts associated with the night-time operation of the new OCGTs include air quality and noise impacts which have been discussed in *Sections 4.3 and 4.4*.

#### 4.6 *TRAFFIC GENERATION*

Construction equipment and major components of the new OCGTs will be delivered via marine route to the LPS jetty, and then by construction vehicles to the Project site via existing roads within LPS. Waste generated during the demolition and construction phase will be transported off-site via marine route to the landfills for disposal. As the demolition and construction works associated with the Project are small scale, additional marine traffic and land-based traffic (outside of Lamma Island) for equipment transport and waste disposal during the demolition and construction phases of the Project are expected to be limited. No additional traffic is expected to be generated during the operation of the Project. Unacceptable impact with respect to traffic generation from the Project is not anticipated.

#### 4.7 *WATER QUALITY*

##### 4.7.1 *Demolition and Construction Phase*

No marine works and no major site formation works will be required during the demolition and construction phases of the Project. As the construction works essentially involve aboveground replacement of existing OCGTs with new OCGTs, with potentially very minor civil works, wastewater generated from the construction site is expected to be minimal. Should there be any wastewater discharge arising from the construction of the Project, a discharge licence under the Water Pollution Control Ordinance (WPCO) will be obtained. Construction site discharge, if any, will be collected and treated on

site before discharge. In addition, sewage will be generated from the construction workforce during the construction phase. Temporary toilets will be provided to collect sewage from the construction workers for off-site disposal on a regular basis. With implementation of good construction site practice, including the *Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN1/94)* and other relevant guidelines and statutory requirements, no unacceptable water quality impacts from the demolition and construction works are anticipated.

#### **4.7.2**      *Operation Phase*

The new OCGTs will only be operated during peak-logging or emergency operation. Similar to existing OCGTs, the new OCGTs will be air-cooled with no cooling water discharge during operation.

#### **4.8**              *DISRUPTION OF WATER MOVEMENT OR BOTTOM SEDIMENT*

As no marine works or operational discharge will be required for the Project, potential impacts to hydrodynamics or disruption of bottom sediment are not expected.

#### **4.9**              *TERRESTRIAL ECOLOGY*

As the Project site will be located within the existing boundaries of the LPS site, there will be no disturbance to terrestrial ecological resources (e.g. recognised sites of conservation importance, habitats, vegetation and wildlife).

No impacts to terrestrial ecology are thus expected during the demolition, construction and operation of the Project.

#### **4.10**            *MARINE ECOLOGY & FISHERIES*

##### **4.10.1**        *Demolition and Construction Phase*

No marine works (including dredging works) will be required during the demolition and construction phases of the Project. Potential direct impacts or indirect impacts to marine ecological and fisheries resources due to perturbations to water quality are not expected.

##### **4.10.2**        *Operation Phase*

Similar to existing OCGTs, no cooling water will be discharged from the new OCGT units. There would be no indirect impacts on marine ecological resources and fisheries during the operation phase.

## 4.11 WASTE MANAGEMENT

### 4.11.1 Demolition and Construction Phase

The site clearance, demolition and construction activities during the demolition and construction phases of the Project will result in the following broad categories of waste:

- Inert Construction and demolition (C&D) materials and excavated material, comprising concrete, steel and soil. These inert C&D materials (or public fill) are mainly generated from the clearance of existing facilities, minor excavation works as well as demolition and construction works;
- Non-inert construction waste including packaging waste and timber;
- Chemical waste, such as batteries and lubricating oils from the maintenance of construction vehicles and equipment; and
- General refuse, including food waste from the on-site work force and the packaging materials from the construction materials.

Public fill generated from the construction of the Project will be properly segregated and reuse on site as far as practicable. Surplus public fill will be disposed of at public fill reception facilities by barge. Recyclables such as scrap metals will also be recovered for recycling as far as practicable. Construction waste will be properly disposed of at landfills. With respect to the small-scale demolition and excavation works, the anticipated quantities of public fill and construction waste to be generated will be small. Also, the construction activities of the Project are not expected to generate significant quantities of chemical waste. With proper housekeeping measures in place and collection and disposal of the public fill and construction waste to appropriate waste disposal facilities, no unacceptable waste management impact is expected due to the construction of the Project.

