ANNEX A2

ENVIRONMENTAL REVIEW REPORT FOR THE PROPOSED MARINE ROUTING OF FSRU VESSEL (NOVEMBER 2024)

Hong Kong Offshore LNG Terminal Project

Environmental Review Report for the Proposed Marine Routing of FSRU Vessel

PREPARED FOR

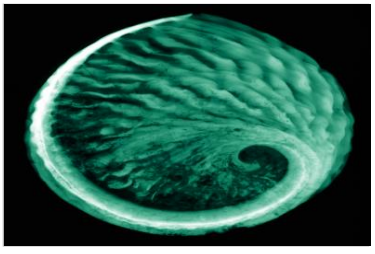
HKLTL

DATE
16 July 2025

REFERENCE
0505354







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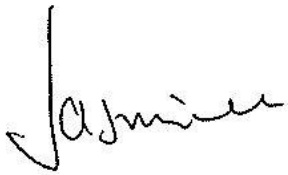
Hong Kong Offshore LNG Terminal Project

Environmental Review Report for the Proposed Marine Routing of FSRU Vessel

0505354



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1. INTRODUCTION

1.1 BACKGROUND

To support the increased use of natural gas in Hong Kong from 2020 onwards, CLP Power Hong Kong Limited (CLP) and The Hongkong Electric Company, Limited (HK Electric) have identified that the development of the Hong Kong Offshore LNG Terminal Project ("Project") would provide a viable additional gas supply option that can access competitive gas supplies from world markets to ensure improved diversity and security of future gas supplies, which shall become an important investment towards meeting the Hong Kong Government's low carbon policy objectives. The offshore LNG Terminal is located in the southern waters of Hong Kong, south of Lantau Island and 4km east of Tau Lo Chau near the Soko Islands as indicated in **Figure 1.1**. The construction of the Project was completed and commenced operation in July 2023.

There are principal arrival and departure routes determined for the FSRU Vessel, which are implemented to support the operation of LNG Terminal. Similar to the LNG industry, the LNG Terminal comprises of both a Safety Zone and a Marine Control Zone to limit unauthorised marine activities. Furthermore, during adverse weather and met-ocean conditions, it is necessary for the FSRU Vessel to depart from the LNG Terminal. Standby vessels, tugs and other supporting vessels are used for safe departure of the FSRU Vessel. To ensure safe operation of the LNG terminal, Marine Routing Plan of the FSRU Vessel and Safety Management Plan have been prepared in accordance with the Further Environmental Permit (EP) FEP No. FEP-01/558/2018/A to outline the marine routing of the FSRU Vessel and principles of the departure plan for the FSRU Vessel in response to adverse weather and met-ocean conditions.

After reviewing the operation of the LNG Terminal, it is identified that there could be optimization of the FSRU Vessel's departure route ("North Departure Route") such that the FSRU Vessel could make use of the new multipurpose anchorage in the southwest of Lamma Island (i.e. the South Cheung Chau Anchorage)(1) for temporary stay during certain events (e.g. maintenance work at the Jetty (2), monsoon, etc.) without crossing Hong Kong water boundary. With the optimization of the FSRU Vessel's departure route, the alternative departure route would allow shorter time for the LNG Terminal to resume normal operation and services to gas supply to power stations. Such alternative departure route was not discussed in the approved EIA Report of the Project and the relevant EP submissions (i.e. Marine Routing Plan of the FSRU Vessel and Safety Management Plan). An environmental review is thus undertaken to assess the potential environmental impact as a result of the adoption of the alternative departure route for the FSRU Vessel under certain events (e.g. maintenance work at the Jetty, monsoon, etc.).

(1) The South Cheung Chau Anchorage is established to facilitate the berthing of vessels for efficient port operation. This new anchorage can also be used by other vessels for contingency berthing when it is not used by LNG carriers.
(2) For safety consideration, the FSRU Vessel needs to depart from the Jetty to facilitate the maintenance work at the Jetty.

