Contract No. HY/2011/03

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road - Section between Scenic Hill and Hong Kong Boundary Crossing Facilities

Dolphin Monitoring Quarterly Progress Report

SEAMAR

Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge

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Dolphin Monitoring Quarterly Progress Report March to May 2025

SEAMAR

Submitted to **China State Construction Engineering (HK) Limited** by

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Contents

Introduction

The Hong Kong Link Road (HKLR) serves to connect the Hong Kong-Zhuhai-Macao Bridge (HZMB) Main Bridge at the Hong Kong Special Administrative Region (HKSAR) Boundary and the HZMB Hong Kong Boundary Crossing Facilities (HKBCF) located at the northeastern waters of the Hong Kong International Airport (HKIA). The construction of HKLR is separated into two sections, with construction of the section between Scenic Hill and Hong Kong Boundary Crossing Facilities (HKBCF) commencing in October 2012.

The updated Environmental Monitoring and Audit (EM&A) Manual for the HKLR states that monthly vessel-based line transect surveys for Indo-Pacific humpback dolphins (*Sousa chinensis*), known locally, and within this and previous reports for this project, as "Chinese white dolphins", are to be conducted in the Northwest (NWL) and Northeast (NEL) Lantau survey areas, as demarcated in the Agriculture and Fisheries Conservation Department (AFCD) Long-Term Marine Mammal Monitoring Programme (AFCD 2024).

In May 2025, Southeast Asia Marine Mammal Research Limited was commissioned by China State Construction Engineering (HK) Limited to conduct vessel surveys in order to collect data on Chinese white dolphins during the final months of the construction phase (i.e., impact period) of the HKLR03 project in the NWL and NEL survey areas. Between October 2012 and May 2025, impact monitoring for HKLR03 had been conducted by another company. The data gathered during the impact monitoring period is to be used to document changes in the distribution, habitat use, encounter rates, density and ranging patterns of Chinese white dolphins; causes of said changes; and if necessary, identify appropriate mitigation measures.

This report is the 40th quarterly progress report of the HKLR03 impact phase dolphin monitoring programme, submitted to China State Construction Engineering (HK) Limited, summarising the results of surveys conducted in March (by Hong Kong Cetacean Research Project Ltd) and April-May 2025 (by Southeast Asia Marine Mammal Research Ltd).

Methodology

Vessel-Based Line Transect Survey

Vessel-based line transect surveys will be conducted on a monthly basis in NEL and NWL, such that all transect lines will be surveyed twice per month, as stated in the EM&A Manual (Figure 1, Table 1). Standard line-transect methods (Buckland et al. 2001; Buckland et al. 2012; Thomas et al. 2010; Thomas et al. 2014) will be employed to collect data comparable to the AFCD long term marine mammal monitoring programme. Surveys will be conducted using a 21.9 m twin-engine motor vessel, with a viewing platform approx. 5 m above sea level with an unobstructed 360° view, at a constant speed of 8-9 kt (tide and current dependent). Two experienced observers will search the area ahead of the vessel between 270° and 90° (in relation to the bow at 0°), with the naked eye and aided by 7x50 binoculars with an in-built compass. A data recorder will input standard effort and environmental data (i.e. prevailing weather conditions, Beaufort Sea State, swell and glare) into a bespoke marine mammal survey app (Cybertracker[1]) that also automatically records the vessel's GPS position, heading and speed. Survey effort conducted on transect lines is denoted "P", while the effort conducted while transiting between transect lines is denoted as "S". Observers and data recorders will rotate every 30 minutes to prevent fatigue. All

[1] https://cybertracker.org/

observers and data recorders are experienced in conducting marine mammal surveys and identifying local cetacean species and behaviour.