### 4.11.2 Operation Phase

The operation of the new OCGTs will only be operated during peak-logging or emergency operation. It should also be noted that as the new OCGTs are installed to replace the existing OCGTs, the wastes to be generated from operation of the new OCGTs will be similar to that of the existing operation. With reference to the operation of the existing OCGTs, the waste generated during operation will be minimal and will be handled following the existing well proven environmental acceptable arrangements. No new waste stream will be generated. Chemical waste will be stored, handled, collected and disposed of according to the *Waste Disposal (Chemical Waste) (General) Regulation* and the conditions and requirements of Chemical Waste Producer Registration of the LPS.

All fuel oils for the new OCGTs will be handled in accordance with the current practices at LPS. The storage and handling of any dangerous goods will follow the standard operating procedures currently adopted in LPS and

comply with the requirements of the *Dangerous Goods Ordinance (DGO)* and its subsidiary legislation.

#### **4.12**            **LAND CONTAMINATION**

The Project site is located within the existing GT Compound at the LPS as shown in *Figure 2.1*. With the proper implementation of the land contamination prevention measures established for the existing operation of the LPS, and no oil or chemical spillage during the operation of the existing OCGTs, the Project site appears to have a low potential for land contamination.

The current practices at LPS will continue to be followed during the operation of the Project. With the implementation of proper site management practices and precautionary measures, potential land contamination due to operation of the new OCGTs is expected to be low.

#### **4.13**            **LANDSCAPE AND VISUAL**

Existing roads connecting the LPS jetty to the Project site will be used for transport of construction materials during the construction phase. No new haul road is required during the construction of the Project.

The proposed new OCGTs will replace the existing OCGTs within the existing GT Compound at the LPS. With the existing stacks serving the existing OCGTs being retained for the new units, the visual context of the proposed new OCGTs is considered fully compatible with the existing OCGTs to be replaced and is consistent with the existing industrial setting at the LPS site. No change to the overall visual quality is envisaged with the implementation of the Project.

Some trees in movable planters are located along the boundary of the existing GT Compound. It is expected that these movable planters will not be affected by the Project and relocation of these movable planters is thus not required. Impact to landscape resources is not anticipated.

It is anticipated that the Project will not cause unacceptable visual and landscape impacts during the demolition, construction and operation of the Project.

#### **4.14**            **CULTURAL HERITAGE**

As the Project site will be located within the existing GT Compound, there will be no impact to cultural heritage/ archaeological resources. No cultural heritage impacts are thus expected due to the demolition, construction and operation of the Project.

The construction site is limited to the existing GT Compound. Also, the construction of the project only involves replacement of OCGT units with potentially minor civil works and will not involve transport or handling of hazardous materials. Construction works within the existing GT Compound would unlikely cause significant hazards to existing LPS facilities or construction workers during the construction phase.

During the operation of the new OCGTs, existing facilities at LPS will be used for storing hazardous materials. No additional hazardous materials will be required for the operation of the Project. ULSD will be used for the operation of the new OCGTs following the existing practice at LPS. The new components of the proposed new OCGTs to be installed will be carefully designed taking into account potential hazard to life considerations during operation. The existing well proven safety management measures of the LPS will continue to be implemented during the operation of the Project. Similar to the current operation at LPS, proper inspection and maintenance of these components of the proposed new OCGTs by qualified personnel will be conducted on a regular basis. With proper plant design, maintenance and operation management, unacceptable risk is not expected due to the Project.

