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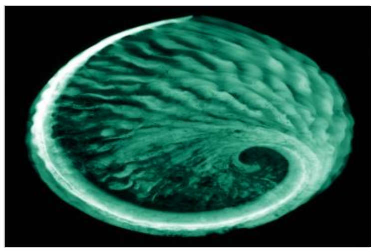
0505354

Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Report







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Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Report

0505354

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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

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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: 7 March 2024

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: 11 March 2024

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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 involves 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). In accordance with the Updated EM&A Manual of the Project, marine mammal monitoring has been conducted covering baseline, construction and post-construction periods.

Further to the completion of the marine-based construction works in October 2022, post-construction marine mammal monitoring was conducted between November 2022 and October 2023 for vessel-based line transect survey and between November 2022 and December 2023 for passive acoustic monitoring (PAM). A total of 103 groups of 250 Finless Porpoises (FPs) were sighted among the three survey areas between November 2022 and October 2023. The monthly variations in combined encounter rates during the post-construction monitoring period indicated that FP occurrences peaked in November 2022, with another peak between February 2023 and April 2023, which are broadly in line with the understanding of seasonal variation in distribution of FP in Hong Kong waters with peak season during winter and spring (December – May) in southern waters. For the PAM results collected between November 2022 and December 2023, the mean porpoise detection positive minutes (DPM) per day ranged from 80.1 to 245.4 for the five deployment locations.

The change in distribution of the finless porpoises between the baseline, construction and post-construction monitoring was evaluated. The number of sightings and number of FPs were found to be higher during post-construction monitoring (23 groups of 78 FPs) when comparing with the same monitoring period (i.e. June to November) of baseline monitoring (18 groups of 35 FPs) and construction monitoring (19 groups of 62 FPs). A few FP sightings were recorded near the Jetty during post-construction phase, indicating the return of FPs around the Jetty upon cessation of the disturbance. The PAM results also showed a return of porpoise usage to a level similar to the baseline period around the Jetty during the post-construction monitoring period.

Overall, unacceptable impacts on marine mammals due to the Project were not detected, which aligns with the EIA study predictions.

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) was 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 ***Figure 1.1***.

This Post-Construction Marine Mammal Monitoring Report is prepared in accordance with the requirements as set out in the Updated EM&A Manual of the Project.

1.2 STRUCTURE OF THE REPORT

The remainder of the report is structured as follows:

- ***Section 2*** details the monitoring locations, monitoring methodology and the monitoring results; and
- ***Section 3*** provides the conclusion of this post-construction marine mammal monitoring.

(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.

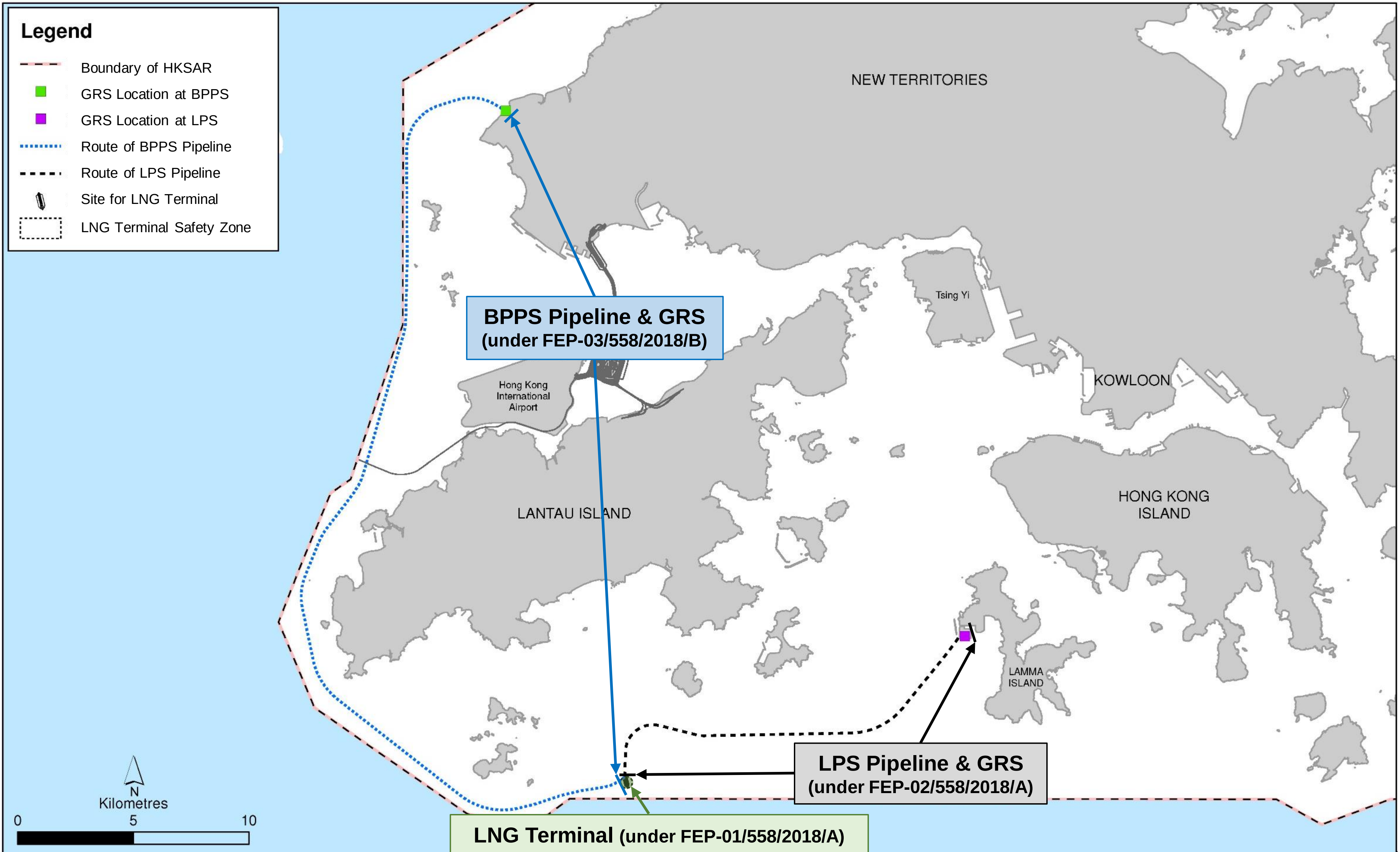

Figure 1.1

Indicative Location of Key Project Components

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Date: March 2024

2. MARINE MAMMAL MONITORING

In order to determine the efficacy of the recommended mitigation measures and provide verification of impact prediction/ evaluation of results, marine mammal monitoring was conducted using vessel-based line transect survey and passive acoustic monitoring (PAM) method according to the Updated EM&A Manual.

2.1 MONITORING METHODOLOGY

2.1.1 VESSEL-BASED LINE TRANSECT SURVEY

Vessel-based marine mammal survey by means of systematic line-transect boat survey was undertaken to examine the distribution and encounter rate of Finless Porpoise (FP) in southern Lantau where a majority of Project construction works would take place. Survey transects covering three survey areas for line-transect boat surveys, namely Southwest Lantau (SWL), Southeast Lantau (SEL) and Lamma (LM), are presented in ***Figure 2.1***.

The transect boat survey was conducted from a 15m inboard vessels (with an open upper deck above the pilothouse, providing a mostly unobstructed 180° view of the area ahead of the vessel), weather permitting (Beaufort 0-5, no heavy rain, and visibility > 1,200m). The marine mammal observer (MMO) team conducted searches and observations from the flying bridge area, 4-5m eye height above the water surface. In order to ensure the quality of the data and allow consistency with the long-term AFCD database, and take consideration of the sea conditions of the monitoring site, a team of three qualified and trained MMOs made up the survey team.

As the vessel transits the transect lines at a relatively constant speed of 13-15km hr^{-1}, the primary MMO searched for marine mammals continuously through 7 X 50 marine binoculars. A second MMO searched with unaided eye and filled out data sheets. Both MMOs searched ahead of the vessel, between 270° and 90° (in relation to the bow, which is defined as 0°). MMOs rotated positions approximately every 30 minutes. An additional MMO was on the boat, who rotated into position to give observers a rest after each hour of search effort to minimise fatigue.

Effort data collected during on-effort monitoring periods included time and position for the start and end of search effort, vessel speed, sea state (Beaufort scale), visibility, and distance travelled in each series (a continuous period of search effort). When marine mammals were sighted, the survey team would end the survey effort and fill out a sighting sheet. The vessel would divert from its course to approach the marine mammal group for group size estimation, behavioural observations, and collection of identification photos. The sighting sheet included information on initial sighting angle and distance, position of initial sighting, sea state, group size and composition, and behaviour, such as response to the survey vessel and associations with vessels. Position, distance travelled, and vessel speed were obtained from a hand-held Global Positioning System (GPS) unit. The perpendicular distance (PSD) of the marine mammal group to the transect line was later calculated from the initial sighting distance and angle.

All records of marine mammal sightings were collated, compiled and integrated with Geographic Information System (GIS). Positions of sightings together with group sizes, activities and calf occurrence were plotted on figures for illustration of spatial and temporal patterns of porpoise distribution, if any. The method for line transect analysis of porpoise

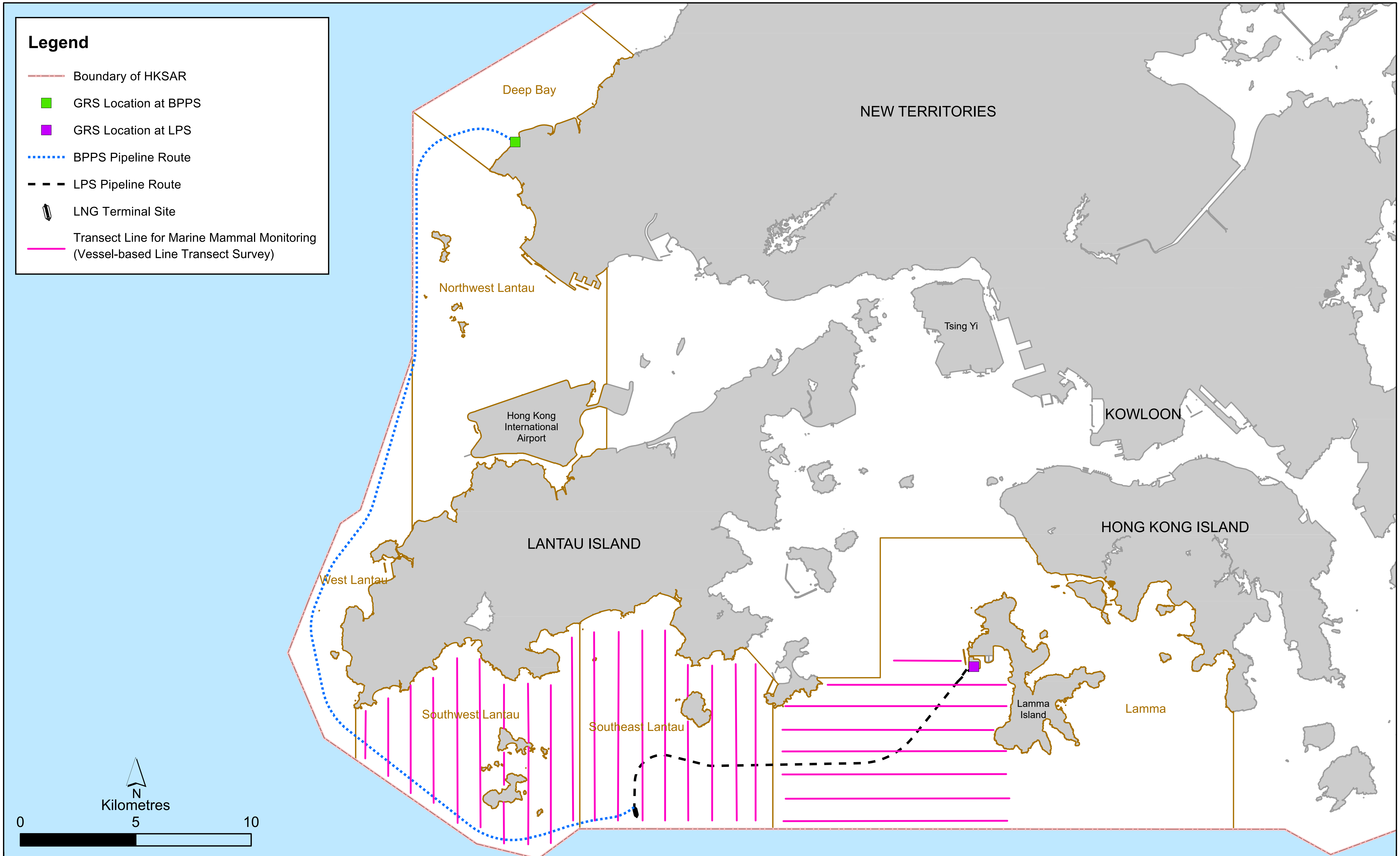

Figure 2.1

Vessel-Based Marine Mammal Survey Location

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encounter rate followed the established approach for AFCD long-term marine mammal monitoring [4]. It should be noted that as FP are cryptic and difficult to identify as unique individuals with no useful natural markings, the potential of double counting could not be eliminated and hence rendering any abundance or density estimation confounded with serious violation of assumption under the line-transect survey method; therefore such analysis was not proposed to be completed for FP, which is the same approach adopted for the AFCD long-term marine mammal monitoring.

Further to the completion of the marine-based construction works in October 2022, vessel-based line transect marine mammal surveys were conducted for 12 months between November 2022 and October 2023 with each transect line surveyed twice per month during post-construction monitoring.

2.1.1.1 DISTRIBUTION PATTERN ANALYSIS

The line-transect survey data was integrated with a Geographic Information System (GIS) to visualize and interpret different spatial and temporal patterns of FP distribution using their sighting positions collected from vessel surveys. Location data of porpoise groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView© 3.1) to examine their distribution patterns in detail. The dataset was also stratified into different subsets to examine distribution patterns of porpoise groups with different categories of group sizes, activities, fishing boat associations and young calves.

2.1.1.2 ENCOUNTER RATE ANALYSIS

Since the line-transect survey effort was uneven among different survey areas and across different months of the study period, the encounter rates of FP in terms of number of on-effort sightings per 100 km of survey effort, and total number of porpoise sighted on-effort per 100 km of survey effort) were calculated in each survey area in relation to the amount of survey effort conducted. The encounter rate could be used as an indicator to determine areas of importance to porpoises within the survey areas.