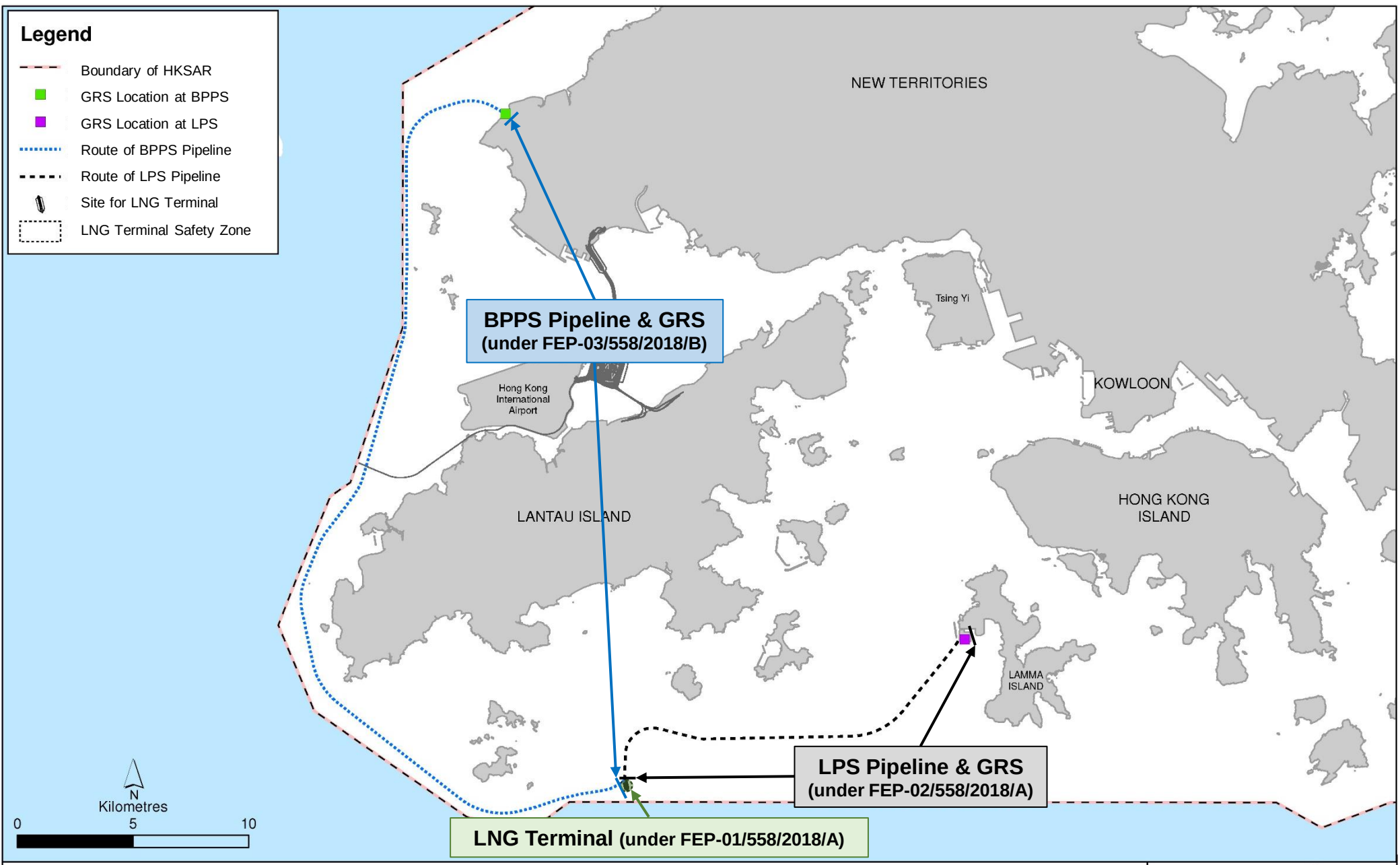

Figure 1.1

Indicative Location of Key Project Components

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1.2 PURPOSE OF THIS REPORT

This Environmental Review Report (ERR) is prepared to provide the information of the proposed alternative departure route of the FSRU Vessel, and review the likely environmental impacts. This ERR also provides recommendations as to whether any modification and/or refinement of proposed mitigation measures and monitoring and audit requirements is needed.

1.3 STRUCTURE OF THIS REPORT

Following this introductory section, the remainder of this ERR is organised as follows:

- Section 2 describes the relevant information on the marine routing of the FSRU Vessel presented in the approved EIA Report and the marine routing plan of the FSRU Vessel;
- Section 3 presents the proposed alternative departure route of the FSRU Vessel;
- Section 4 describes the potential impacts associated with the proposed alternative departure route of the FSRU Vessel;
- Section 5 includes a review of the environmental monitoring and audit requirements; and
- Section 6 provides the conclusion of this environmental review.

2. RELEVANT INFORMATION FROM APPROVED EIA AND MARINE ROUTING PLAN OF THE FSRU VESSEL

2.1 RELEVANT INFORMATION FROM THE APPROVED EIA REPORT

With reference to Sections 3.3.1, 3.5.1 and 5.4.1 of the approved EIA Report, the FSRU Vessel will be permanently moored at the Jetty during normal operations. For the initial transit to the LNG Terminal, the FSRU Vessel will transit and approach the LNG Terminal on the same route as the LNG Carrier (LNGC) normal transit route shown in **Figure 2.1**. Due to its safe operational requirement, the FSRU Vessel will need depart its berth at the LNG Terminal and transit through the South Lantau Marine Park (SLMP) during manoeuvring to the Jetty and under adverse weather conditions, which is anticipated to be about 3-4 times a year, under pilotage, with the stand-by vessel in attendance and under tug control at a low manoeuvring speed. Once the weather conditions have returned to acceptable operating limits for berthing, the FSRU Vessel will return to the LNG Terminal using the same LNGC normal transit route as presented in **Figure 2.1**.

2.1.1 AIR QUALITY

With reference to Section 4.9.1 of the approved EIA Report, the air quality impact due to the emissions from the FSRU Vessel was assessed. During normal operation, FSRU Vessel is permanently moored at the Jetty and is fueled by natural gas to minimise the associated emissions. No air sensitive receiver (ASR) has been identified within approximately 4km from the LNG Terminal. Due to the large separation distance between the LNG Terminal and the nearest ASR, adverse air quality impact associated with the operation of the LNG terminal is not anticipated.

2.1.2 HAZARD TO LIFE

As presented in Section 5.4 of the approved EIA Report, the support of tug fleet for access to/from the LNG Terminal can enable adequate control capability to mitigate events when FSRU Vessel encounter engine or control system failure during the approaching to the LNG Terminal. The individual risk and societal risk associated with the transits of the FSRU Vessel are in compliance with the risk criteria stipulated in Section 2 of Annex 4 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM).

2.1.3 ECOLOGY

With reference to Sections 9.5.2, 9.6.2 and 9.7.2 of the approved EIA Report, the key impacts on marine ecological resources, marine mammals and marine parks relevant to FSRU Vessel are underwater sound from FSRU Vessel transits and increased marine traffic, each is summarised below.

2.1.3.1 UNDERWATER SOUND FROM FSRU VESSEL TRANSITS

The FSRU Vessel is anticipated to be permanently moored (except under adverse weather conditions) and so transit would be minimal. The underwater sound characteristics of the FSRU vessel are expected to be of low energy and in lower