Upon sighting dolphins, search effort will be paused and sighting data (i.e. location, time, distance and bearing from the transect line) will be recorded. Distance (m) of the group from the vessel will be estimated by eye and bearing (°) of the group from the vessel will be measured using the binoculars' in-built compass. The perpendicular distance (PSD) of the group from the transect will be calculated post-hoc using the estimated distance and bearing measurement. The vessel will then leave the transect and approach the group to confirm species, group size, group composition and behaviour, as well as to collect photo-identification images. For group composition, four age classes will be used based on external appearance, colouration and body size: calf, juvenile, subadult and adult (Jefferson 2000; Hung and Jefferson 2004; Chan and Karczmarski 2017). An individual is recorded as a 'calf' if it is a solid dark grey colour, approx. 1-1.8 m in length and always in close association with an adult. An individual is classed as a 'juvenile' if it is light grey in colour and has no spots, at least 2 m in length and relatively slender. Juveniles often swim independently but are still associated with at least one adult. An individual is recorded as an 'adult' if it is mostly solid pink with dark spots, at least 2.5 m in length with a robust body and a well-developed dorsal ridge. A dolphin with an external appearance between a juvenile and an adult, with a predominantly grey cast or dense spotting, is classified as a 'subadult'. Behaviour is categorised using Parsons' (1997) ethogram for Chinese white dolphins in Hong Kong. Once all data are recorded, the vessel will return to the point it departed the transect line and search effort will resume.

Photo-Identification

Upon sighting dolphins, every effort will be made to take images (using > 20 megapixel, DSLR cameras equipped with 300 mm telephoto lenses) of both the left and right sides of the dorsal fin of each individual, regardless of perceived dorsal fin distinctiveness.

Photo-identification images of Chinese white dolphins will be catalogued using standardised methods (Würsig and Jefferson 1990). Images will first be graded based on image quality, using features such as focus, exposure, angle and visibility of the dorsal fin. Images of suitable quality will then be compared to existing Chinese white dolphin photo-identification catalogues to identify individual dolphins. Individual dolphins are identified using distinctive features such as dorsal fin shape; dorsal fin markings (nicks and notches); and body scars, deformities and injuries. Pigmentation such as spots and freckles will also be used in conjunction with other identifiers (Karczmarski and Cockcroft 1998).

Data Analysis

Encounter Rate

Encounter rates are defined as the number of sightings (STG) and the total number of dolphins (ANI) per 100 km of survey effort. Only data collected in a Beaufort Sea State 3 or better is used for encounter rate calculation.

For comparison with the baseline monitoring period of this project, monthly encounter rates are calculated using transect line effort from each survey and area (NEL and NWL) and these are then averaged to produce a rate per area for the current quarterly period.

Two-way ANOVA testing can be utilised to examine differences between survey periods (baseline and impact) and survey areas (NEL and NWL). If required, the use of two ANOVAs will be explored using the variables employed in previous quarterly reports: (1) average

encounter rates from the baseline and the relevant quarterly period; and (2) average encounter rates from the baseline and all impact quarterly periods (2013 to current). All statistical tests will be performed in R (R Core Team 2025).

Encounter rates will also be calculated using effort conducted while on the transect line plus the effort conducted while transiting between transect lines for comparison to the AFCD long term marine mammal monitoring programme data.

Density

To investigate density patterns, a quantitative grid analysis will be conducted as described in the AFCD long term marine mammal monitoring programme. The survey area is divided into 1 x 1 km grid cells; densities within each grid cell are defined as the number of sightings (SPSE) and the number of dolphins from sightings (DPSE) per 100 units of survey effort, which are calculated using the following formulae:

$$SPSE = ((S / E) \times 100 / SA\%$$
$$DPSE = ((D / E) \times 100 / SA\%$$

S = total number of on-effort sightings
D = total number of dolphins from on-effort sightings
E = total number of units of survey effort
SA% = proportion of sea area

Units of survey effort are defined as the number of times a grid cell is surveyed, such that a grid cell that has been surveyed 10 times is considered to have 10 units of survey effort. For grid cells that encompass some land area, the percentage of sea area is calculated using QGIS.