Only survey data collected under Beaufort 2 or below condition would be used for encounter rate analysis of FP [5]. Formula for encounter rate is provided below:

<u>Encounter Rate of Number of Porpoise Sightings (STG)</u>

$$STG = \frac{Total\ Number\ of\ On-effort\ Sightings}{Total\ Amount\ of\ Survey\ Effort\ (km)}\ x\ 100$$

<u>Encounter Rate of Number of Porpoises (ANI)</u>

$$ANI = \frac{Total\ Number\ of\ Porpoises\ from\ On-effort\ Sightings}{Total\ Amount\ of\ Survey\ Effort\ (km)}\ x\ 100$$

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(4) Samuel K.Y. Hung (2015) *Monitoring of Marine Mammals in Hong Kong Waters (2014-15): Final Report (1 April 2014 to 31 March 2015)*. Submitted to the Agriculture, Fisheries and Conservation Department of the Hong Kong SAR Government Tender Re.: AFCD/SQ/177/13

(5) Samuel K.Y. Hung (2018) *Monitoring of Marine Mammals in Hong Kong Waters (2018-19): Final Report (1 April 2018 to 31 March 2019)*. Submitted to the Agriculture, Fisheries and Conservation Department of the Hong Kong SAR Government Tender Re.: AFCD/SQ/197/17

2.1.2 PASSIVE ACOUSTIC MONITORING

Underwater PAM surveys were conducted to monitor porpoise usage of southern Lantau waters over 24 hours under all weather conditions. Specific C-POD (Cetacean-Porpoise Detector) devices were used to record vocalizations of echolocating toothed whales and dolphins, in particular FP by detecting the trains of echolocation sounds they produced. C-PODs were deployed at five locations on the seabed within and in the vicinity of the LNG Terminal site, including three monitoring locations near the LNG terminal site (i.e. Locations 2-4), one monitoring location at east of Tai A Chau (i.e. Location 1) and one monitoring location at southeast of Shek Kwu Chau (i.e. Location 5) (***Figure 2.2***). During each deployment, the C-POD unit serial numbers as well as the time and date of deployments were recorded. Information including the GPS positions and water depth at each of the deployment locations were also obtained. The records downloaded from the C-PODs were examined to identify vocalisation of FP. Analysis was undertaken to obtain information on FP, including:

- Number of clicks: calculated per hour to detect diel patterns, and per day to determine activity level at a site;
- Detection positive minutes (DPM): indicates the total amount of minutes where at least one click train was detected within a one minute time period, to measure the duration the FP spent in an area;
- Duration of click trains: provides an indication of the average density of FP at a site; and
- Encounter rates: represents the number of porpoise echolocation click train (>5 clicks) encounters per hour of acoustic measurement with the C-POD.

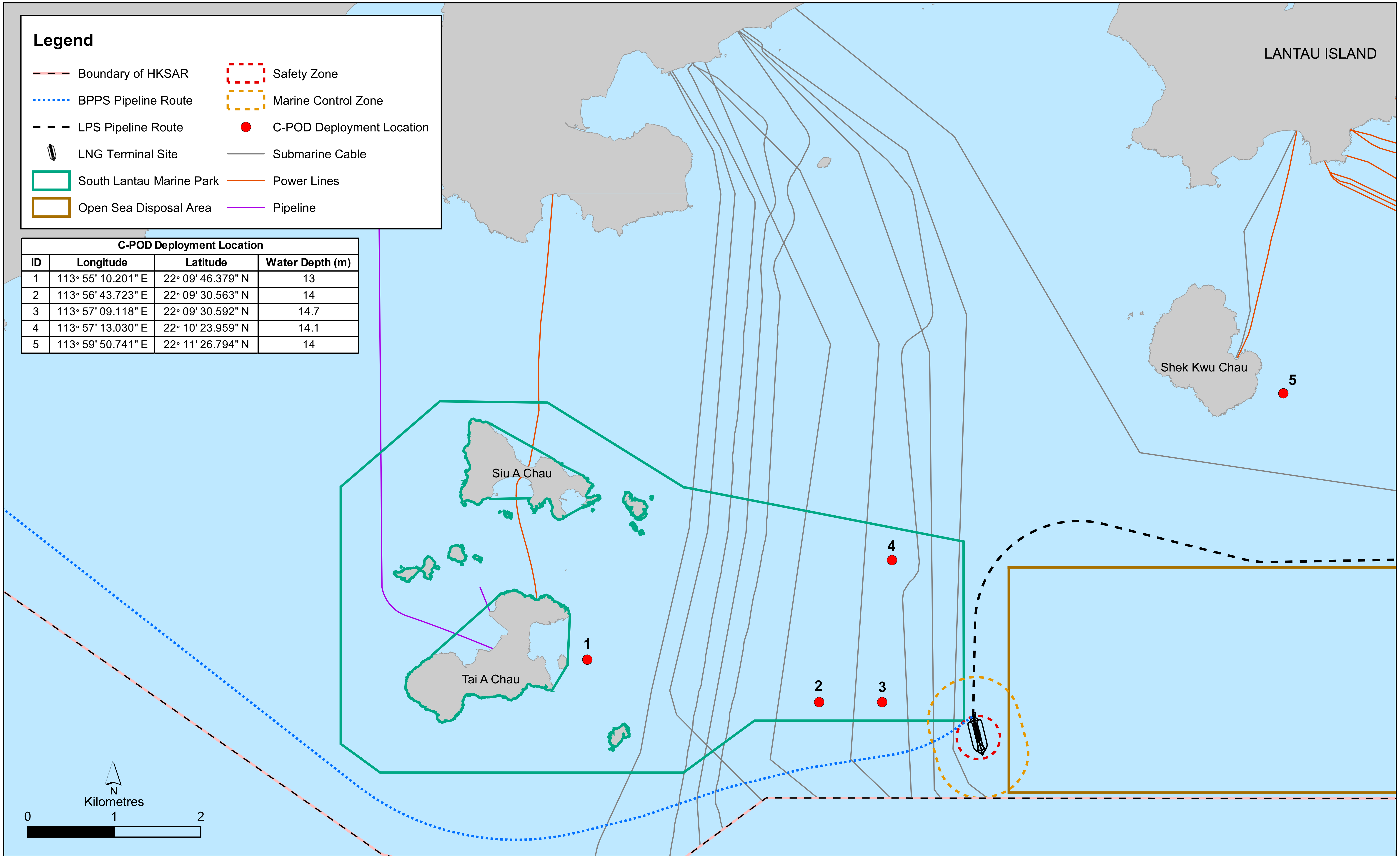
Any spatial or temporal trends (especially the 24-hour activity patterns) in changes of the above parameters were determined.

2.1.2.1 ANALYSIS OF PAM DATA

For detailed data analyses, the raw click data on the C-POD was first converted by the CPOD.exe software to "CP1" files. The click data was then processed using the KERNO classifier to identify click trains and their likely sources, and to reject weak boat sonar. The classified click trains were recorded in a "CP3" file.

The integrity of data record was first checked, and the period of adequate deployment and correct operation were identified. Visual validation was then performed to assess the overall rate of false positive detection positive minutes (DPM) as identified by the KERNO classifier. This validation method was based on the characteristics of clicks, multi-path clusters, and trains. Additional criteria based on the characteristics of the ambient noise regime could also be used, particularly in relation to boat sonar and sediment transport noise, which could generate a large number of ultrasonic "clicks".

Notably, the level of false positives is not some consistent fraction of true positives, but is determined by the prevalence of the sources that are liable to be misclassified as dolphin clicks, such as boat sonar and sediment transport noise. Moreover, it should be recognized that the cause of a substantial proportion of the "false positive porpoises" was actually true porpoises, but were rejected simply because they were not distinctive enough to meet the stringency of these criteria.



C-POD Deployment Location			
ID	**Longitude**	**Latitude**	**Water Depth (m)**
1	113° 55' 10.201" E	22° 09' 46.379" N	13
2	113° 56' 43.723" E	22° 09' 30.563" N	14
3	113° 57' 09.118" E	22° 09' 30.592" N	14.7
4	113° 57' 13.030" E	22° 10' 23.959" N	14.1
5	113° 59' 50.741" E	22° 11' 26.794" N	14

Figure 2.2

Underwater PAM Survey Location

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After the visual validations, the DPMs could then be assessed as the parameter for porpoise occurrences at each deployment location. The DPM was chosen to calculate the total number of minutes where at least one click train was detected within a one-minute period, in order to measure the amount of time porpoises spend in an area.

Using DPM could eliminate the possibility of counting individual click trains produced by more than one porpoise, as the number of animals detected is unknown. The DPM is also useful for detecting diel and seasonal patterns of porpoise occurrences in order to determine the level of habitat utilization by both species at the various deployment locations.

2.1.3 ACTION AND LIMIT LEVELS FOR MARINE MAMMAL MONITORING (APPLICABLE FOR CONSTRUCTION PHASE)

The Action and Limit Levels for marine mammal monitoring are established for the construction phase of the Project using encounter rate calculated from the six-month baseline vessel-based line transect surveys from the three survey areas as a whole in accordance with the Updated EM&A Manual. The combined baseline encounter rate was used to compare with the encounter rate obtained during construction phase monitoring calculated from last three month's monitoring data (i.e. running quarterly value). This approach would allow natural seasonal fluctuations in FP encounter rate to be accounted for, and allow data to be reviewed every month such as appropriate remedial actions could be taken timely if the threshold values are triggered. The established Action and Limit Levels for the construction phase marine mammal monitoring are provided in ***Table 2.1***. The Event and Action Plan for the construction phase marine mammal monitoring is provided in ***Table 2.2***.

TABLE 2.1 ACTION AND LIMIT LEVELS FOR MARINE MAMMAL MONITORING

Monitoring Area	Action Level	Limit Level
SWL, SEL and LM as a whole	Running quarterly STG < 1.12 & ANI < 2.18	Two consecutive running quarterly STG < 1.12 & ANI < 2.18

Notes:
[a] STG = Encounter Rate of Number of Porpoise Sightings
[b] ANI = Encounter Rate of Number of Porpoises
[c] Action / Limit Levels will be triggered if both STG and ANI fall below the criteria

TABLE 2.2 EVENT AND ACTION PLAN FOR MARINE MAMMAL MONITORING

Event	Action			
	ET	**IEC**	**Contractor(s)**	**Project Proponents**
Action Level exceeded	1. Check monitoring data and repeat data analysis to confirm findings; 2. Review available AFCD data and relevant EM&A data to check if the exceedance is due to natural variation or works related; 3. Identify potential source(s) of impact; 4. Inform the IEC, Project Proponents and Contractor; 5. Increase site inspection and audit frequency to ensure all the marine mammal protective and/or precautionary measures are properly implemented.	1. Check monitoring data and analysis and investigation by ET; 2. Conduct additional site inspection and audit with ET to ensure all the marine mammal protective and/or precautionary measures are properly implemented and advise Project Proponents the audit results and findings accordingly.	1. Inform the Project Proponents and confirm notification of the non-compliance in writing; 2. Conduct site inspection and audit with the ETL and IEC; 3. Ensure all the marine mammal protective and/or precautionary measures are properly implemented.	1. Discuss the need for increased site inspection and audit frequency proposed by ET with IEC and the Contractor; 2. Check the audit results and findings from ET and IEC.
Limit Level exceeded	1. Check monitoring data and repeat data analysis to confirm findings; 2. Review available AFCD data and relevant EM&A data to check if the exceedance is due to natural variation or works related; 3. Identify potential source(s) of impact; 4. Inform the IEC, Project Proponents and Contractor; 5. Increase site inspection and audit frequency to ensure all the marine mammal protective and/or precautionary measures are properly implemented; 6. Review previous occurrence of non-compliance events to investigate if there is a longer term trend that needs attention; 7. ET to discuss and confirm with Project Proponents, IEC and Contractor on the need for further mitigation measures (e.g. consider controlling and, if necessary suspending marine works associated with the suspected source of impact).	1. Check monitoring data and analysis and investigation by ET; 2. Conduct additional site inspection and audit with ET to ensure all the marine mammal protective and/or precautionary measures are properly implemented and advise Project Proponents the audit results and findings accordingly; 3. Discuss and confirm further mitigation measures with Project Proponents, ET and Contractor; 4. Supervise / audit the implementation of further mitigation measures and advise Project Proponents the results and findings accordingly.	1. Inform the Project Proponents and confirm notification of the non-compliance in writing; 2. Conduct site inspection and audit with the ETL and IEC; 3. Ensure all the marine mammal protective and/or precautionary measures are properly implemented; 4. Discuss and confirm further mitigation measures with the ETL, IEC and Project Proponents; 5. Carry out further measures when advised by ET and agreed by Project Proponents and IEC.	1. Discuss the need for increased site inspection and audit frequency proposed by ET with IEC and the Contractor; 2. Check the audit results and findings from ET and IEC; 3. Discuss and confirm further mitigation measures with the ET, IEC and Contractor; 4. Supervise the implementation of further mitigation measures.

2.2 MONITORING RESULTS

2.2.1 VESSEL-BASED LINE TRANSECT SURVEY

2.2.1.1 LINE-TRANSECT SURVEY EFFORT

During the 12 months of post-construction monitoring surveys conducted between November 2022 and October 2023 after completion of the marine-based construction works in October 2022, a total of 72 line-transect surveys were conducted among the three survey areas in SWL, SEL and LM. The detailed monitoring schedule is shown in ***Annex A.*** Details of these survey effort data are presented in ***Annex B***.

A total of 5,154.78 km of survey effort was collected from the line-transect vessel surveys, which included 1,677.35 km in SWL, 1,634.17 km in SEL and 1,834.26 km in LM (***Annex B***). The total survey effort conducted on primary and secondary lines among these three survey areas were 4,286.48 km and 868.30 km, respectively. 67.4% of the total survey effort was conducted in condition of Beaufort Sea State 2 or below with good visibility, and such data can be used for the encounter rate analysis of FP. No other major activities that might affect the results were recorded during the surveys.

2.2.1.2 FINLESS PORPOISE SIGHTINGS

For the 12-month post-construction monitoring period, a total of 103 groups of 250 FPs were sighted among the three survey areas and 101 groups of 248 FPs were sighted during on-effort search (***Annex C***). Among these FP sightings, a total of 82 groups of 218 FPs were sighted at Beaufort 2 or below (***Annex C***), which can be utilized for encounter rate analysis.

2.2.1.3 DISTRIBUTION AND HABITAT USE OF FINLESS PORPOISE

Throughout the post-construction monitoring period, FP were regularly sighted in all three survey areas of SWL, SEL and LM (***Figure 2.3***) and they were mainly recorded at both western and eastern sides of Tai A Chau, and the waters between Siu A Chau and Shek Kwu Chau (especially at the juncture of SWL and SEL survey areas). On the contrary, FPs rarely occurred at the western portion of SWL waters, the inshore waters to the south of Lantau Island (except a handful of sighting made near Shui Hau Peninsula), as well as the offshore waters to the south of Shek Kwu Chau (***Figure 2.3***). Furthermore, FP sightings made in the western side of LM survey area were quite scattered, but it appeared that they occurred more often at the offshore waters than inshore waters in LM survey area. Several FP sightings were made near the Project area.