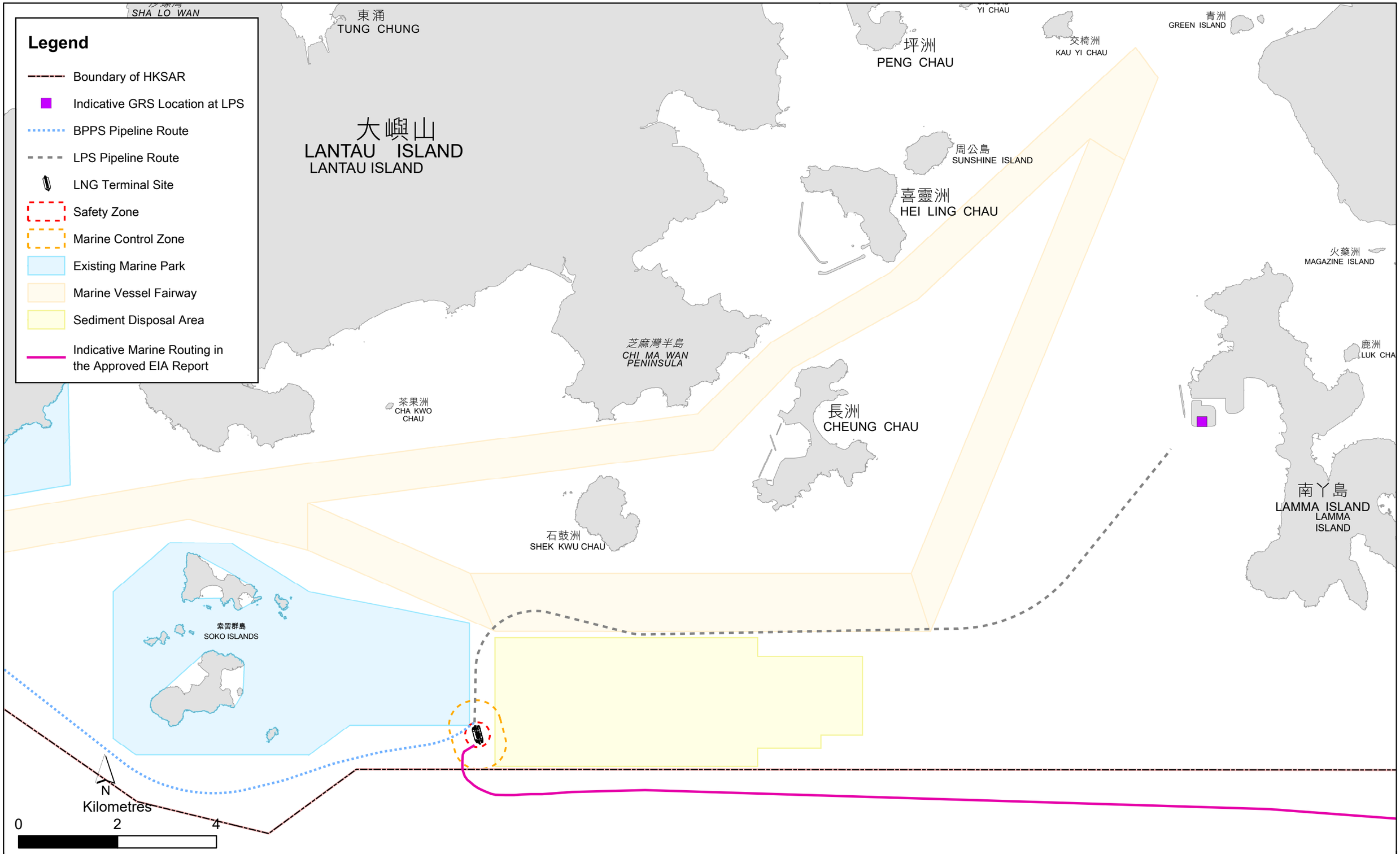

Figure 2.1

Indicative Marine Routing in the Approved EIA Report

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frequencies (i.e. 20Hz to 2.5kHz between 155 and 185 dB re 1 μPa at 1m). These sounds are below the peak range of 8 - 90 kHz and 142 kHz reported for dolphins and porpoises respectively and thus Chinese White Dolphins (CWD) and Finless Porpoises (FP) are not expected to be acoustically disturbed. It is noted that CWD are rarely sighted near the LNG Terminal and thus potential impacts to CWD are negligible, and CWD habitats further west (e.g. Soko Islands, the western portion of the SLMP, and the Southwest Lantau Marine Park) are over 4 km away and acoustic disturbance from LNG Terminal operation, if any, would also be negligible. Although FP inhabit the waters of the LNG Terminal, they are high frequency specialists and potential acoustic disturbance impacts would be limited. The functionality of key habitats nearby such as the eastern portion of the SLMP is also not expected to be affected, considering the minimal impact on marine ecological resources. Overall, unacceptable impacts of increased underwater sound level from FSRU Vessel transits on marine mammals and the functionality of the SLMP for the conservation of these species are not anticipated.

In addition, the underwater sound characteristics of the FSRU Vessel are very much similar to those in the area at present from similar marine traffic. Marine organisms in these waters are habituated to the background level of underwater sound, and a small increase in vessel activity associated with the operation of this Project is not anticipated to result in unacceptable impacts on marine ecology, including horseshoe crabs, whale shark and green turtle if temporarily present.

2.1.3.2 INCREASED MARINE TRAFFIC

During normal operations, the FSRU Vessel will be permanently moored at the Jetty and thus will not pose any risk of vessel collision with marine mammals. During incidents (e.g. typhoons) and emergency conditions, the FSRU Vessel will need transit through the SLMP and sail away to the waters outside Hong Kong as a precautionary measure to minimize accidental events. It is expected that very few vessel movements (the FSRU Vessel and additional stand-by vessel) are expected for such emergency conditions. Considering the slow speed of these vessels, it is not expected there would be a significant risk of vessel strike due to these vessel movements. Unacceptable adverse impacts of increased marine traffic due to potential incidents (e.g. during typhoon) on marine mammals and the functionality of the existing, proposed and potential marine parks are not anticipated.

2.1.4 FISHERIES

As presented in Section 10.5.2 of the approved EIA Report, impact to fisheries resources due to underwater sound of the FSRU Vessel was assessed. The FSRU Vessel is anticipated to be permanently moored and so transit would be minimal except for typhoon evacuation. Consequently, very few vessel movements are expected for the day-to-day operation of the LNG Terminal, and the underwater sound characteristics of the vessels involved are very much similar to those in the area at present from similar marine traffic. Fish in these waters are habituated to the background level of underwater sound, and a small increase in vessel activity associated with the operation of this Project is not anticipated to result in unacceptable impacts on fisheries resources.

2.2 RELEVANT INFORMATION FROM THE MARINE ROUTING PLAN OF THE FSRU VESSEL

2.2.1 DESCRIPTION OF THE MARINE TRANSIT ROUTE OF THE FSRU VESSEL

As the Project progresses, due to the associated pilotage arrangement, the marine transit routes of FSRU Vessel have been further discussed with the relevant authorities. Consequently, the marine transit routes ('Principal Arrival Route' and 'South Departure Route') are determined and agreed with the relevant authorities for implementation to support the operation of the Project. The indicative Principal Arrival Route and South Departure Route are presented in **Figure 2.2**.

In the unlikely event that the southern departure route cannot be used (e.g. structural blockage at sea), the FSRU Vessel will need to travel north to follow the same Principal Arrival Route back to the waters south of Cheung Chau before navigating to Dangan Channel. It is anticipated that during the transit of FSRU Vessel, the FSRU Vessel as well as the tugs and supporting vessels will need to pass through SLMP until turning to north of CEDD's South Cheung Chau Disposal Ground.

No stopping over or anchoring of vessels will be necessary during the transit.

2.2.2 KEY ENVIRONMENTAL IMPACTS ASSESSED

2.2.2.1 AIR QUALITY

As presented in Section 4.2 of the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers appended in the Marine Routing Plan of the FSRU Vessel, no unacceptable change to air quality due to the transit of FSRU Vessel will be anticipated, given the low frequency of vessel movement (about 3-4 times a year for FSRU Vessel) for FSRU Vessel adopting the Principal Arrival Route and South Departure Route, and the use of boil off gas or low sulphur marine fuel for FSRU Vessel. In addition, due to the large separation between the Principal Arrival Route and South Departure Route to the nearest ASR, adverse air quality impacts associated with the marine emissions from FSRU Vessel and supporting vessels are not anticipated. The associated impacts arising from vessel movement adopting the Principal Arrival Route and South Departure Route for the FSRU Vessel would remain unchanged as those predicted in the approved EIA Report.

2.2.2.2 HAZARD TO LIFE

As presented in Section 4.3 of the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers appended in the Marine Routing Plan of the FSRU Vessel, quantitative risk assessment (QRA) was conducted to assess the risk due to marine transits of FSRU Vessel using the Principal Arrival Route and South Departure Route. The QRA showed that the individual and societal risks for marine transits of FSRU Vessel using the marine transit routes (i.e. Principal Arrival Route and South Departure Route) during operation of the Project is in compliance with the risk criteria in Section 2 of Annex 4 of the EIAO-TM.