Distribution and Habitat Use

To investigate distribution patterns, all sightings will be stratified by group size, group composition and behaviour, and mapped using QGIS (QGIS Development Team 2025). These data can be used to identify important areas for different age classes (e.g. mother-calf pairs) and behaviours (e.g. foraging and resting).

Ranging Patterns

Ranging patterns of individual dolphins will be plotted, using information that is made available from previous quarterly reports (submitted by Hong Kong Cetacean Research Project) and new data collected from May 2025 onwards. Available location histories of identified dolphins will be used to calculate 95% kernel density estimates (KDE) using the *AniMove* plugin in QGIS and the *adehabitatHR* and *rgdal* packages in R (R Core Team 2025).

Results

Vessel-Based Line Transect Surveys

During the period March to May 2025, six line-transect vessel surveys were conducted in NWL and NEL, with each survey taking two days to complete. As the previous contractor did not conduct surveys in April, 'April surveys' were conducted under this contract in May. All transect lines were surveyed six times during the quarterly period. A total survey length of **808.9 km** was completed (transect lines plus transit distance; P+S), with **770.27 km** (95.22%) of effort being conducted under favourable weather conditions (i.e., Beaufort Sea State 3 or better, with visibility of more than 5km). The total surveyed distance in NEL and NWL was **312.57 km** and **496.33 km**, respectively.

Of the **808.9km** of survey effort, **602.62 km** was conducted on the transect line and **206.28 km** of effort was conducted transiting between transect lines. Observers continuously monitored the area in front of the survey vessel both while travelling the transect lines and when in transit between transects. A table of detailed survey effort is provided in Annex I.

Encounter Rate

No dolphins were recorded either on or between the transect lines in NEL and NWL between March and May 2025. As such, all STG and ANI encounter rates, in both areas, are 0 for this quarterly period (Table 2). These rates were compared to the baseline monitoring period (September-November 2011) and the previously reported March-May monitoring periods of this project (Table 3).

The encounter rates for each area were 0 therefore, and has been previously reported in quarterly reports for this project, significant differences were detected between the baseline and the present quarter, in both the STG and ANI encounter rates (Table 4; Table 5), in both NEL and NWL.

Density

No density analysis could be conducted as there were no sightings recorded.

Distribution and Habitat Use

No distribution and habitat mapping could be completed as there were no sightings recorded.

Ranging Patterns

No ranging patterns could be plotted as there were no sightings recorded.

Discussion

Since monitoring for this project began (2012), this is the second March-May quarterly period during which no sightings were recorded (the previous quarterly period was March-May 2022). In addition, two other quarterly periods also did not record any sightings (June-August 2021 and September-November 2022).

In NEL, the dolphin encounter rates (both STG and ANI) in the present three-month impact monitoring period were both 0. Encounters within NEL have been rarely recorded during this quarterly period throughout this project's duration; the only sightings recorded were in March-May 2013 and March-May 2024. Dolphins have been largely absent from the NEL area during this project's monitoring period, which is consistent with the AFCD long-term marine mammal monitoring programme which records only two sightings in NEL since 2015 (all months of the year).

In NWL, the dolphin encounter rates (both STG and ANI) in the present three-month impact monitoring period were both 0. A complete absence of dolphins in the NWL area during this quarterly period is unusual; this is the second March-May quarterly period since this project's monitoring began during which no dolphins were sighted in NWL; no sightings were recorded in March-May 2022.

On review of the past 12 years' March-May quarterly periods (2013-2024), both STG and ANI have markedly decreased since 2015. As yet, there is no evidence that dolphins are returning to NWL, noting that HKLR03 marine works are still ongoing but will be completed soon. This quarter's findings are consistent with the data presented in the

AFCD long-term marine mammal monitoring reports which record only two sightings in the past year April 2023-March 2024[2]; in September 2023 and January 2024.

Conclusion

As the EIA predicted that dolphins will return to northern Lantau waters following the completion of construction work, it is critical to keep monitoring both the NEL and NWL areas to continuously document how the dolphins habitat use is impacted by changes in construction activities, related to HZMB and other projects, and to assess if further mitigation measures can be applied.

