RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_3248L.15

05 August 2015

By Fax (3767 5922) and By Post

ARUP
Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon

Attention: Mr. Colin Meadows / Mr. Michael Chan

Dear Sirs,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2011/09 HZMB Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill
Quarterly EM&A Report No. 9 for March to May 2015

Further to the captioned submission (version 1.0 dated 15 July 2015) certified by the ET Leader provided to us via email on 28 July 2015, please be advised that we have no adverse comments on the captioned report.

Thank you for your kind attention. Please do not hesitate to contact the undersigned or the ENPO Leader Mr. Y H Hui should you have any queries.

Yours sincerely,
For and on behalf of
Ramboll Environ Hong Kong Limited

Antony Wong
Independent Environmental Checker
Hong Kong Link Road

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Y K Lam	(By Fax: 3188 6614)
	ARUP	Mr. Eric Chan	(By Fax: 2268 3970)
	Cinotech	Dr. Priscilla Choy	(By Fax: 3107 1388)
	DCVJV	Mr. Chu Chung Sing	(By Fax: 3121 6688)

Internal: DY, YH, LP, CL, ENPO Site

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Dragages -China Harbour-VSL JV

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

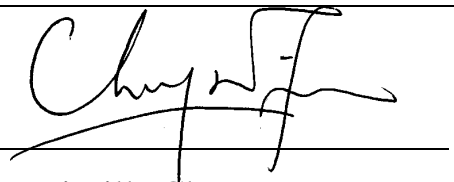
Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Quarterly EM&A Report

March to May 2015

(Version 1.0)

Certified By



Dr. Priscilla Choy
Environmental Team Leader
(Date: 15 July 2015)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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EXECUTIVE SUMMARY

Introduction

1. This is the 9th Quarterly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the project "Contract No. HY/2011/09 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill" (hereinafter called the "Contract"). This report documents the findings of EM&A Works performed in the period between March and May 2015.

Environmental Monitoring and Audit Progress

2. A summary of the monitoring activities in this reporting period is listed in **Table I** below:

Table I Summary Table for Monitoring Activities in the Reporting Period

Parameter(s)	Monitoring Date(s)
1-hr TSP Monitoring	5th, 11th, 17th, 23rd and 27th March 2015 2nd, 8th, 14th, 20th, 24th and 30th April 2015 6th, 12th, 18th, 22nd and 28th May 2015
24-hr TSP Monitoring	
Noise Monitoring	6th, 12th, 18th and 24th March 2015 9th, 15th, 21st and 27th April 2015 7th, 13th, 19th and 29th May 2015
Water Quality Monitoring	2nd, 4th, 6th, 9th, 11th, 13th, 17th, 19th, 21st, 23rd, 25th, 27th and 31st March 2015 2nd, 4th, 6th, 8th, 10th, 13th, 15th, 17th, 20th, 22nd, 24th, 27th and 29th April 2015 2nd, 4th, 6th, 8th, 11th, 13th, 15th, 18th, 20th, 22nd, 25th, 27th and 29th May 2015
Dolphin Monitoring (Line-transect Vessel Surveys)	19th and 27th March 2015 2nd and 13th April 2015 7th and 15th May 2015
Additional Land-based Dolphin Behaviour and Movement Monitoring	9th and 13th March 2015 14th and 20th April 2015 11th and 19th May 2015
Environmental Site Inspection	3rd, 10th, 17th, 23rd and 31st March 2015 9th, 14th, 21st and 29th April 2015 5th, 12th, 18st and 26th May 2015
Archaeological Site Inspection	17th March 2015

Breaches of Action and Limit Levels

3. Summary of the environmental exceedances of the reporting period is tabulated in **Table II**.

Table II Summary Table for Events Recorded in the Reporting Period

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Air Quality	1-hr TSP	0	0	0	0
	24-hr TSP	0	0	0	0
Noise	$L_{eq(30min)}$	0	0	0	0
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	8	6	0	0
Dolphin Monitoring	Line-transect Vessel Surveys	0	0	0	0

4. Environmental monitoring works were performed in the reporting period and all monitoring results were checked and reviewed. The details of each exceedance were attached in the Monthly EM&A Reports.

Complaint Log

5. No environmental complaint was received in the reporting period.

Notification of Summons and Successful Prosecutions

6. No notification of summons and successful prosecution was received in the reporting period.

Reporting Changes

7. This report has been developed in compliance with the reporting requirements for the quarterly EM&A Summary Report as required by the EM&A Manual for Hong Kong Link Road (EM&A Manual).

Future Key Issues

8. Major site activities for the coming reporting month will include:

WA4

- Fabrication of lifting frames
- Deliveries of frame structures

WA7

- Fabrication of cofferdam frame structures
- Maintenance of Reverse Circulation Drill (RCD) equipment

Marine Viaduct (P0 to P80)

Reverse Circulation Drill (RCD) Method:

- Temporary platform formation
- Installation of Jacket
- Dismantling of piling jackets
- Pile excavation and casing installation
- Inter-face tests, full depth coring test and sonic test
- Grouting works

Pile Cap Construction:

- Installation of precast cap shells
- Concreting
- Kingpost installation and associated steel welding works
- Concreting trimming
- Rock excavation
- Steel Fixing works of pile cap

Works with Cofferdam:

- Installation of waling strut
- Installation of sheet pile
- Installation of temporary working platform
- Installation of shear pin
- Installation of bored pile casing
- Excavation works and casting of concrete plug
- Dewatering works and sealing works
- Additional welding

Column Construction:

- Lifting works
- Lift concreting
- Pier head works
- Pier head concreting

Precast Column Erection

- Installation of base units and precast units
- Stressing of vertical nailing tendons

Deck Erection

- Setting up of equipment
- Segment erection

Precast Segment

- Segment casting

Land Viaduct (P81 to Abutment at Scenic Hill Tunnel (SHT))

- Pile construction
- Pouring of column
- Excavation works and waling & struts installation work
- Sewage diversion
- Pre-bored sheet pile
- Pile cap excavation work and waling & struts installation
- Erection of steel girders and cross beams
- Erection of vertical formwork and kickers
- Steel fixing for portal
- Removal of falsework
- Formworks
- Construction of temporary foundations
- Segment deliveries
- Segment erection

1 INTRODUCTION

1.1 Cinotech Consultants Limited (Cinotech) was appointed by Dragages -China Harbour-VSL JV (hereinafter called "the Contractor") as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Contract No. HY/2011/09 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill" (hereinafter called the "Contract") in accordance with EP Conditions 2.1.

Purpose of the report

1.2 This is the 9th Quarterly EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme in the period between March and May 2015.

Structure of the report

1.3 The structure of the report is as follows:

Section 1: **Introduction -** purpose and structure of the report.

Section 2: **Contract Information** - summarises background and scope of the Contract, site description, project organization and contact details, construction programme, the construction works undertaken and the status of Environmental Permits/Licenses during the reporting month.

Section 3: **Environmental Monitoring and Audit Requirements -** summarises the monitoring parameters, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, site audit summary and environmental mitigation measures.

Section 4: **Environmental Monitoring Results -** summarises the environmental monitoring results in terms of air quality, noise, water quality, dolphin and waste management.

Section 5: **Environmental Non-conformance -** summarises any monitoring exceedance, environmental complaints, environmental summons and successful prosecutions within the reporting period.

Section 6: **Conclusions and Recommendation**

2 CONTRACT INFORMATION

Background

2.1 The proposed Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road (HKLR) is 12km long connecting the Hong Kong-Zhuhai-Macao Bridge (HZMB) at the HKSAR Boundary with the Hong Kong Boundary Crossing Facilities (HKBCF) situated at the north eastern waters of the Hong Kong International Airport, opening a new and direct connection route between Hong Kong, Macao and the Western Pearl River Delta.

2.2 The HKLR comprises a 9.4km long viaduct section from the HKSAR boundary to Scenic Hill on the Airport Island; a 1km tunnel section to the reclamation formed along the east coast of the Airport Island and a 1.6km long at-grade road section on the reclamation connecting to the HKBCF. The tunnel section of HKLR will pass under Scenic Hill, Airport Road and Airport Railway to minimize the environmental and visual impacts to Tung Chung residents.

2.3 An application (No ESB-110/2003) for an Environmental Impact Assessment (EIA) Study Brief under Section 5(1) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by Highways Department (the Project Proponent) on 8 October 2003 with a Project Profile (No. No. PP-201/2003) for the Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection. The Hong Kong - Zhuhai - Macao Bridge Hong Kong Section and North Lantau Highway Connection has subsequently been renamed as HKLR. EPD issued an EIA Study Brief (No: ESB-110/2003) in November 2003 to the Project Proponent to carry out an EIA study.

2.4 An EIA Study (Reg. No. AEIAR-144/2009) has been undertaken to provide information on nature and extent of environmental impacts arising from the construction and operation of HKLR. The Environmental Permit was issued on 4 November 2009 (Permit No. EP-352/2009). Pursuant to Section 13 of the EIAO, the Director of Environmental Protection amends the Environmental Permit (No. EP-352/2009) based on the Application No. VEP-339/2011 and the environmental Permit (Permit No. EP-352/2009/A) was issued on 9 November 2011 for HKLR to the Highways Department as the Permit Holder. Subsequently, the Director of Environmental Protection amends the Environmental Permits (No. EP-352/2009/A, EP-352/2009/B, EP-352/2009/C) based on the Application No. VEP-409/2013, VEP-411/2013 and VEP-459/2014 respectively. The environmental Permit (Permit No. EP-352/2009/D) was then issued on 22 December 2014.

2.5 **Figure 1a-d** shows the layout of the Contract and the scope of the Contract works comprises the following major items:

- a dual 3-lane carriageway in the form of viaduct from the HKSAR boundary (connecting with the HZMB Main Bridge) to the Scenic Hill (connecting with the tunnel under separate Contract No. HY/2011/03), of approximately 9.4km in length with a hard shoulder for each bound of carriageway and a utilities trough on the outer edge of each bound of viaducts;
- a grade-separated turnaround facility located near San Shek Wan, composed of sliproads in the form of viaduct with single-lane carriageway bifurcated from the HKLR mainline with an elevated junction above the mainline;

- provision of ancillary facilities including, but not limited to, meteorological enhancement measures including the provisioning of anemometers and modification of the wind profiler station at hillside of Sha Lo Wan, provisioning of a compensatory marine radar, and provisioning of security systems; and
- associated civil, structural, geotechnical, marine, environmental protection, landscaping, drainage and highways electrical and mechanical (E&M) works, street lightings, traffic aids and sign gantries, marine navigational aids, ship impact protection system, water mains and fire hydrants, lightning protection system, structural health monitoring and maintenance management system (SHM&MMS), supervisory control and data acquisition (SCADA) system, as well as operation and maintenance provisions of viaducts, provisioning of facilities for installation of traffic control and surveillance system (TCSS), provisioning of facilities for installation of telecommunication cables/equipments and reprovisioning works of affected existing facilities/utilities.

Contract Organisation

2.6 Different parties with different levels of involvement in the Contract organization include:

- Supervising Officer's Representative (SOR) – Ove Arup & Partners Hong Kong Limited (ARUP)
- Contractor –Dragages -China Harbour-VSL JV (DCVJV)
- Environmental Team (ET) – Cinotech Consultants Ltd. (Cinotech)

2.7 The proposed project organization and lines of communication with respect to the on-site environmental management structure are shown in **Figure 2**. The key personnel contact names and numbers are summarized in **Table 2.1.**

Table 2.1 Key Contacts of the Contract

Party	Position	Name	Phone No.	Fax No.
SOR (ARUP)	CRE	Mr. Michael Chan	3767 5803	3767 5922
		Mr. Colin Meadows	3767 5801	
ENPO/IEC (Environ)	Environmental Project Office Leader	Mr. Y. H Hui	3465 2888	3465 2899
	Independent Environmental Checker	Mr. Antony Wong	3465 2888	3465 2899
Contractor (DCVJV)	Deputy Project Director	Mr. W.K Poon	3121 6638	3121 6688
	Environmental Officer	Mr. CHU Chung Sing	3121 6672	
	24-hour Hotline	--	6898 6161	--
ET (Cinotech)	Environmental Team Leader	Dr. Priscilla Choy	2151 2089	3107 1388

2.8 ENVIRON Hong Kong Ltd. (Environ) is employed by the Highways Department as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

Construction Programme

2.9 A copy of Contractor's construction programme is provided in **Appendix A**.

Summary of Construction Works Undertaken During Reporting Period

2.10 The major site activities undertaken in the reporting period included:

March 2015:

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

(a) The last pile for land viaduct was concreted in this reporting period.

(b) Total 169 pours for column were completed with 7 pours in this reporting period; 61 columns were completed to top level (30 gridlines - P85 to P114). Land viaduct column completed.

(c) P81R&L excavation works and waling & struts installation work are in progress.

(d) Sewage diversion at P82 is in progress.

(e) P82R pre-bored sheet pile were completed, P82L pre-bored sheet pile in progress.

(f) P83R pile cap excavation work and waling & struts installation is in progress.

(g) Portal Works:

Pier Location	Progress
P84	Formation work is in progress, steel bracket system to be erected;
P87	Erection of steel girders and cross beams is in progress;
P88	Erection of vertical formwork and kickers is in progress;
P93	Steel fixing for portal is in progress;
P94	Portal was concreted on 24 March 2015;
P95	Portal was concreted on 13 March 2015, removal of vertical formwork is in progress;
P96	Removal of falsework is in progress;
P98	Removal of steel bracket system is in progress;
P99	Removal of falsework is in progress;
P100	Removal of falsework was completed;
P101	Removal of falsework was completed;

(h) Construction of drainage work near P115 Abutment was completed, adjusting manhole covers is in progress.

(i) Construction of temporary foundations for P114 segment temporary supports at R & C Lines were completed, pile caps construction at L-Line is in progress.

Marine Viaduct (P0 to P80)

RCD Method (except P68):

(a) Piling jackets were dismantled at D18 and P26.

(b) Pile excavations and casing installation are in progress at P69. 4 marine piles using RCD method were concreted in the reporting period.

(c) Inter-face coring tests were carried out at P5, P6, P10, P11 & P26.

(d) No Full depth coring test was carried.

(e) Sonic tests were carried out at P5, P6, P10, P11 & P69.

(f) Grouting works were carried out at P26.

Progress at P68

(a) Temporary platform formation is on-going (about 16,000T of grade 150 fill placed and 2,000T of rock armour).

(b) Jacket was installed on RHS and casing driven.

(c) Logistic platform was completed.

Disposal from Marine Works

(a) The disposals in this reporting period are shown in below table.

Disposal Location	No of Trip	Type of Materials
TM38	0	Inert Materials
TMCLK	0	Inert Materials
HK Open Sea Mud Pits	1	Types II Marine Mud
Cross Boundary Disposal	5	Type I Marine Mud

Pilecap Construction:

(a) 8 precast cap shells were installed P1, P12, P54 & P58.

(b) Stage 1 concreting was completed at P12, P17, P22 & P23.

(c) Stage 1 works is in progress at P1, P12, P17, P22 & P23.

(d) Stage 2 concreting was completed at P3, P4, P17R, P22 & P25.

(e) Stage 2 works is in progress at P3, P4, P17, P22, P23 & P25.

(f) Kingpost installation and associated steel welding works for precast shell installation are in progress at P7, P12, P13, P15 & P54.

(g) Concrete trimming and advanced trimming (inside casing) works were carried out at P2, P7, P15, P19-F1 &F2, P22, P55, P79 & P80.

(h) Submerged pilecap works with cofferdam:

Pier Location	Side	Progress
P70	L	Concreting works of pile cap completed on 13-Jan-15
	R	Concreting works of pile cap completed on 5-Jan-15
P71	L	Concreting works of pile cap completed on 6-Oct-14
	R	Concreting works of pile cap completed on 18-Dec-14
P72	L	Concreting works of pile cap completed on 10-Mar-15
	R	Concreting works of pile cap completed on 31-Jan-15
P73	L	Concreting works of pile cap completed on 4-Dec-14
	R	Concreting works of pile cap completed on 3-Jan-15
P74	L	Concreting works of plug completed on 2-Mar-15; Trimming of pile head concrete is in progress
	R	Excavation works is in progress
P75	L	Rock excavation is in progress
	R	Rock excavation is in progress
P76	L	Trimming of pile head concrete is in progress
	R	Concreting works of plug completed on 16-Mar-15; Cleaning works before blinding layer is in progress.
P77	L	Concreting works of pile cap completed on 24-Mar-15
	R	Steel Fixing works of pile cap is in progress
P78	L	Concreting works of pile cap completed on 24-Jan-15
	R	Concreting works of pile cap completed on 30-Jan-15

In-situ Column Construction

(a) 1st lift works is in progress at P16, P21, P27, P28, P29, P30, P31, P53, P59 & P70.
(b) 1st lift concrete was poured at P27, P28, P29, P30, P31, P53, P59 and P70.
(c) 2nd lift works and poured at P53.
(d) Pier head works is in progress at P50, P61 & P62.
(e) Pier head concreting was poured at P50, P61 & P62.

Precast Column Erection

(a) P29, P30 & P32 - Base units installed.
(b) P32 - P44 All precast units now installed.
(c) P43 - Vertical nailing tendons stressed.

In-situ Double Blade Column Construction

Pier Location	Side	Progress
P18	L	To be started in April 2015
	R	To be started in April 2015
P19	L	Completed 4th and 5th lift in progress
	R	Completed 3rd & 4th lift and started for 5th lift
P20	L	All cast in March 2015, total 7th lift
	R	All cast in March 2015, total 7th lift

Pier Location	Side	Progress
P71	L	All cast in February 2015, total 3 lifts (including pierhead)
	R	All cast in March 2015, total 3 lifts (including pierhead)
P72	L	To be started in April 2015
	R	To be started in April 2015
P73	L	Completed 1st lift and 2nd lift in progress
	R	Completed 1st lift and 2nd lift in progress

Marine Portal

(a) Steel fixing of portal at P52 is in progress. Bearing installation and faleswork of portal at P60 were completed and soffit formwork is in progress.

Deck Erection

(a) Setting up of Equipment:

Type of Equipment	Status
Lifting Frames 1 (LF1)	Assembly of the first set of LF1 is on-going at WA4; Steelwork for the 2nd set of Lifting Frames is under fabrication with some deliveries commenced.
Lifting Frames 3 (LF3)	Fabrication of LF3 in China has commenced. Some major components have been completed, and some deliveries have been commenced. Assembly of the first 4 sets of LF3 is targeted to be commenced by mid-April at WA4.
Launching Gantry 1 (LG1)	Segment erection at P110, P111 & P112R&C completed. Gantry has been commissioned for launching and launched to P113 & P114 is completed
Launching Gantry 2 (LG2)	Load test and commissioning of the first part have been completed.