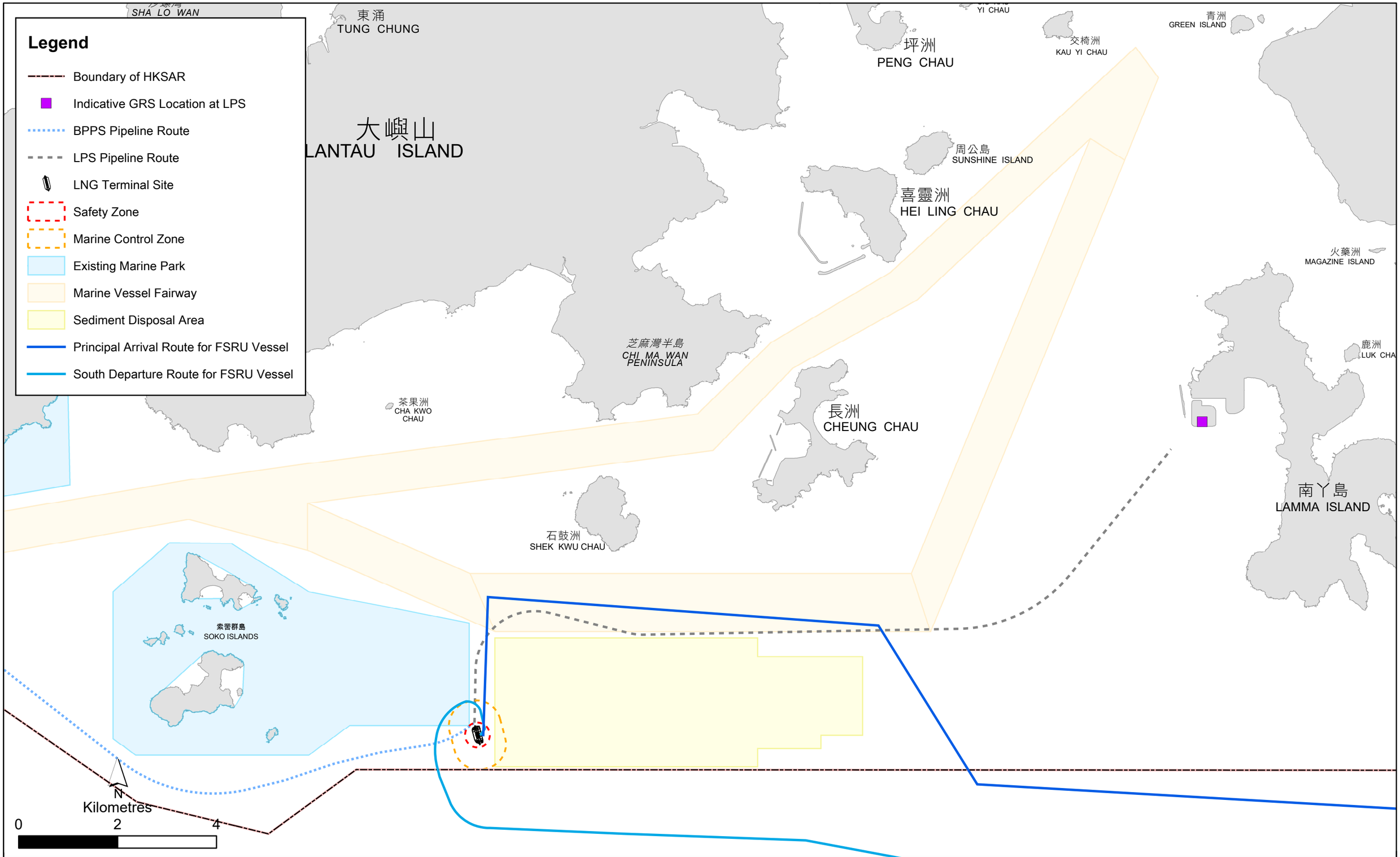

Figure 2.2

Indicative Marine Routing of the FSRU Vessel
in the Marine Routing Plan of the FSRU Vessel

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The FSRU Vessel annual visit frequency is expected to be about 3-4 times per year which is same as the assumption in the approved EIA Report. The risks of collision with the Jetty are thus expected not to be greater or worse than those predicted in the approved EIA Report. In addition, manoeuvring of FSRU Vessel access to/ from the Jetty would be supported by tug boats to minimise the collision risks near Jetty for both Principal Arrival Route and South Departure Route as well as the original route in EIA study. As such, the marine transit routes (i.e. Principal Arrival Route and South Departure Route) will not cause adverse impacts on the Jetty (e.g. increase in the risk of collision with the Jetty) when the FSRU Vessel is manoeuvring around the Jetty to approach or depart from the Jetty, compared with the original arrival and departure routes proposed in the EIA report.

Overall, the proposed marine transit route arrangement is anticipated not to cause any adverse impact on the Jetty when comparing with those predicted in the approved EIA Report.

2.2.2.3 ECOLOGY

With reference to Section 4.6 of the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers appended in the Marine Routing Plan of the FSRU Vessel, potential impacts to marine ecological resources, marine mammals and marine parks due to the marine transit routes include underwater sound from FSRU vessel and increased marine traffic from LNG Terminal operation, each is summarised below.

Underwater Sound from FSRU Vessel

Given the low frequency of vessel movement expected for the day-to-day operation of the LNG Terminal (about 3-4 times a year), and the underwater sound characteristics of the vessels involved are very much similar to those in the area at present from similar marine traffic, marine organisms and marine mammals in these waters are habituated to the background level of the underwater sound. No unacceptable impacts to marine organisms and marine mammals are expected due to the small increase in vessel activity.

The marine transit routes for FSRU Vessel will require vessel entry to SLMP occasionally. Given the vessels are slow-moving in nature, the duration of SLMP entry is short (about 30 minutes each time) and the frequency of SLMP entry will be low, adverse impacts on the functionality of SLMP caused by vessel transition through the proposed marine transit routes is not anticipated. Moreover, the continuous and low level of underwater sound which is of low energy and lower frequencies will be below the peak range of dolphins and porpoises and thus CWD and FP are not expected to be acoustically disturbed. The associated underwater sound from FSRU Vessel during transit of the proposed marine transit routes would be similar as those predicted in the approved EIA Report.