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[2] The April 2024-March 2025 Report was not available at time of writing

Tables

Table 1. Coordinates (HK80 Grid) of transects in the Northwest (NWL) and Northeast (NEL) Lantau survey areas.

Transect Number	Start		End	
	Easting	Northing	Easting	Northing
1	804671	815456	804671	831404
2	805476	820800	805476	826654
3	806464	821150	806464	822911
4	807518	821500	807518	829230
5	808504	821850	808504	828602
6	809490	822150	809490	825352
7	810499	822000	810499	824613
8	811508	821123	811508	824254
9	812516	821303	812516	824254
10	813425	821176	813425	824657
11	814556	818853	814556	820992
12	815542	818807	815542	824882
13	816506	819480	816506	824859
14	817537	820220	817537	824613
15	818568	820735	818568	824433
16	819532	821420	819532	824209
17	820451	822125	820451	823671
18	821504	822371	821504	823761
19	822513	823268	822513	824321
20	823477	823402	823477	824613
21	805476	827081	805476	830562
22	806464	824033	806464	829598
23	814559	821739	814559	824768
24	805476	815900	805476	819100

Table 2. Encounter rates of Chinese white dolphins (*Sousa chinensis*) in Northwest (NWL) and Northeast (NEL) Lantau for surveys conducted during the current quarterly period (March to May 2025).

Survey Area	Dolphin Monitoring Dates	Encounter Rate (STG) (No. of sightings per 100 km of survey effort)	Encounter Rate (ANI) (No. of dolphins from all sightings per 100 km of survey effort)
		Transect Lines Only (P)	Transect Lines Only (P)
Northeast Lantau	Set 1: March 11th / 12th	0.00	0.00
	Set 2: March 14th / 18th	0.00	0.00
	Set 3: April (23rd/24th May)	0.00	0.00
	Set 4: April (25th/26th May)	0.00	0.00
	Set 5: May 27th / 28th	0.00	0.00
	Set 6: May 29th / 30th	0.00	0.00
Northwest Lantau	Set 1: March 11th / 12th	0.00	0.00
	Set 2: March 14th / 18th	0.00	0.00
	Set 3: April (23rd/24th May)	0.00	0.00
	Set 4: April (25th/26th May)	0.00	0.00
	Set 5: May 27th / 28th	0.00	0.00
	Set 6: May 29th / 30th	0.00	0.00

Table 3. Comparison of average encounter rates of Chinese white dolphins (*Sousa chinensis*) in Northwest (NWL) and Northeast (NEL) Lantau between the current quarterly period (March to May 2025) and the baseline monitoring period (September to November 2011).

	Encounter Rate (STG) (No. of sightings per 100 km of survey effort)		Encounter Rate (ANI) (No. of dolphins from all sightings per 100 km of survey effort)	
	March - May 2025	September - November 2011	March - May 2025	September - November 2011
Northeast Lantau	0.00	6.00 ± 5.05	0.00	22.19 ± 26.81
Northwest Lantau	0.00	9.85 ± 5.85	0.00	44.66 ± 29.85

Note: Encounter rates for the baseline monitoring period have been calculated using effort conducted on the transect lines (P) and under favourable conditions. Encounter rates are presented with ± 1 S.D. (standard deviation).

Table 4. Comparison of average encounter rates of Chinese White dolphins (*Sousa chinensis*) in Northeast (NEL) from all spring quarterly periods (March to May 2013-2024) and the baseline monitoring period (September to November 2011).