(b) Segment erection:

- A cumulative total of 140 segments have been erected

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
LG1*	P110 & P111	16	112
LG2	P47	4	4
SOP	P65	4	24

Precast Segment

(a) Segment Casting:

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	41	1850

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	134
A2	228

Precast Concrete Shell Casting

(a) Summary of precast shell cast in the precast yard:

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	6	80
CP2	Completed	12
CP3	1	8
CP4	Completed	8
CP5	Completed	6
CP6	1	4

Precast Column & Precast Pier Head Casting

(a) Progress of the precast column & precast pier head casting:

- All the 5 moulds are in service for precast production.
- Totally 25 precast elements (6 piers with 3m high, 12 piers with 6m high, 4 monolithic pier heads and 3 pier heads with bearing support) were cast in this reporting period.
- Cumulatively 162 precast elements have been produced.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of additional barges engaged in this period: 6
- Cumulative number of barges: 11 (2 barges allocated for long span storage)
- Number of Deck Segment deliveries in this period: 7 trips
- Cumulative number of Deck Segment deliveries: 43 trips

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	12	40
B	0	0
C	0	0
D	0	0

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
E	22	164

(b) Precast column units:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 1
- Number of column unit deliveries in this period: 5 trips
- Cumulative number of column unit deliveries: 19 trips

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
3m	4	16
6m	8	34
PH1	8	18
PH2	0	8

(c) Temporary storage of long span segments:

- First barge loaded with four long span segments on 26 March 15.
- Preparation of 2nd Long-Span storage barge on going.

April 2015:

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

(a) P81L pile cap excavation works was completed and reinforced concrete works is in progress. P81R pile cap excavation works and waling & struts installation works are in progress.

(b) P82L pre-bored sheet pile is in progress.

(c) P83R pile cap excavation work and waling & struts installation is in progress.

(d) Portal Works:

Pier Location	Progress
P84	Steel bracket and girders erection completed;
P87	Erection of steel bracket system completed, formwork erection is in progress;
P88	Portal concrete was poured on 24 April 2015;
P90	Formation work is in progress;
P91	Erection of steel cross beams and falsework is in progress
P93	Portal concrete was poured on 11 April 2015, removal of formwork is in progress;
P94	Removal of falsework is in progress;
P95	Removal of falsework is in progress;
P96	Removal of falsework completed;

Pier Location	Progress
P98	Removal of falsework completed;
P99	Removal of falsework completed;

Marine Viaduct (P0 to P80)

Reverse Circulation Drill (RCD) Method (except P68 & P75):

(a) Piling jackets were dismantled at P69.

(b) No pile excavations, casing installation and concrete casting in the reporting period.

(c) Inter-face coring tests were carried out at P6, P57 & P69.

(d) P6-L2 & P69-R1 Full depth coring test was carried.

(e) Sonic tests were carried out at P5, P6, P9, P56, P57 & P69.

(f) Grouting works were carried out at P10, P11, P56 & P69.

Progress at P68 & P75

(a) Temporary platform formation is on-going (about 32,000 tonnes of grade 150 fill and 6,000 tonnes of rock armour placed).

(b) Jacket was installed on right-hand side (RHS) and casing driven.

(c) Excavation to formation (at concrete plug base) level by breaker & chisel at P75 R & L continued.

Disposal from Marine Works

(a) The disposals in this reporting period are shown in below table.

Disposal Location	No of Trip	Type of Materials
TM38	0	Inert Materials
TMCLK	0	Inert Materials
HK Open Sea Mud Pits	0	Types II Marine Mud
Cross Boundary Disposal	0	Type I Marine Mud

Pilecap Construction:

(a) 10 precast cap shells were installed P2L, P7, P13, P15, P26R & P58.

(b) Stage 1 concreting was completed at P1, P54 & P58R.

(c) Stage 1 works is in progress at P1, P15, P54 & P58R.

(d) Stage 2 concreting was completed at P1, P12, P17L, P22 & P23.

(e) Stage 2 works is in progress at P1, P12, P17L, P22, P23 & P54.

(f) Kingpost installation and associated steel welding works for precast shell installation are in progress at P55 & P80.

(g) Concrete trimming and advanced trimming (inside casing) works were carried out at P10, P11, D17-F1, D19-F1, D20-F1, P26R, P54, P55, P56 & P58.(h) Submerged pilecap works with cofferdam:

Pier Location	Side	Progress
P74	L	Trimming of pile head concrete is in progress
	R	Concreting works of concrete beam completed on 29-Apr-15
P75	L	Rock excavation is in progress
	R	Rock excavation is in progress
P76	L	Concreting works of pile cap completed on 20-Apr-15
	R	Steel Fixing works of pile cap is in progress
P77	R	Concreting works of pile cap completed on 2-Apr-15

In-situ Column Construction

(a) 1st lift works is in progress at P14, P22 & P24.
(b) 1st lift concrete was poured at P16, P21, P25 & P70.
(c) 2nd lift works: N/A.
(d) Pier head works is in progress at P53.
(e) Pier head concreting was poured at P59 & P62.

Precast Column Erection

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Precast Column Base Unit	P28, P29	4	17 (P28-P44)
Precast Column Pier Head	P30, P31	4	15 (P30-P44)
Vertical Tendons Stressed	P39, P40, P41, P42	8	6 (P39-P44)
Grouting Vertical Tendons	P40, P42	4	3.5 (P40, P42, P43L, P44)
Pier Head Concrete	P44	2	1 (P44)

In-situ Double Blade Column Construction

Pier Location	Side	Progress
P18	L	Poured concrete to 1st lift and 2nd lift in progress
	R	Poured concrete to 1st lift and 2nd lift in progress
P19	L	Poured concrete to 5th & 6th lift and started for 7th lift
	R	Poured concrete to 5th & 6th lift and started for 7th lift
P72	L	Just commenced
	R	Just commenced
P73	L	Poured concrete to 2nd lift and pier head in progress
	R	All cast in April 2015, total 3 lifts (including pier head)

Marine Portal

(a) Portal at P52 was casted on 18 April 2015.
(b) Steel fixing at P60 is in progress.

Deck Erection

(a) Setting up of Equipment:

Type of Equipment	Status
Lifting Frames 1 (LF1)	Assembly of the first set of LF1 is on-going at WA4; Steelwork for the 2nd set of Lifting Frames is under fabrication with some deliveries commenced.
Lifting Frames 3 (LF3)	Fabrication of LF3 in China has commenced. Some major components have been completed, and some deliveries have been commenced. Assembly of the first 4 sets of LF3 is targeted to be commenced by mid-April at WA4. 2 sets will be assembled at WA4 by Mid-May
Launching Gantry 1 (LG1)	LG1 in operation and erection of P113-P114 (R&C) is under progress
Launching Gantry 2 (LG2)	Load test and commissioning of the first part have been completed, erection of segments to P46 and P47 in progress

(b) Segment erection:

- A cumulative total of 140 segments have been erected

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
LG1*	P113 & P114	62	174
LG2	P46-P47	44	48
SOP	P64	4	28

Precast Segment

(a) Segment Casting:

- Segment production has resumed on 20 April 2015.
- Storage for long span & type D segments is still the main issue.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	75	1925

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	134
A2	228
A3	32

Precast Concrete Shell Casting

(a) Summary of precast shell cast in the precast yard:

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	6	87
CP2	Completed	12
CP3	2	10
CP4	Completed	8
CP5	Completed	6
CP6	Completed	4
CP11	1	1

Precast Column & Precast Pier Head Casting

(a) Progress of the precast column & precast pier head casting:

- All the 5 moulds are in service for precast production.
- Totally 37 precast elements (12 piers with 3m high, 15 piers with 6m high, 7 monolithic pier heads and 3 pier heads with bearing support) were cast in this reporting period.
- Cumulatively 199 precast elements have been produced.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 9
- Number of Deck Segment deliveries in this period: 21 trips
- Cumulative number of Deck Segment deliveries: 64 trips

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	48	88

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
B	0	0
C	0	0
D	0	0
E	50	214

(b) Precast column units:

- Number of additional barges engaged in this period: 0
- Cumulative number of barges: 1
- Number of column unit deliveries in this period: 5 trips
- Cumulative number of column unit deliveries: 24 trips

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
3m	2	18
6m	14	48
PH1	2	20
PH2	2	10

(c) Temporary storage of long span segments:

- Number of barges engaged in this period: 1
- Cumulative number of barges: 3
- Second Long-span storage barge loaded with long span segments on 21 Apr 2015
- Preparation of 3rd Long-Span storage barge is ongoing.

May 2015:

Land Viaduct (P85 to Abutment at SHT) & Marine Viaduct (P81 - P84)

(a) P81L pile cap was completed and column construction work is in progress.

(b) P81R excavation works was completed and reinforced concrete works is in progress.

(c) P82L pre-bored sheet pile was completed and P82L&R excavation works are in progress.

(d) P83R pile cap was completed and pre-bored sheet pile was completed.

(e) Portal Works:

Pier Location	Progress
P84	Steel bracket and girders erection completed; Pier head construction is in progress
P86	Formation for falsework is in progress

Pier Location	Progress
P87	Steel fixing is in progress, target to concrete by end May 2015
P88	Removal of falsework is in progress
P89	Formation for falsework is in progress
P90	Steel bracket erection completed; Erection of planking and steel cross beams at road side is in progress
P91	Formwork erection completed; Steel fixing is in progress
P92	Erection of soffit formwork and construction of lower bearing plinths is in progress
P93	Removal of falsework completed; Removal steel cross beams is in progress
P94	Removal of falsework and steel bracket completed
P95	Removal of falsework completed

Marine Viaduct (P0 to P80)

RCD Method (locations other than P68 & P75):

(a) Inter-face coring tests were carried out at P8 & D17.

(b) P6-L2 & P9-R2 Full depth coring test was carried.

(c) Sonic tests were carried out at P8, P9 & D17.

(d) Grouting works were carried out at P6, P8, P57 & P69.

Progress at P68

(a) Temporary Rockfill platform formation completed.

(b) Outer and inner permanent casings were installed on left hand side (LHS).

(c) Annulus concrete around casings was cast.

(d) Infill concrete between inner and outer casing was cast.

(e) Torque frame was installed on LHS and right hand side (RHS).

(f) Temporary access to spoil barge was installed.

(g) RCD were set up on LHS.

Progress at P75

(a) Excavation to formation (at concrete plug base) level by breaker & chisel at P75 RHS was completed and levelling/preparation for cofferdam box installation is on-going.

Disposal from Marine Works

(a) The disposals in this reporting period are shown in below table.

Disposal Location	No of Trip	Type of Materials
TM38	0	Inert Materials
TMCLK	0	Inert Materials
HK Open Sea Mud Pits	0	Types II Marine Mud
Cross Boundary Disposal	0	Type I Marine Mud

Pilecap Construction:

(a) 2 precast cap shells were installed P55.

(b) Stage 1 concreting was completed at P2L, P7, P13 & P58L.

(c) Stage 1 works is in progress at P26R.

(d) Stage 2 concreting was completed at P15, P54 & P58R.

(e) Stage 2 works is in progress at P7, P13 & P58L.

(f) Kingpost installation and associated steel welding works for precast shell installation are in progress at P57.

(g) Concrete trimming and advanced trimming (inside casing) works were carried out at P5L, P11, D17-F1, P26R (inside shell), P56 & P57.

(h) Submerged pile cap works with cofferdam:

Pier Location	Side	Progress
P71	L	Backfilling and removal of cofferdam completed on 8-May-15
	R	Backfilling and removal of cofferdam completed on 8-May-15
P73	L	Backfilling and removal of cofferdam started on 20-May-15
	R	Backfilling and removal of cofferdam started on 20-May-15
P74	L	Trimming of pile head concrete is in progress
	R	Concreting works of concrete plug and concrete beam completed and dewatering to the bottom of cofferdam will be carried out
P75	L	Rock excavation is in progress
	R	Rock excavation is in progress
P76	R	Concreting works of pile cap completed on 2-May-15

In-situ Column Construction

(a) 1st lift works is in progress at P1, P3, P4, 59L-ramp & P78.
(b) 1st lift concrete was poured at P12, P14, P22, P23, P24, P54 & P59R-ramp.
(c) 2nd lift works is in progress at P54 and P70R.
(d) 2nd lift concrete was poured at P70L.
(e) Pier head works is in progress at: nil
(f) Pier head concreting was poured at P53.

Precast Column Erection

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Precast Column Base	P21, P27	4	19 (P21, P27-P44)

Description	Location completed in this reporting period	Number of Units erected/ Number of Columns completed in this reporting period	Cumulative No. of Piers completed (up to 28th of each month)
Unit			
Precast Column Pier Head	Nil	0	15 (P30-P44)
Vertical Tendons Stressed	P37, P38	4	8 (P37-P44)
Grouting Vertical Tendons	P39, P41, P43R	5	6 (P39-P44)
Pier Head Concrete	P42, P43	4	3 (P42-P44)

In-situ Double Blade Column Construction

Pier Location	Side	Progress
P17	L	Works commenced
	R	Works commenced
P18	L	Poured concrete to 3rd lift and 4th lift in progress
	R	Poured concrete to 3rd lift and 4th lift in progress
P19	L	All cast in May 2015, total 7 lifts
	R	All cast in May 2015, total 7 lifts
P20	L	All cast in March 2015, total 7 lifts
	R	All cast in March 2015, total 7 lifts
P71	L	All cast in February 2015, total 3 lifts (including pierhead)
	R	All cast in March 2015, total 3 lifts (including pierhead)
P72	L	Poured concrete to 1st lift and 2nd lift in progress
	R	Poured concrete to 1st lift and 2nd lift in progress
P73	L	All cast in May 2015, total 3 lifts (including pierhead)
	R	All cast in April 2015, total 3 lifts (including pierhead)
P77	L	Works commenced
	R	Works commenced

Marine Portal

(a) Formwork removal and remedial works for Portal at P52 are in progress.
(b) Portal at P60 was casted on 16 May 2015.

Deck Erection

(a) Setting up of Equipment:

Type of Equipment	Status
Lifting Frames 1 (LF1)	Assembly of the first & second set of LF1 is on-going at WA4; Steelwork for the 3rd and 4th set of Lifting Frames is under fabrication with some deliveries commenced.
Lifting Frames 3 (LF3)	Fabrication of LF3 in China is almost completed for 8 sets. Most of the major components have been completed, and have been delivered to site. Assembly of the first 2 sets of LF3 is completed. The 3rd and 4th sets are targeted to be completed by early-June at WA4. Assembly of the 5th to 8th sets will commence in June as well.
	LG1 in operation and launching back to P112L is in progress.

Type of Equipment	Status
Launching Gantry 1 (LG1)	
Launching Gantry 2 (LG2)	Commissioning completed for segment erection; Load test part 2 for launching scheduled in June.

(b) Segment erection:

- A cumulative total of 140 segments have been erected

Type	Location of Segments erected in this reporting period	Number of Segments erected in this reporting period	Cumulative No. of Segments erected (up to 28th of each month)
LG1	P108 & P113 & P114	46	220
LG2	P46-P47	32	80
SOP	P44 & P63	8	36

Precast Segment

(a) Segment Casting:

- Storage for long span & type D segments is still the main issue.

Item	Number in this reporting period	Cumulative No. of Precast Segment Completed (up to 28th of each month)
Segment Cast	164	2089

(b) Off-site Storage:

Area	No. in Off-site Storage
A1	134
A2	226
A3	98

Precast Concrete Shell Casting

(a) Summary of precast shell cast in the precast yard:

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP1	3	90
CP2	Completed	12
CP3	2	12
CP4	Completed	8
CP5	Completed	6
CP6	Completed	4

Type of Shell	Number of Precast Shell Cast in this reporting period	Cumulative No. of Precast Shell Completed (up to 28th of each month)
CP11	Completed	1
CP12	1	1

Precast Column & Precast Pier Head Casting

(a) Progress of the precast column & precast pier head casting:

- All the 5 moulds are in service for precast production.
- Totally 30 precast elements (5 piers with 3m high, 20 piers with 6m high, 4 monolithic pier heads and 1 pier heads with bearing support) were cast in this reporting period.
- All the 3m high piers have been completed in this period (in total 39 elements).
- Cumulatively 229 precast elements have been produced.

Delivery for Precast Concrete Elements (by barge)

(a) Precast Deck Segments:

- Number of additional barges engaged in this period: 2
- Cumulative number of barges: 11
- Number of Deck Segment deliveries in this period: 14 trips
- Cumulative number of Deck Segment deliveries: 67 trips

Segment Types	Segment Delivered in this reporting period	Cumulative No. of Precast Segment Delivered (up to 28th of each month)
A	38	130
B	0	0
C	0	0
D	0	0
E	38	252

(b) Precast column units:

- Number of additional barges engaged in this period: 1
- Cumulative number of barges: 4
- Number of column unit deliveries in this period: 3 trips
- Cumulative number of column unit deliveries: 27 trips

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
3m	0	18

Unit Types	Number of units delivered in this reporting period	Cumulative No. of Precast Column Delivered (up to 28th of month)
6m	10	56
PH1	0	20
PH2	4	10

(c) Temporary storage of long span segments:

- Number of barges engaged in this period: 1
- Cumulative number of barges: 4
- 4th barge loaded with long span.

Status of Environmental Licences, Notification and Permits

2.11 The valid environmental licenses and permits were attached in the Monthly EM&A Reports.

3 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

Monitoring Parameters and Monitoring Locations

3.1 The EM&A Manual designates locations for the ET to monitor environmental impacts in terms of air quality, noise, underwater noise, water quality and dolphin to the Contract. The monitoring locations are depicted in **Figures 3 to 6**. The details of monitoring requirements are presented in **Table 3.1**.

Table 3.1 Summary of Impact EM&A Requirements

Type of Monitoring	Parameter	Frequency	Location	Remarks
Air Quality	1-hr TSP	Three times / 6 days	AMS1 – Sha Lo Wan AMS4 – San Tau	While the highest dust impact was expected
	24-hr TSP	Once / 6 days		--
Noise	$L_{10(30\ min.)}$ dB(A) $L_{90(30\ min.)}$ dB(A) $L_{eq(30\ min.)}$ dB(A) (as six consecutive $L_{eq,\ 5min}$ readings)	Once per week	NMS1 – Sha Lo Wan NMS4 – San Tau	Daytime on normal weekdays (0700-1900 hrs)
Water Quality	• Temperature(°C) • pH(pH unit) • turbidity (NTU) • water depth (m) • salinity (ppt) • dissolved oxygen (DO) (mg/L and % of saturation) • suspended solids (SS) (mg/L)	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides (within ± 1.75 hour of the predicted time) during the construction period of the Contract	IS1, IS2, IS3 IS4, CS1, CS2, SR1, SR2, SR3, SR6, ST1, ST2, ST3, SRA	• 3 water depths: 1m below sea surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth sampling only. • If water depth less than 6m, mid-depth may be omitted.
Dolphin	Line-transect Methods	Twice per month	West Lantau	--

3.2 The wind speed and wind direction were recorded by the installed Wind Anemometer set at AMS4. The location is shown in **Figure 3**.