Increased Marine Traffic

According to the AFCD's marine mammal monitoring report in Hong Kong Waters (2021-22) [3], the important CWD habitats were concentrated along the West Lantau coastline as well as the western end of South Lantau waters, mainly extending from Tai O Peninsula toward Fan Lau Peninsula, which are located far away from the marine transit routes. The important FP habitats were mainly located to the east and west of the Soko Islands and the majority of the marine transit routes did not overlap with the waters with higher FP density. As a precautionary measure, the FSRU Vessel will travel through the marine transit routes at a speed of 10 knots or below when moving within the areas frequented by Finless Porpoise, including the waters between Soko Islands and Shek Kwu Chau.

FSRU Vessel will be permanently moored at the Jetty during normal operation and therefore not expected to pose risk of vessel collision with marine mammals. Unacceptable adverse impacts on marine mammals are not anticipated with the adoption of the marine transit routes.

FSRU Vessel and supporting vessels will pass through the SLMP during transit to and from LNG Terminal. Given vessel movements will be controlled by tugs and a pilot boat at a low speed, no impact to the marine buoy at the corner of SLMP will be anticipated during transit. Upon entry to the SLMP, the 10-knot vessel speed limit of the Marine Parks and Reserves Regulations (*Cap. 476A*) for all vessels will be observed and strictly followed. No anchorage or stop-over is expected in SLMP. Adverse impacts to the functionality of SLMP is not anticipated.

The associated impacts due to increased marine traffic would remain unchanged as those predicted in the approved EIA Report.

2.2.2.4 FISHERIES

As presented in Section 4.7 of the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers appended in the Marine Routing Plan of the FSRU Vessel, the vessel movement from transit of FSRU Vessel for the day-to-day operation of the LNG Terminal is very low (about 3-4 times a year) and the underwater sound characteristics of the vessels involved would be very much similar to those of the existing marine traffic in the area. No unacceptable change to fisheries resources is anticipated with the use of the proposed marine transit routes for FSRU Vessel during operation of the LNG Terminal.

(3) HKCRP (2022). Monitoring of Marine Mammals in Hong Kong Waters (2021-22). Submitted to AFCD under Contract Ref. AFCD/SQ/260/20/C.

3. PROPOSED ALTERNATIVE DEPARTURE ROUTE OF THE FSRU VESSEL

After reviewing the operation of the LNG Terminal, it is identified that there could be optimization of the FSRU Vessel's departure route ("North Departure Route") such that the FSRU Vessel could make use of the new multipurpose anchorage in the southwest of Lamma Island (i.e. the South Cheung Chau Anchorage) for temporary stay during certain events (e.g maintenance work at the Jetty, monsoon, etc.) without crossing Hong Kong water boundary. The duration of stay at the anchorage is typically around 48 hours but this can vary depending on the situation. Consequently, an alternative departure route ('North Departure Route'), which is the reverse of the Principal Arrival Route between the LNG Terminal and the South Cheung Chau Anchorage, is proposed for the FSRU Vessel. The indicative North Departure Route for the FSRU Vessel is presented in **Figure 3.1**.

On departure from the LNG Terminal, the manoeuvres of the FSRU Vessel will be executed by the HK Pilots and captains of FSRU Vessel. It is anticipated that during the transit of FSRU Vessel, FSRU Vessel as well as the tugs and supporting vessels will need to pass through SLMP with a duration of about 30 minutes until turning to north of CEDD's South Cheung Chau Disposal Ground. No stopping over or anchoring of vessels will be necessary within SLMP during the transit. The transit frequency of the FSRU Vessel, taking into account adverse weather conditions, emergency situations and the certain events discussed in this report, will be within 12 times per year, which matches with the assumptions made in the QRA for the Project. Examples of navigation simulation plots for FSRU Vessel departing the LNG Terminal via North Departure Route are presented in **Figure 3.2**.

It should be noted that during the departure of the FSRU Vessel, there might be adjustment to the proposed North Departure Route to suit the navigation safety and weather conditions.

Legend

- Boundary of HKSAR
- Indicative GRS Location at LPS
- BPPS Pipeline Route
- LPS Pipeline Route
- LNG Terminal Site
- Safety Zone
- Marine Control Zone
- Existing Marine Park
- Marine Vessel Fairway
- Sediment Disposal Area
- South Cheung Chau Anchorage
- Principal Arrival Route for FSRU Vessel
- South Departure Route for FSRU Vessel
- North Departure Route for FSRU Vessel

South Cheung Chau Anchorage		
Position	Latitude	Longitude
A	22° 10.060′N	114° 02.325′E
B	22° 10.060′N	114° 03.819′E
C	22° 09.291′N	114° 03.819′E
D	22° 09.291′N	114° 02.325′E

SHA LO WAN
東涌
大嶼山
LANTAU ISLAND
坪洲
PENG CHAU
YI CHAU
交椅洲
KAU YI CHAU
青洲
GREEN ISLAND
周公島
SUNSHINE ISLAND
喜靈洲
HEI LING CHAU
火藥洲
MAGAZINE ISLAND
芝麻灣半島
CHI MA WAN PENINSULA
茶果洲
CHA KWO CHAU
長洲
CHEUNG CHAU
鹿洲
LUK CHA
南丫島
LAMMA ISLAND
石鼓洲
SHEK KWU CHAU
索罟群島
SOKO ISLANDS
A
B
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Figure 3.1

Indicative Marine Routing of the FSRU Vessel

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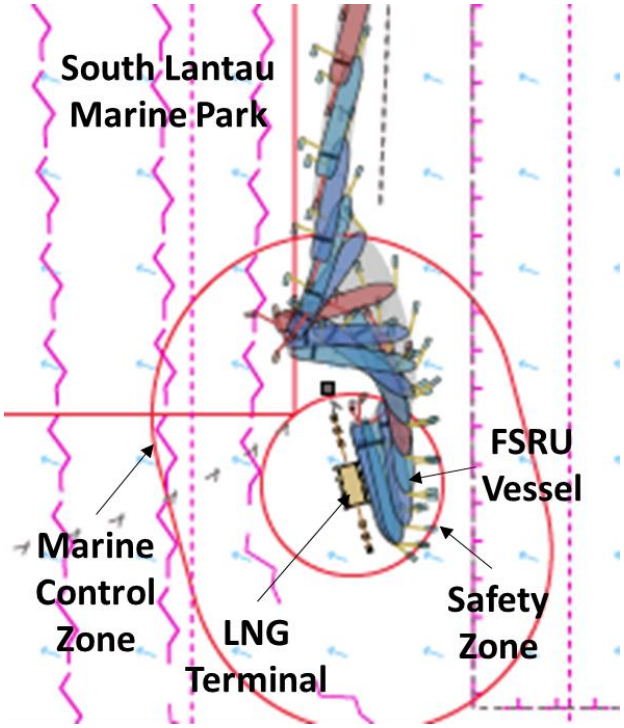
FIGURE 3.2 EXAMPLES OF NAVIGATION SIMULATION PLOTS FOR FSRU VESSEL DEPARTING THE LNG TERMINAL VIA NORTH DEPARTURE ROUTE



4. POTENTIAL IMPACTS ON THE ENVIRONMENT

4.1 KEY ENVIRONMENTAL ISSUES ASSOCIATED WITH THE PROPOSED ALTERNATIVE DEPARTURE ROUTE OF THE FSRU VESSEL

Table 4.1 identifies the potential environmental impacts associated with the proposed alternative departure route of the FSRU Vessel.