The FP sighting distribution with different group sizes is shown in ***Figure 2.4***. The group sizes of FP occurred during the post-construction monitoring period ranged from 1 to 16 animals, with an overall mean of 2.4 ± 2.49. The majority of FP groups were very small, with 71.8% of porpoise groups composed of 1-2 animals, and 87.3% of porpoise groups composed of fewer than five animals (***Annex C***). On the contrary, there were ten groups with 5-9 animals per group, and three groups with more than 10 animals per group (***Annex C***). The very small groups of 1-2 porpoises largely resembled their overall distribution for the post-construction monitoring period. On the other hand, the medium-sized groups with 3-4 porpoises per group were scattered around the Soko Islands (mainly on the southern side), near Shek Kwu Chau and Pui O Wan and the offshore waters in SEL and LM survey areas. Notably, the larger groups

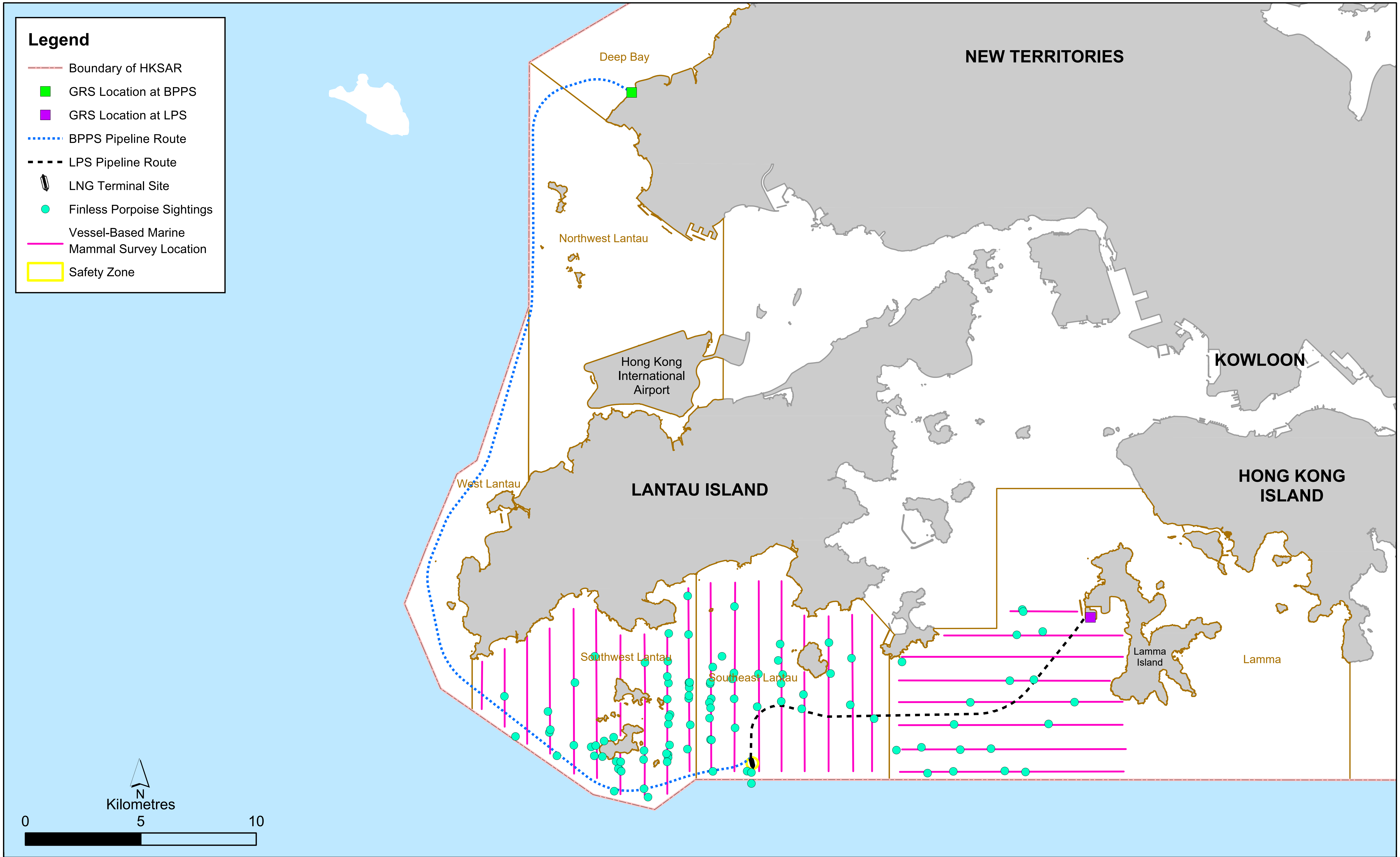

Figure 2.3

Distribution of Finless Porpoise Sightings during Marine Mammal Shipboard Survey between November 2022 and October 2023

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Date: 7/3/2024

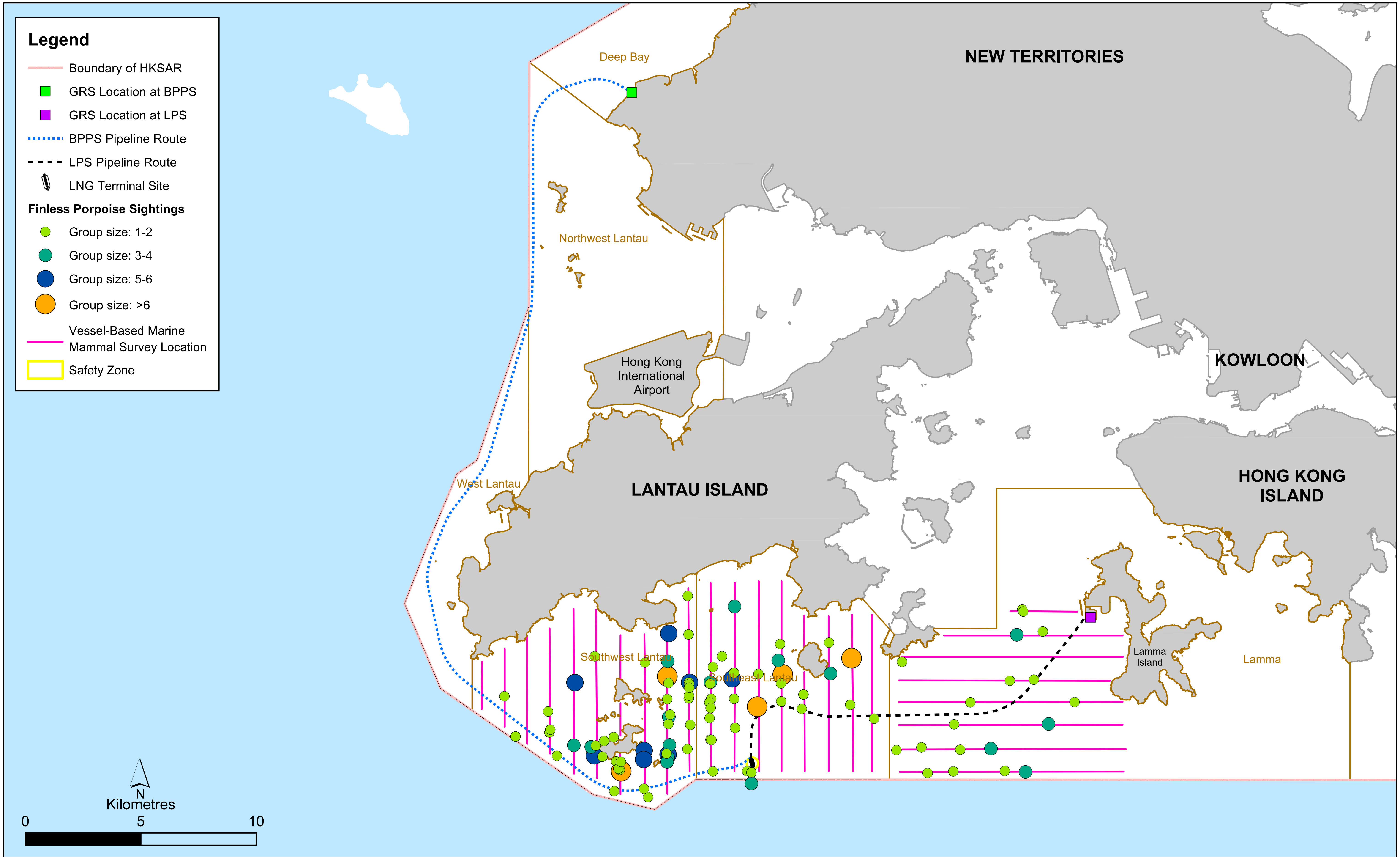

Figure 2.4

Distribution of Finless Porpoises with Different Group Sizes during Marine Mammal Shipboard Survey between November 2022 and October 2023

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Date: 7/3/2024

of porpoises were mostly located at the southern side of Tai A Chau, and between Shek Kwu Chau and Siu A Chau (***Figure 2.4***). The exceptionally large group of porpoises were located to the northeast of Siu A Chau, between Siu A Chau and Shek Kwu Chau, and between Shek Kwu Chau and Cheung Chau.

2.2.1.4 ENCOUNTER RATES OF FINLESS PORPOISE

The combined encounter rates of FP from SWL, SEL and LM during the 12-month post-construction monitoring period was 2.36 sightings per 100 km of survey effort. The monthly variations in combined encounter rates during the post-construction monitoring period indicated that FP occurrences peaked in November 2022, with another peak between February 2023 and April 2023 (***Table 2.3***).

TABLE 2.3 MONTHLY AND QUARTERLY STG AND ANI FOR FINLESS PORPOISE

Survey Period	On-effort (km)	No. of Sighting	No. of Porpoise	STG	ANI
Nov 2022	116.27	4	19	3.44	16.34
Dec 2022	249.03	7	13	2.81	5.22
Jan 2023	305.74	7	10	2.29	3.27
Feb 2023	381.36	13	37	3.41	9.70
Mar 2023	271.00	16	40	5.90	14.76
Apr 2023	234.50	8	19	3.41	8.10
May 2023	308.75	8	21	2.59	6.80
Jun 2023	279.36	3	5	1.07	1.79
Jul 2023	365.41	1	3	0.27	0.82
Aug 2023	327.61	3	7	0.92	2.14
Sep 2023	317.93	9	24	2.83	7.55
Oct 2023	315.39	3	20	0.95	6.34
Overall (Nov 2022-Oct 2023)	3472.35	82	218	2.36	6.28

Notes:
[a] Only data collected at Beaufort 2 or below were included for encounter rate analysis.

2.2.2 PASSIVE ACOUSTIC MONITORING

2.2.2.1 SUMMARY OF PASSIVE ACOUSTIC MONITORING DATA COLLECTION

C-POD units were deployed at five locations (see ***Figure 2.2*** for the locations) during the post-monitoring period from 9 November 2022 to 6 December 2023 after completion of the marine-based construction works in October 2022. All units from the five deployment locations were recovered and refurbished for data download. The mean porpoise detection positive minutes (DPM) per day ranged from 80.1 to 245.4 for the five deployment locations. The summaries of deployment data are presented in ***Table 2.4*** below, with detection statistics of FP included in ***Annex D***.

TABLE 2.4 SUMMARY OF PAM DATA FOR EACH LOCATION

Location	Description
Location 1 (East of Tai A Chau)	The C-POD units were deployed for 282.9 days during the period of 9 November 2022 to 25 November 2023. Data could not be retrieved between 26 February and 4 May 2023, 22 August and 20 September 2023 as well as after 25 November 2023 due to equipment failure. Porpoise activity was recorded on most monitoring days (99.7%), with mean porpoise DPM per day to be 144.8.
Location 2 (FSRU-W)	The C-POD units were deployed for 319.1 days during the period of 9 November 2022 to 5 December 2023. The C-POD unit was lost during the period of 10 July 2023 to 20 September 2023. Porpoise activity was recorded on all monitoring days (100%), with mean porpoise DPM per day to be 237.8.
Location 3 (FSRU-E)	The C-POD units were deployed for 391.1 days during the period of 9 November 2022 to 5 December 2023. Porpoise activity was recorded on all monitoring days (100%), with mean porpoise DPM per day to be 245.4.
Location 4 (FSRU-N)	The C-POD units were deployed for 341.0 days during the period of 10 November 2022 to 17 October 2023. Data could not be retrieved after 17 October 2023 due to equipment failure. Porpoise activity was recorded on most monitoring days (92.4%), with mean porpoise DPM per day to be 183.0.
Location 5 (Shek Kwu Chau)	The C-POD units were deployed for 329.0 days during the period of 9 November 2022 to 25 November 2023. Data could not be retrieved between 10 December 2022 and 10 February 2023 due to equipment failure. Porpoise activity was recorded on most monitoring days (99.4%), with mean porpoise DPM per day to be 80.1.

2.2.2.2 EVALUATION OF DETECTION ERRORS, LOSS OF CLICK DETECTIONS AND BOAT SONAR

Visual validation was used to assess the overall rate of false positive porpoise DPM as identified by the KERNO classifier. Such false positives were found to be 0-2% (with 95% confidence level) across the monitoring locations (***Annex D***). Inspection of the sampled porpoise DPM found that the majority of false positives were most likely due to misclassified boat sonar noise.

Notably, the minute click limit can be exceeded in very noisy environments, meaning that no further clicks will be detected until the start of the next minutes. However, no time was lost at all five monitoring locations. Moreover, boat sonar was detected throughout the five monitoring locations, and this was generally around 50 kHz.

2.2.2.3 TEMPORAL VARIATIONS IN FINLESS PORPOISE OCCURRENCES

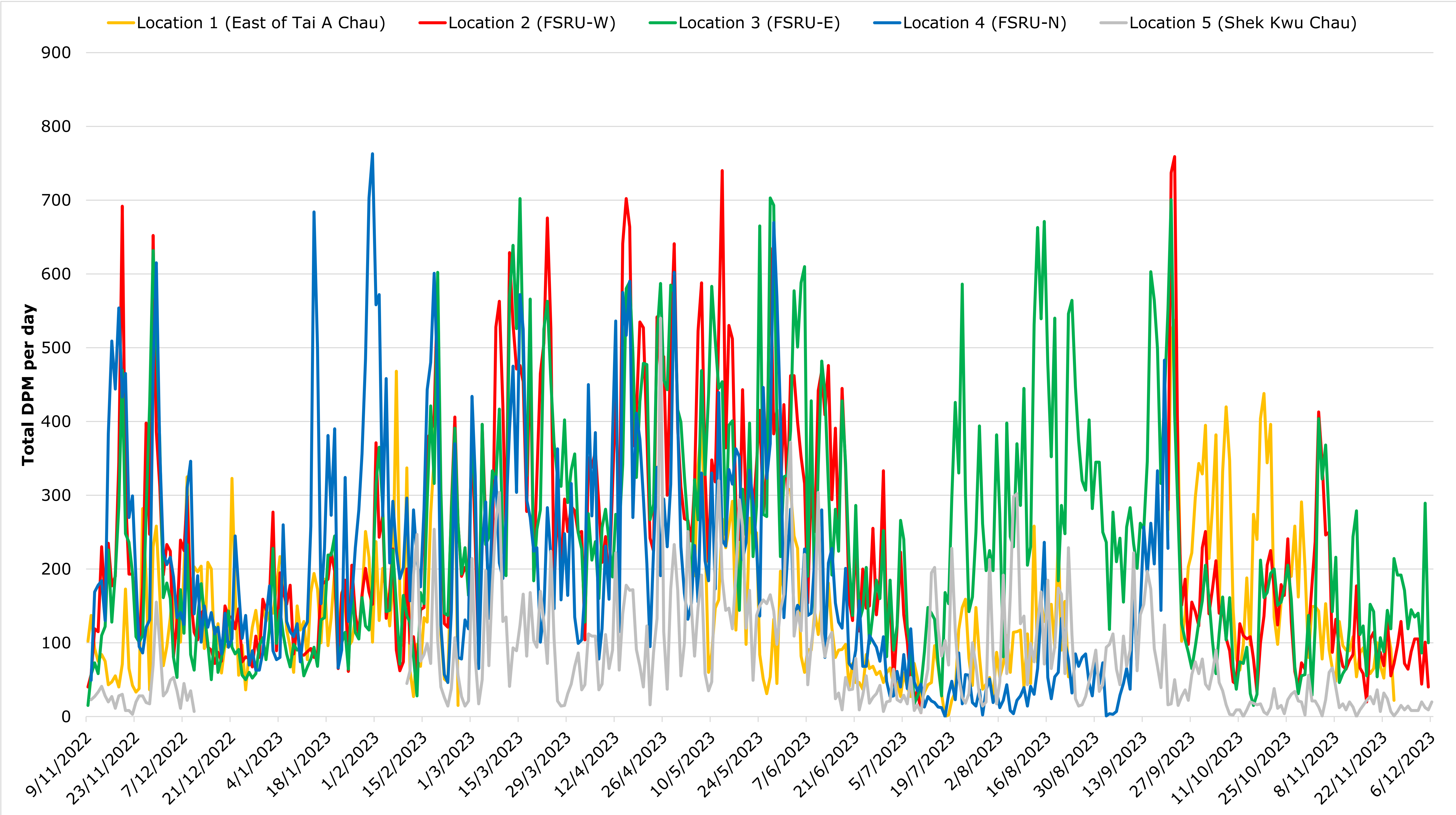
Variations in porpoise activity per day were observed at all five locations (***Figure 2.5***). At Location 1 (East of Tai A Chau), much higher porpoise activity was detected in February 2023 as well as in late September to October 2023. In contrast, such activity dropped noticeably between mid-June and mid-July, and in November 2023. Both Location 2 (FSRU-W) and Location 3 (FSRU-E) showed similar patterns in porpoise activities with several peaks detected between March and May 2023. At Location 3 (FSRU-E) with no interrupted period of data collection, there were several larger peaks between February and September 2023. Higher porpoise activity was detected between January and May 2023 at Location 4 (FSRU-N). In contrast, Location 5 (Shek Kwu Chau) recorded the least porpoise activity amongst the five locations.