	Encounter Rate (STG) (No. of sightings per 100 km of survey effort)	**Encounter Rate (ANI) (No. of dolphins from all sightings per 100 km of survey effort)**
September - November 2011 (Baseline)	6.00 ± 5.05	22.19 ± 26.81
March - May 2013 (HKLR03 Impact)	0.42 ± 1.03	0.42 ± 1.03
March - May 2014 (HKLR03 Impact)	0.00	0.00
March - May 2015 (HKLR03 Impact)	0.00	0.00
March - May 2016 (HKLR03 Impact)	0.00	0.00
March - May 2017 (HKLR03 Impact)	0.00	0.00
March - May 2018 (HKLR03 Impact)	0.00	0.00
March - May 2019 (HKLR03 Impact)	0.00	0.00
March - May 2020 (HKLR03 Impact)	0.00	0.00
March - May 2021 (TMCLKL Post-Construction)	0.00	0.00
March - May 2022 (TMCLKL Post-Construction)	0.00	0.00
March - May 2023 (HKLR03 Impact)	0.00	0.00
March - May 2024 (HKLR03 Impact)	0.48 ± 1.17	0.48 ± 1.17
March - May 2025 (HKLR03 Impact)	0.00	0.00

Note: Encounter rates for the baseline monitoring period have been calculated using effort conducted on the transect lines (P) and under favourable conditions. Encounter rates are presented with ± 1 S.D. (standard deviation).

Table 5. Comparison of average encounter rates of Indo-Pacific humpback dolphins (*Sousa chinensis*) in Northwest (NWL) from all spring quarterly periods (March to May 2013-2024) and the baseline monitoring period (September to November 2011).

	Encounter Rate (STG) (No. of sightings per 100 km of survey effort)	**Encounter Rate (ANI) (No. of dolphins from all sightings per 100 km of survey effort)**
September - November 2011 (Baseline)	9.85 ± 5.85	44.66 ± 29.85
March - May 2013 (HKLR03 Impact)	7.75 ± 3.96	24.23 ± 18.05
March - May 2014 (HKLR03 Impact)	6.51 ± 3.34	19.14 ± 7.19
March - May 2015 (HKLR03 Impact)	0.47 ± 0.73	2.36 ± 4.07
March - May 2016 (HKLR03 Impact)	0.98 ± 1.10	4.78 ± 6.85
March - May 2017 (HKLR03 Impact)	0.93 ± 1.03	5.25 ± 9.53
March - May 2018 (HKLR03 Impact)	2.88 ± 4.81	11.12 ± 22.46
March - May 2019 (HKLR03 Impact)	1.13 ± 1.39	2.54 ± 3.00
March - May 2020 (HKLR03 Impact)	0.56 ± 0.86	0.56 ± 0.86
March - May 2021 (TMCLKL Post-Construction)	1.13 ± 1.37	3.44 ± 4.26
March - May 2022 (TMCLKL Post-Construction)	0.00	0.00
March - May 2023 (HKLR03 Impact)	0.55 ± 0.86	1.35 ± 2.56
March - May 2024 (HKLR03 Impact)	0.57 ± 0.89	1.14 ± 1.77
March - May 2025 (HKLR03 Impact)	0.00	0.00

Note: Encounter rates for the baseline monitoring period have been calculated using effort conducted on the transect lines (P) and under favourable conditions. Encounter rates are presented with ± 1 S.D. (standard deviation).