## 5.1 AIR QUALITY

### 5.1.1 Demolition and Construction Phase

The following mitigation measures stipulated in the *Air Pollution Control (Construction Dust) Regulation* are recommended to be implemented to minimise dust nuisance:

#### *Measures for Demolition Activities*

- The area at which demolition of concrete structures takes place, if any, will be sprayed with water immediately prior to, during and immediately after the demolition activities so as to keep the entire surface wet;
- Any dusty materials remaining after a stockpile is removed will be wetted with water and cleared from the surface of roads; and
- All demolished items that may dislodge dust particles will be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition.

#### *Measures for General Construction Activities*

- Every main haul road will be sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet;
- All areas involving site clearance and excavations works will be sprayed with water before, during and after the operations to maintain the entire surface wet;
- The portion of any road leading only to works site that is within 30m of a discernible or designated vehicle entrance or exit shall be kept clear of dusty materials;
- Any stockpile of dusty materials on-site will be covered entirely by impervious sheeting; and/or placed in an area sheltered on the top and 3-sides. They should also be sprayed with water immediately prior to any loading, unloading or transfer operation to dampen the dusty materials; and
- Where a vehicle leaving the works site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.

### 5.1.2 Operation Phase

Maintenance of the proposed new OCGTs will be carried out on a regular basis to ensure compliance with emissions requirements.

## 5.2 NOISE

### 5.2.1 *Demolition and Construction Phase*

The following construction noise management measures are proposed for the demolition and construction works:

- Only well-maintained equipment will be operated on-site and equipment will be serviced regularly during the works;
- Machines and equipment that are in intermittent use will be shut down between work periods or will be throttled down to a minimum;
- Silencers or mufflers on demolition equipment will be utilised as far as practicable and should be properly maintained during the demolition works; and
- Where necessary, mobile noise barriers will be positioned within a few metres of noisy plant items.

### 5.2.2 *Operation Phase*

Adequate noise mitigating measures will be adopted to ensure that the noise level both during day and night time will comply with requirements in the NCO. Noise mitigation measures will be addressed during design stage to meet the relevant NCO requirements.

## 5.3 WATER QUALITY

### 5.3.1 *Demolition and Construction Phase*

Appropriate measures will be implemented during the demolition and construction of the Project to control potential contaminated run-off, thereby minimising suspended solids (SS) and potential impacts on water quality. Proper site management measures will be implemented to minimise surface water run-off, soil erosion and the impacts of sewage effluents.

Site run-off and drainage impacts will be controlled in accordance with the guidelines stipulated in the EPD's *Professional Persons Environmental Consultative Committee Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94)*. The implementation of good housekeeping and best management practices will ensure that WPCO standards are met and that no unacceptable impacts on the WSRs arise during the demolition and construction of the Project.

### 5.3.2 *Operation Phase*

There is no operational discharge (cooling water discharge) during the operation phase of the project.

## 5.4 *MARINE ECOLOGY & FISHERIES*

As there will be no marine works associated with the demolition and construction of the Project, mitigation measures related to marine ecology and fisheries are not required during the demolition and construction phases of the Project.

## 5.5 *WASTE MANAGEMENT*

### 5.5.1 *Demolition and Construction Phase*

The contractors employed for the demolition and construction of the Project will be required to incorporate recommendations on waste recycling, storage, transportation and disposal measures into a comprehensive on-site waste management plan. Such a waste management plan should incorporate site-specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials.

In the waste management plan to be prepared, the hierarchy presented below will be used to evaluate waste management options, thus allowing maximum waste reduction and often reducing costs:

- Avoidance and minimisation, i.e. not generating waste through changing practices;
- Reuse of materials, thus avoiding disposal (generally with only limited reprocessing);
- Recovery and recycling, thus avoiding disposal (although reprocessing may be required); and
- Treatment and disposal, according to relevant laws, guidelines and good practice.

To further minimise waste arising and keep environmental impacts within acceptable levels, careful design, planning and good site management practice will be adopted to minimise waste generated and wastes will be properly segregated on-site to increase the feasibility of recycling certain components of the waste streams, such as steel.