2.2.2.4 DIEL PATTERNS ON FINLESS PORPOISE OCCURRENCES

The diel patterns of FP occurrences at the five deployment locations are presented in ***Figures 2.6-2.7***. All five locations generally showed a decline in porpoise activity from late morning to the middle of the day to some extent. Similar diel patterns were observed in Locations 2 - 4 (i.e. locations near the LNG terminal site) with peaks at early morning (around 6-7 am) and early evening (around 6-7 pm). Location 1 (East of Tai A Chau) and Location 5 (Shek Kwu Chau) were observed to have higher porpoise activity during night-time.

2.3 EVALUATION

For vessel-based line transect monitoring, the sightings of FP for the three monitoring phases (baseline, construction and post-construction) are presented in **Figure 2.8**. The results showed that FP were sighted in all the three survey areas (i.e. SWL, SEL and LM) during the three monitoring phases with sightings mainly recorded at both western and eastern sides of Tai A Chau, and the waters between Siu A Chau and Shek Kwu Chau (especially at the juncture of SWL and SEL survey areas). In addition, a few FP sightings were recorded near the Jetty during post-construction phase, indicating the return of FPs around the Jetty upon cessation of the disturbance. The findings are generally in line with the EIA prediction that marine mammals are expected to avoid the vicinity of the works areas and would return to the areas upon cessation of the disturbance. Based on the literature review, it is understood that



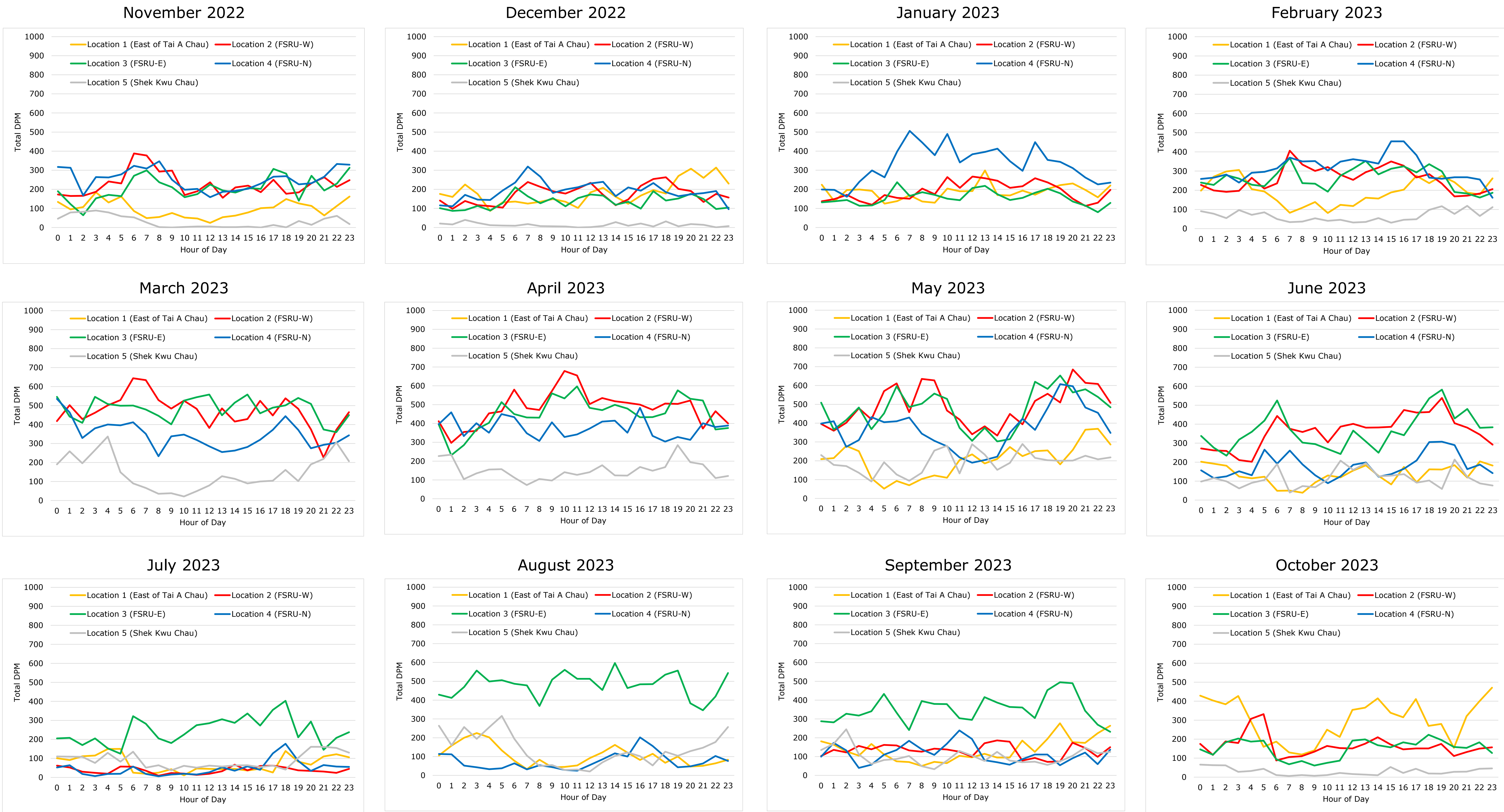
Remarks:
Location 1: Data could not be retrieved between 26 February and 4 May 2023, 22 August and 20 September 2023 as well as after 25 November 2023 due to equipment failure.
Location 2: The C-POD unit was lost during the period of 10 July 2023 to 20 September 2023.
Location 4: Data could not be retrieved after 17 October 2023 due to equipment failure.
Location 5: Data could not be retrieved between 10 December 2022 and 10 February 2023 due to equipment failure.

Figure 2.5

Detection Positive Minutes (DPM) per Day for Finless Porpoises among the Five Deployment Locations during the Post-construction Monitoring

ERM

Date: March 2024



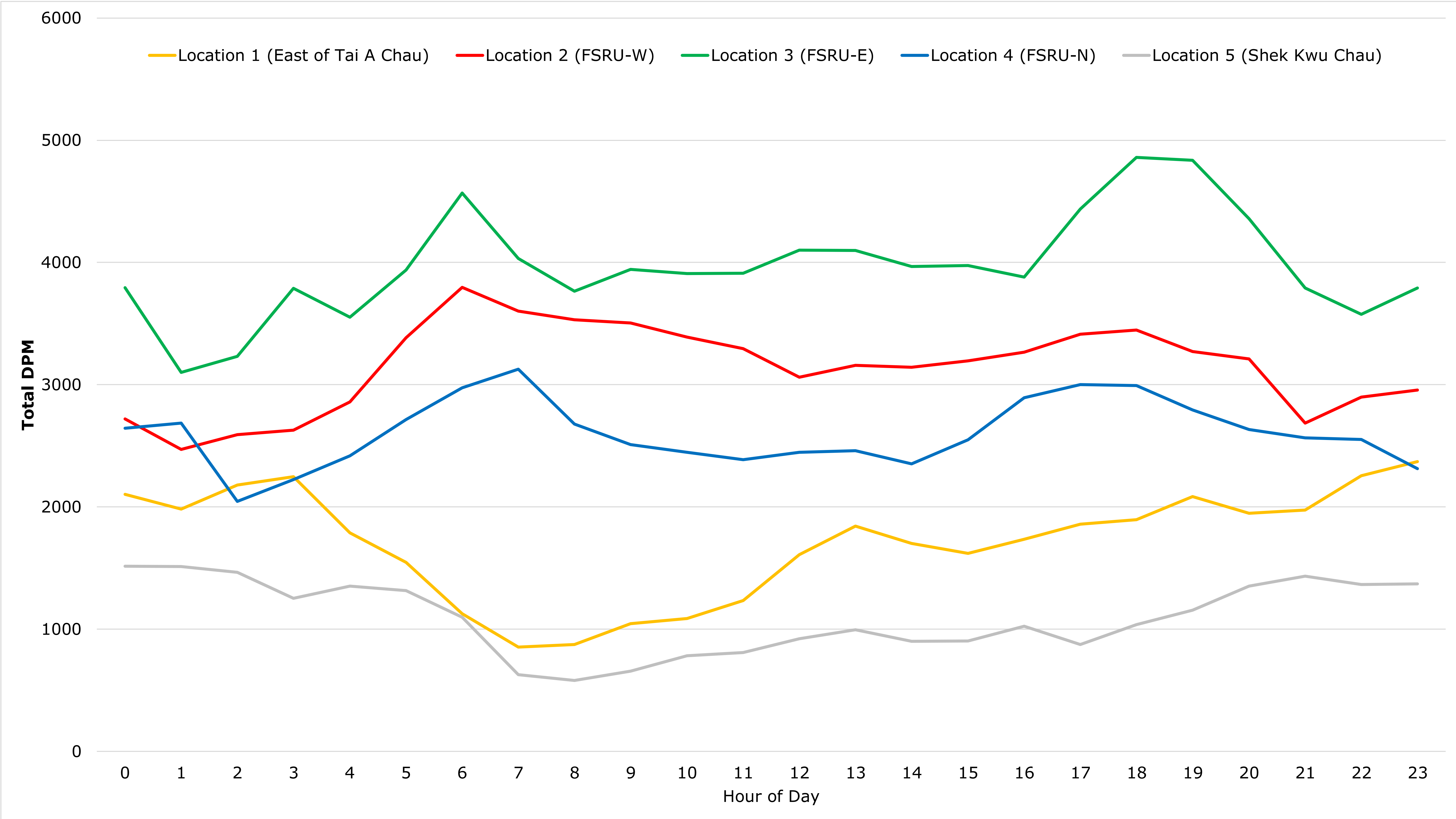
Remarks:
Location 1: Data could not be retrieved between 26 February and 4 May 2023, 22 August and 20 September 2023 as well as after 25 November 2023 due to equipment failure.
Location 2: The C-POD unit was lost during the period of 10 July 2023 to 20 September 2023.
Location 4: Data could not be retrieved after 17 October 2023 due to equipment failure.
Location 5: Data could not be retrieved between 10 December 2022 and 10 February 2023 due to equipment failure.

Figure 2.6

Monthly Comparisons on DPM Diel Patterns of Finless Porpoises among the Five Deployment Locations from November 2022 to October 2023

ERM

Date: March 2024



Remarks:
Location 1: Data could not be retrieved between 26 February and 4 May 2023, 22 August and 20 September 2023 as well as after 25 November 2023 due to equipment failure.
Location 2: The C-POD unit was lost during the period of 10 July 2023 to 20 September 2023.
Location 4: Data could not be retrieved after 17 October 2023 due to equipment failure.
Location 5: Data could not be retrieved between 10 December 2022 and 10 February 2023 due to equipment failure.

Figure 2.7

DPM Diel Patterns of Finless Porpoises among the Five Deployment Locations during the Post-construction Monitoring

ERM

Date: March 2024

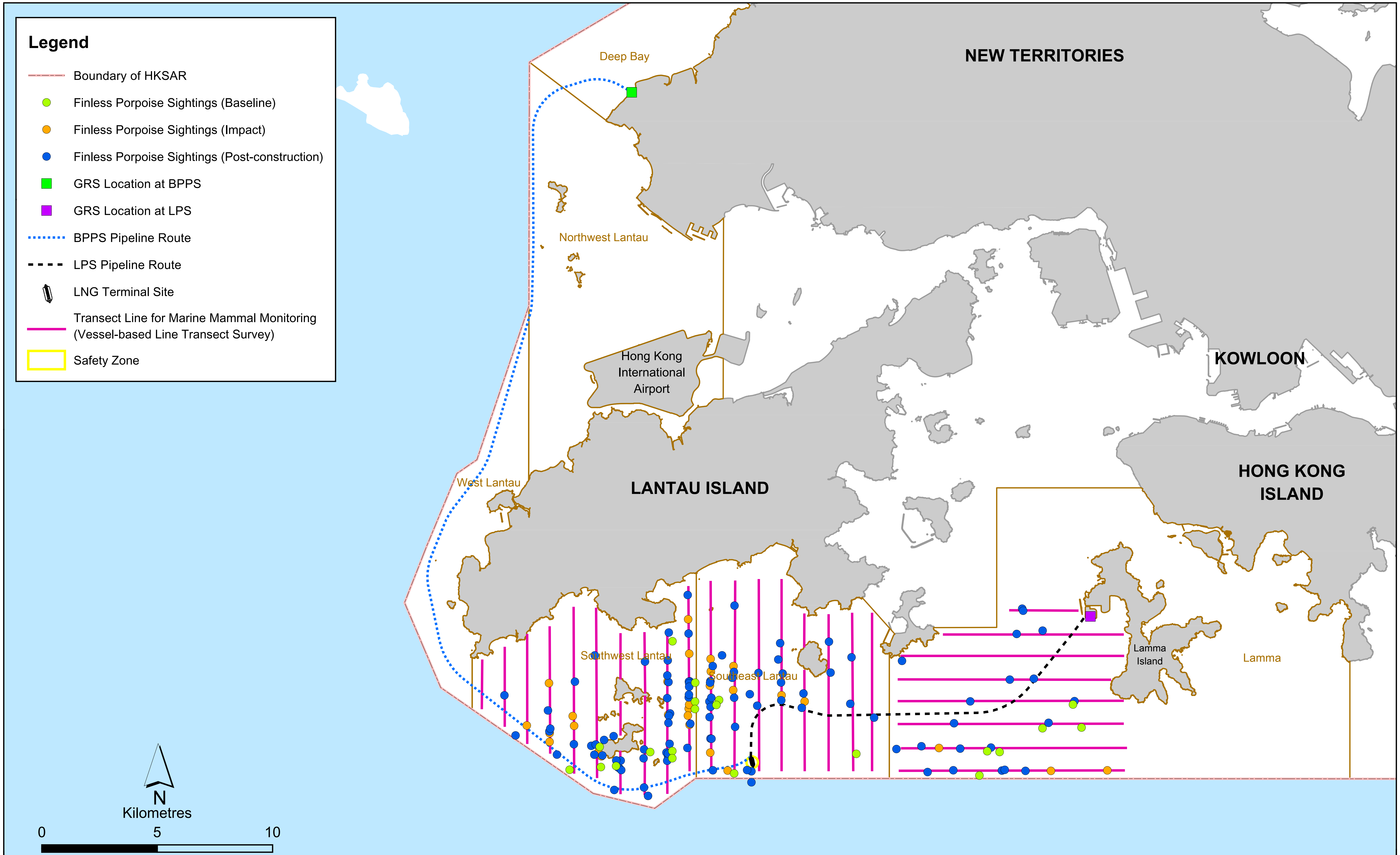


Figure 2.8

Distribution of Finless Porpoise Sightings during Marine Mammal Shipboard Survey

File: T:\GIS\CONTRACT\0505354\mxd\CWDFP\0505354_FP_3_Periods.mxd
Date: 7/3/2024

seasonal variation in distribution is evident for FP in Hong Kong [6][7][8]. FPs were reported to be more commonly sighted in southern waters (i.e. waters off South Lantau and Lamma) during winter (December-February) and spring (March-May), while in summer (June-August) and autumn (September-November) they occurred more often in eastern waters [9][10]. The 12-month post-construction monitoring showed that higher encounter rates of FP were recorded during winter and spring (December – May) which are broadly in line with the understanding of seasonal variation in distribution of FP in Hong Kong waters with peak season during winter and spring (December – May) in southern waters. The number of sightings and number of FPs were found to be higher during post-construction monitoring (23 groups of 78 FPs) when comparing with the same monitoring period (i.e. June to November) of baseline monitoring (18 groups of 35 FPs) and construction monitoring (19 groups of 62 FPs) [11]. Based on the vessel-based line transect survey results from the baseline, construction and post-construction monitoring, there is no evidence of unacceptable impacts on change in marine mammal distribution, abundance and usage pattern in the wider Hong Kong waters due to the construction of the Project.