Figures

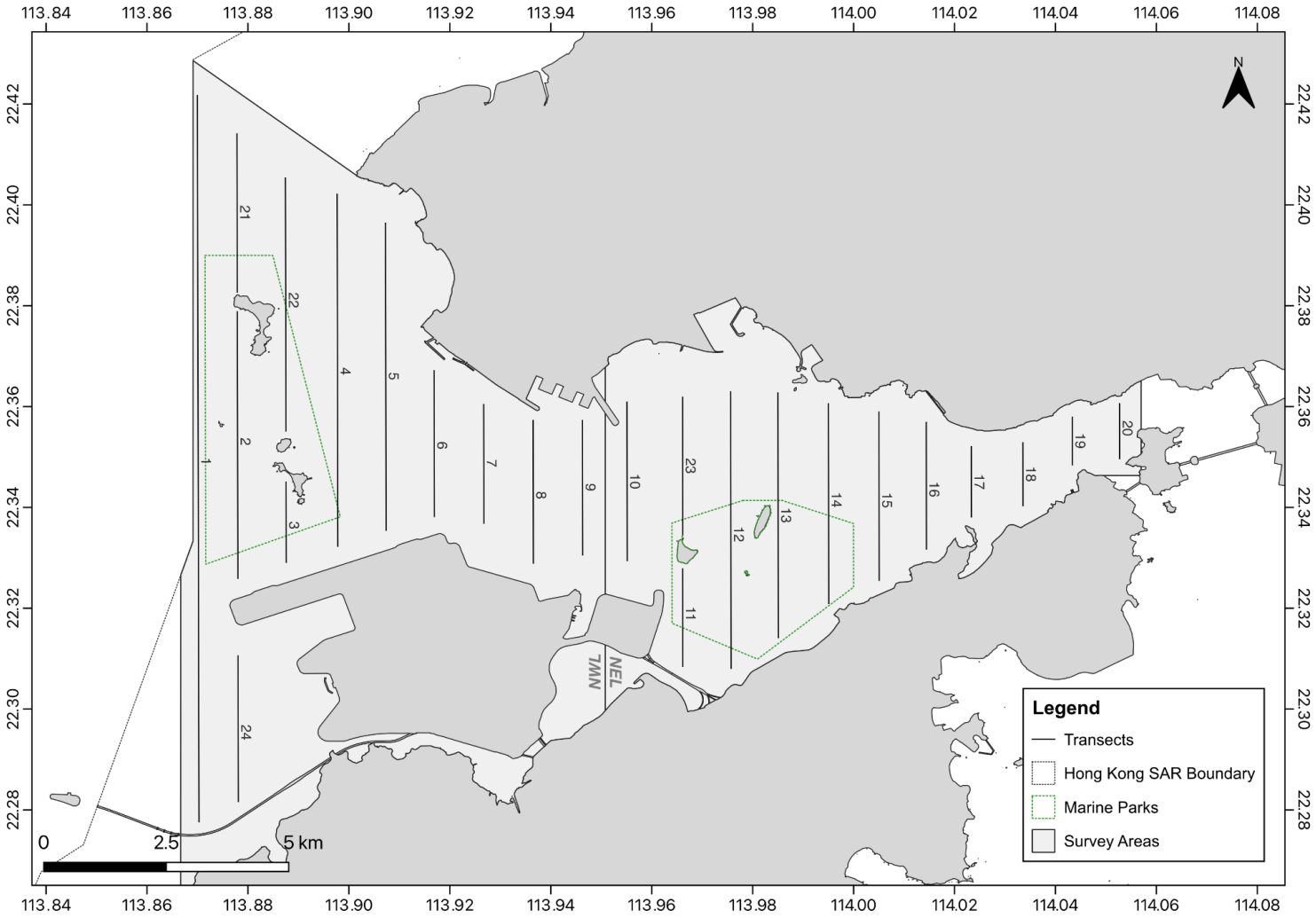

Figure 1. Transects in the Northeast (NEL) and Northwest (NWL) Lantau survey areas.

Annexes

Annex I. Survey effort for the quarterly period March to May 2025.