Monitoring Methodology and Calibration Details

3.3 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly EM&A Reports.

Environmental Quality Performance Limits (Action and Limit Levels)

3.4 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results (except the Action and Limit Levels for underwater noise monitoring). Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Table 3.2a-f**.

Table 3.2a Action and Limit Levels for 1-Hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AMS1	381	500
AMS4	352	

Table 3.2b Action and Limit Levels for 24-Hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AMS1	170	260
AMS4	171	

Table 3.2c Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) *

Noted: If works are to be carried during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.
(*) reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Table 3.2d Action and Limit Levels for Water Quality

Parameter (unit)	Water Depth	Action Level	Limit Level
Dissolved Oxygen (mg/L) (surface, middle, bottom)	Surface and Middle	***5.0***	***4.2*** except 5 for FCZ
	Bottom	***4.7***	***3.6***
Turbidity (NTU)	Depth average	***27.5*** and 120% of upstream control station's turbidity at the same tide of the same day	***47.0*** and 130% of turbidity at the upstream control station at the same tide of same day
Suspended Solids (mg/L)	Depth average	***23.5*** and 120% of upstream control station's SS at the same tide of the same day	***34.4*** and 130% of SS at the upstream control station at the same tide of same day and 10mg/L for WSD Seawater Intakes

Note:
(1) Depth-averaged is calculated by taking the arithmetic means of reading of all three depths
(2) For DO, non-compliance of the water quality limit occurs when monitoring result is lower that the limit.
(3) For SS & turbidity non-compliance of the water quality limits occur when monitoring result is higher than the limits.
(4) All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.
(5) The 1%-ile of baseline data for dissolved oxygen (surface and middle) and dissolved oxygen (bottom) are 4.2mg/L and 3.6mg/L respectively.

Table 3.2e Action and Limit Levels for Dolphin Line Transect Monitoring

	West Lantau
Action Level	STG < 60% of baseline & ANI <60% of baseline
Limit Level	STG < 45% of baseline & ANI <45% of baseline

Derived Value of Action Level (AL) and Limit Level (LL):

	West Lantau
Action Level	STG < 9.8 & ANI <36.3
Limit Level	STG < 7.4 & ANI <27.2

Remarks:
1. STG means quarterly encounter rate of number of dolphin sightings
2. ANI means quarterly encounter rate of total number of dolphins
3. Baseline value: 16.4 for ER (STG) and 60.5 for ER (ANI)

Event and Action Plan

3.5 Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Appendix G** shall be carried out.

Implementation Status of Environmental Mitigation Measures

3.6 Relevant mitigation measures as recommended in the EIA report have been stipulated in the EM&A Manual for the Contractor to implement. The implementation status of environmental mitigation measures (EMIS) is given in **Appendix H**.

3.7 Regular marine travel route for marine vessels were implemented properly in accordance with the submitted plan and relevant records were kept properly.

3.8 Acoustic decoupling measures for the stationary equipment (generators, winch generators and air compressors) mounted on boards were adopted according to EP Condition 3.7 and EM&A Manual, Section 10.2.18.

3.9 Dolphin exclusion zone and dolphin watching plan according to EM&A Manual, Section 10.2.12 and EP Condition 3.5 was implemented by DCVJV's trained dolphin watcher.

3.10 Spill kits and booms are ready on site for the event of accidental spillage of oil or other hazardous chemicals from construction activities including vessels operating for the Contract.

Site Audit Summary

3.11 Site audits were carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Contract site. The observations and recommendations made during the reporting period are summarized in **Appendix I**.

3.12 According to EP condition 4.7 and EM&A Manual, periodic monitoring (every three months) of construction works shall be conducted to ensure the avoidance of any impacts on Sha Lo Wan (West) Archaeological Site. Access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment is not allowed. One inspection to the Sha Lo Wan (West) Archaeological Site was conducted in the reporting period (17th March 2015). No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed. The photographic records of the inspection to the Sha Lo Wan (West) Archaeological Site are shown in the Monthly EM&A Reports**.**

Status of Waste Management

3.13 The amount of wastes generated by the activities of the Contract during the reporting month is shown in **Appendix J**.

4 ENVIRONMENTAL MONITORING RESULTS

Air Quality Monitoring Results

4.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in **Table 4.1 and 4.2** respectively. Graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices B and C** respectively.

Table 4.1 Summary Table of 1-hour TSP Monitoring Results during the Reporting Period

Month	Monitoring Station	Concentration (µg/m3)		Action Level, µg/m^3	Limit Level, µg/m^3
		Average	Range		
March 2015	AMS1	112	43 – 179	381	500
	AMS4	114	42 – 270	352	
April 2015	AMS1	68	15 – 168	381	
	AMS4	89	14 – 177	352	
May 2015	AMS1	38	19 – 72	381	
	AMS4	37	15 – 90	352	

Table 4.2 Summary Table of 24-hour TSP Monitoring Results during the Reporting Period

Month	Monitoring Station	Concentration (µg/m3)		Action Level, µg/m^3	Limit Level, µg/m^3
		Average	Range		
March 2015	AMS1	53	28 – 100	170	260
	AMS4	64	35 – 105	171	
April 2015	AMS1	53	27 – 92	170	
	AMS4	48	27 – 73	171	
May 2015	AMS1	37	15 – 52	170	
	AMS4	29	9 – 42	171	

4.2 According to our field observations, the major dust source identified at the designated air quality monitoring stations in the reporting period are as follows:

Table 4.3 Observation at Dust Monitoring Stations

Monitoring Station	Major Dust Source
AMS1	Exhaust from marine traffic
AMS4	N/A

4.3 The wind data monitoring results were attached in the Monthly EM&A Reports

Noise Monitoring Results

4.4 The noise monitoring results are summarized in **Table 4.4**. Graphical presentations of noise monitoring are shown in **Appendix D**.

Table 4.4 Summary Table of Noise Monitoring Results during the Reporting Period

Month	Monitoring Station	Noise Level, $L_{eq\ (30min)}$ dB(A)		Limit Level
		Average	Range	
March 2015	NMS1	68	65 - 72	75 dB(A)
	NMS4	61	53 – 66	
April 2015	NMS1	71	68 - 73	
	NMS4	67	63 – 69	
May 2015	NMS1	69	67 - 72	
	NMS4	63	57 – 66	

Remark: +3dB(A) Façade correction included

4.5 According to our field observations, the major noise source identified at the designated noise monitoring stations in the reporting period are as follows:

Table 4.5 Observation at Noise Monitoring Stations

Monitoring Station	Major Noise Source
NMS1	Air traffic & marine traffic noise
NMS4	Air traffic & marine traffic noise

Water Quality Monitoring Results

4.6 The graphical presentation of water quality at the monitoring stations is shown in **Appendix E**.

4.7 Water quality impact sources during the water quality monitoring were the construction activities of the Contract, nearby construction activities by other parties and nearby operating vessels by other parties.

Dolphin Monitoring (Line-transect Vessel Survey)

Summary of survey effort and dolphin sightings

4.8 During the period of March to May 2015, six sets of systematic line-transect vessel surveys were conducted to cover all transect lines in WL survey area twice per month.

4.9 From these surveys, a total of 196.44 km of survey effort was collected, with 86.9% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 130.31 km, while the effort on secondary lines was 66.13km.

Survey effort conducted on primary and secondary lines were both considered as on-effort survey data. Summary table of the survey effort is shown in **Appendix I of Appendix F**.

4.10 During the six sets of monitoring surveys in March to May 2015, a total of 29 groups of 97 Chinese White Dolphins were sighted. All except three sightings were made during on-effort search. Fourteen on-effort sightings were made on primary lines, while the other on-effort sightings were made on secondary lines. Summary table of the dolphin sightings is shown in **Appendix II of Appendix F**.

Distribution

4.11 Distribution of dolphin sightings made during monitoring surveys in March to May 2015 is shown in **Figure 1 of Appendix F**. The dolphin groups were evenly distributed throughout the WL survey area, with higher concentrations of sightings to the north of Tai O Peninsula and near Kai Kung Shan (**Figure 1 of Appendix F)**. However, it appeared that they occurred less frequently at the southern end of the survey area.

4.12 Sighting distribution of dolphins in the present quarter was similar to the one during the baseline period, with some subtle differences. There appeared to be fewer dolphins sighted in the offshore waters of West Lantau survey area (especially in the northern portion of the survey area) during the present monitoring quarter when compared to the dolphin distribution record in the baseline period.

4.13 Only one of the 29 dolphin groups was sighted near the HKLR09 alignment in WL survey area during the present quarter (**Figure 1 of Appendix F)**.

Encounter rate

4.14 During the three-month impact phase monitoring period (March – May 2015), the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) from West Lantau survey area are shown in **Table 4.6**. The average encounter rates deduced from the six sets of surveys from present quarter were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (**Table 4.7**).

Table 4.6 Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (March – May 2015)

Survey Area	Dolphin Monitoring	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	Primary Lines Only
West Lantau	Set 1 (March 19th)	9.7	106.4
	Set 2 (March 27th)	18.7	56.1
	Set 3 (April 2nd)	12.2	12.2
	Set 4 (April 13th)	5.8	5.8
	Set 5 (May 7th)	15.1	65.3
	Set 6 (May 15th)	13.1	26.1

Table 4.7 Comparison of average dolphin encounter rates from impact monitoring period (March – May 2015) and baseline monitoring period (September-November 2011)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	March - May 2015	September-November 2011	March - May 2015	September-November 2011
West Lantau	12.42 ± 4.42	16.43 ± 7.70	45.32 ± 38.14	60.50 ± 38.47

4.15 The encounter rates were also calculated for the present quarter using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 15.2 sightings and 53.3 dolphins per 100 km of survey effort respectively during the present quarter.

4.16 A one-way ANOVA was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. For the comparison between the baseline period and the present quarter (i.e. ninth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.294 and 0.954 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

4.17 Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first nine quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.508 and 0.999

respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

Group size

4.18 Group size of Chinese White Dolphins ranged from 1-20 individuals per group in WL survey area between March and May 2015. The average dolphin group sizes from these three-month period was compared with the one deduced from the baseline period in September to November 2011, as shown in **Table 4.8**. The average dolphin group size in the WL region during the present quarter was slightly lower than the one recorded in the three-month baseline period (**Table 4.8**). The majority of the dolphin groups (79.3%) were composed of 1-3 dolphins, but there were also six groups with more than 5 animals per group, and one very large group with 20 animals.

Table 4.8 Comparison of average dolphin group sizes from impact monitoring period (March – May 2015) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	March – May 2015	**September to November 2014**
West Lantau	3.34 ± 3.81 (n = 29)	3.63 ± 2.97 (n = 46)

4.19 Distribution of dolphins with the larger groups during March to May 2015 is shown **Figure 4 of Appendix F**. These groups were scattered from the bridge alignment to Fan Lau waters, with slightly higher concentration near Kai Kung Shan. This was slightly different from the baseline period, when the larger dolphin groups mostly occurred to the northwest of Tai O Peninsula (near the bridge alignment) as well as near Kai Kung Shan and Peaked Hill (**Figure 4 of Appendix F**).

Habitat use

4.20 From March to May 2015, the most heavily utilized habitats by the dolphins were mainly found near Tai O Peninsula, Kai Kung Shan and Fan Lau (**Figures 5a and 5b of Appendix F**). However, it should be cautioned that the amount of survey effort collected in each grid during the three-month period was fairly low (6 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern will be presented when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

4.21 When compared with the habitat use pattern recorded during the baseline period, it appears that the overall dolphin densities were lower in West Lantau waters, especially the waters adjacent to Tai O Peninsula, around Peaked Hill and near Fan Lau during the present quarter (**Figure 6 of Appendix F**).

Mother-calf pairs

4.22 During the three-month impact phase monitoring period, only two unspotted juveniles (UJ) were sighted in WL survey area. The young calves comprised 2.0% of all animals sighted, which was less than one-third of the percentage recorded during the baseline monitoring period (6.6%).

4.23 The infrequent occurrences of the two mother-calf pairs were located near Fan Lau and Tai O Peninsula (**Figure 7 of Appendix F**). This was in stark contrast to the baseline period when calf occurrence was frequent and more concentrated near Tai O Peninsula at the northern portion of WL waters (**Figure 7 of Appendix F**).

Activities and associations with fishing boats

4.24 During the three-month impact monitoring period, four dolphin sightings were associated with feeding activities between the HKLR09 bridge alignment and Peaked Hill (**Figure 8 of Appendix F**), comprising 13.8% of the total number of dolphin sightings. This percentage was very similar to the percentage recorded during the baseline period.

4.25 On the other hand, only one of the 29 sightings was associated with socializing activity near the HKLR09 bridge alignment (**Figure 8 of Appendix F**), while no dolphin group was engaged in traveling or milling/resting activity during the present quarter.

4.26 Notably, distribution of the feeding and socializing activities during the present impact phase monitoring period was somewhat different from the one during the baseline period, with the main concentration of these activities occurred between Tai O and Peaked Hill during the baseline period but no particular concentration of these activities during the impact phase period (**Figure 8 of Appendix F)**.

4.27 During the three-month monitoring period, one of the dolphin groups was associated with an operating hang-trawler near the HKLR09 bridge alignment.

Summary of photo-identification works

4.28 From March to May 2015, over 2,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

4.29 In total, 33 individuals sighted 45 times altogether were identified (see summary table in **Appendix III of Appendix F** and photographs of identified individuals in **Appendix IV of Appendix F**. Almost all identified individuals were sighted only once or twice during the three-month period, but one individual (WL72) were sighted three times.

4.30 Notably, two of these 33 individuals (i.e. NL123, NL285) were also sighted in North Lantau waters during the HKLR03 monitoring surveys in the same three-month period, showing some movements across the HKLR09 bridge alignment. Moreover, as in previous quarters, some individuals that were consistently sighted in North Lantau waters in the past were identified in West Lantau waters (e.g. NL123, NL188, NL226,

NL286). It is possible that some of these identified dolphins have shifted their range use into West Lantau.

4.31 During the three-month period, four recognizable females, NL123, NL188, WL44 and WL171, were accompanied with their calves during their re-sightings.

Individual range use

4.32 Ranging patterns of the 33 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in **Appendix V of Appendix F**.

4.33 For those that primarily used West Lantau waters as their home ranges, most of their re-sightings were made at a distance away from the HKLR09 alignment where they were frequently re-sighted in the past. It is possible that their range use in West Lantau waters have been somewhat affected by the HKLR09 construction activities with some moderate shift in range use.

Conclusion

4.34 During this quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.

4.35 Nevertheless, the dolphin usage in WL region should be continuously monitored, to further examine whether it has been significantly affected by the on-going construction activities in relation to the HZMB works.

Additional Land-based Dolphin Behaviour and Movement Monitoring

4.36 Additional land-based dolphin behavior and movement monitoring were conducted in the reporting period. The progress of the monitoring is summarized in the **Table 4.9**.

Table 4.9 Progress Record of Additional Land-based Dolphin Behaviour and Movement Monitoring (March to May 2015)

Date	Time	Weather		Number of Staff	Number of Dolphin Sighting
		Beaufort	Visibility		
09/03/2015	09:16 - 14:42	1	3.5-4	3	1
13/03/2015	09:04 - 14:35	2	1.5-2	3	1
14/04/2015	09:21 - 14:49	2	1	3	1
20/04/2015	09:14 - 14:32	2	3.5	3	0
11/05/2015	09:16 - 14:36	2	1.5	3	0
19/05/2015	09:04 - 14:05	2-3	2	3	0

4.37 Detailed monitoring methodology and results will be provided in a separate report after

the completion of full set of additional land-based dolphin behavior and movement monitoring.

Advice on the Solid and Liquid Waste Management Status

4.38 The Contractor was advised to minimize the wastes generated through the recycling or reusing. All mitigation measures stipulated in approved waste management plan shall be fully implemented.

4.39 The amount of wastes generated by the activities of the Contract during the reporting month is shown in **Appendix J**.

5 ENVIRONMENTAL NON-CONFORMANCE (EXCEEDANCES)

Summary of Exceedances

5.1 Summary of exceedance is provided in **Appendix K**. The details of the exceedances were attached in the Monthly EM&A Report.

Air Quality

5.2 For 1-hour TSP monitoring, no Action/Limit Level exceedance was recorded in the reporting period.

5.3 For 24-hr TSP monitoring, no Action/Limit Level exceedance was recorded in the reporting period.

Noise

5.4 No Action/Limit Level exceedance was recorded in the reporting period.

Water Quality

5.5 There are 8 Action Level exceedances and 6 Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance for turbidity were recorded in the reporting period.

5.6 According to the investigation, the exceedances are considered not due to the Contract due to the following reasons:

1) Installation work at Pile Cap was carried at near the monitoring stations in which exceedances were recorded. Water quality impact due to this work is not anticipated;
2) No pollution discharge was observed from the site;
3) Sediment plume due to natural fluctuation of shallow water was observed but no vessels were observed near the plumes;
4) Dispersion of sediment plume to the monitoring stations from the area outside the site boundary (i.e. works area not under and related to HY/2011/09) was observed; and
5) No site activity was carried at near the monitoring stations in which exceedances were recorded.

Dolphin Monitoring (Line-transect Vessel Survey)

5.7 No Action/Limit Level exceedance was recorded in the reporting period.

Summary of Environmental Complaint

5.8 No environmental related complaint was received in the reporting period. The Complaint Log is attached in **Appendix L**.

Summary of Notification of Summons and Successful Prosecution

5.9 There was one prosecution or notification of summons received since the Contract

commencement. Summary of successful prosecution is attached in **Appendix M**.

6 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

6.1 This Quarterly Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken in the period between March and May 2015 in accordance with EM&A Manual.

6.2 No Action/Limit Level exceedance was recorded for air quality and noise.

6.3 For water quality monitoring, there are 8 Action Level exceedances and 6 Limit Level exceedances were recorded for suspended solids. No Action/Limit Level exceedance was for turbidity were recorded in the reporting period.

6.4 According to the investigation, all exceedances are considered not due to the Contract.

6.5 During this quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.

6.6 Environmental site inspection was conducted on 3rd, 10th, 17th, 23rd and 31st March 2015, 9th, 14th, 21st and 29th April 2015, 5th, 12th, 18st and 26th May 2015 by ET in the reporting month. All deficiencies identified during the site inspection have already rectified / improved during the follow-up audit session.

6.7 The inspection to the Sha Lo Wan (West) Archaeological Site was conducted on 17th March 2015. No access to Sha Lo Wan (West) Archaeological site for works areas and storage of construction equipment was observed.

6.8 There was no environmental complaint, notification of summons and successful prosecution received in the reporting period.

6.9 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Recommendations

6.10 According to the environmental audit performed in the reporting month, the following recommendations were made:

Air Quality Impact

- To regularly maintain the quality of machinery and vehicles on site.
- To implement dust suppression measures on all haul roads, stockpiles, dry surfaces and excavation works.
- To provide hoarding along the entire length of that portion of the site boundary.