For the PAM results, the mean porpoise DPM per day at the five deployment locations generally followed similar pattern amongst the baseline, construction and post-construction monitoring, with higher mean porpoise DPM per day recorded near the Jetty (i.e. Location 2, Location 3 and Location 4) during baseline (ranged from 207.1 to 241.5) and post-construction (ranged from 183.0 to 245.4) monitoring, and lower mean porpoise DPM per day recorded during construction monitoring (ranged from 80.3 to 137.9). This indicates that porpoise activities near the Jetty were lower during the construction phase, and then porpoise activities returned to a level similar to the baseline period during the post-construction phase. Diel patterns were found to be similar amongst the baseline, construction and post-construction monitoring with a decline in porpoise activity from late morning to the middle of the day to some extent. There is no observable change of diel patterns throughout the three monitoring phases. Based on the PAM results from the baseline, construction and post-construction monitoring, it is observed that there is a return of porpoise usage to a level similar to the baseline period around the Jetty during the post-construction monitoring period.

Overall, unacceptable impacts on marine mammals due to the Project were not detected, which aligns with the EIA study predictions.

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(6) Jefferson, T. A. and Braulik, G. T. 1999. Preliminary report on the ecology of the finless porpoise in Hong Kong waters. IBI Reports 9: 41-54.
(7) Jefferson, T. A., Hung, S. K., Law, L., Torey, M. and Tregenza, N. 2002. Distribution and abundance of finless porpoises in Hong Kong and adjacent waters of China. Raffles Bulletin of Zoology, Supplement 10:43-55.
(8) Hung, S. K. 2005. Monitoring of finless porpoise (Neophocaena phocaenoides) in Hong Kong waters: final report (2003-05). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department, 95 pp.
(9) Jefferson, T. A., Hung, S. K., Law, L., Torey, M. and Tregenza, N. 2002. Op cit.
(10) Hung, S. K. 2005. Op cit.
(11) It should be noted that construction phase marine mammal monitoring was conducted in December 2020 and July to November 2021. The data collected in July to November 2021 are presented for comparison.

3. CONCLUSION

In accordance with the Updated EM&A Manual of the Project, post-construction marine mammal monitoring was conducted between November 2022 and December 2023 upon completion of marine construction activities for the Project.

A total of 103 groups of 250 FPs were sighted among the three survey areas between November 2022 and October 2023. The monthly variations in combined encounter rates during the post-construction monitoring period indicated that FP occurrences peaked in November 2022, with another peak between February 2023 and April 2023, which are broadly in line with the understanding of seasonal variation in distribution of FP in Hong Kong waters. For the PAM results collected between November 2022 and December 2023, the mean porpoise DPM per day ranged from 80.1 to 245.4 for the five deployment locations.

The change in distribution of the finless porpoises between the baseline, construction and post-construction monitoring was evaluated. The number of sightings and number of FPs were found to be higher during post-construction monitoring (23 groups of 78 FPs) when comparing with the same monitoring period (i.e. June to November) of baseline monitoring (18 groups of 35 FPs) and construction monitoring (19 groups of 62 FPs). A few FP sightings were recorded near the Jetty during post-construction phase, indicating the return of FPs around the Jetty upon cessation of the disturbance. The PAM results also showed a return of porpoise usage to a level similar to the baseline period around the Jetty during the post-construction monitoring period.

Overall, unacceptable impacts on marine mammals due to the Project were not detected, which aligns with the EIA study predictions.

ANNEX A MONITORING SCHEDULE

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (November 2022)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1/Nov	2/Nov	3/Nov	4/Nov	5/Nov
6/Nov	7/Nov	8/Nov	9/Nov	10/Nov	11/Nov	12/Nov
	Vessel Survey (Lamma)		**Vessel Survey (SEL/SWL)**		**Vessel Survey (SWL)**	
13/Nov	14/Nov	15/Nov	16/Nov	17/Nov	18/Nov	19/Nov
		Vessel Survey (SWL)		**Vessel Survey (Lamma)**		
20/Nov	21/Nov	22/Nov	23/Nov	24/Nov	25/Nov	26/Nov
27/Nov	28/Nov	29/Nov	30/Nov			
		Vessel Survey (SEL/SWL)				

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project
Post-Construction Marine Mammal Monitoring Schedule (December 2022)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1/Dec	2/Dec	3/Dec
					Vessel Survey (SWL)	
4/Dec	5/Dec	6/Dec	7/Dec	8/Dec	9/Dec	10/Dec
			Vessel Survey (Lamma)	**Vessel Survey (SEL/SWL)**		
11/Dec	12/Dec	13/Dec	14/Dec	15/Dec	16/Dec	17/Dec
		Vessel Survey (SWL)		**Vessel Survey (SEL/SWL)**		
18/Dec	19/Dec	20/Dec	21/Dec	22/Dec	23/Dec	24/Dec
				Vessel Survey (Lamma)		
25/Dec	26/Dec	27/Dec	28/Dec	29/Dec	30/Dec	31/Dec

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project
Post-Construction Marine Mammal Monitoring Schedule (January 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1/Jan	2/Jan	3/Jan	4/Jan	5/Jan	6/Jan	7/Jan
		Vessel Survey (Lamma)		**Vessel Survey (SWL)**		
8/Jan	9/Jan	10/Jan	11/Jan	12/Jan	13/Jan	14/Jan
		Vessel Survey (SEL/SWL)		**Vessel Survey (SWL)**	**Vessel Survey (SEL/SWL)**	
15/Jan	16/Jan	17/Jan	18/Jan	19/Jan	20/Jan	21/Jan
				Vessel Survey (Lamma)		
22/Jan	23/Jan	24/Jan	25/Jan	26/Jan	27/Jan	28/Jan
29/Jan	30/Jan	31/Jan				

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (February 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1/Feb	2/Feb	3/Feb	4/Feb
			Vessel Survey (Lamma)			
5/Feb	6/Feb	7/Feb	8/Feb	9/Feb	10/Feb	11/Feb
	Vessel Survey (SWL)	**Vessel Survey (SEL)**			**Vessel Survey (Lamma)**	
12/Feb	13/Feb	14/Feb	15/Feb	16/Feb	17/Feb	18/Feb
	Vessel Survey (SEL/SWL)					
19/Feb	20/Feb	21/Feb	22/Feb	23/Feb	24/Feb	25/Feb
	Vessel Survey (SWL)					
26/Feb	27/Feb	28/Feb				

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (March 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1/Mar	2/Mar	3/Mar	4/Mar
5/Mar	6/Mar	7/Mar	8/Mar	9/Mar	10/Mar	11/Mar
			Vessel Survey (SEL/SWL)		**Vessel Survey (Lamma)**	
12/Mar	13/Mar	14/Mar	15/Mar	16/Mar	17/Mar	18/Mar
			Vessel Survey (SWL)		**Vessel Survey (Lamma)**	
19/Mar	20/Mar	21/Mar	22/Mar	23/Mar	24/Mar	25/Mar
		Vessel Survey (SEL/SWL)		**Vessel Survey (SWL)**		
26/Mar	27/Mar	28/Mar	29/Mar	30/Mar	31/Mar	

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (April 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1/Apr
2/Apr	3/Apr	4/Apr	5/Apr	6/Apr	7/Apr	8/Apr
9/Apr	10/Apr	11/Apr	12/Apr **Vessel Survey (SWL)**	13/Apr **Vessel Survey (SEL/SWL)**	14/Apr **Vessel Survey (Lamma)**	15/Apr
16/Apr	17/Apr	18/Apr	19/Apr	20/Apr **Vessel Survey (Lamma)**	21/Apr	22/Apr
23/Apr	24/Apr **Vessel Survey (SWL)**	25/Apr **Vessel Survey (SEL/SWL)**	26/Apr **Vessel Survey (SEL)**	27/Apr	28/Apr	29/Apr
30/Apr						

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (May 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1/May	2/May	3/May	4/May	5/May	6/May
			Vessel Survey (Lamma)			
7/May	8/May	9/May	10/May	11/May	12/May	13/May
14/May	15/May	16/May	17/May	18/May	19/May	20/May
	Vessel Survey (SWL)			**Vessel Survey (SEL/SWL)**	**Vessel Survey (Lamma)**	
21/May	22/May	23/May	24/May	25/May	26/May	27/May
	Vessel Survey (SEL/SWL)	**Vessel Survey (SWL)**				
28/May	29/May	30/May	31/May			

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (June 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1/Jun	2/Jun	3/Jun
4/Jun	5/Jun	6/Jun	7/Jun	8/Jun	9/Jun	10/Jun
				Vessel Survey (SWL)	**Vessel Survey (Lamma)**	
11/Jun	12/Jun	13/Jun	14/Jun	15/Jun	16/Jun	17/Jun
			Vessel Survey (SEL/SWL)			
18/Jun	19/Jun	20/Jun	21/Jun	22/Jun	23/Jun	24/Jun
			Vessel Survey (Lamma)			
25/Jun	26/Jun	27/Jun	28/Jun	29/Jun	30/Jun	
	Vessel Survey (SEL/SWL)	**Vessel Survey (SWL)**				

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Tentative Post-Construction Marine Mammal Monitoring Schedule (July 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1/Jul
2/Jul	3/Jul	4/Jul	5/Jul	6/Jul **Vessel Survey (SWL)**	7/Jul	8/Jul
9/Jul	10/Jul	11/Jul	12/Jul **Vessel Survey (Lamma)**	13/Jul	14/Jul **Vessel Survey (SEL/SWL)**	15/Jul
16/Jul	17/Jul	18/Jul	19/Jul	20/Jul **Vessel Survey (SWL)**	21/Jul **Vessel Survey (SEL)**	22/Jul
23/Jul	24/Jul **Vessel Survey (Lamma)**	25/Jul	26/Jul	27/Jul	28/Jul	29/Jul
30/Jul	31/Jul					

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (August 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1/Aug	2/Aug	3/Aug	4/Aug	5/Aug
		Vessel Survey (SWL)	**Vessel Survey (SEL)**	**Vessel Survey (Lamma)**		
6/Aug	7/Aug	8/Aug	9/Aug	10/Aug	11/Aug	12/Aug
			Vessel Survey (SWL)			
13/Aug	14/Aug	15/Aug	16/Aug	17/Aug	18/Aug	19/Aug
20/Aug	21/Aug	22/Aug	23/Aug	24/Aug	25/Aug	26/Aug
		Vessel Survey (SEL/SWL)	**Vessel Survey (Lamma)**			
27/Aug	28/Aug	29/Aug	30/Aug	31/Aug		

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (September 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1/Sep	2/Sep
3/Sep	4/Sep	5/Sep	6/Sep	7/Sep	8/Sep	9/Sep
	Vessel Survey (SWL)			**Vessel Survey (SEL/Lamma)**		
10/Sep	11/Sep	12/Sep	13/Sep	14/Sep	15/Sep	16/Sep
		Vessel Survey (SEL/SWL)	**Vessel Survey (SEL/Lamma)**	**Vessel Survey (SEL/SWL)**		
17/Sep	18/Sep	19/Sep	20/Sep	21/Sep	22/Sep	23/Sep
			Vessel Survey (SWL)			
24/Sep	25/Sep	26/Sep	27/Sep	28/Sep	29/Sep	30/Sep

Environmental Team Consultancy Services for the Hong Kong Offshore LNG Terminal Project

Post-Construction Marine Mammal Monitoring Schedule (October 2023)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1/Oct	2/Oct	3/Oct	4/Oct	5/Oct	6/Oct
			Vessel Survey (Lamma)	**Vessel Survey (SEL/SWL)**		
7/Oct	8/Oct	9/Oct	10/Oct	11/Oct	12/Oct	13/Oct
					Vessel Survey (SWL)	**Vessel Survey (SEL/SWL)**
14/Oct	15/Oct	16/Oct	17/Oct	18/Oct	19/Oct	20/Oct
						Vessel Survey (SWL)
21/Oct	22/Oct	23/Oct	24/Oct	25/Oct	26/Oct	27/Oct
					Vessel Survey (Lamma/SEL)	
28/Oct	29/Oct	30/Oct	31/Oct	1/Nov		