Date	Survey Area	Beaufort Sea State	Effort (km)	Season	Vessel	Type	P/S*
2025-03-11	NWL	2	34.97	SPRING	STANDARD36826	HKLR	P
2025-03-11	NWL	2	14.53	SPRING	STANDARD36826	HKLR	S
2025-03-11	NEL	2	34.82	SPRING	STANDARD36826	HKLR	P
2025-03-11	NEL	2	12.58	SPRING	STANDARD36826	HKLR	S
2025-03-12	NWL	1	12.27	SPRING	STANDARD36826	HKLR	P
2025-03-12	NWL	2	13.20	SPRING	STANDARD36826	HKLR	P
2025-03-12	NWL	1	2.91	SPRING	STANDARD36826	HKLR	S
2025-03-12	NWL	2	8.02	SPRING	STANDARD36826	HKLR	S
2025-03-14	NWL	2	9.10	SPRING	STANDARD36826	HKLR	P
2025-03-14	NWL	3	27.50	SPRING	STANDARD36826	HKLR	P
2025-03-14	NWL	2	2.40	SPRING	STANDARD36826	HKLR	S
2025-03-14	NWL	3	10.50	SPRING	STANDARD36826	HKLR	S
2025-03-14	NEL	2	6.32	SPRING	STANDARD36826	HKLR	P
2025-03-14	NEL	3	29.34	SPRING	STANDARD36826	HKLR	P
2025-03-14	NEL	2	4.10	SPRING	STANDARD36826	HKLR	S
2025-03-14	NEL	3	9.64	SPRING	STANDARD36826	HKLR	S
2025-03-18	NWL	2	2.60	SPRING	STANDARD36826	HKLR	P
2025-03-18	NWL	3	23.76	SPRING	STANDARD36826	HKLR	P
2025-03-18	NWL	2	2.30	SPRING	STANDARD36826	HKLR	S
2025-03-18	NWL	3	6.14	SPRING	STANDARD36826	HKLR	S
2025-05-23	NWL	1	37.01	SPRING	SEAMAR	HKLR	P
2025-05-23	NWL	2	11.06	SPRING	SEAMAR	HKLR	P
2025-05-23	NWL	4	5.93	SPRING	SEAMAR	HKLR	P
2025-05-23	NWL	1	4.76	SPRING	SEAMAR	HKLR	S
2025-05-23	NWL	2	1.15	SPRING	SEAMAR	HKLR	S
2025-05-24	NEL	1	20.55	SPRING	SEAMAR	HKLR	P
2025-05-24	NEL	2	18.12	SPRING	SEAMAR	HKLR	P
2025-05-24	NEL	1	10.62	SPRING	SEAMAR	HKLR	S
2025-05-24	NEL	2	2.42	SPRING	SEAMAR	HKLR	S
2025-05-24	NWL	1	3.68	SPRING	SEAMAR	HKLR	P
2025-05-24	NWL	2	6.49	SPRING	SEAMAR	HKLR	P
2025-05-24	NWL	3	2.21	SPRING	SEAMAR	HKLR	P
2025-05-24	NWL	1	1.75	SPRING	SEAMAR	HKLR	S
2025-05-24	NWL	2	2.93	SPRING	SEAMAR	HKLR	S
2025-05-25	NWL	1	11.04	SPRING	SEAMAR	HKLR	P
2025-05-25	NWL	2	28.78	SPRING	SEAMAR	HKLR	P
2025-05-25	NWL	3	12.37	SPRING	SEAMAR	HKLR	P
2025-05-25	NWL	4	1.15	SPRING	SEAMAR	HKLR	P