Noise Impact

- To inspect the noise sources inside the site.

- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers, if necessary.

Water Impact

- To prevent any surface runoff discharge into any stream course and sea.
- To review and implement temporary drainage system.
- To identify any wastewater discharges from site.
- To ensure properly maintenance for de-silting facilities.
- To clear the silt and sediment in the sedimentation tanks.
- To review the capacity of de-silting facilities for discharge.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.
- To avoid accumulation of stagnant and ponding water on site.

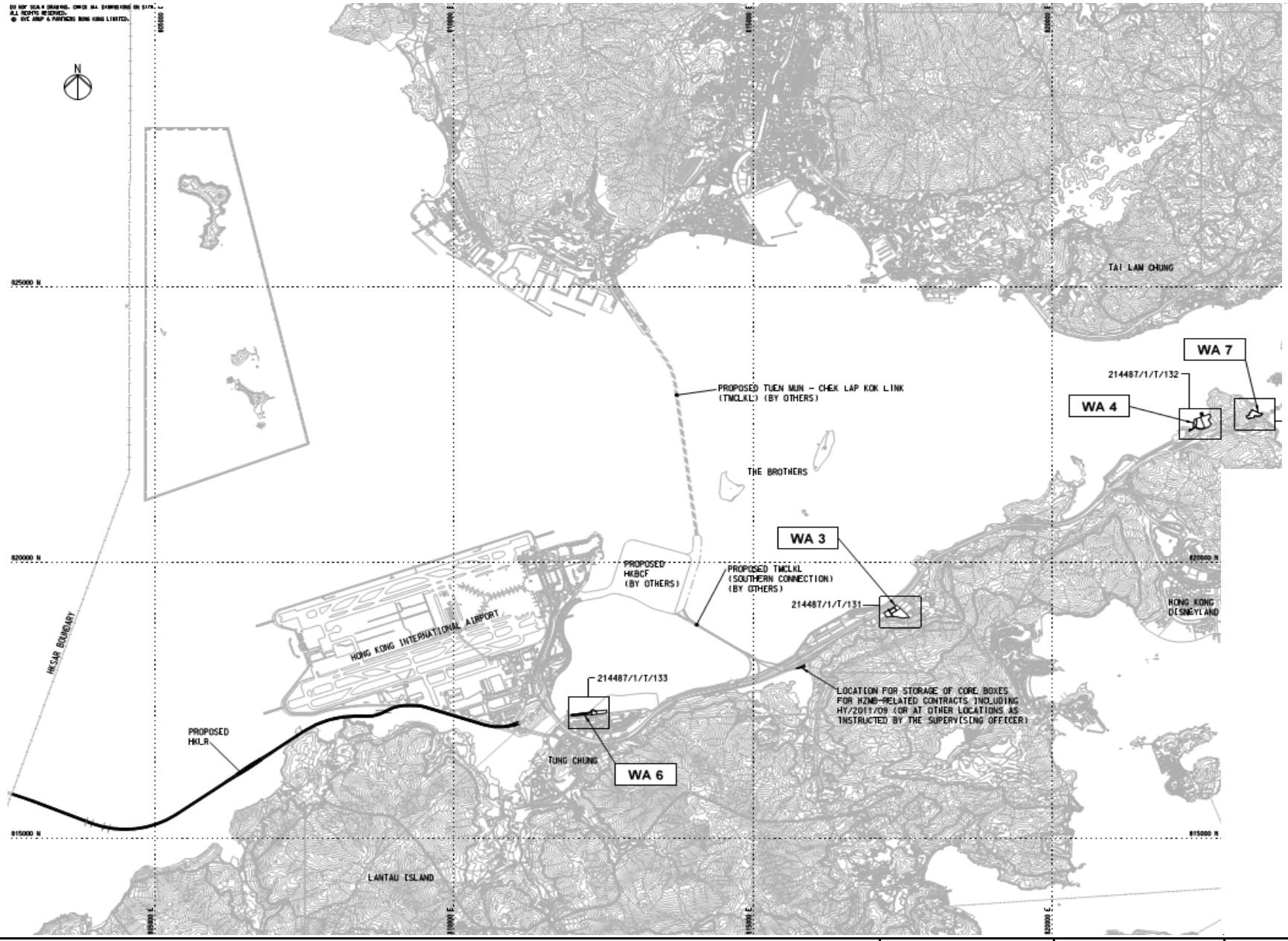
Ecology Impact

- To implement Spill Response Plan in the event of accidential spillage of or other hazardours chemicals.
- To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport.
- To implement Dolphin Watching Plan after the bored piling casing is installed.
- To ensure the acoustically-decoupled measures were implemented for air compressors and other noisy equipment mounted on construction vessels according to acoustic decoupling measures plan.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To ensure the performance of sorting of C&D materials at source (during generation);
- To carry out inspection of dump truck at site exit to ensure inert and non-inert C&D materials are properly segregated before removing off site.
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the site.
- To avoid improper handling or storage of oil drum on site.

FIGURE(S)



Title		Scale	Proposa
Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (WA3, WA4, WA6 and WA7)		N.T.S	No. MA12014
		Date Feb-13	Figure 1a

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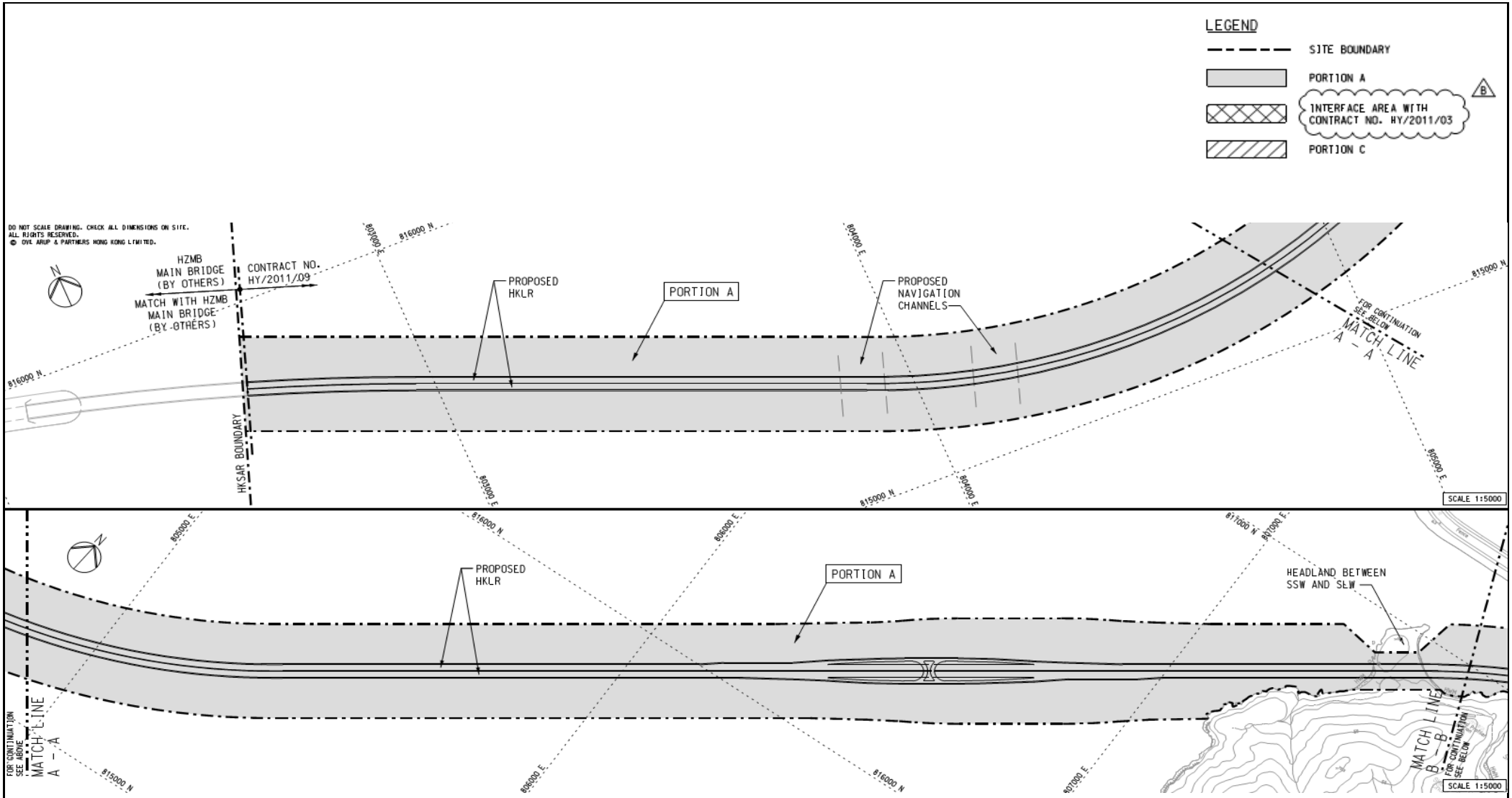

Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Portion A)	Scale: N.T.S Date: May-13	Proposa No.: MA12014 Figure: 1b

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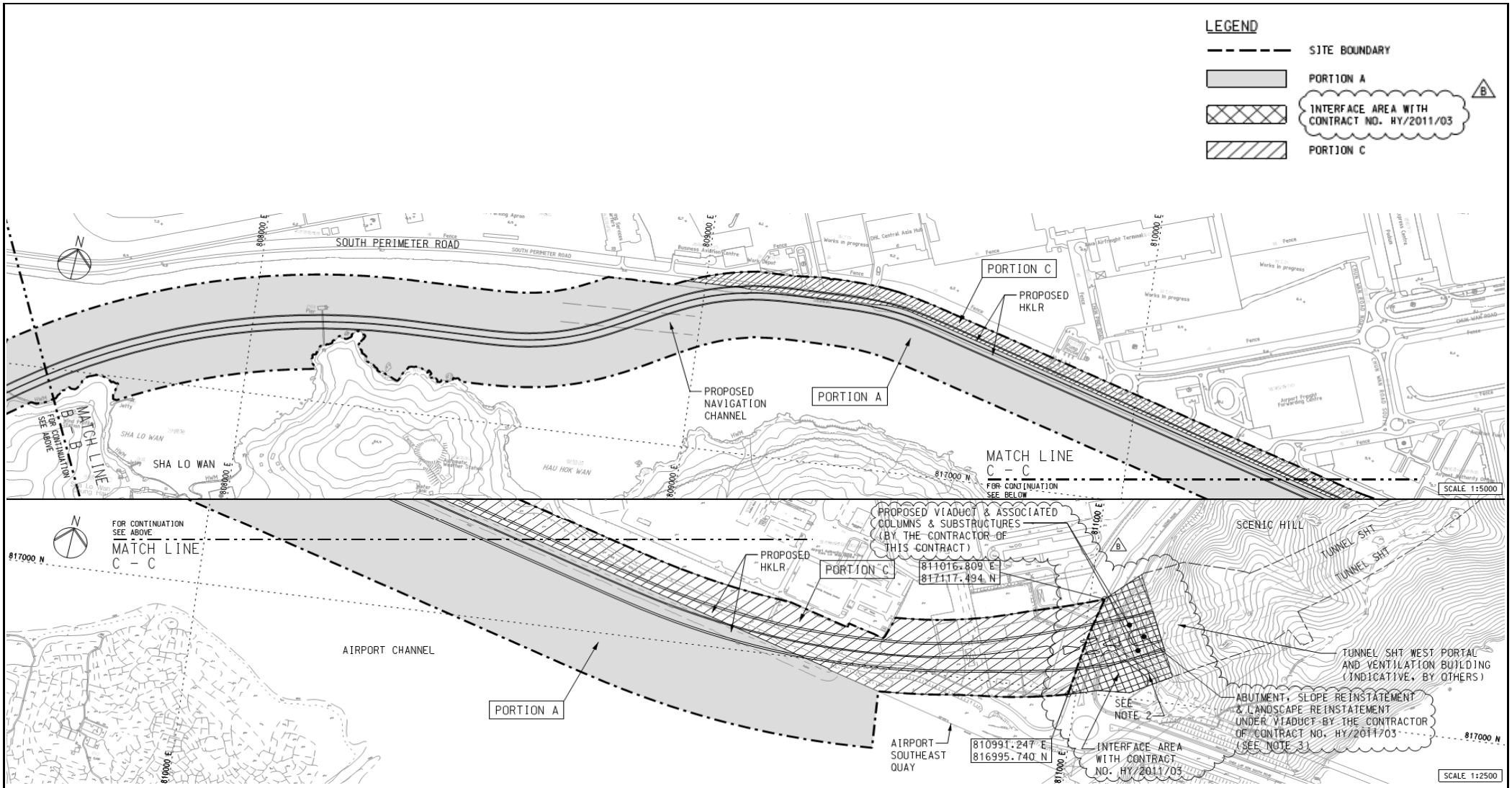

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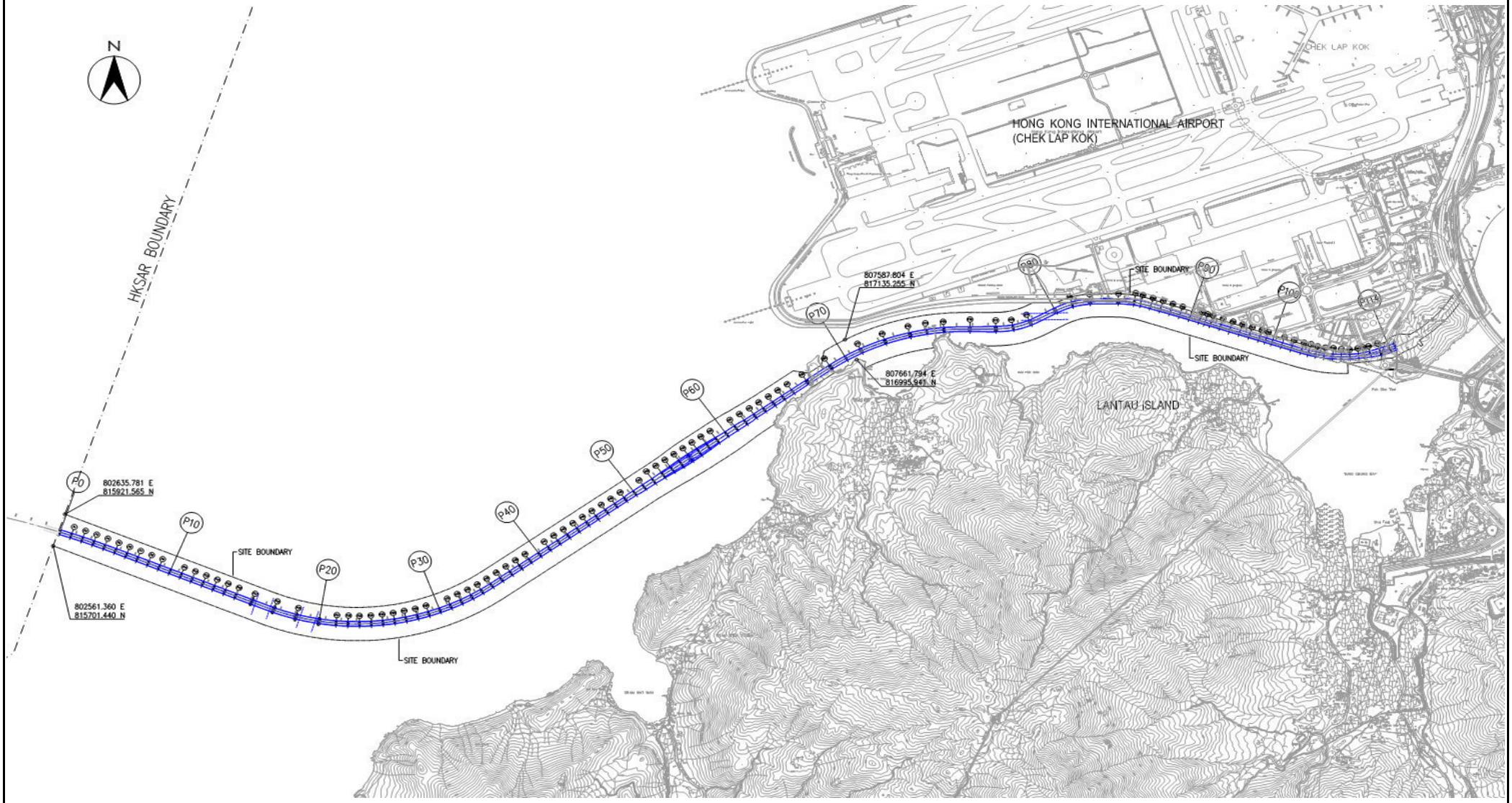

Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Site Layout Plan (Pier(s) Site)	Scale: N.T.S Date: Feb-13	Proposa No. MA12014 Figure: 1d

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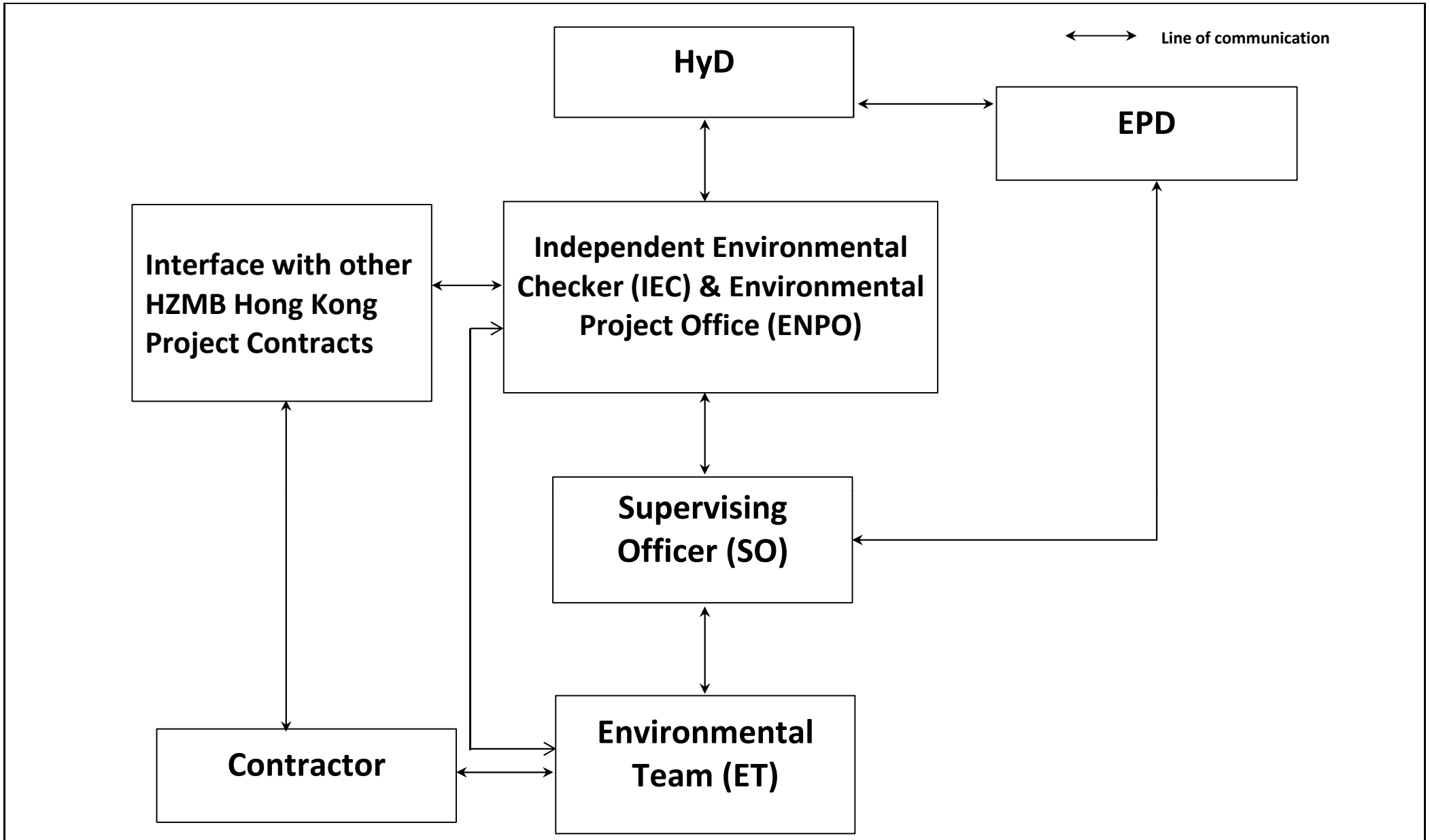

Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Project Organisation for Environmental Works	Scale: N.T.S Date: Feb-13	Proposa No.: MA12014 Figure: 2

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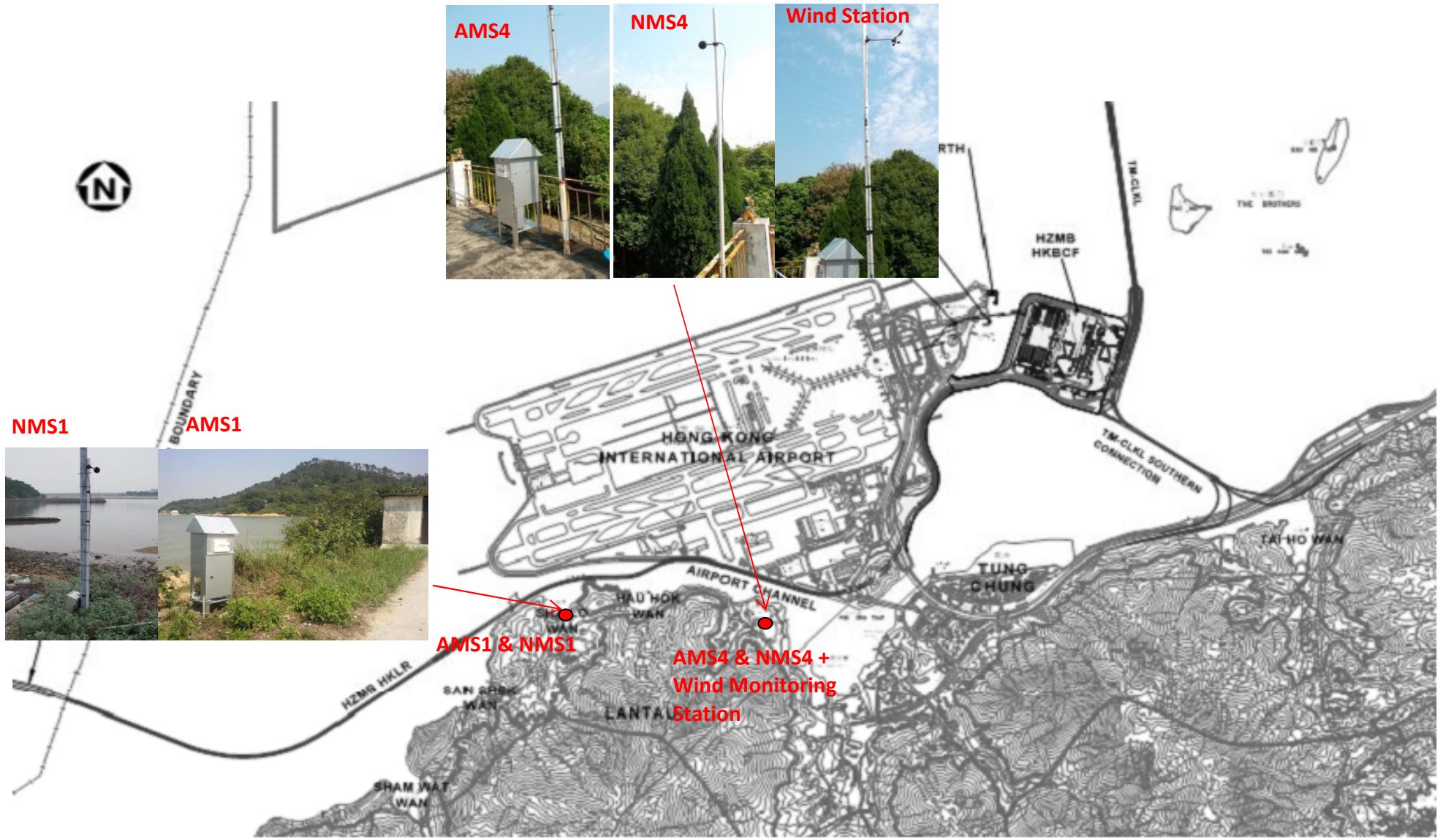

Title	Contract No. HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Locations of Air Quality and Noise Monitoring Stations	Scale: N.T.S Date: Feb-13	Proposa No. MA12014 Figure: 3

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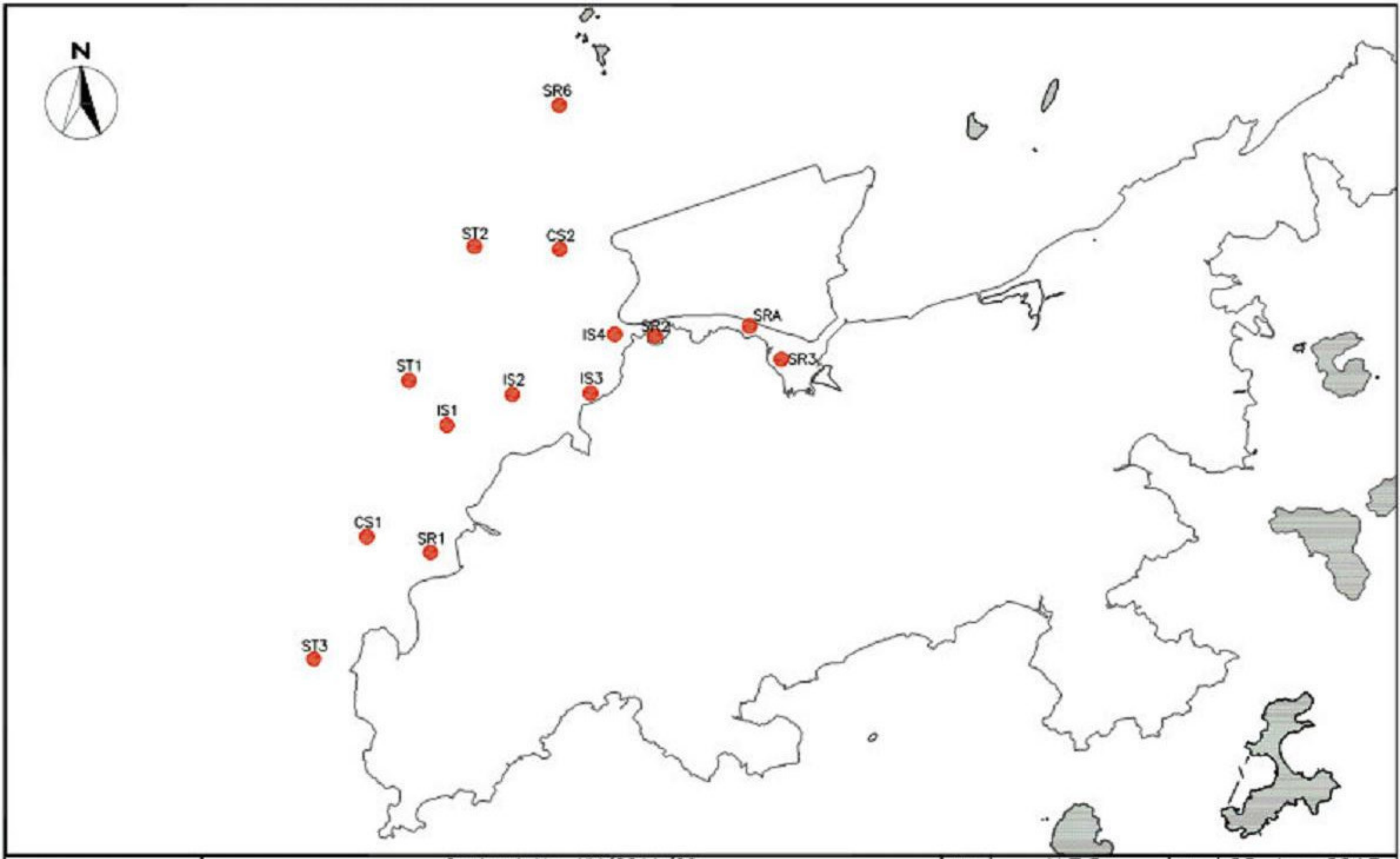


CINOTECH
Cinotech Consultants Limited

Contract No. HY/2011/09
Hong Kong–Zhuhai–Macao Bridge Hong Kong Link Road – Section Between HKSAR Boundary and Scenic Hill
Locations of Marine Water Quality Monitoring Stations

SCALE	N.T.S	DATE	28 Jan 2013
CHECK	PC	DRAWN	IT
PROJECT NO.	MA12014	FIGURE NO.	4
		REV	–

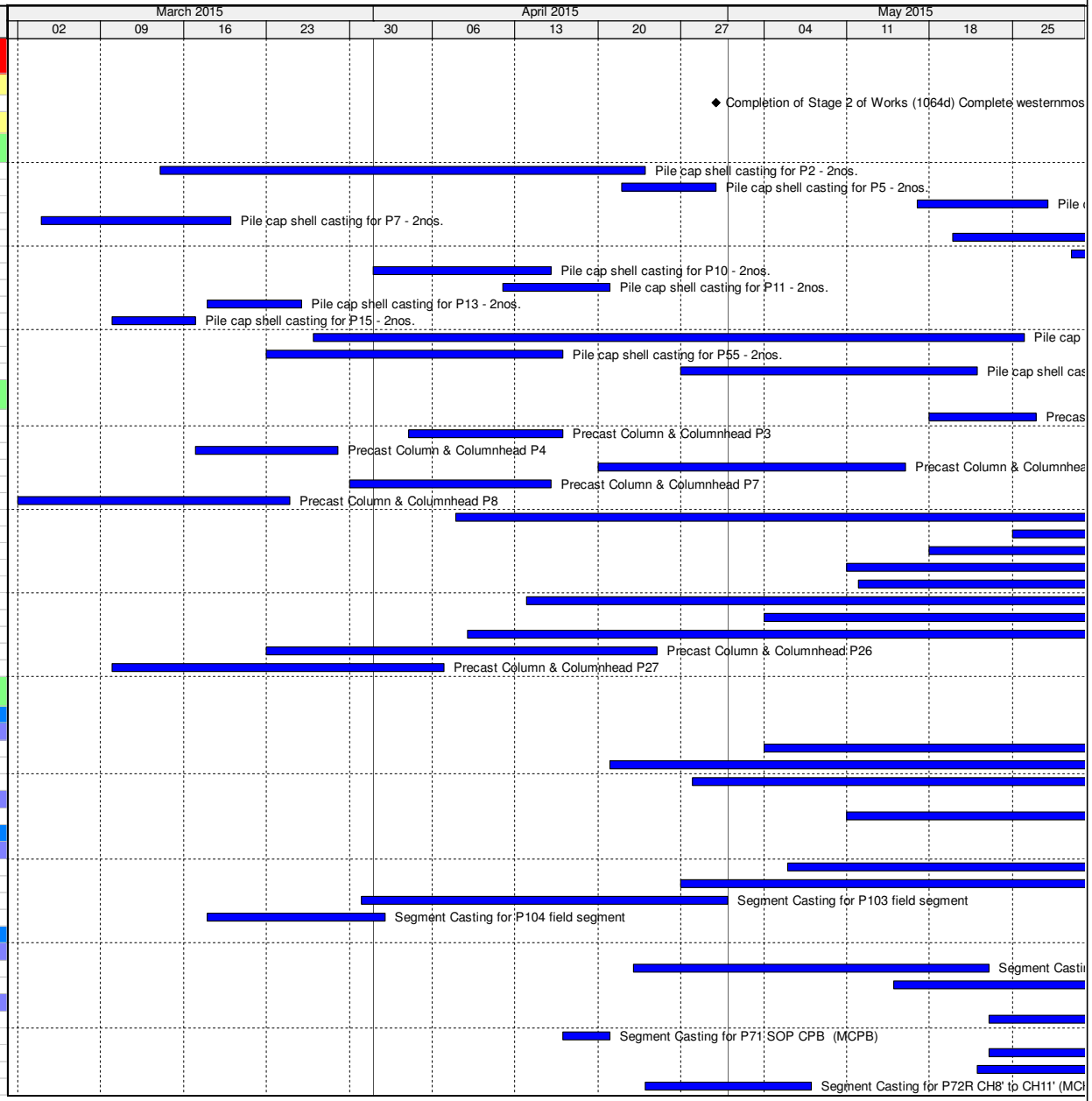
APPENDIX A
CONSTRUCTION PROGRAMME

Dragages - China Harbour - VSL Joint Venture 實基 - 中國港灣 - 威勝利聯營

CONTRACT NO. HY/2011/09
HONG KONG-ZHUHAI-MACAO BRIDGE
HONG KONG LINK ROAD
- SECTION BETWEEN HKSAR BOUNDARY AND SCENIC HILL

HKZB Hong Kong Link Road - 3 Months Rolling Pro

Activity ID	Activity Name	Original Duration	Start	Finish
Project Key Dates				
KD1015	Completion of Stage 2 of Works (1064d) Complete westernmost spar	0		30/4/15 A
Procurement and Fabrication				
Pile Cap Shell Casting				
PC1020	Pile cap shell casting for P2 - 2nos.	8	14/3/15 A	24/4/15 A
PC1050	Pile cap shell casting for P5 - 2nos.	8	22/4/15 A	30/4/15 A
PC1060	Pile cap shell casting for P6 - 2nos.	8	17/5/15 A	28/5/15 A
PC1070	Pile cap shell casting for P7 - 2nos.	8	4/3/15 A	20/3/15 A
PC1080	Pile cap shell casting for P8 - 2nos.	8	20/5/15 A	6/6/15 A
PC1090	Pile cap shell casting for P9 - 2nos.	8	30/5/15 A	26/6/15 A
PC1100	Pile cap shell casting for P10 - 2nos.	8	1/4/15 A	16/4/15 A
PC1110	Pile cap shell casting for P11 - 2nos.	8	12/4/15 A	21/4/15 A
PC1130	Pile cap shell casting for P13 - 2nos.	8	18/3/15 A	26/3/15 A
PC1150	Pile cap shell casting for P15 - 2nos.	8	10/3/15 A	17/3/15 A
PC1220	Pile cap shell casting for P26 - 2nos.	8	27/3/15 A	26/5/15 A
PC1510	Pile cap shell casting for P55 - 2nos.	13	23/3/15 A	17/4/15 A
PC1530	Pile cap shell casting for P57 - 2nos.	13	27/4/15 A	22/5/15 A
Column Casting				
PC1740	Precast Column & Columnhead P1	5	18/5/15 A	27/5/15 A
PC1760	Precast Column & Columnhead P3	9	4/4/15 A	17/4/15 A
PC1770	Precast Column & Columnhead P4	9	17/3/15 A	29/3/15 A
PC1790	Precast Column & Columnhead P6	13	20/4/15 A	16/5/15 A
PC1800	Precast Column & Columnhead P7	13	30/3/15 A	16/4/15 A
PC1810	Precast Column & Columnhead P8	13	2/3/15 A	25/3/15 A
PC1820	Precast Column & Columnhead P9	17	8/4/15 A	19/6/15 A
PC1830	Precast Column & Columnhead P10	17	25/5/15 A	23/7/15
PC1840	Precast Column & Columnhead P11	17	18/5/15 A	27/7/15
PC1850	Precast Column & Columnhead P12	21	11/5/15 A	13/7/15
PC1860	Precast Column & Columnhead P13	21	12/5/15 A	14/7/15
PC1870	Precast Column & Columnhead P14	21	14/4/15 A	3/6/15 A
PC1880	Precast Column & Columnhead P15	25	4/5/15 A	30/6/15
PC1920	Precast Column & Columnhead P23	25	9/4/15 A	14/7/15
PC1950	Precast Column & Columnhead P26	21	23/3/15 A	25/4/15 A
PC1960	Precast Column & Columnhead P27	17	10/3/15 A	7/4/15 A
Segment Casting				
Type A, C, D Segment (Total 12 set Moulds)				
Type A Segment (Western Water Typical Span)				
SC_A1520	Segment Casting for P30 SOP	10	4/5/15 A	11/8/15
SC_A1540	Segment Casting for P31 SOP	10	21/4/15 A	6/8/15
SC_A1590	Segment Casting for P33 field segment	40	28/4/15 A	7/7/15
Type D Segment (P49 to P63)				
SC_D1090	Segment Casting for P61 field segment	100	11/5/15 A	25/9/15
Type E Segment (Total 5 set Moulds)				
Land Viaduct (P85 to Easternmost Abutment)				
SC_E1170	Segment Casting for P101 field segment	45	6/5/15 A	29/7/15
SC_E1180	Segment Casting for P102 field segment	23	27/4/15 A	9/6/15 A
SC_E1190	Segment Casting for P103 field segment	23	31/3/15 A	1/5/15 A
SC_E1200	Segment Casting for P104 field segment	23	18/3/15 A	2/4/15 A
Type CH Segment (Total 12 set Moulds)				
ML03 (P16 TO P21)				
SC_CH1650	Segment Casting for P17R CH14' to CH19' (MCH5)	15	23/4/15 A	23/5/15 A
SC_CH1740	Segment Casting for P17L CH9' to CH13' (MCH4)	15	15/5/15 A	14/6/15 A
ML11 (P70 TO P74)				
SC_CH2340	Segment Casting for P71R CH8' to CH11' (MCH3)	16	23/5/15 A	14/6/15 A
SC_CH2380	Segment Casting for P71 SOP CPB (MCPB)	24	17/4/15 A	21/4/15 A
SC_CH2410	Segment Casting for P71R CH8 to CH11 (MCH3)	16	23/5/15 A	14/6/15 A
SC_CH2460	Segment Casting for P71L CH8' to CH11' (MCH3)	16	22/5/15 A	7/6/15 A
SC_CH2570	Segment Casting for P72R CH8' to CH11' (MCH3)	16	24/4/15 A	8/5/15 A