ERM

ANNEX B VESSEL-BASED LINE TRANSECT SURVEY EFFORT DATABASE

Annex B HKOLNG Survey Effort Database (Nov 2022-Oct 2023)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
07-Nov-22	LAMMA	2	5.78	AUTUMN	STANDARD138716	P
07-Nov-22	LAMMA	3	62.09	AUTUMN	STANDARD138716	P
07-Nov-22	LAMMA	2	5.19	AUTUMN	STANDARD138716	S
07-Nov-22	LAMMA	3	5.54	AUTUMN	STANDARD138716	S
09-Nov-22	SW LANTAU	2	3.89	AUTUMN	STANDARD36826	P
09-Nov-22	SW LANTAU	3	4.02	AUTUMN	STANDARD36826	P
09-Nov-22	SE LANTAU	2	5.48	AUTUMN	STANDARD36826	P
09-Nov-22	SE LANTAU	3	48.45	AUTUMN	STANDARD36826	P
09-Nov-22	SE LANTAU	4	3.80	AUTUMN	STANDARD36826	P
09-Nov-22	SE LANTAU	2	3.27	AUTUMN	STANDARD36826	S
09-Nov-22	SE LANTAU	3	6.60	AUTUMN	STANDARD36826	S
09-Nov-22	SE LANTAU	4	1.10	AUTUMN	STANDARD36826	S
11-Nov-22	SW LANTAU	2	23.83	AUTUMN	STANDARD138716	P
11-Nov-22	SW LANTAU	3	23.13	AUTUMN	STANDARD138716	P
11-Nov-22	SW LANTAU	2	7.69	AUTUMN	STANDARD138716	S
11-Nov-22	SW LANTAU	3	7.35	AUTUMN	STANDARD138716	S
15-Nov-22	SW LANTAU	2	1.30	AUTUMN	STANDARD138716	P
15-Nov-22	SW LANTAU	3	50.19	AUTUMN	STANDARD138716	P
15-Nov-22	SW LANTAU	2	2.50	AUTUMN	STANDARD138716	S
15-Nov-22	SW LANTAU	3	13.81	AUTUMN	STANDARD138716	S
15-Nov-22	SW LANTAU	4	1.30	AUTUMN	STANDARD138716	S
17-Nov-22	LAMMA	2	23.00	AUTUMN	STANDARD138716	P
17-Nov-22	LAMMA	3	46.19	AUTUMN	STANDARD138716	P
17-Nov-22	LAMMA	2	4.92	AUTUMN	STANDARD138716	S
17-Nov-22	LAMMA	3	4.49	AUTUMN	STANDARD138716	S
29-Nov-22	SE LANTAU	2	18.25	AUTUMN	STANDARD138716	P
29-Nov-22	SE LANTAU	3	38.38	AUTUMN	STANDARD138716	P
29-Nov-22	SE LANTAU	1	1.02	AUTUMN	STANDARD138716	S
29-Nov-22	SE LANTAU	2	4.86	AUTUMN	STANDARD138716	S
29-Nov-22	SE LANTAU	3	4.85	AUTUMN	STANDARD138716	S
29-Nov-22	SW LANTAU	2	5.29	AUTUMN	STANDARD138716	P
02-Dec-22	SW LANTAU	2	20.65	WINTER	STANDARD138716	P
02-Dec-22	SW LANTAU	3	30.51	WINTER	STANDARD138716	P
02-Dec-22	SW LANTAU	4	4.15	WINTER	STANDARD138716	P
02-Dec-22	SW LANTAU	2	10.20	WINTER	STANDARD138716	S
02-Dec-22	SW LANTAU	3	5.90	WINTER	STANDARD138716	S
07-Dec-22	LAMMA	2	28.67	WINTER	STANDARD138716	P
07-Dec-22	LAMMA	3	40.96	WINTER	STANDARD138716	P
07-Dec-22	LAMMA	2	5.74	WINTER	STANDARD138716	S
07-Dec-22	LAMMA	3	3.73	WINTER	STANDARD138716	S
08-Dec-22	SE LANTAU	2	56.71	WINTER	STANDARD140232	P
08-Dec-22	SE LANTAU	3	0.77	WINTER	STANDARD140232	P
08-Dec-22	SE LANTAU	2	11.49	WINTER	STANDARD140232	S
08-Dec-22	SW LANTAU	2	3.55	WINTER	STANDARD140232	P
13-Dec-22	SW LANTAU	2	13.65	WINTER	STANDARD36826	P
13-Dec-22	SW LANTAU	3	28.17	WINTER	STANDARD36826	P
13-Dec-22	SW LANTAU	4	3.95	WINTER	STANDARD36826	P
13-Dec-22	SW LANTAU	2	5.63	WINTER	STANDARD36826	S
13-Dec-22	SW LANTAU	3	10.80	WINTER	STANDARD36826	S
13-Dec-22	SW LANTAU	4	1.04	WINTER	STANDARD36826	S

Annex B (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
15-Dec-22	SE LANTAU	2	37.28	WINTER	STANDARD36826	P
15-Dec-22	SE LANTAU	3	13.95	WINTER	STANDARD36826	P
15-Dec-22	SE LANTAU	2	14.86	WINTER	STANDARD36826	S
15-Dec-22	SE LANTAU	3	2.12	WINTER	STANDARD36826	S
15-Dec-22	SW LANTAU	1	2.98	WINTER	STANDARD36826	P
15-Dec-22	SW LANTAU	2	4.82	WINTER	STANDARD36826	P
22-Dec-22	LAMMA	2	28.60	WINTER	STANDARD138716	P
22-Dec-22	LAMMA	3	39.51	WINTER	STANDARD138716	P
22-Dec-22	LAMMA	2	4.20	WINTER	STANDARD138716	S
22-Dec-22	LAMMA	3	4.89	WINTER	STANDARD138716	S
03-Jan-23	LAMMA	2	15.91	WINTER	STANDARD138716	P
03-Jan-23	LAMMA	3	52.93	WINTER	STANDARD138716	P
03-Jan-23	LAMMA	2	5.47	WINTER	STANDARD138716	S
03-Jan-23	LAMMA	3	4.09	WINTER	STANDARD138716	S
05-Jan-23	SW LANTAU	2	43.56	WINTER	STANDARD36826	P
05-Jan-23	SW LANTAU	3	1.71	WINTER	STANDARD36826	P
05-Jan-23	SW LANTAU	2	14.04	WINTER	STANDARD36826	S
10-Jan-23	SW LANTAU	2	8.10	WINTER	STANDARD138716	P
10-Jan-23	SE LANTAU	1	11.39	WINTER	STANDARD138716	P
10-Jan-23	SE LANTAU	2	46.02	WINTER	STANDARD138716	P
10-Jan-23	SE LANTAU	1	1.90	WINTER	STANDARD138716	S
10-Jan-23	SE LANTAU	2	8.19	WINTER	STANDARD138716	S
12-Jan-23	SW LANTAU	2	4.30	WINTER	STANDARD138716	P
12-Jan-23	SW LANTAU	3	36.30	WINTER	STANDARD138716	P
12-Jan-23	SW LANTAU	4	7.80	WINTER	STANDARD138716	P
12-Jan-23	SW LANTAU	2	4.10	WINTER	STANDARD138716	S
12-Jan-23	SW LANTAU	3	11.20	WINTER	STANDARD138716	S
12-Jan-23	SW LANTAU	4	2.40	WINTER	STANDARD138716	S
13-Jan-23	SE LANTAU	1	39.57	WINTER	STANDARD36826	P
13-Jan-23	SE LANTAU	2	20.34	WINTER	STANDARD36826	P
13-Jan-23	SE LANTAU	1	6.19	WINTER	STANDARD36826	S
13-Jan-23	SE LANTAU	2	4.10	WINTER	STANDARD36826	S
13-Jan-23	SW LANTAU	2	4.13	WINTER	STANDARD36826	P
19-Jan-23	LAMMA	2	59.73	WINTER	STANDARD36826	P
19-Jan-23	LAMMA	3	7.49	WINTER	STANDARD36826	P
19-Jan-23	LAMMA	2	8.70	WINTER	STANDARD36826	S
01-Feb-23	LAMMA	1	16.50	WINTER	STANDARD36826	P
01-Feb-23	LAMMA	2	29.32	WINTER	STANDARD36826	P
01-Feb-23	LAMMA	3	21.10	WINTER	STANDARD36826	P
01-Feb-23	LAMMA	1	4.07	WINTER	STANDARD36826	S
01-Feb-23	LAMMA	2	3.25	WINTER	STANDARD36826	S
01-Feb-23	LAMMA	3	2.10	WINTER	STANDARD36826	S
06-Feb-23	SW LANTAU	2	36.77	WINTER	STANDARD140232	P
06-Feb-23	SW LANTAU	3	17.60	WINTER	STANDARD140232	P
06-Feb-23	SW LANTAU	2	15.05	WINTER	STANDARD140232	S
06-Feb-23	SW LANTAU	3	2.00	WINTER	STANDARD140232	S
07-Feb-23	SE LANTAU	1	1.40	WINTER	STANDARD140232	P
07-Feb-23	SE LANTAU	2	55.32	WINTER	STANDARD140232	P
07-Feb-23	SE LANTAU	2	12.08	WINTER	STANDARD140232	S

Annex B (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
10-Feb-23	LAMMA	1	55.64	WINTER	STANDARD36826	P
10-Feb-23	LAMMA	2	11.33	WINTER	STANDARD36826	P
10-Feb-23	LAMMA	1	4.82	WINTER	STANDARD36826	S
10-Feb-23	LAMMA	2	3.91	WINTER	STANDARD36826	S
13-Feb-23	SE LANTAU	1	14.30	WINTER	STANDARD36826	P
13-Feb-23	SE LANTAU	2	41.70	WINTER	STANDARD36826	P
13-Feb-23	SE LANTAU	3	1.00	WINTER	STANDARD36826	P
13-Feb-23	SE LANTAU	1	6.35	WINTER	STANDARD36826	S
13-Feb-23	SE LANTAU	2	4.77	WINTER	STANDARD36826	S
13-Feb-23	SW LANTAU	2	11.48	WINTER	STANDARD36826	P
13-Feb-23	SW LANTAU	1	0.81	WINTER	STANDARD36826	S
13-Feb-23	SW LANTAU	2	1.41	WINTER	STANDARD36826	S
20-Feb-23	SW LANTAU	2	39.45	WINTER	STANDARD36826	P
20-Feb-23	SW LANTAU	3	4.10	WINTER	STANDARD36826	P
20-Feb-23	SW LANTAU	2	11.63	WINTER	STANDARD36826	S
20-Feb-23	SW LANTAU	3	2.50	WINTER	STANDARD36826	S
08-Mar-23	SE LANTAU	1	8.50	SPRING	STANDARD36826	P
08-Mar-23	SE LANTAU	2	49.69	SPRING	STANDARD36826	P
08-Mar-23	SE LANTAU	1	0.92	SPRING	STANDARD36826	S
08-Mar-23	SE LANTAU	2	10.60	SPRING	STANDARD36826	S
08-Mar-23	SW LANTAU	2	7.71	SPRING	STANDARD36826	P
10-Mar-23	LAMMA	2	4.08	SPRING	STANDARD36826	P
10-Mar-23	LAMMA	3	63.17	SPRING	STANDARD36826	P
10-Mar-23	LAMMA	2	4.66	SPRING	STANDARD36826	S
10-Mar-23	LAMMA	3	4.80	SPRING	STANDARD36826	S
15-Mar-23	SW LANTAU	2	27.60	SPRING	STANDARD36826	P
15-Mar-23	SW LANTAU	3	18.14	SPRING	STANDARD36826	P
15-Mar-23	SW LANTAU	2	6.41	SPRING	STANDARD36826	S
15-Mar-23	SW LANTAU	3	8.25	SPRING	STANDARD36826	S
17-Mar-23	LAMMA	2	11.45	SPRING	STANDARD36826	P
17-Mar-23	LAMMA	3	54.96	SPRING	STANDARD36826	P
17-Mar-23	LAMMA	2	5.85	SPRING	STANDARD36826	S
17-Mar-23	LAMMA	3	3.90	SPRING	STANDARD36826	S
21-Mar-23	SE LANTAU	2	56.85	SPRING	STANDARD36826	P
21-Mar-23	SE LANTAU	3	0.80	SPRING	STANDARD36826	P
21-Mar-23	SE LANTAU	2	10.85	SPRING	STANDARD36826	S
21-Mar-23	SW LANTAU	2	8.06	SPRING	STANDARD36826	P
23-Mar-23	SW LANTAU	1	6.40	SPRING	STANDARD36826	P
23-Mar-23	SW LANTAU	2	38.04	SPRING	STANDARD36826	P
23-Mar-23	SW LANTAU	3	2.74	SPRING	STANDARD36826	P
23-Mar-23	SW LANTAU	1	1.17	SPRING	STANDARD36826	S
23-Mar-23	SW LANTAU	2	12.16	SPRING	STANDARD36826	S
23-Mar-23	SW LANTAU	3	1.37	SPRING	STANDARD36826	S
12-Apr-23	SW LANTAU	1	1.03	SPRING	STANDARD138716	P
12-Apr-23	SW LANTAU	2	45.16	SPRING	STANDARD138716	P
12-Apr-23	SW LANTAU	2	13.64	SPRING	STANDARD138716	S
13-Apr-23	SE LANTAU	2	1.00	SPRING	STANDARD138716	P
13-Apr-23	SE LANTAU	3	45.14	SPRING	STANDARD138716	P
13-Apr-23	SE LANTAU	4	11.38	SPRING	STANDARD138716	P
13-Apr-23	SE LANTAU	2	4.08	SPRING	STANDARD138716	S
13-Apr-23	SE LANTAU	3	3.72	SPRING	STANDARD138716	S
13-Apr-23	SE LANTAU	4	0.80	SPRING	STANDARD138716	S

Annex B (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
13-Apr-23	SW LANTAU	3	7.89	SPRING	STANDARD138716	P
14-Apr-23	LAMMA	1	1.58	SPRING	STANDARD140232	P
14-Apr-23	LAMMA	2	65.17	SPRING	STANDARD140232	P
14-Apr-23	LAMMA	3	2.10	SPRING	STANDARD140232	P
14-Apr-23	LAMMA	2	9.25	SPRING	STANDARD140232	S
20-Apr-23	LAMMA	1	13.63	SPRING	STANDARD138716	P
20-Apr-23	LAMMA	2	21.59	SPRING	STANDARD138716	P
20-Apr-23	LAMMA	3	34.51	SPRING	STANDARD138716	P
20-Apr-23	LAMMA	2	6.18	SPRING	STANDARD138716	S
20-Apr-23	LAMMA	3	3.39	SPRING	STANDARD138716	S
24-Apr-23	SW LANTAU	2	11.56	SPRING	STANDARD138716	P
24-Apr-23	SW LANTAU	3	38.43	SPRING	STANDARD138716	P
24-Apr-23	SW LANTAU	2	6.96	SPRING	STANDARD138716	S
24-Apr-23	SW LANTAU	3	9.35	SPRING	STANDARD138716	S
25-Apr-23	SW LANTAU	2	4.74	SPRING	STANDARD36826	P
25-Apr-23	SE LANTAU	2	7.71	SPRING	STANDARD36826	P
25-Apr-23	SE LANTAU	3	33.77	SPRING	STANDARD36826	P
25-Apr-23	SE LANTAU	2	2.92	SPRING	STANDARD36826	S
25-Apr-23	SE LANTAU	3	6.18	SPRING	STANDARD36826	S
26-Apr-23	SE LANTAU	2	16.54	SPRING	STANDARD138716	P
26-Apr-23	SE LANTAU	2	1.76	SPRING	STANDARD138716	S
03-May-23	LAMMA	2	15.72	SPRING	STANDARD25686	P
03-May-23	LAMMA	3	52.98	SPRING	STANDARD25686	P
03-May-23	LAMMA	2	3.20	SPRING	STANDARD25686	S
03-May-23	LAMMA	3	6.40	SPRING	STANDARD25686	S
15-May-23	SW LANTAU	1	11.39	SPRING	STANDARD25686	P
15-May-23	SW LANTAU	2	33.05	SPRING	STANDARD25686	P
15-May-23	SW LANTAU	1	1.78	SPRING	STANDARD25686	S
15-May-23	SW LANTAU	2	10.90	SPRING	STANDARD25686	S
18-May-23	SE LANTAU	1	17.21	SPRING	STANDARD25686	P
18-May-23	SE LANTAU	2	38.34	SPRING	STANDARD25686	P
18-May-23	SE LANTAU	1	1.67	SPRING	STANDARD25686	S
18-May-23	SE LANTAU	2	8.71	SPRING	STANDARD25686	S
18-May-23	SW LANTAU	2	8.26	SPRING	STANDARD25686	P
19-May-23	LAMMA	1	10.28	SPRING	STANDARD25686	P
19-May-23	LAMMA	2	53.01	SPRING	STANDARD25686	P
19-May-23	LAMMA	3	2.80	SPRING	STANDARD25686	P
19-May-23	LAMMA	1	2.92	SPRING	STANDARD25686	S
19-May-23	LAMMA	2	5.69	SPRING	STANDARD25686	S
22-May-23	SE LANTAU	2	37.75	SPRING	STANDARD25686	P
22-May-23	SE LANTAU	3	19.67	SPRING	STANDARD25686	P
22-May-23	SE LANTAU	2	9.45	SPRING	STANDARD25686	S
22-May-23	SE LANTAU	3	1.00	SPRING	STANDARD25686	S
22-May-23	SW LANTAU	2	4.08	SPRING	STANDARD25686	P
22-May-23	SW LANTAU	3	1.09	SPRING	STANDARD25686	P
23-May-23	SW LANTAU	1	3.30	SPRING	STANDARD36826	P
23-May-23	SW LANTAU	2	23.22	SPRING	STANDARD36826	P
23-May-23	SW LANTAU	3	11.58	SPRING	STANDARD36826	P
23-May-23	SW LANTAU	4	10.00	SPRING	STANDARD36826	P
23-May-23	SW LANTAU	1	1.20	SPRING	STANDARD36826	S
23-May-23	SW LANTAU	2	7.62	SPRING	STANDARD36826	S
23-May-23	SW LANTAU	3	6.18	SPRING	STANDARD36826	S