2025-05-25	NWL	1	1.28	SPRING	SEAMAR	HKLR	S
2025-05-25	NWL	2	2.62	SPRING	SEAMAR	HKLR	S
2025-05-25	NWL	3	2.88	SPRING	SEAMAR	HKLR	S
2025-05-26	NEL	1	7.07	SPRING	SEAMAR	HKLR	P
2025-05-26	NEL	2	9.06	SPRING	SEAMAR	HKLR	P
2025-05-26	NEL	3	13.11	SPRING	SEAMAR	HKLR	P
2025-05-26	NEL	4	8.08	SPRING	SEAMAR	HKLR	P
2025-05-26	NEL	1	5.80	SPRING	SEAMAR	HKLR	S
2025-05-26	NEL	2	2.44	SPRING	SEAMAR	HKLR	S
2025-05-26	NEL	3	2.42	SPRING	SEAMAR	HKLR	S
2025-05-26	NEL	4	1.18	SPRING	SEAMAR	HKLR	S
2025-05-26	NWL	2	11.06	SPRING	SEAMAR	HKLR	P
2025-05-26	NWL	2	4.41	SPRING	SEAMAR	HKLR	S
2025-05-27	NEL	1	0.43	SPRING	SEAMAR	HKLR	P
2025-05-27	NEL	2	2.63	SPRING	SEAMAR	HKLR	P
2025-05-27	NEL	3	9.22	SPRING	SEAMAR	HKLR	P
2025-05-27	NEL	4	5.43	SPRING	SEAMAR	HKLR	P
2025-05-27	NEL	2	4.91	SPRING	SEAMAR	HKLR	S
2025-05-27	NEL	3	5.37	SPRING	SEAMAR	HKLR	S
2025-05-27	NEL	4	0.41	SPRING	SEAMAR	HKLR	S
2025-05-27	NWL	2	12.77	SPRING	SEAMAR	HKLR	P
2025-05-27	NWL	3	8.75	SPRING	SEAMAR	HKLR	P
2025-05-27	NWL	4	1.32	SPRING	SEAMAR	HKLR	P
2025-05-27	NWL	2	6.30	SPRING	SEAMAR	HKLR	S
2025-05-27	NWL	3	0.18	SPRING	SEAMAR	HKLR	S
2025-05-27	NWL	4	0.81	SPRING	SEAMAR	HKLR	S
2025-05-28	NEL	2	13.43	SPRING	SEAMAR	HKLR	P
2025-05-28	NEL	3	2.58	SPRING	SEAMAR	HKLR	P
2025-05-28	NEL	4	1.34	SPRING	SEAMAR	HKLR	P
2025-05-28	NEL	2	6.68	SPRING	SEAMAR	HKLR	S
2025-05-28	NEL	3	2.92	SPRING	SEAMAR	HKLR	S
2025-05-28	NWL	2	19.27	SPRING	SEAMAR	HKLR	P
2025-05-28	NWL	3	17.91	SPRING	SEAMAR	HKLR	P
2025-05-28	NWL	4	3.96	SPRING	SEAMAR	HKLR	P
2025-05-28	NWL	2	11.90	SPRING	SEAMAR	HKLR	S
2025-05-28	NWL	3	0.36	SPRING	SEAMAR	HKLR	S
2025-05-28	NWL	4	2.33	SPRING	SEAMAR	HKLR	S
2025-05-29	NEL	1	11.99	SPRING	SEAMAR	HKLR	P
2025-05-29	NEL	2	7.49	SPRING	SEAMAR	HKLR	P
2025-05-29	NEL	1	6.03	SPRING	SEAMAR	HKLR	S
2025-05-29	NEL	2	6.01	SPRING	SEAMAR	HKLR	S
2025-05-29	NWL	1	22.98	SPRING	SEAMAR	HKLR	P

2025-05-29	NWL	2	1.69	SPRING	SEAMAR	HKLR	P
2025-05-29	NWL	1	8.94	SPRING	SEAMAR	HKLR	S
2025-05-30	NEL	2	2.83	SPRING	SEAMAR	HKLR	P
2025-05-30	NEL	3	11.72	SPRING	SEAMAR	HKLR	P
2025-05-30	NEL	4	3.42	SPRING	SEAMAR	HKLR	P
2025-05-30	NEL	2	1.65	SPRING	SEAMAR	HKLR	S
2025-05-30	NEL	3	8.28	SPRING	SEAMAR	HKLR	S
2025-05-30	NEL	4	0.13	SPRING	SEAMAR	HKLR	S
2025-05-30	NWL	1	2.34	SPRING	SEAMAR	HKLR	P
2025-05-30	NWL	2	8.91	SPRING	SEAMAR	HKLR	P
2025-05-30	NWL	3	28.40	SPRING	SEAMAR	HKLR	P
2025-05-30	NWL	4	1.16	SPRING	SEAMAR	HKLR	P
2025-05-30	NWL	1	3.58	SPRING	SEAMAR	HKLR	S
2025-05-30	NWL	2	2.95	SPRING	SEAMAR	HKLR	S
2025-05-30	NWL	3	4.78	SPRING	SEAMAR	HKLR	S
2025-05-30	NWL	4	1.98	SPRING	SEAMAR	HKLR	S

* P=distance travelled on transect lines; S=distance travelled transiting between transect lines