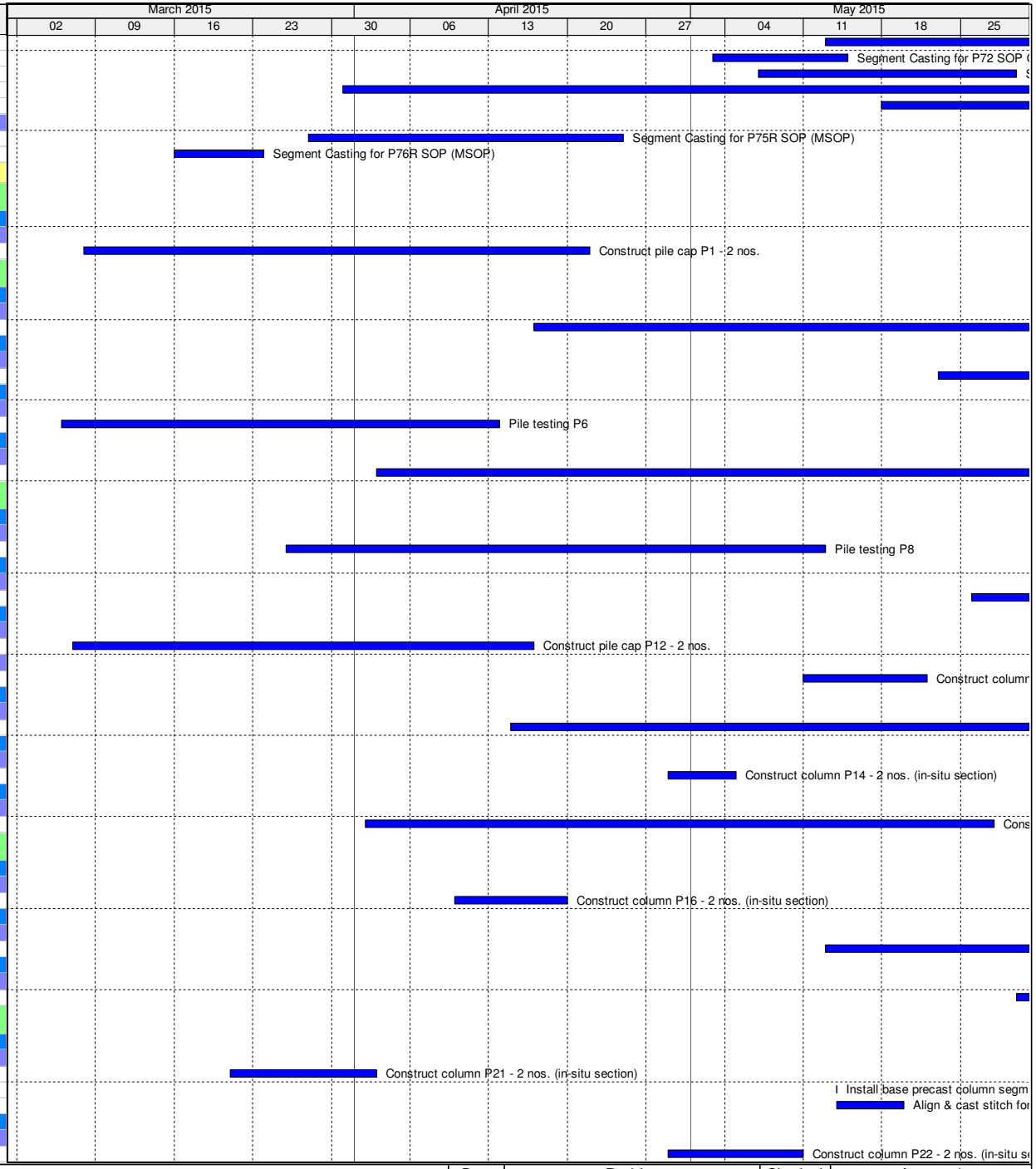


Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

HKLR EMA report (Mar 15 to May 15)
Page 1 of 5

Date	Revision	Checked	Approved
28/7/15	Rolling Prog. Mar 15 to May 15	Tim	

Activity ID	Activity Name	Original	Start	Finish
SC_CH2580	Segment Casting for P72R CH12' to CH16' (MCH4)	15	13/5/15 A	25/8/15
SC_CH2610	Segment Casting for P72 SOP CPB (MCPB)	24	3/5/15 A	15/5/15 A
SC_CH2790	Segment Casting for P73R CH4' to CH7' (MCH2)	16	7/5/15 A	30/5/15 A
SC_CH2840	Segment Casting for P73 SOP CPB (MCPB)	24	31/3/15 A	20/6/15 A
SC_CH2860	Segment Casting for P73R CH4 to CH7 (MCH2)	16	18/5/15 A	10/6/15 A
ML12 (P74 TO P78)				
SC_CH3110	Segment Casting for P75R SOP (MSOP)	24	28/3/15 A	25/4/15 A
SC_CH3390	Segment Casting for P76R SOP (MSOP)	24	16/3/15 A	24/3/15 A
Viaduct between HKSAR Boundary and Landing Point on Airport Island				
ML01L/R 75mx8 - Stage 2 of Works				
Pier P1L/R				
Pile Cap Construction				
WW1130	Construct pile cap P1 - 2 nos.	30	8/3/15 A	22/4/15 A
ML01L/R 75mx8 - Stage 4 of Works				
Pier P2L/R				
Pile Cap Construction				
WW1210	Construct pile cap P2 - 2 nos.	30	17/4/15 A	7/7/15
Pier P4L/R				
Column Construction				
WW1380	Construct column P4 - 2 nos. (in-situ section)	12	23/5/15 A	6/6/15 A
Pier P6L/R				
Foundation - Bored Pile				
WW1520	Pile testing P6	28	6/3/15 A	14/4/15 A
Pier P7L/R				
Pile Cap Construction				
WW1610	Construct pile cap P7 - 2 nos.	30	3/4/15 A	2/7/15
ML02L/R 75mx8 - Stage 4 of Works				
Pier P8L/R (M.J.)				
Foundation - Bored Pile				
WW1680	Pile testing P8	28	26/3/15 A	13/5/15 A
Pier P11L/R				
Pile Cap Construction				
WW1930	Construct pile cap P11 - 2 nos.	30	26/5/15 A	12/9/15
Pier P12L/R				
Pile Cap Construction				
WW2010	Construct pile cap P12 - 2 nos.	30	7/3/15 A	17/4/15 A
Column Construction				
WW2020	Construct column P12 - 2 nos. (in-situ section)	12	11/5/15 A	22/5/15 A
Pier P13L/R				
Pile Cap Construction				
WW2090	Construct pile cap P13 - 2 nos.	30	15/4/15 A	8/6/15 A
Pier P14L/R				
Column Construction				
WW2180	Construct column P14 - 2 nos. (in-situ section)	12	29/4/15 A	5/5/15 A
Pier P15L/R				
Pile Cap Construction				
WW2250	Construct pile cap P15 - 2 nos.	30	2/4/15 A	28/5/15 A
ML03L/R 109.661m+150mx3+109.661m Navigation Channel - S				
Pier P16L/R (M.J.)				
Column Construction				
NC1100	Construct column P16 - 2 nos. (in-situ section)	12	10/4/15 A	20/4/15 A
Pier P17L/R				
Column Construction				
NC1220	Construct column P17 - 4 nos.	92	13/5/15 A	29/10/15
Pier P18L/R				
Foundation - Bored Pile				
NC1310	Pile testing P18 (Downstream Dolphin)	28	30/5/15 A	16/6/15 A
ML04L/R 74.5mx8 - Stage 4 of Works				
Pier P21L/R (M.J.)				
Column Construction				
WW8670	Construct column P21 - 2 nos. (in-situ section)	12	21/3/15 A	3/4/15 A
WW9240	Install base precast column segment at P21	1	14/5/15 A	14/5/15 A
WW9242	Align & cast stitch for base column segment at P21	6	14/5/15 A	20/5/15 A
Pier P22L/R				
Column Construction				
WW5060	Construct column P22 - 2 nos. (in-situ section)	12	29/4/15 A	11/5/15 A



Actual Work
Remaining Work
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Date	Revision	Checked	Approved
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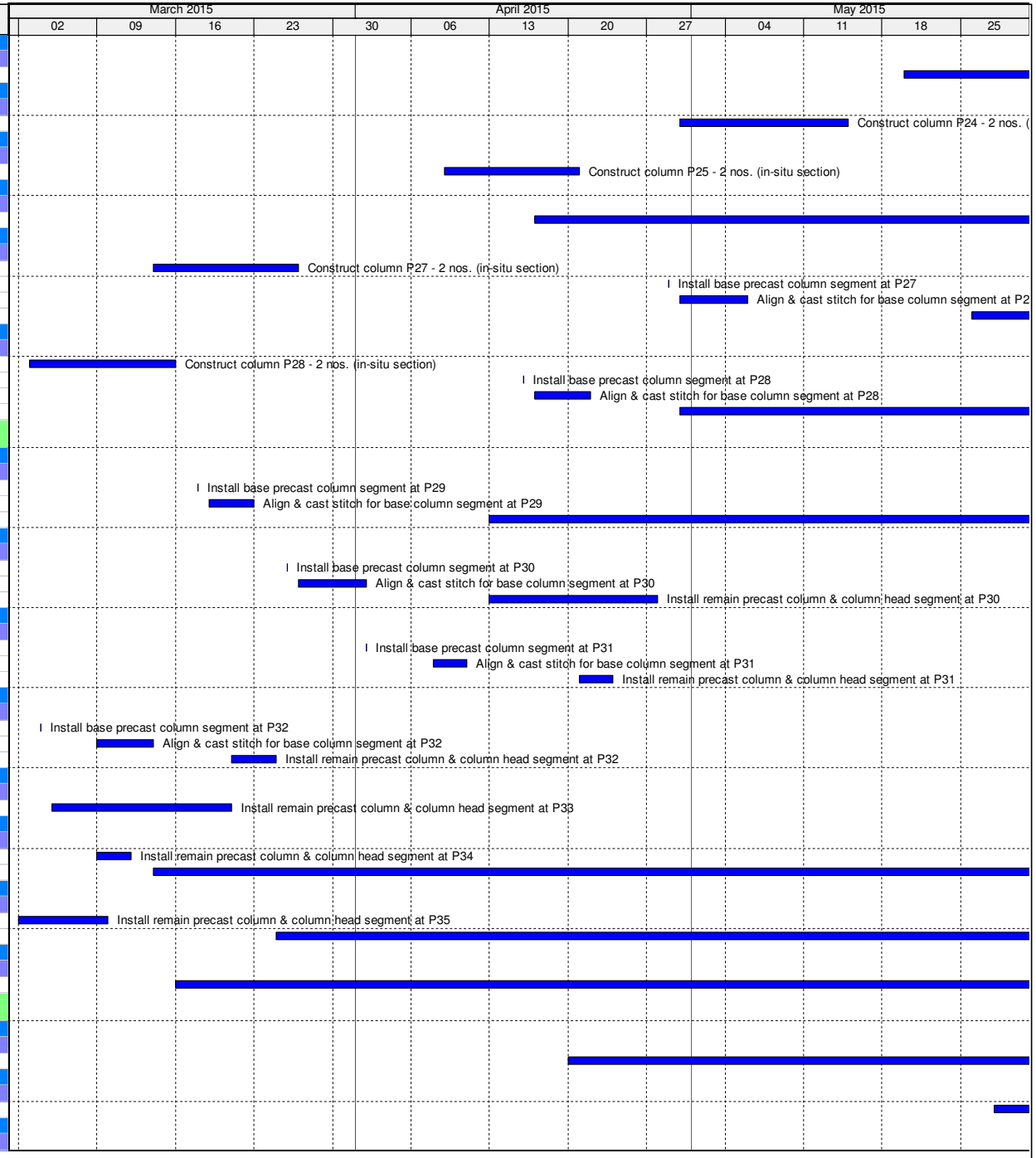
Activity ID	Activity Name	Original	Start	Finish
Pier P23L/R				
Column Construction				
WW5140	Construct column P23 - 2 nos. (in-situ section)	12	20/5/15 A	2/6/15 A
Pier P24L/R				
Column Construction				
WW5220	Construct column P24 - 2 nos. (in-situ section)	12	30/4/15 A	15/5/15 A
Pier P25L/R				
Column Construction				
WW5300	Construct column P25 - 2 nos. (in-situ section)	12	9/4/15 A	21/4/15 A
Pier P26L/R				
Pile Cap Construction				
WW5370	Construct pile cap P26 - 2 nos.	30	17/4/15 A	15/7/15
Pier P27L/R				
Column Construction				
WW5460	Construct column P27 - 2 nos. (in-situ section)	12	14/3/15 A	27/3/15 A
WW9360	Install base precast column segment at P27	1	29/4/15 A	29/4/15 A
WW9362	Align & cast stitch for base column segment at P27	6	30/4/15 A	6/5/15 A
WW9364	Install remain precast column & column head segment at P27	3	26/5/15 A	28/9/15
Pier P28L/R				
Column Construction				
WW5540	Construct column P28 - 2 nos. (in-situ section)	12	3/3/15 A	16/3/15 A
WW9380	Install base precast column segment at P28	1	16/4/15 A	16/4/15 A
WW9382	Align & cast stitch for base column segment at P28	6	17/4/15 A	22/4/15 A
WW9384	Install remain precast column & column head segment at P28	3	30/4/15 A	5/6/15 A
ML05L/R 74.5mx8 - Stage 4 of Works				
Pier P29L/R (M.J.)				
Column Construction				
WW9400	Install base precast column segment at P29	1	18/3/15 A	18/3/15 A
WW9402	Align & cast stitch for base column segment at P29	6	19/3/15 A	23/3/15 A
WW9404	Install remain precast column & column head segment at P29	3	13/4/15 A	3/6/15 A
Pier P30L/R				
Column Construction				
WW9420	Install base precast column segment at P30	1	26/3/15 A	26/3/15 A
WW9422	Align & cast stitch for base column segment at P30	6	27/3/15 A	2/4/15 A
WW9424	Install remain precast column & column head segment at P30	3	13/4/15 A	28/4/15 A
Pier P31L/R				
Column Construction				
WW9440	Install base precast column segment at P31	1	2/4/15 A	2/4/15 A
WW9442	Align & cast stitch for base column segment at P31	6	8/4/15 A	11/4/15 A
WW9444	Install remain precast column & column head segment at P31	3	21/4/15 A	24/4/15 A
Pier P32L/R				
Column Construction				
WW9460	Install base precast column segment at P32	1	4/3/15 A	4/3/15 A
WW9462	Align & cast stitch for base column segment at P32	6	9/3/15 A	14/3/15 A
WW9464	Install remain precast column & column head segment at P32	3	21/3/15 A	25/3/15 A
Pier P33L/R				
Column Construction				
WW9484	Install remain precast column & column head segment at P33	3	5/3/15 A	21/3/15 A
Pier P34L/R				
Column Construction				
WW9504	Install remain precast column & column head segment at P34	3	9/3/15 A	12/3/15 A
WW9510	Prestress works & infill concrete at P34	12	14/3/15 A	28/7/15
Pier P35L/R				
Column Construction				
WW9524	Install remain precast column & column head segment at P35	3	2/3/15 A	10/3/15 A
WW9530	Prestress works & infill concrete at P35	12	25/3/15 A	18/7/15
Pier P36L/R				
Column Construction				
WW9550	Prestress works & infill concrete at P36	12	16/3/15 A	10/7/15
ML06L/R 74.5mx8 - Stage 4 of Works				
Pier 40L/R				
Pier Segment Construction				
WW6508	Prepare works for precast SOP P40 - 4 nos.	2	20/4/15 A	30/6/15
Pier 41L/R				
Pier Segment Construction				
WW6588	Prepare works for precast SOP P41 - 4 nos.	2	28/5/15 A	30/6/15
Pier 42L/R				
Pier Segment Construction				