TABLE 4.1 POTENTIAL ENVIRONMENTAL ISSUES

Aspect	Any Potential Impact?	Remarks
Air Quality	✓	The potential impacts on air quality are discussed in **Section 4.2**.
Hazard to Life	✓	The potential impacts on hazard to life are discussed in **Section 4.3**.
Noise	×	No noise sensitive receivers (NSRs) were identified within the 300m Assessment Area; as discussed in Sections 6.5 and 6.6 of the approved EIA Report, unacceptable adverse noise impacts due to the proposed marine transit route are not anticipated.
Water Quality	×	The proposed alternative departure route of the FSRU Vessel will adopt the same route as the Principal Arrival Route in which the potential water quality impacts have been assessed in the Environmental Review Report for the Marine Transit Routes of FSRU Vessel and LNG Carriers appended in the Marine Routing Plan of the FSRU Vessel. Unacceptable water quality impacts are not anticipated due to the proposed alternative departure route of the FSRU Vessel.
Waste Management Implications	×	The proposed alternative departure route of the FSRU Vessel will adopt the same route as the Principal Arrival Route in which the potential waste management implications have been assessed in the Environmental Review Report for the Marine Transit Routes of FSRU Vessel and LNG Carriers appended in the Marine Routing Plan of the FSRU Vessel. Further waste management implications are not anticipated due to the proposed alternative departure route of the FSRU Vessel.
Ecology	✓	Impacts to terrestrial ecology and offshore avifauna are not expected. The potential impacts on marine ecology are discussed in **Section 4.4.**
Fisheries	✓	The potential impacts on fisheries are discussed in **Section 4.5.**
Visual	×	According to Section 11.6 of the approved EIA report, operational visual impacts are expected to be minimal and arise from the presence and operation of the LNG Terminal. No

Aspect	Any Potential Impact?	Remarks
		change of visual impact is expected from the proposed marine transit route.
Cultural and Heritage	×	As the transit of FSRU Vessel from the LNG Terminal will not disturb the seabed along the proposed alternative departure route, no marine archaeological impact is expected for the proposed alternative departure route of the FSRU Vessel.

Notes:
(a) '✓' = Possible, '×' = Not Expected

A description and evaluation, where appropriate, of potential impacts on air quality, hazard to life, marine ecology and fisheries arising from the proposed alternative departure route marine routing of FSRU Vessel, and how the environment and the community might be affected by the proposed variations, are provided in the following sections.

4.2 AIR QUALITY

As presented in Section 3.3.1 of the EIA Report, the FSRU Vessel will be permanently moored at the Jetty during the operation of the Project (except under adverse weather conditions). Given the low frequency of vessel movement for FSRU Vessel (< 12 times a year) adopting the proposed alternative departure route (i.e. North Departure Route) and the use of natural gas fuel for FSRU Vessel during normal operation, no unacceptable change to air quality due to the transit of FSRU Vessel will be anticipated. In addition, no ASR has been identified within 1.5 km from the proposed alternative departure route of the FSRU Vessel. The nearest identified ASR to the proposed North Departure Route and the South Cheung Chau Anchorage proposed for temporary stay is Shek Kwu Chau Treatment and Rehabilitation Centre (separation distance >1.5 km) and Nga Ning Court – Leung Chak House (separation distance >3.9 km), respectively, as indicated in **Figure 4.1**. Due to the large separation between the proposed alternative departure route of FSRU Vessel and the South Cheung Chau Anchorage proposed for temporary stay to the nearest ASR, adverse air quality impacts associated with the marine emissions from FSRU Vessel and supporting vessels are not anticipated. The associated impacts arising from vessel movement adopting the proposed alternative departure route and the proposed temporary stay at South Cheung Chau Anchorage for the FSRU Vessel would remain unchanged as those predicted in the approved EIA Report and the Environmental Review Report for the Marine Transit Routes of FSRU Vessel and LNG Carriers.

4.3 HAZARD TO LIFE

Given the proposed North Departure Route adopt the similar routing as the Principal Arrival Route, the quantitative risk assessment (QRA) conducted under the Environmental Review Report for the Marine Transit Routes of FSRU Vessel and LNG