Annex B (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
23-May-23	SW LANTAU	4	2.30	SPRING	STANDARD36826	S
08-Jun-23	SW LANTAU	2	21.35	SUMMER	STANDARD25686	P
08-Jun-23	SW LANTAU	3	22.67	SUMMER	STANDARD25686	P
08-Jun-23	SW LANTAU	2	3.50	SUMMER	STANDARD25686	S
08-Jun-23	SW LANTAU	3	10.48	SUMMER	STANDARD25686	S
09-Jun-23	LAMMA	2	58.39	SUMMER	STANDARD25686	P
09-Jun-23	LAMMA	3	7.50	SUMMER	STANDARD25686	P
09-Jun-23	LAMMA	2	7.32	SUMMER	STANDARD25686	S
09-Jun-23	LAMMA	3	0.80	SUMMER	STANDARD25686	S
14-Jun-23	SE LANTAU	0	0.61	SUMMER	STANDARD25686	P
14-Jun-23	SE LANTAU	1	10.26	SUMMER	STANDARD25686	P
14-Jun-23	SE LANTAU	2	34.11	SUMMER	STANDARD25686	P
14-Jun-23	SE LANTAU	3	9.90	SUMMER	STANDARD25686	P
14-Jun-23	SE LANTAU	0	0.33	SUMMER	STANDARD25686	S
14-Jun-23	SE LANTAU	1	0.62	SUMMER	STANDARD25686	S
14-Jun-23	SE LANTAU	2	11.32	SUMMER	STANDARD25686	S
14-Jun-23	SE LANTAU	3	2.00	SUMMER	STANDARD25686	S
14-Jun-23	SW LANTAU	2	2.80	SUMMER	STANDARD25686	P
14-Jun-23	SW LANTAU	3	5.32	SUMMER	STANDARD25686	P
21-Jun-23	LAMMA	2	2.70	SUMMER	STANDARD25686	P
21-Jun-23	LAMMA	3	63.31	SUMMER	STANDARD25686	P
21-Jun-23	LAMMA	3	8.49	SUMMER	STANDARD25686	S
26-Jun-23	SE LANTAU	1	16.80	SUMMER	STANDARD25686	P
26-Jun-23	SE LANTAU	2	35.76	SUMMER	STANDARD25686	P
26-Jun-23	SE LANTAU	3	3.80	SUMMER	STANDARD25686	P
26-Jun-23	SE LANTAU	1	4.70	SUMMER	STANDARD25686	S
26-Jun-23	SE LANTAU	2	6.64	SUMMER	STANDARD25686	S
26-Jun-23	SW LANTAU	1	5.55	SUMMER	STANDARD25686	P
26-Jun-23	SW LANTAU	2	6.16	SUMMER	STANDARD25686	P
26-Jun-23	SW LANTAU	2	1.19	SUMMER	STANDARD25686	S
27-Jun-23	SW LANTAU	2	35.90	SUMMER	STANDARD25686	P
27-Jun-23	SW LANTAU	3	4.99	SUMMER	STANDARD25686	P
27-Jun-23	SW LANTAU	2	13.35	SUMMER	STANDARD25686	S
27-Jun-23	SW LANTAU	3	2.36	SUMMER	STANDARD25686	S
06-Jul-23	SW LANTAU	2	19.73	SUMMER	STANDARD25686	P
06-Jul-23	SW LANTAU	3	25.74	SUMMER	STANDARD25686	P
06-Jul-23	SW LANTAU	2	5.77	SUMMER	STANDARD25686	S
06-Jul-23	SW LANTAU	3	10.36	SUMMER	STANDARD25686	S
12-Jul-23	LAMMA	1	7.84	SUMMER	STANDARD25686	P
12-Jul-23	LAMMA	2	43.39	SUMMER	STANDARD25686	P
12-Jul-23	LAMMA	3	16.90	SUMMER	STANDARD25686	P
12-Jul-23	LAMMA	1	1.62	SUMMER	STANDARD25686	S
12-Jul-23	LAMMA	2	5.25	SUMMER	STANDARD25686	S
12-Jul-23	LAMMA	3	2.00	SUMMER	STANDARD25686	S
14-Jul-23	SW LANTAU	1	5.14	SUMMER	STANDARD25686	P
14-Jul-23	SW LANTAU	2	2.12	SUMMER	STANDARD25686	P
14-Jul-23	SE LANTAU	1	5.86	SUMMER	STANDARD25686	P
14-Jul-23	SE LANTAU	2	41.16	SUMMER	STANDARD25686	P
14-Jul-23	SE LANTAU	3	8.50	SUMMER	STANDARD25686	P
14-Jul-23	SE LANTAU	2	11.88	SUMMER	STANDARD25686	S
14-Jul-23	SE LANTAU	3	1.00	SUMMER	STANDARD25686	S
20-Jul-23	SW LANTAU	2	55.98	SUMMER	STANDARD138716	P

Annex B (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
20-Jul-23	SW LANTAU	2	15.10	SUMMER	STANDARD138716	S
20-Jul-23	SW LANTAU	3	1.16	SUMMER	STANDARD138716	S
21-Jul-23	SE LANTAU	1	14.05	SUMMER	STANDARD25686	P
21-Jul-23	SE LANTAU	2	42.93	SUMMER	STANDARD25686	P
21-Jul-23	SE LANTAU	1	1.82	SUMMER	STANDARD25686	S
21-Jul-23	SE LANTAU	2	10.20	SUMMER	STANDARD25686	S
24-Jul-23	LAMMA	1	7.83	SUMMER	STANDARD25686	P
24-Jul-23	LAMMA	2	58.17	SUMMER	STANDARD25686	P
24-Jul-23	LAMMA	3	0.90	SUMMER	STANDARD25686	P
24-Jul-23	LAMMA	2	9.57	SUMMER	STANDARD25686	S
01-Aug-23	SW LANTAU	1	1.00	SUMMER	STANDARD25686	P
01-Aug-23	SW LANTAU	2	23.88	SUMMER	STANDARD25686	P
01-Aug-23	SW LANTAU	3	22.03	SUMMER	STANDARD25686	P
01-Aug-23	SW LANTAU	2	9.33	SUMMER	STANDARD25686	S
01-Aug-23	SW LANTAU	3	4.10	SUMMER	STANDARD25686	S
02-Aug-23	SW LANTAU	2	8.27	SUMMER	STANDARD25686	P
02-Aug-23	SE LANTAU	2	15.68	SUMMER	STANDARD25686	P
02-Aug-23	SE LANTAU	3	41.20	SUMMER	STANDARD25686	P
02-Aug-23	SE LANTAU	2	5.67	SUMMER	STANDARD25686	S
02-Aug-23	SE LANTAU	3	6.80	SUMMER	STANDARD25686	S
03-Aug-23	LAMMA	1	31.27	SUMMER	STANDARD25686	P
03-Aug-23	LAMMA	2	26.20	SUMMER	STANDARD25686	P
03-Aug-23	LAMMA	3	9.90	SUMMER	STANDARD25686	P
03-Aug-23	LAMMA	1	3.10	SUMMER	STANDARD25686	S
03-Aug-23	LAMMA	2	3.20	SUMMER	STANDARD25686	S
03-Aug-23	LAMMA	3	2.90	SUMMER	STANDARD25686	S
09-Aug-23	SW LANTAU	1	7.32	SUMMER	STANDARD25686	P
09-Aug-23	SW LANTAU	2	27.06	SUMMER	STANDARD25686	P
09-Aug-23	SW LANTAU	3	3.90	SUMMER	STANDARD25686	P
09-Aug-23	SW LANTAU	1	1.26	SUMMER	STANDARD25686	S
09-Aug-23	SW LANTAU	2	5.95	SUMMER	STANDARD25686	S
09-Aug-23	SW LANTAU	3	4.13	SUMMER	STANDARD25686	S
22-Aug-23	SW LANTAU	2	15.19	SUMMER	STANDARD25686	P
22-Aug-23	SW LANTAU	2	1.39	SUMMER	STANDARD25686	S
22-Aug-23	SE LANTAU	1	11.05	SUMMER	STANDARD25686	P
22-Aug-23	SE LANTAU	2	36.51	SUMMER	STANDARD25686	P
22-Aug-23	SE LANTAU	1	0.50	SUMMER	STANDARD25686	S
22-Aug-23	SE LANTAU	2	10.24	SUMMER	STANDARD25686	S
23-Aug-23	SE LANTAU	1	3.97	SUMMER	STANDARD25686	P
23-Aug-23	SE LANTAU	2	2.87	SUMMER	STANDARD25686	P
23-Aug-23	LAMMA	1	11.03	SUMMER	STANDARD25686	P
23-Aug-23	LAMMA	2	56.48	SUMMER	STANDARD25686	P
23-Aug-23	LAMMA	3	0.70	SUMMER	STANDARD25686	P
23-Aug-23	LAMMA	2	9.19	SUMMER	STANDARD25686	S
04-Sep-23	SW LANTAU	2	32.91	AUTUMN	STANDARD25686	P
04-Sep-23	SW LANTAU	3	12.99	AUTUMN	STANDARD25686	P
04-Sep-23	SW LANTAU	2	9.69	AUTUMN	STANDARD25686	S
04-Sep-23	SW LANTAU	3	5.31	AUTUMN	STANDARD25686	S
07-Sep-23	LAMMA	1	32.05	AUTUMN	STANDARD25686	P
07-Sep-23	LAMMA	2	32.49	AUTUMN	STANDARD25686	P
07-Sep-23	LAMMA	1	2.30	AUTUMN	STANDARD25686	S
07-Sep-23	LAMMA	2	7.54	AUTUMN	STANDARD25686	S

Annex B (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	P/S
07-Sep-23	SE LANTAU	2	0.92	AUTUMN	STANDARD25686	P
07-Sep-23	SE LANTAU	3	5.92	AUTUMN	STANDARD25686	P
12-Sep-23	SE LANTAU	2	45.53	AUTUMN	STANDARD36826	P
12-Sep-23	SE LANTAU	3	4.70	AUTUMN	STANDARD36826	P
12-Sep-23	SE LANTAU	2	8.77	AUTUMN	STANDARD36826	S
12-Sep-23	SE LANTAU	3	2.40	AUTUMN	STANDARD36826	S
12-Sep-23	SW LANTAU	2	1.02	AUTUMN	STANDARD36826	P
12-Sep-23	SW LANTAU	3	6.98	AUTUMN	STANDARD36826	P
13-Sep-23	LAMMA	2	13.08	AUTUMN	STANDARD25686	P
13-Sep-23	LAMMA	3	54.60	AUTUMN	STANDARD25686	P
13-Sep-23	LAMMA	2	3.22	AUTUMN	STANDARD25686	S
13-Sep-23	LAMMA	3	5.50	AUTUMN	STANDARD25686	S
13-Sep-23	SE LANTAU	3	6.64	AUTUMN	STANDARD25686	P
14-Sep-23	SE LANTAU	1	3.60	AUTUMN	STANDARD36826	P
14-Sep-23	SE LANTAU	2	47.82	AUTUMN	STANDARD36826	P
14-Sep-23	SE LANTAU	1	0.90	AUTUMN	STANDARD36826	S
14-Sep-23	SE LANTAU	2	7.96	AUTUMN	STANDARD36826	S
14-Sep-23	SW LANTAU	2	11.69	AUTUMN	STANDARD36826	P
14-Sep-23	SW LANTAU	2	2.25	AUTUMN	STANDARD36826	S
20-Sep-23	SW LANTAU	2	39.24	AUTUMN	STANDARD140232	P
20-Sep-23	SW LANTAU	2	14.95	AUTUMN	STANDARD140232	S
03-Oct-23	LAMMA	2	66.61	AUTUMN	STANDARD36826	P
03-Oct-23	LAMMA	2	9.19	AUTUMN	STANDARD36826	S
03-Oct-23	SE LANTAU	2	6.86	AUTUMN	STANDARD36826	P
04-Oct-23	SE LANTAU	2	51.29	AUTUMN	STANDARD25686	P
04-Oct-23	SE LANTAU	3	0.70	AUTUMN	STANDARD25686	P
04-Oct-23	SE LANTAU	2	9.52	AUTUMN	STANDARD25686	S
04-Oct-23	SW LANTAU	1	1.45	AUTUMN	STANDARD25686	P
04-Oct-23	SW LANTAU	2	13.89	AUTUMN	STANDARD25686	P
04-Oct-23	SW LANTAU	2	2.44	AUTUMN	STANDARD25686	S
12-Oct-23	SW LANTAU	2	36.43	AUTUMN	STANDARD25686	P
12-Oct-23	SW LANTAU	3	3.98	AUTUMN	STANDARD25686	P
12-Oct-23	SW LANTAU	2	9.90	AUTUMN	STANDARD25686	S
12-Oct-23	SW LANTAU	3	4.90	AUTUMN	STANDARD25686	S
13-Oct-23	SE LANTAU	2	15.65	AUTUMN	STANDARD25686	P
13-Oct-23	SE LANTAU	3	35.48	AUTUMN	STANDARD25686	P
13-Oct-23	SE LANTAU	2	5.85	AUTUMN	STANDARD25686	S
13-Oct-23	SE LANTAU	3	2.56	AUTUMN	STANDARD25686	S
13-Oct-23	SE LANTAU	4	0.80	AUTUMN	STANDARD25686	S
13-Oct-23	SW LANTAU	2	1.80	AUTUMN	STANDARD25686	P
13-Oct-23	SW LANTAU	3	8.15	AUTUMN	STANDARD25686	P
13-Oct-23	SW LANTAU	2	2.45	AUTUMN	STANDARD25686	S
20-Oct-23	SW LANTAU	2	35.39	AUTUMN	STANDARD25686	P
20-Oct-23	SW LANTAU	3	9.30	AUTUMN	STANDARD25686	P
20-Oct-23	SW LANTAU	2	13.31	AUTUMN	STANDARD25686	S
20-Oct-23	SW LANTAU	3	1.90	AUTUMN	STANDARD25686	S
26-Oct-23	SE LANTAU	2	3.56	AUTUMN	STANDARD25686	P
26-Oct-23	SE LANTAU	3	3.13	AUTUMN	STANDARD25686	P
26-Oct-23	LAMMA	2	26.20	AUTUMN	STANDARD25686	P
26-Oct-23	LAMMA	3	36.33	AUTUMN	STANDARD25686	P
26-Oct-23	LAMMA	4	5.38	AUTUMN	STANDARD25686	P
26-Oct-23	LAMMA	2	3.60	AUTUMN	STANDARD25686	S
26-Oct-23	LAMMA	3	6.09	AUTUMN	STANDARD25686	S