Actual Work
Remaining Work
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Date	Revision	Checked	Approved
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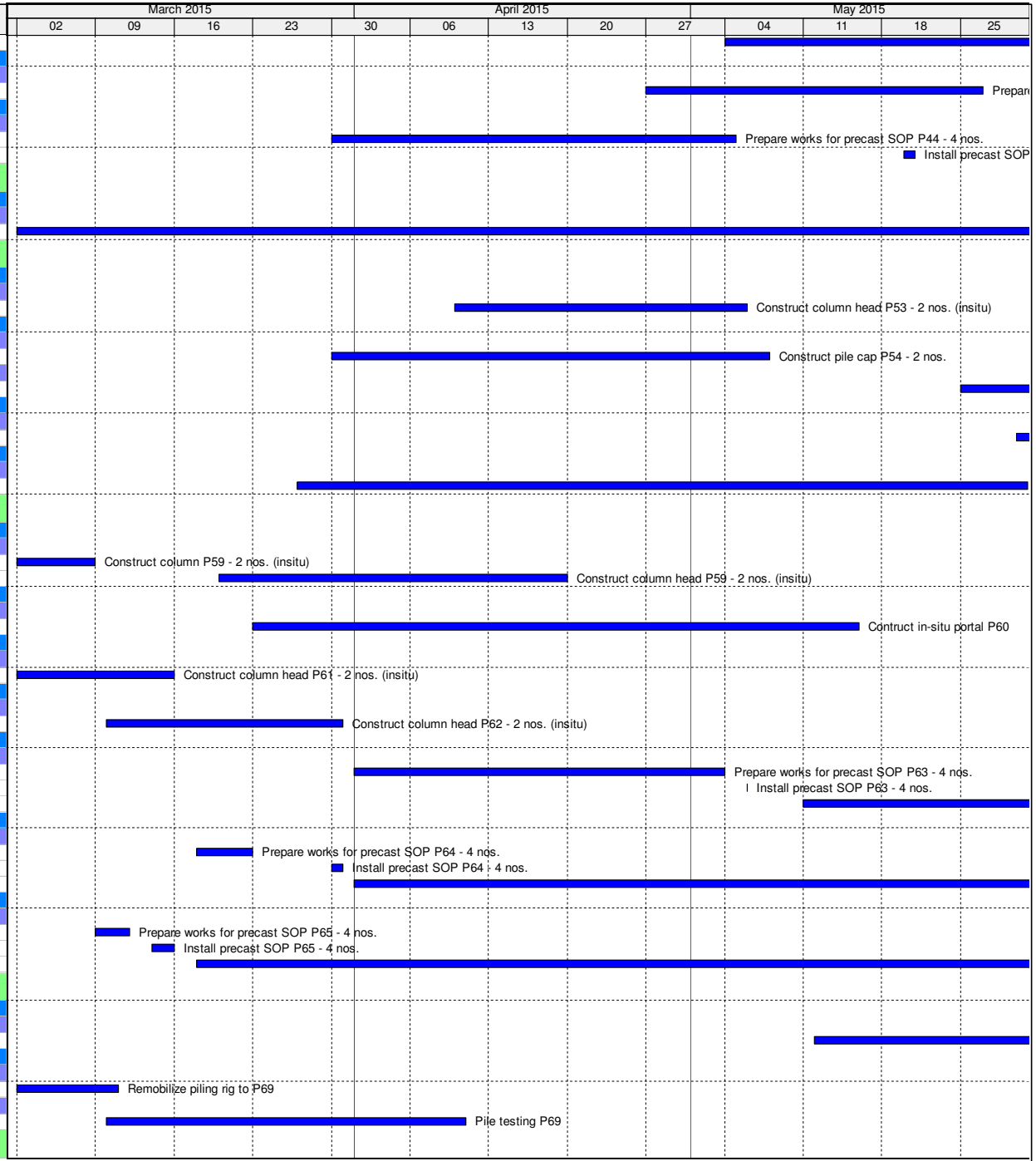
Activity ID	Activity Name	Original	Start	Finish
WW6668	Prepare works for precast SOP P42 - 4 nos.	2	4/5/15 A	22/8/15
Pier 43L/R				
Pier Segment Construction				
WW6748	Prepare works for precast SOP P43 - 4 nos.	2	27/4/15 A	27/5/15 A
Pier 44L/R				
Pier Segment Construction				
WW6828	Prepare works for precast SOP P44 - 4 nos.	2	30/3/15 A	5/5/15 A
WW6830	Install precast SOP P44 - 4 nos.	3	20/5/15 A	21/5/15 A
ML07L/R 73.396mx8 - Stage 4 of Works				
Pier P45L/R (M.J.)				
Pier Segment Construction				
WW6912	Insitu works for SOP P45 - 4 nos.	9	2/3/15 A	30/6/15
ML08L/R 70mx6 - Stage 4 of Works				
Pier P53L/R (M.J.)				
Column Construction				
WW10157	Construct column head P53 - 2 nos. (insitu)	21	10/4/15 A	6/5/15 A
Pier P54L/R				
Pile Cap Construction				
WW7580	Construct pile cap P54 - 2 nos.	35	30/3/15 A	8/5/15 A
Column Construction				
WW10167	Construct column P54 - 2 nos. (insitu)	12	25/5/15 A	2/10/15
Pier P55L/R				
Pile Cap Construction				
WW7660	Construct pile cap P55 - 2 nos.	35	30/5/15 A	6/8/15
Pier P58L/R				
Pile Cap Construction				
WW7900	Construct pile cap P58 - 2 nos.	35	27/3/15 A	31/5/15 A
ML09L/R 73.396Mx8 - Stage 4 of Works				
Pier P59L/R (M.J.)				
Column Construction				
WW10267	Construct column P59 - 2 nos. (insitu)	12	2/3/15 A	9/3/15 A
WW10277	Construct column head P59 - 2 nos. (insitu)	21	20/3/15 A	20/4/15 A
Pier P60L/R				
In-situ Portal/SOP Construction				
WW8070	Contruct in-situ portal P60	90	23/3/15 A	16/5/15 A
Pier P61L/R				
Column Construction				
WW10317	Construct column head P61 - 2 nos. (insitu)	21	2/3/15 A	16/3/15 A
Pier P62L/R				
Column Construction				
WW10337	Construct column head P62 - 2 nos. (insitu)	21	10/3/15 A	31/3/15 A
Pier P63L/R				
Pier Segment Construction				
WW8318	Prepare works for precast SOP P63 - 4 nos.	2	1/4/15 A	4/5/15 A
WW8320	Install precast SOP P63 - 4 nos.	4	6/5/15 A	6/5/15 A
WW8322	Insitu works for SOP P63 - 4 nos.	9	11/5/15 A	12/8/15
Pier P64L/R				
Pier Segment Construction				
WW8398	Prepare works for precast SOP P64 - 4 nos.	2	18/3/15 A	23/3/15 A
WW8400	Install precast SOP P64 - 4 nos.	4	30/3/15 A	31/3/15 A
WW8402	Insitu works for SOP P64 - 4 nos.	9	1/4/15 A	5/8/15
Pier P65L/R				
Pier Segment Construction				
WW8478	Prepare works for precast SOP P65 - 4 nos.	2	9/3/15 A	12/3/15 A
WW8480	Install precast SOP P65 - 4 nos.	4	14/3/15 A	16/3/15 A
WW8482	Insitu works for SOP P65 - 4 nos.	9	18/3/15 A	29/6/15
ML10L/R 115m+180m+115m - Stage 4 of Works				
Pier P68L/R				
Foundation - Bored Pile				
AC2836	Construct bored piles P68L - 6 nos.	60	12/5/15 A	18/12/15
Pier P69L/R				
Temporary Works				
AC1123	Remobilize piling rig to P69	18	2/3/15 A	11/3/15 A
Foundation - Bored Pile				
AC2490	Pile testing P69	28	10/3/15 A	11/4/15 A
ML11L/R 109m+165mx2+109m - Stage 4 of Works				



Actual Work
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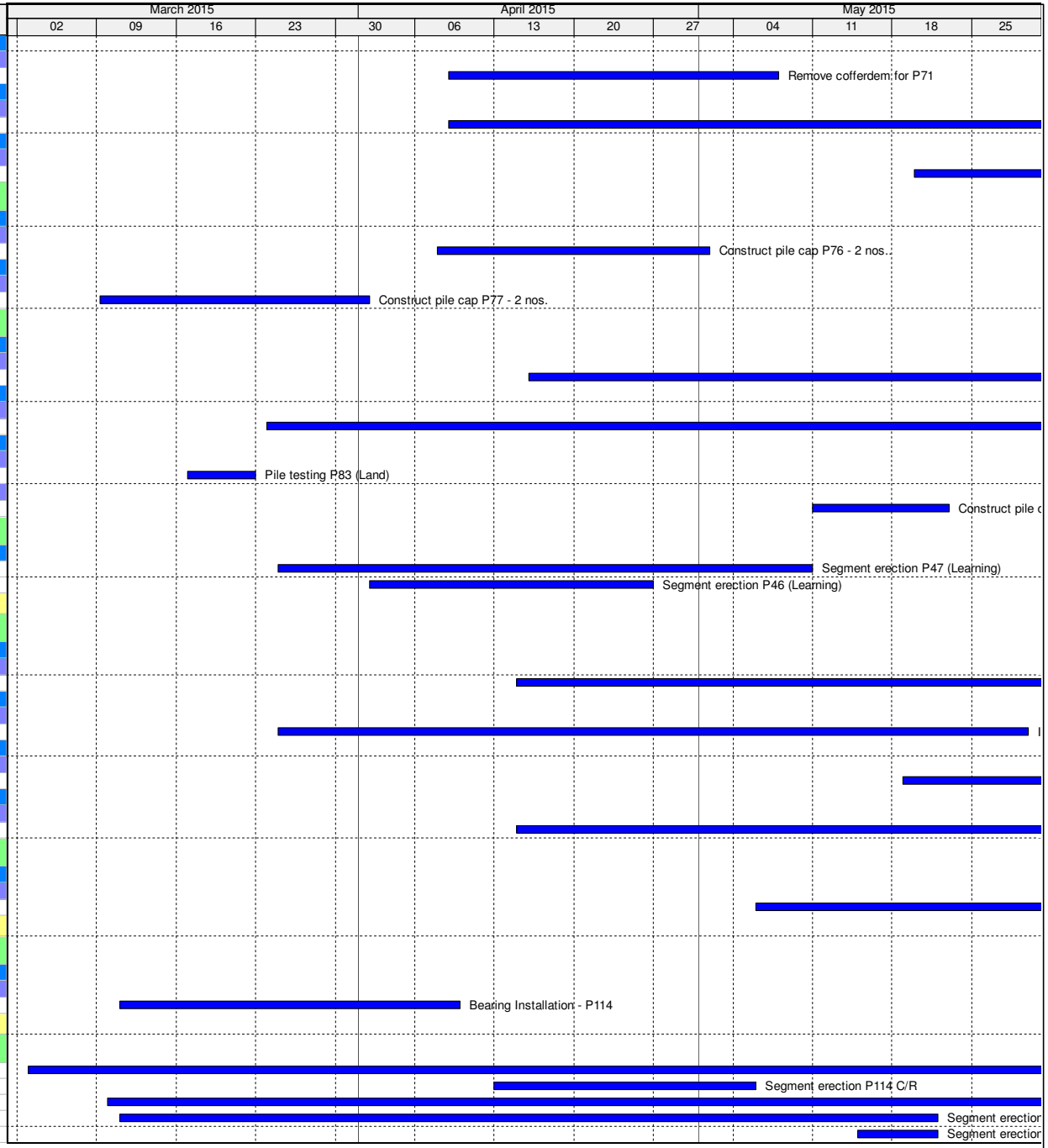
Activity ID	Activity Name	Original	Start	Finish
Pier P71L/R				
Temporary Works				
AC1250	Remove cofferdem for P71	18	9/4/15 A	8/5/15 A
Pier P72L/R				
Column Construction				
AC1390	Construct column P72 - 4 nos.	62	9/4/15 A	14/7/15
Pier P73L/R				
Temporary Works				
AC1430	Remove cofferdem for pier P73	18	20/5/15 A	19/6/15 A
ML12L/R 109m+165mx2+109m - Stage 4 of Works				
Pier P76L/R				
Pile Cap Construction				
AC1740	Construct pile cap P76 - 2 nos..	29	8/4/15 A	2/5/15 A
Pier P77L/R				
Pile Cap Construction				
AC1820	Construct pile cap P77 - 2 nos.	38	9/3/15 A	2/4/15 A
ML14L/R 115m+180m+100.561m - Stage 4 of Works				
Pier P81L/R (M.J.)				
Pile Cap Construction				
AC2160	Construct pile cap P81 - 2 nos.	45	16/4/15 A	6/6/15 A
Pier P82L/R				
Temporary Works				
AC2227	Install cofferdem for pile cap construction - P82 - Land side	80	24/3/15 A	30/7/15
Pier P83L/R				
Foundation - Bored Pile				
AC2666	Pile testing P83 (Land)	28	17/3/15 A	23/3/15 A
Pile Cap Construction				
AC2360	Construct pile cap P83 - Marine side	35	11/5/15 A	23/5/15 A
Deck Construction between HKSAR Boundary and Landing P				
Segment Erection - Launching Girder				
DC1075	Segment erection P47 (Learning)	21	25/3/15 A	11/5/15 A
DC1100	Segment erection P46 (Learning)	21	2/4/15 A	27/4/15 A
Viaduct between Landing Point on Airport Island and Scenic Hill				
ML15L/R 43m+65mx6+37m - Stage 5 of Works				
Pier P84L/R (M.J.)				
In-situ Portal/T-pier Construction				
AI3590	In-situ portal P84 - 1 nos.	60	15/4/15 A	14/11/15
Pier P87L/R				
In-situ Portal/T-pier Construction				
AI1290	In-situ portal P87 - 1 nos.	60	25/3/15 A	30/5/15 A
Pier P90L/R				
In-situ Portal/T-pier Construction				
AI1500	In-situ portal P90 - 1 nos.	60	19/5/15 A	3/9/15
Pier P91L/R				
In-situ Portal/T-pier Construction				
AI1570	In-situ portal P91 - 1 nos.	60	15/4/15 A	9/6/15 A
MI16L/R 37m+65mx5+43m - Stage 5 of Works				
Pier P92L/R (M.J.)				
In-situ Portal/T-pier Construction				
AI1640	In-situ portal P92 - 1 nos.	60	6/5/15 A	12/9/15
Land Viaduct P108 to P114				
ML19L/C/R 40m+65mx2 Stage 5 of Works				
Pier P114 L/C/R				
Column Construction				
AI3085	Bearing Installation - P114	10	11/3/15 A	10/4/15 A
Deck Construction between Landing Point on Airport Island and Scenic Hill				
Segment Erection - Launching Girder				
DC5010	Segment erection P111 C/R	11	3/3/15 A	9/6/15 A
DC5035	Segment erection P114 C/R	6	13/4/15 A	6/5/15 A
DC5038	Segment erection P111 L	6	10/3/15 A	9/6/15 A
DC5039	Segment erection P113 L	13	11/3/15 A	22/5/15 A
DC5045	Segment erection P114 L	4	15/5/15 A	22/5/15 A



Actual Work
Remaining Work
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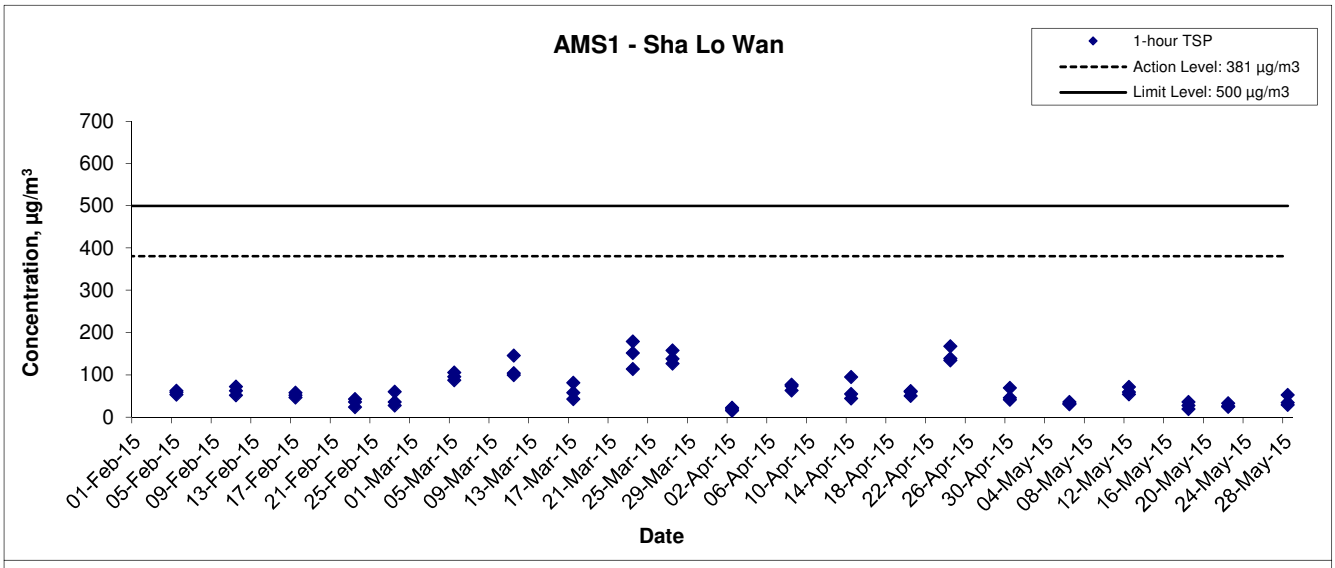
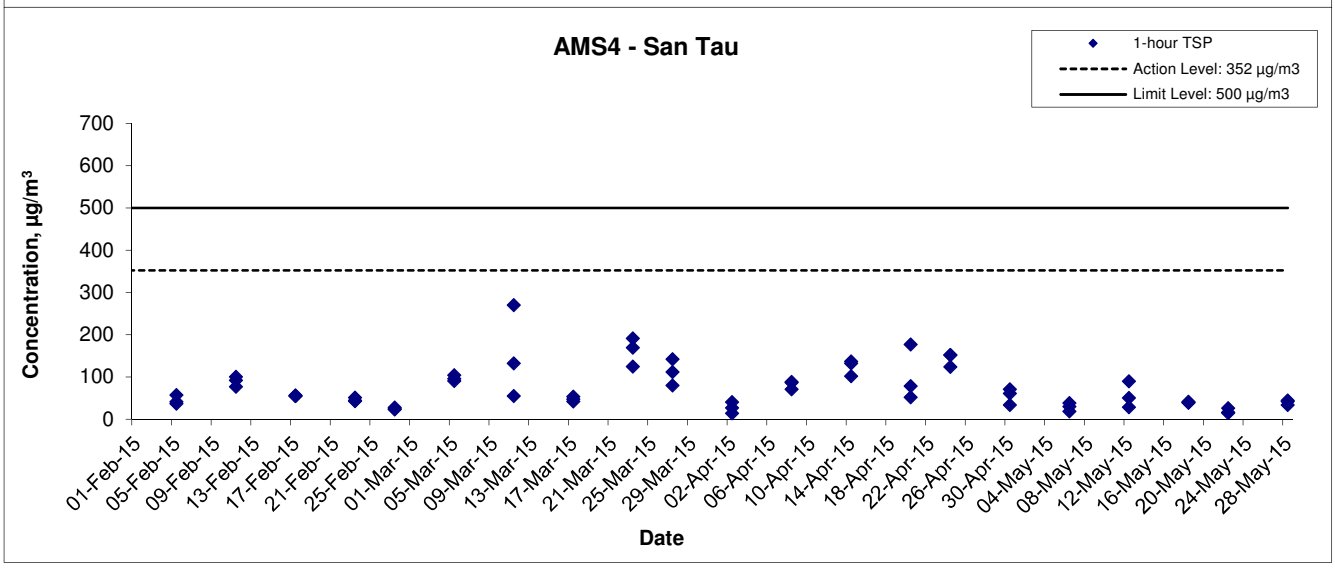
APPENDIX B
GRAPHICAL PRESENTATION OF 1-HOUR TSP MONITORING RESULTS