Chemical waste generated during the demolition and construction of the Project will be properly stored in accordance with EPD's *Code of Practice on the Packaging, Labelling and Storage of Chemical Waste* for subsequent collection and disposal by a licensed Chemical Waste Collector. General refuse generated on-site will be stored in enclosed bins and collected by waste collector on regular basis.

### 5.5.2 *Operation Phase*

Chemical waste will be stored, handled, collected and disposed of according to the *Waste Disposal (Chemical Waste) (General) Regulation* and the conditions and requirements of Chemical Waste Producer Registration in LPS.

The storage and handling of dangerous goods for the Project will comply with the requirements of the *DGO* and its subsidiary legislation.

#### 5.6 *LAND CONTAMINATION*

Precautionary measures will be implemented to prevent potential oil leak/spill and improper handling/use of chemicals and chemical wastes. The existing spill response plan established for the LPS will be implemented in the event of oil or chemical spillage.

#### 5.7 *HAZARD TO LIFE*

Before the commencement of construction, construction safety plan will be developed and a number of key safety management measures will be implemented. During construction, all construction workers must comply with HK Electric's safety policy and requirements and equip with appropriate personal protective equipment (PPE) when working at the Project site. All work procedures shall comply with the operating plant procedures or guidelines at LPS.

Process design for the operation of the OCGTs will take account of the potential risk associated with the operation of the new OCGTs and the lessons learnt during the operation of the existing OCGTs. Proper inspection and maintenance of the components of the OCGTs by qualified personnel will be undertaken on a regular basis during operation.

The approved EIA reports of projects that are of relevance to the Project are listed in *Table 6.1*.

**Table 6.1** *Previously Approved EIA Reports Relevant to the Project*

Register No.	Project Title	Aspect of Relevance
AEIAR-218/2018	Hong Kong Offshore LNG Terminal	<ul style="list-style-type: none"> <li>• Surrounding environment and sensitive receivers</li> <li>• Air emissions from OCGTs</li> </ul>
AEIAR-212/2017	Improvement Dredging for Lamma Power Station Navigation Channel	<ul style="list-style-type: none"> <li>• Surrounding environment and sensitive receivers</li> </ul>
AEIAR-197/2016	Additional Gas-fired Generation Units	<ul style="list-style-type: none"> <li>• Nature of the Project</li> <li>• Potential environmental impacts of the Project, and the appropriate mitigation measures</li> </ul>
AEIAR-098/2006	Lamma Power Station Units L4 & L5 Flue Gas Desulphurisation Plant Retrofit Project	<ul style="list-style-type: none"> <li>• Surrounding environment and sensitive receivers</li> <li>• Potential environmental impacts of the Project, and the appropriate mitigation measures</li> </ul>
AEIAR-010/1999	1,800MW Gas-fired Power Station at Lamma Extension	<ul style="list-style-type: none"> <li>• Surrounding environment and sensitive receivers</li> <li>• Nature of the Project</li> <li>• Potential environmental impacts of the Project, and the appropriate mitigation measures</li> </ul>

*The English version of this Project Profile shall prevail wherever there is a discrepancy between the English version and the Chinese version.*

**ERM has over 160 offices across the following countries and territories worldwide**

Argentina	New Zealand
Australia	Norway
Belgium	Panama
Brazil	Peru
Canada	Poland
China	Portugal
Colombia	Puerto Rico
France	Romania
Germany	Russia
Hong Kong	Singapore
Hungary	South Africa
India	South Korea
Indonesia	Spain
Ireland	Sweden
Italy	Switzerland
Japan	Taiwan
Kazakhstan	Thailand
Kenya	UAE
Malaysia	UK
Mexico	US
Myanmar	Vietnam
The Netherlands	

**ERM's Hong Kong Office**

**2507, 25/F One Harbourfront  
18 Tak Fung Street  
Hung Hom, Kowloon  
Hong Kong  
T: 2271 3000  
F: 2723 5660**

[www.erm.com](http://www.erm.com)