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ANNEX C FINLESS PORPOISE SIGHTING DATABASE

Annex C HKOLNG Finless Porpoise Sighting Database (November 2022-October 2023)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Sighting Distance; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	NORTHING	EASTING	SEASON	P/S
7-Nov-22	1	1431	1	LAMMA	3	109	ON	802532	821572	AUTUMN	P
7-Nov-22	2	1438	1	LAMMA	3	93	ON	802411	820489	AUTUMN	P
15-Nov-22	1	1245	1	SW LANTAU	3	33	ON	802168	805779	AUTUMN	S
29-Nov-22	1	1100	1	SE LANTAU	3	24	ON	804374	818490	AUTUMN	P
29-Nov-22	2	1236	1	SE LANTAU	3	234	ON	805296	815490	AUTUMN	P
29-Nov-22	3	1322	11	SE LANTAU	2	43	ON	804290	814457	AUTUMN	P
29-Nov-22	4	1405	2	SE LANTAU	2	45	ON	804635	813457	AUTUMN	P
29-Nov-22	5	1414	5	SE LANTAU	2	185	ON	805499	813376	AUTUMN	P
29-Nov-22	6	1454	2	SE LANTAU	3	479	ON	805290	812417	AUTUMN	P
29-Nov-22	7	1526	1	SW LANTAU	2	44	ON	804649	811487	AUTUMN	P
2-Dec-22	2	1449	1	SW LANTAU	2	44	ON	800378	809727	WINTER	P
2-Dec-22	3	1524	6	SW LANTAU	2	45	ON	807463	810626	WINTER	S
2-Dec-22	4	1551	1	SW LANTAU	2	37	ON	807417	811482	WINTER	P
2-Dec-22	5	1613	1	SE LANTAU	2	ND	OFF	804789	814138	WINTER	
7-Dec-22	1	1123	1	LAMMA	2	51	ON	806232	820730	WINTER	S
13-Dec-22	3	1147	1	SW LANTAU	4	125	ON	803002	803986	WINTER	S
13-Dec-22	4	1405	1	SW LANTAU	3	122	ON	801919	808347	WINTER	P
15-Dec-22	1	1359	2	SE LANTAU	2	61	ON	801500	814020	WINTER	S
15-Dec-22	2	1537	1	SW LANTAU	2	23	ON	803508	811558	WINTER	P
15-Dec-22	3	1605	1	SW LANTAU	2	64	ON	809090	811443	WINTER	P
22-Dec-22	1	1427	1	LAMMA	3	245	ON	801510	825181	WINTER	P
3-Jan-23	1	1208	1	LAMMA	3	15	ON	804487	828205	WINTER	P
5-Jan-23	4	1350	1	SW LANTAU	2	70	ON	800635	808262	WINTER	S
5-Jan-23	5	1358	1	SW LANTAU	2	89	ON	801565	808501	WINTER	P
5-Jan-23	6	1404	1	SW LANTAU	2	8	ON	802131	807749	WINTER	S
10-Jan-23	1	1059	1	SW LANTAU	2	165	ON	805336	811499	WINTER	P
10-Jan-23	2	1104	1	SW LANTAU	2	147	ON	804771	811498	WINTER	P
10-Jan-23	3	1205	4	SE LANTAU	1	67	ON	808632	813473	WINTER	P
13-Jan-23	1	1520	1	SW LANTAU	2	115	ON	805269	811509	WINTER	P
19-Jan-23	1	0948	2	LAMMA	3	5	ON	808497	825939	WINTER	P
1-Feb-23	1	1018	3	LAMMA	1	60	ON	807401	825701	WINTER	P
6-Feb-23	1	1132	1	SW LANTAU	2	164	ON	804741	803505	WINTER	P

Annex C (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Sighting Distance; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	NORTHING	EASTING	SEASON	P/S
6-Feb-23	2	1224	2	SW LANTAU	2	82	ON	803176	805451	WINTER	P
6-Feb-23	3	1305	1	SW LANTAU	1	106	ON	806472	807417	WINTER	P
10-Feb-23	1	1154	1	LAMMA	1	13	ON	805463	826442	WINTER	P
10-Feb-23	2	1240	1	LAMMA	1	320	ON	804479	823688	WINTER	P
10-Feb-23	3	1409	4	LAMMA	1	178	ON	802474	824584	WINTER	P
13-Feb-23	1	1058	13	SE LANTAU	1	336	ON	806389	818544	WINTER	P
13-Feb-23	2	1403	2	SE LANTAU	2	182	ON	806474	812934	WINTER	S
13-Feb-23	3	1443	2	SE LANTAU	1	70	ON	804636	812467	WINTER	P
20-Feb-23	1	1330	3	SW LANTAU	2	110	ON	802552	807265	WINTER	P
20-Feb-23	2	1349	2	SW LANTAU	2	308	ON	801609	808439	WINTER	P
20-Feb-23	3	1400	2	SW LANTAU	2	21	ON	802806	807823	WINTER	S
8-Mar-23	1	1118	1	SE LANTAU	2	95	ON	807066	817565	SPRING	P
8-Mar-23	2	1202	2	SE LANTAU	2	63	ON	804819	816459	SPRING	P
8-Mar-23	3	1240	2	SE LANTAU	2	284	ON	807002	815451	SPRING	P
8-Mar-23	4	1248	4	SE LANTAU	2	549	ON	806293	815367	SPRING	P
8-Mar-23	5	1300	1	SE LANTAU	2	171	ON	804521	815499	SPRING	P
8-Mar-23	6	1528	2	SW LANTAU	2	130	ON	805114	811509	SPRING	P
10-Mar-23	1	0951	1	LAMMA	2	311	ON	808409	825980	SPRING	P
15-Mar-23	1	1332	1	SW LANTAU	2	93	ON	802607	807461	SPRING	P
17-Mar-23	1	1418	1	LAMMA	3	74	ON	801490	822953	SPRING	P
21-Mar-23	1	1406	1	SE LANTAU	2	3	ON	805753	813449	SPRING	P
23-Mar-23	1	1231	2	SW LANTAU	2	192	ON	803298	805492	SPRING	P
23-Mar-23	3	1405	9	SW LANTAU	2	168	ON	801498	808563	SPRING	P
23-Mar-23	4	1431	1	SW LANTAU	2	56	ON	802971	808235	SPRING	S
23-Mar-23	5	1523	5	SW LANTAU	1	311	ON	802393	809555	SPRING	P
23-Mar-23	6	1533	1	SW LANTAU	2	320	ON	800743	809552	SPRING	P
23-Mar-23	7	1547	5	SW LANTAU	2	76	ON	802214	810596	SPRING	P
23-Mar-23	8	1555	2	SW LANTAU	2	183	ON	803543	810609	SPRING	P
12-Apr-23	1	1240	2	SW LANTAU	2	715	ON	804084	805391	SPRING	P
12-Apr-23	2	1436	1	SW LANTAU	2	472	ON	806203	809592	SPRING	P
12-Apr-23	3	1514	3	SW LANTAU	2	46	ON	802093	810596	SPRING	P
12-Apr-23	4	1519	4	SW LANTAU	2	534	ON	802635	810659	SPRING	P

Annex C (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Sighting Distance; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	NORTHING	EASTING	SEASON	P/S
12-Apr-23	5	1532	1	SW LANTAU	2	110	ON	805315	810612	SPRING	P
12-Apr-23	6	1538	3	SW LANTAU	2	80	ON	806256	810582	SPRING	P
13-Apr-23	1	1503	1	SE LANTAU	2	72	ON	802865	812433	SPRING	P
20-Apr-23	1	1258	2	LAMMA	3	9	ON	803527	822986	SPRING	P
24-Apr-23	1	1445	1	SW LANTAU	3	7	ON	802259	810524	SPRING	P
25-Apr-23	1	1506	1	SE LANTAU	3	97	ON	804199	816386	SPRING	P
25-Apr-23	2	1546	4	SE LANTAU	2	6	ON	805726	817636	SPRING	S
15-May-23	1	1243	5	SW LANTAU	2	135	ON	805333	806559	SPRING	P
15-May-23	2	1503	1	SW LANTAU	2	0	ON	803953	810682	SPRING	P
18-May-23	1	1359	1	SE LANTAU	1	122	ON	803373	813497	SPRING	P
18-May-23	2	1452	4	SE LANTAU	1	196	ON	805356	812427	SPRING	P
18-May-23	3	1458	1	SE LANTAU	2	284	ON	804470	812384	SPRING	P
18-May-23	4	1501	1	SE LANTAU	2	196	ON	803795	812394	SPRING	P
19-May-23	1	1327	3	LAMMA	2	98	ON	803547	827081	SPRING	P
22-May-23	1	1527	2	SE LANTAU	3	252	ON	802854	812475	SPRING	P
22-May-23	2	1558	5	SW LANTAU	2	102	ON	805347	811530	SPRING	P
9-Jun-23	1	1028	1	LAMMA	2	19	ON	807544	826825	SUMMER	P
9-Jun-23	2	1154	2	LAMMA	2	198	ON	805419	825401	SUMMER	P
14-Jun-23	1	1029	2	SE LANTAU	2	156	ON	803774	819521	SUMMER	P
14-Jul-23	2	1301	3	SE LANTAU	2	54	ON	800969	814205	SUMMER	S
24-Jul-23	1	1453	1	LAMMA	2	ND	OFF	801477	825058	SUMMER	
2-Aug-23	1	1125	1	SE LANTAU	2	84	ON	801491	812534	SUMMER	P
3-Aug-23	1	1034	3	LAMMA	1	196	ON	801465	826079	SUMMER	P
22-Aug-23	1	1056	3	SW LANTAU	2	208	ON	803853	810630	SUMMER	P
4-Sep-23	1	1334	6	SW LANTAU	2	114	ON	802165	807398	AUTUMN	P
4-Sep-23	2	1354	2	SW LANTAU	2	13	ON	801908	808543	AUTUMN	P
7-Sep-23	1	1405	1	LAMMA	1	210	ON	802431	823253	AUTUMN	P
7-Sep-23	2	1516	1	LAMMA	2	34	ON	801413	821839	AUTUMN	P
12-Sep-23	1	1432	2	SW LANTAU	2	222	ON	802457	811432	AUTUMN	P
14-Sep-23	1	1409	1	SE LANTAU	2	133	ON	804238	812436	AUTUMN	P
14-Sep-23	3	1541	2	SW LANTAU	2	136	ON	804617	810559	AUTUMN	P
20-Sep-23	3	1433	6	SW LANTAU	2	388	ON	802006	809533	AUTUMN	P

Annex C (cont'd)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Sighting Distance; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	NORTHING	EASTING	SEASON	P/S
20-Sep-23	4	1458	3	SW LANTAU	2	92	ON	801904	810554	AUTUMN	P
4-Oct-23	1	1402	1	SE LANTAU	2	197	ON	806009	812531	AUTUMN	P
4-Oct-23	2	1519	16	SW LANTAU	2	199	ON	805603	810561	AUTUMN	P
13-Oct-23	1	1211	7	SE LANTAU	3	35	ON	805684	815563	AUTUMN	P
13-Oct-23	2	1306	2	SE LANTAU	3	52	ON	805708	814511	AUTUMN	P
13-Oct-23	3	1330	1	SE LANTAU	4	176	ON	801445	814205	AUTUMN	S
20-Oct-23	1	1252	3	SW LANTAU	2	59	ON	802620	806512	AUTUMN	P

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ANNEX D PAM DEPLOYMENT DATABASE

Annex D Summary deployment data and statistics on finless porpoise detection for post-construction monitoring

("Days": no. of logged days the CPOD was on and recording; "DPD% of days": detection positive days as a percentage of logged days; DPM: detection positive minutes, minutes where at least one porpoise train was detected; "Mins on": no. of minutes the CPOD was on a logging data; % Time lost: percentage of time lost because the minute click limit has been reached and no data was recorded for that minute)

Notes:
1) Location 1: Data could not be retrieved between 26 February and 4 May 2023, 22 August and 20 September 2023 as well as after 25 November 2023 due to equipment failure.
2) Location 2: The C-POD unit was lost during the period of 10 July 2023 to 20 September 2023.
3) Location 4: Data could not be retrieved after 17 October 2023 due to equipment failure.
4) Location 5: Data could not be retrieved between 10 December 2022 and 10 February 2023 due to equipment failure.

LOCATION	POD#	Start	End	Days	DPD % of days	DPM	DPM/day	% FP DPM	% Time lost
#1 (EAST OF TAI A CHAU) (See Note 1)	3455	9-Nov-22	7-Feb-23	90.00	100.00%	12485	138.72	0.00%	0.00%
	3455	7-Feb-23	25-Feb-23	17.66	100.00%	3286	186.07	0.00%	0.00%
	2865	5-May-23	10-Jul-23	66.03	100.00%	8594	130.15	0.00%	0.00%
	2865	10-Jul-23	22-Aug-23	43.16	97.73%	3783	87.65	1.00%	0.00%
	2865	20-Sep-23	25-Nov-23	66.03	100.00%	12812	194.03	0.00%	0.00%
#2 (FSRU-W) (See Note 2)	3459	9-Nov-22	7-Feb-23	90.00	100.00%	15634	173.71	0.00%	0.00%
	3459	7-Feb-23	4-May-23	85.93	100.00%	28625	333.12	0.00%	0.00%
	3459	4-May-23	10-Jul-23	67.01	100.00%	20356	303.78	0.00%	0.00%
	3459	10-Jul-23	20-Sep-23	-	-	-	-	-	-
	3458	20-Sep-23	5-Dec-23	76.15	100.00%	11256	147.81	0.00%	0.00%
#3 (FSRU-E)	3457	9-Nov-22	7-Feb-23	90.00	100.00%	13547	150.52	0.00%	0.00%
	3457	7-Feb-23	4-May-23	85.94	100.00%	28221	328.38	0.00%	0.00%
	3457	4-May-23	10-Jul-23	67.01	100.00%	20274	302.55	0.00%	0.00%
	3457	10-Jul-23	20-Sep-23	71.93	100.00%	22252	309.36	0.00%	0.00%
	3457	20-Sep-23	5-Dec-23	76.20	100.00%	11663	153.06	0.00%	0.00%
#4 (FSRU-N) (See Note 3)	3458	10-Nov-22	10-Feb-23	91.99	100.00%	21759	236.54	0.00%	0.00%
	3458	10-Feb-23	4-May-23	83.13	100.00%	22349	268.84	1.00%	0.00%
	3458	4-May-23	11-Jul-23	67.81	100.00%	13161	194.09	0.00%	0.00%
	2867	11-Jul-23	20-Sep-23	71.08	98.61%	5139	72.30	0.00%	0.00%
	2867	20-Sep-23	17-Oct-23	26.95	7.14%	2	0.07	0.00%	0.00%
#5 (SHEK KWU CHAU) (See Note 4)	3444	10-Nov-22	10-Dec-22	29.99	100.00%	1042	34.74	2.00%	0.00%
	3444	10-Feb-23	5-May-23	83.99	100.00%	9265	110.31	0.00%	0.00%
	3444	5-May-23	11-Jul-23	66.98	100.00%	7083	105.75	0.00%	0.00%
	3444	11-Jul-23	21-Sep-23	71.89	100.00%	7200	100.15	1.00%	0.00%
	3444	21-Sep-23	6-Dec-23	76.17	97.40%	1777	23.33	0.00%	0.00%
TOTAL				**1663.03**		**301565**			