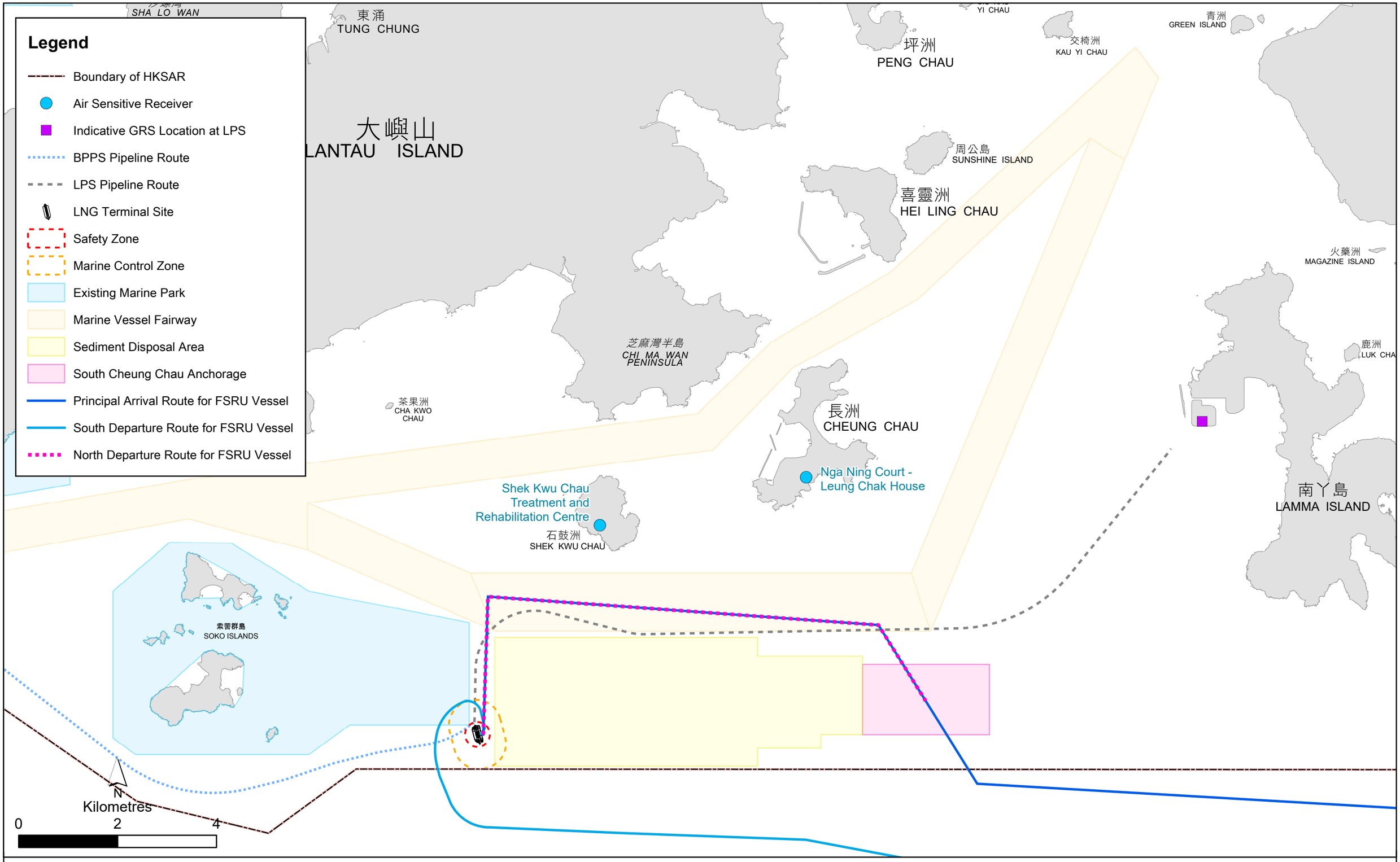


Figure 4.1

Identified Representative Air Sensitive Receiver

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ERM

Carriers is still valid and the individual and societal risks for marine transits of FSRU Vessel using the proposed alternative departure route during operation of the Project is in compliance with the risk criteria in Section 2 of Annex 4 of the EIAO-TM.

Vessel movement for FSRU Vessel is expected to be < 12 times a year which is within the scenario adopted in the approved EIA and the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers. The risks of collision with the Jetty are thus expected not to be greater or worse than those predicted in the approved EIA Report and the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers. In addition, manoeuvring of FSRU Vessel access to/ from the Jetty would be supported by tug boats to minimise the collision risks near Jetty during transit, which is the same as the current marine transit routes for the FSRU Vessel. As such, the proposed North Departure Route will not cause adverse impacts on the Jetty (e.g. increase in the risk of collision with the Jetty) when the FSRU Vessel is manoeuvring around the Jetty to depart from the Jetty, compared with the marine transit routes described in the approved EIA report and the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers.

Overall, the proposed alternative departure route of FSRU Vessel would not cause adverse impact on hazard to life when comparing with those predicted in the approved EIA report and the ERR for the Marine Transit Routes of FSRU Vessel and LNG Carriers.

4.4 ECOLOGY

Potential impacts to marine ecological resources, marine mammals and marine parks due to the proposed alternative departure route of FSRU Vessel include underwater sound from FSRU vessel and increased marine traffic. These impacts are discussed below.

4.4.1 UNDERWATER SOUND FROM FSRU VESSEL

As indicated in **Section 3**, the frequency of FSRU vessel transit will be < 12 times a year. Given the low frequency of vessel movement expected for the day-to-day operation of the LNG Terminal, and the underwater sound characteristics of the vessels involved are very much similar to those in the area at present from similar marine traffic, marine organisms and marine mammals in these waters are habituated to the background level of the underwater sound. No unacceptable impacts to marine organisms and marine mammals are expected due to the small increase in vessel activity.

The proposed North Departure Route for FSRU Vessel will require vessel entry to SLMP occasionally. Given the vessels are slow-moving in nature, the duration of SLMP entry is short (about 30 minutes each time) and the frequency of SLMP entry will be low, adverse impacts on the functionality of SLMP caused by vessel transition through the proposed alternative departure route is not anticipated. Moreover, the continuous and low level of underwater sound which is of low energy and lower frequencies will be below the peak range of dolphins and porpoises and thus CWD and FP are not expected to be acoustically disturbed. The associated underwater sound from FSRU Vessel during transit of the proposed alternative departure route would be similar as those predicted in

the approved EIA Report and the Environmental Review Report for the Marine Transit Routes of FSRU Vessel and LNG Carriers.

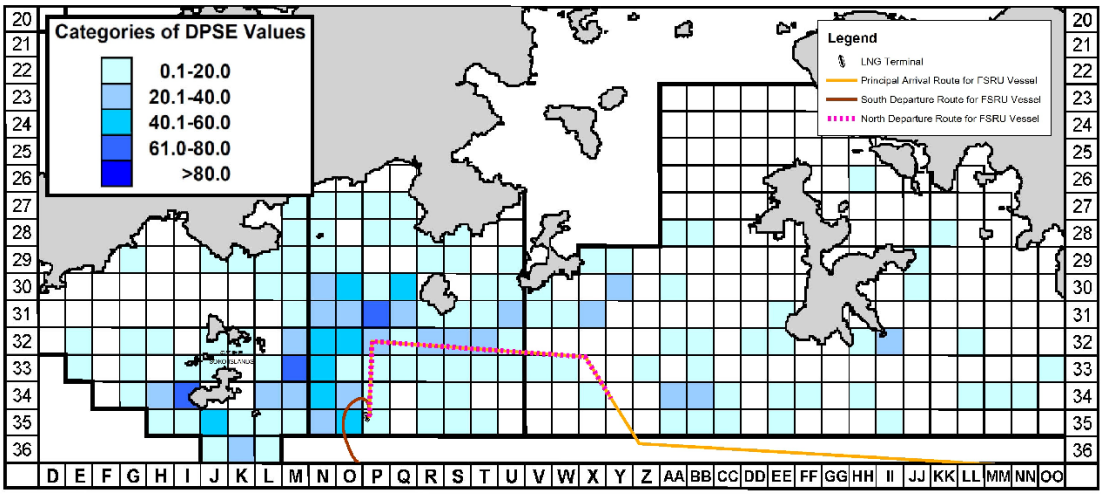
4.4.2 INCREASED MARINE TRAFFIC

A review of the distribution of CWD and FP was conducted with reference to the AFCD's latest marine mammal monitoring report in Hong Kong Waters (2022-23) [(4)]. The important CWD habitats were concentrated along the West Lantau coastline as well as the western end of South Lantau waters, mainly extending from Tai O Peninsula toward Fan Lau Peninsula, which are located far away from the proposed alternative departure route. The important FP habitats were mainly located to the east and west of the Soko Islands and the majority of the proposed alternative departure route did not overlap with the waters with higher FP density as presented in **Figure 4.2**. As a precautionary measure, the FSRU Vessel will travel through the proposed alternative departure route at a speed of 10 knots or below when moving within the areas frequented by FP, including the waters between Soko Islands and Shek Kwu Chau.

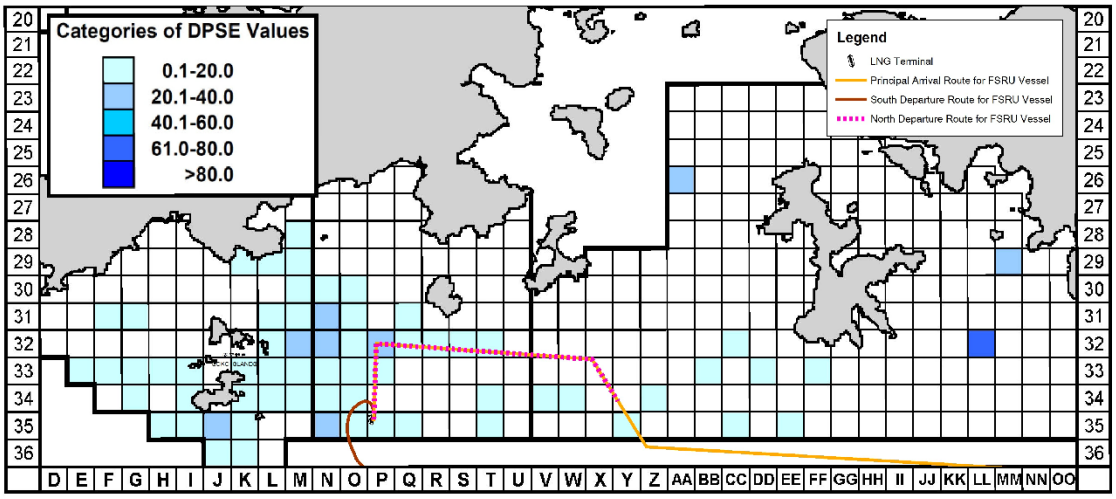
(4) HKCRP (2023). Monitoring of Marine Mammals in Hong Kong Waters (2022-23). Submitted to AFCD under Contract Ref. AFCD/SQ/283/21/C.

FIGURE 4.2 DENSITY OF FINLESS PORPOISES IN SOUTHERN WATERS OF HONG KONG DURING (A) DRY SEASON (DECEMBER TO MAY) AND (B) WET SEASON (JUNE TO OCTOBER) USING DATA COLLECTED DURING 2018-22 (SOURCE: AFCD'S MARINE MAMMAL MONITORING REPORT IN HONG KONG WATERS (2022-23))

(a)



(b)



Remark: DPSE = no. of porpoises per 100 units of survey effort.

FSRU Vessel will be permanently moored at the Jetty during normal operations except under specific situations such as adverse weather conditions, maintenance work at the jetty, emergency, etc.. The FSRU Vessel transit is anticipated to be low in frequency and with slow vessel movement and therefore not expected to pose risk of vessel collision with marine mammals. Unacceptable adverse impacts on marine mammals are not anticipated with the adoption of the proposed North Departure Route.

FSRU Vessel and supporting vessels will pass through the SLMP during transit from LNG Terminal via North Departure Route. Given vessel movements will be controlled by tugs and a pilot boat at a low speed, no impact to the marine buoy at the corner of SLMP will be anticipated during transit. Upon entry to the SLMP, the 10-knot vessel speed limit of the Marine Parks and Reserves Regulations (*Cap. 476A*) for all vessels will be observed

and strictly followed. No anchorage or stop-over is expected in SLMP. Adverse impacts to the functionality of SLMP is not anticipated.

The associated impacts due to increased marine traffic would remain unchanged as those predicted in the approved EIA Report and the Environmental Review Report for the Marine Transit Routes of FSRU Vessel and LNG Carriers.

4.5 FISHERIES

The vessel movement from transit of FSRU Vessel for the day-to-day operation of the LNG Terminal is low (< 12 times a year) and the underwater sound characteristics of the vessels involved would be very much similar to those of the existing marine traffic in the area. No unacceptable change to fisheries resources is anticipated with the use of the proposed North Departure Route for FSRU Vessel for certain events (e.g. maintenance work at the Jetty, monsoon, etc.).

4.6 ASSESSMENT OF THE PROPOSED CHANGES AGAINST EIAO-TM SECTION 6

The proposed alternative departure route for FSRU Vessel has been evaluated to consider whether the change may constitute a material change to a designated project or to an environmental impact (Section 6 of the EIAO-TM refers). In accordance with Section 6.2 of the EIAO-TM, *the environmental impact of a designated project, for which an environmental permit has been issued, is considered to be materially changed if the environmental performance requirements set out in the EIA report for this project may be exceeded or violated, even with the mitigation measures in place*.

An assessment of the potential environmental impacts associated with the proposed alternative departure route for FSRU Vessel is provided in detail in **Sections 4.1-4.5**. The proposed change is considered as conforming to the information and requirements set out in the approved EIA Report. Hence, it is considered that the proposed alternative departure route for FSRU Vessel will not lead to a material change to the designated project, or an environmental impact in accordance with Section 6.2 of the EIAO-TM.

5. REVIEW OF PROPOSED MITIGATION MEASURES & ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REQUIREMENTS

The findings of this review of environmental impacts associated with the proposed alternative departure route for FSRU Vessel have indicated that no unacceptable adverse environmental impacts would be anticipated. It is considered that the proposed mitigation measures and EM&A requirements recommended in the approved EIA Report are adequate and no additional mitigation measures and EM&A requirements will be required.

6. CONCLUSION

After reviewing the operation of the LNG Terminal, it is identified that there could be optimization of the FSRU Vessel's departure route ("North Departure Route") such that the FSRU Vessel could make use of the new multipurpose anchorage in the southwest of Lamma Island (i.e. the South Cheung Chau Anchorage) for temporary stay during certain events (e.g. maintenance work at the Jetty, monsoon, etc.) without crossing Hong Kong water boundary. The duration of stay at the anchorage is typically around 48 hours but this can vary depending on the situation. With this optimization, the alternative departure route would allow shorter time for the LNG Terminal to resume normal operation and services to gas supply to power stations. An environmental review is undertaken to assess the potential environmental impact as a result of the proposed alternative departure route for the FSRU Vessel.

The review indicates that no adverse impacts are anticipated from the proposed alternative departure route for the FSRU Vessel with respect to the assessment criteria stipulated in the EIAO-TM and relevant environmental legislation, and the same environmental performance requirements set out in the approved EIA Report will apply. The proposed alternative departure route for FSRU Vessel will not result in a material change to the designated project, or an environmental impact in accordance with Section 6 of the EIAO-TM. The Project fully complies with the EIAO-TM requirements.

It is considered that the EM&A requirements recommended in the approved EIA Report are adequate and no additional mitigation measures and EM&A requirements will be required.