1-hour TSP Concentration Levels

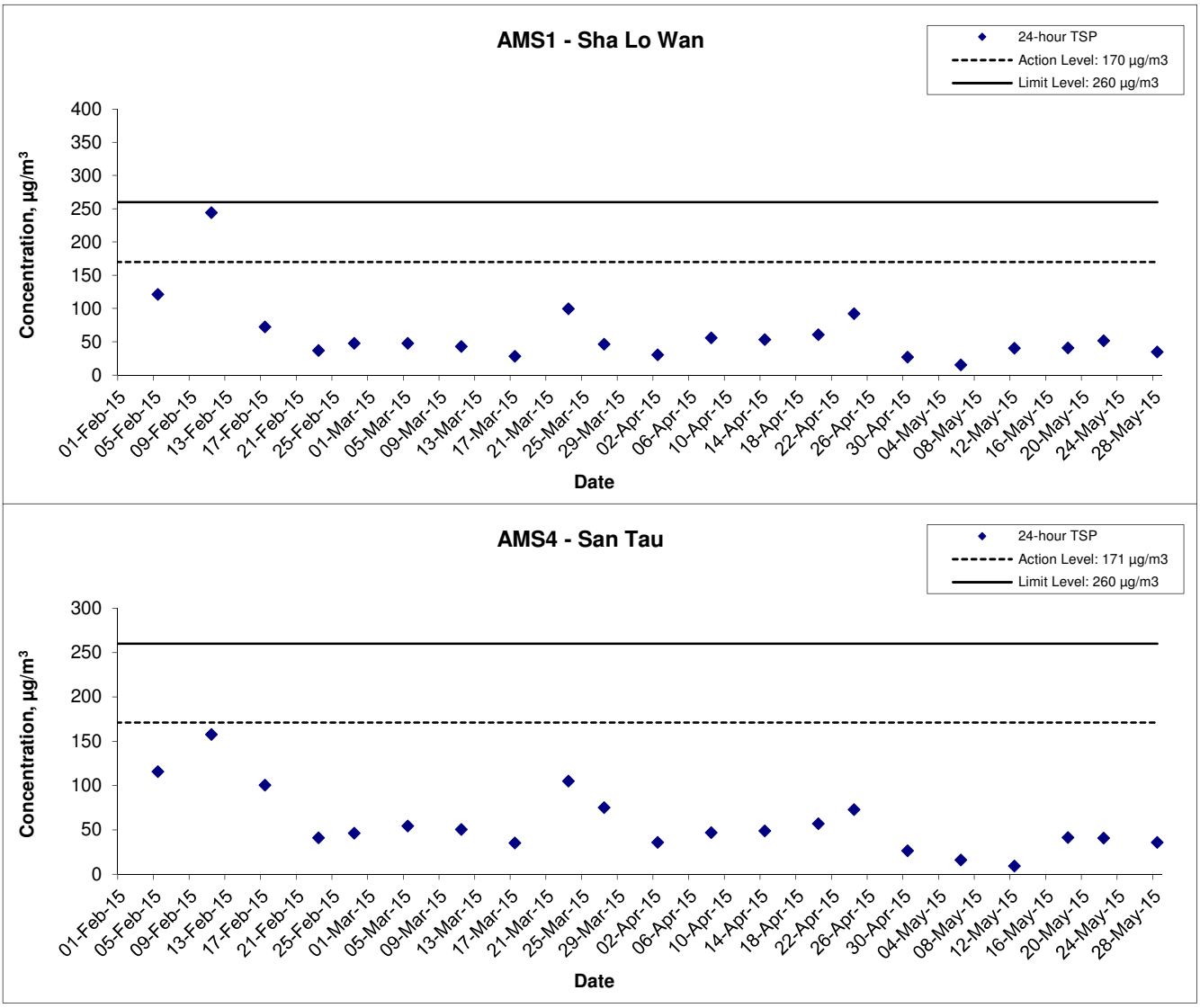




Title: Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 1-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
	Date: May 15	Appendix: B	

APPENDIX C
GRAPHICAL PRESENTATION OF 24-HOUR TSP MONITORING RESULTS

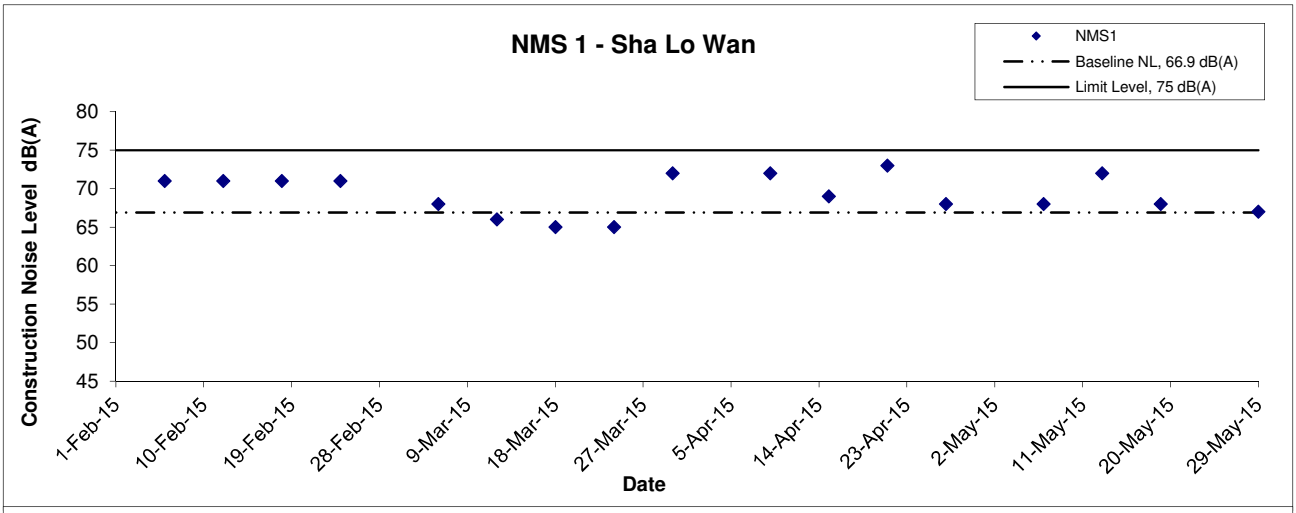
24-hour TSP Concentration Levels

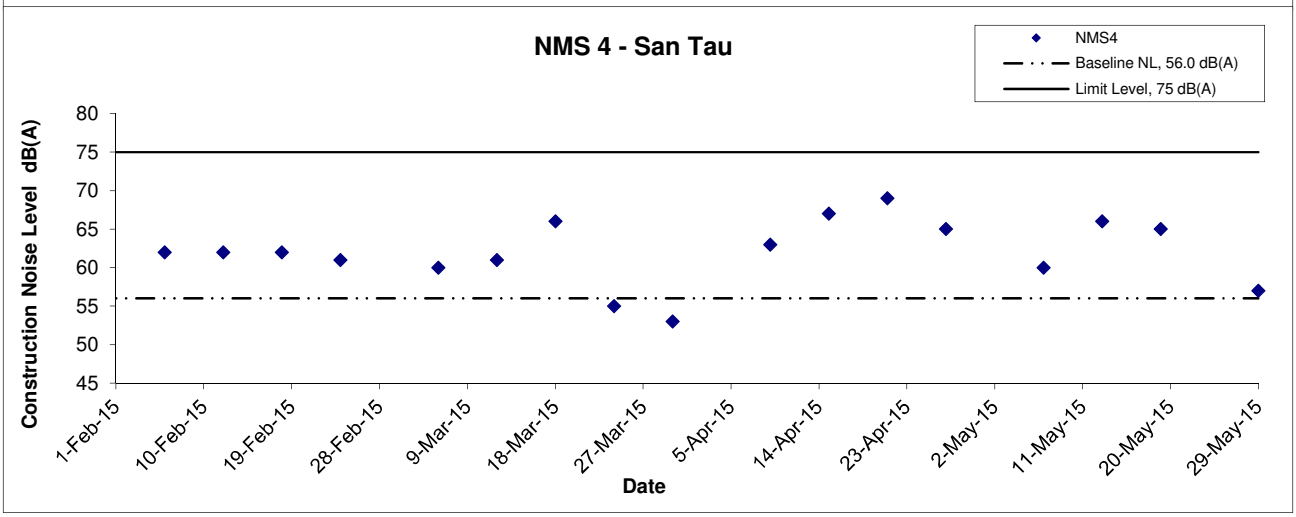


Title: Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Graphical Presentation of 24-hour TSP Monitoring Results	Scale: N.T.S Date: May 15	Project No.: MA12014 Appendix: C	CINOTECH

APPENDIX D
GRAPHICAL PRESENTATION OF NOISE MONITORING RESULTS

Noise Levels





Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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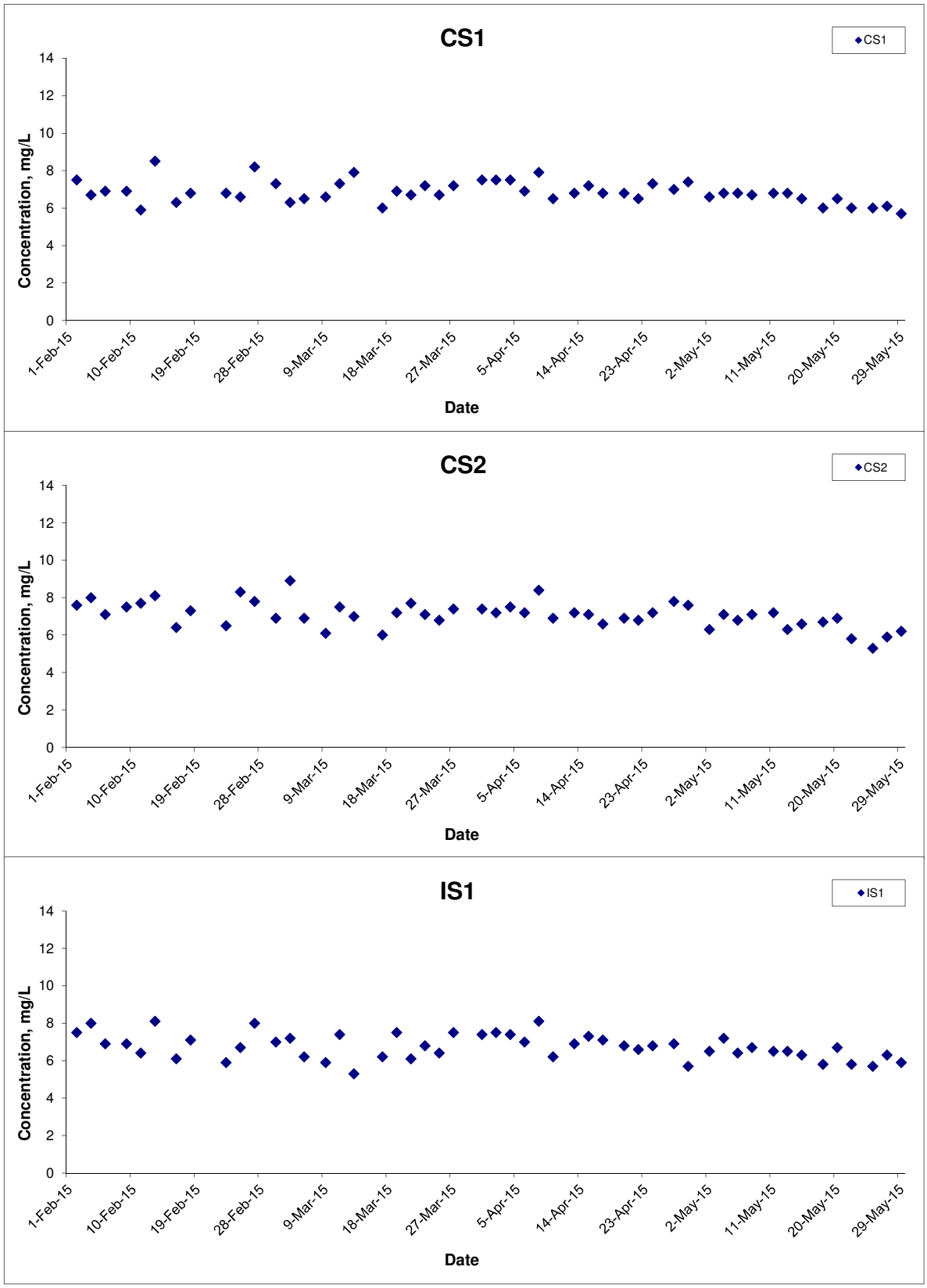
APPENDIX E
GRAPHICAL PRESENTATION OF WATER QUALITY MONITORING RESULTS

Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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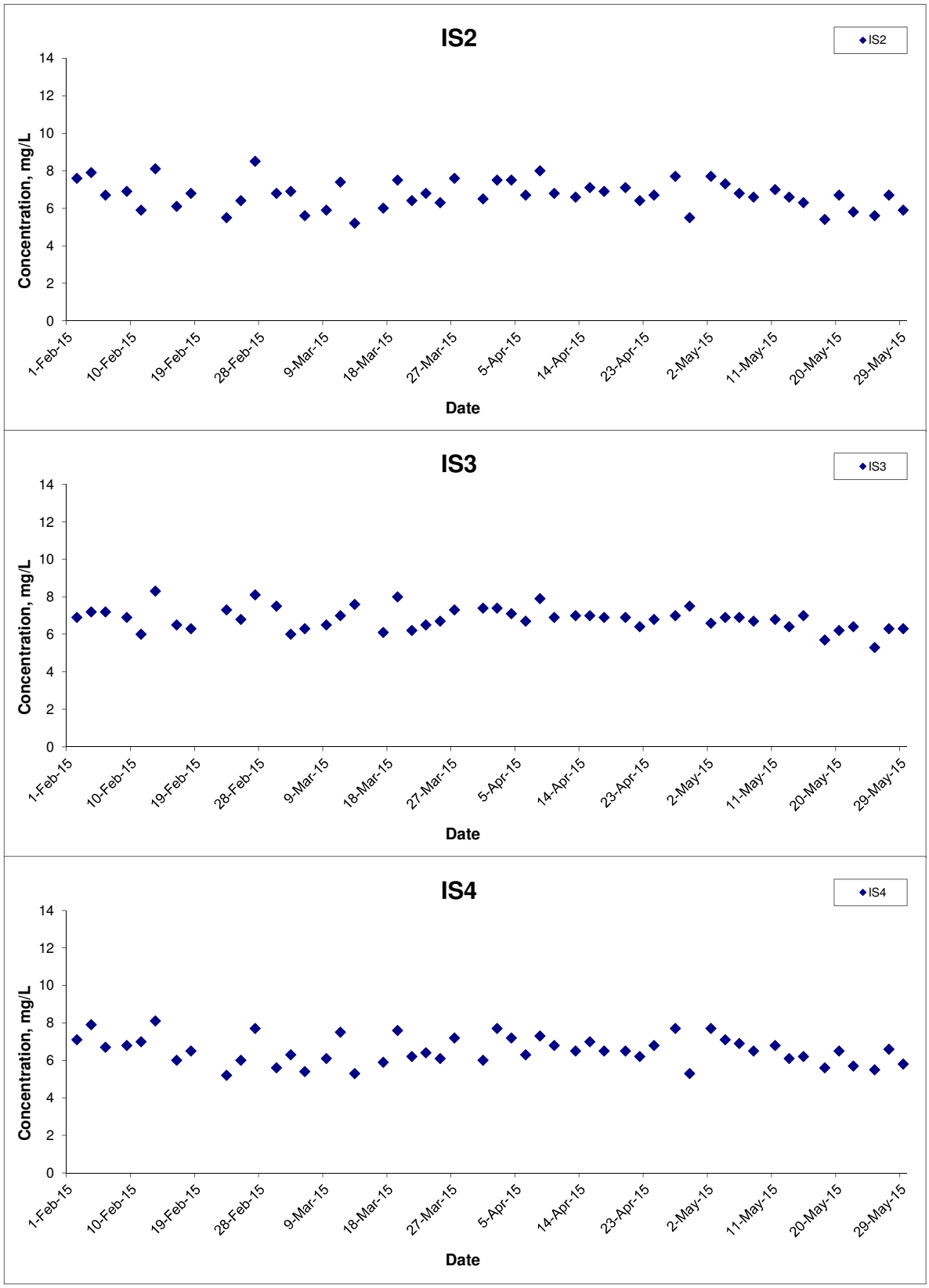
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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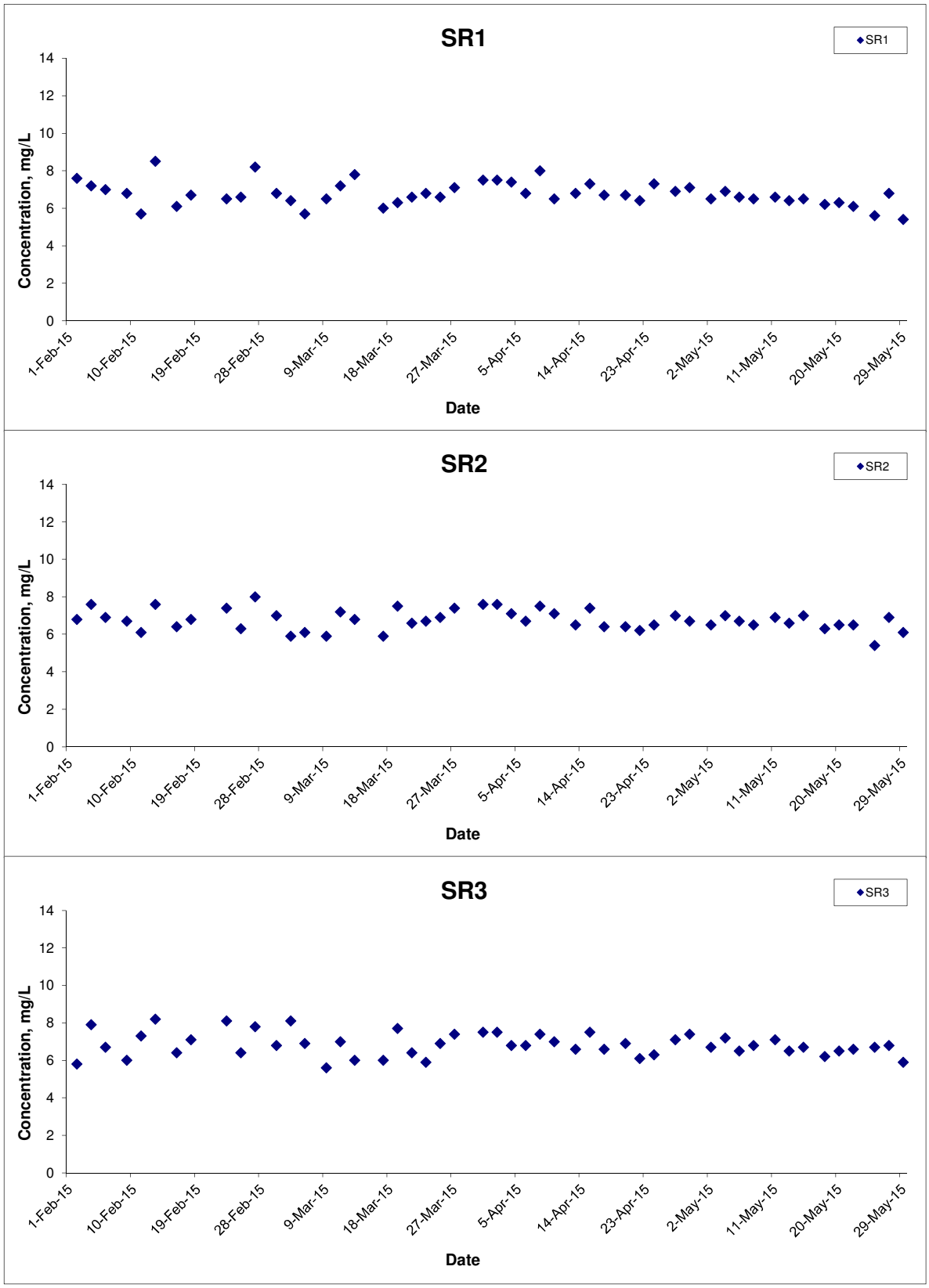
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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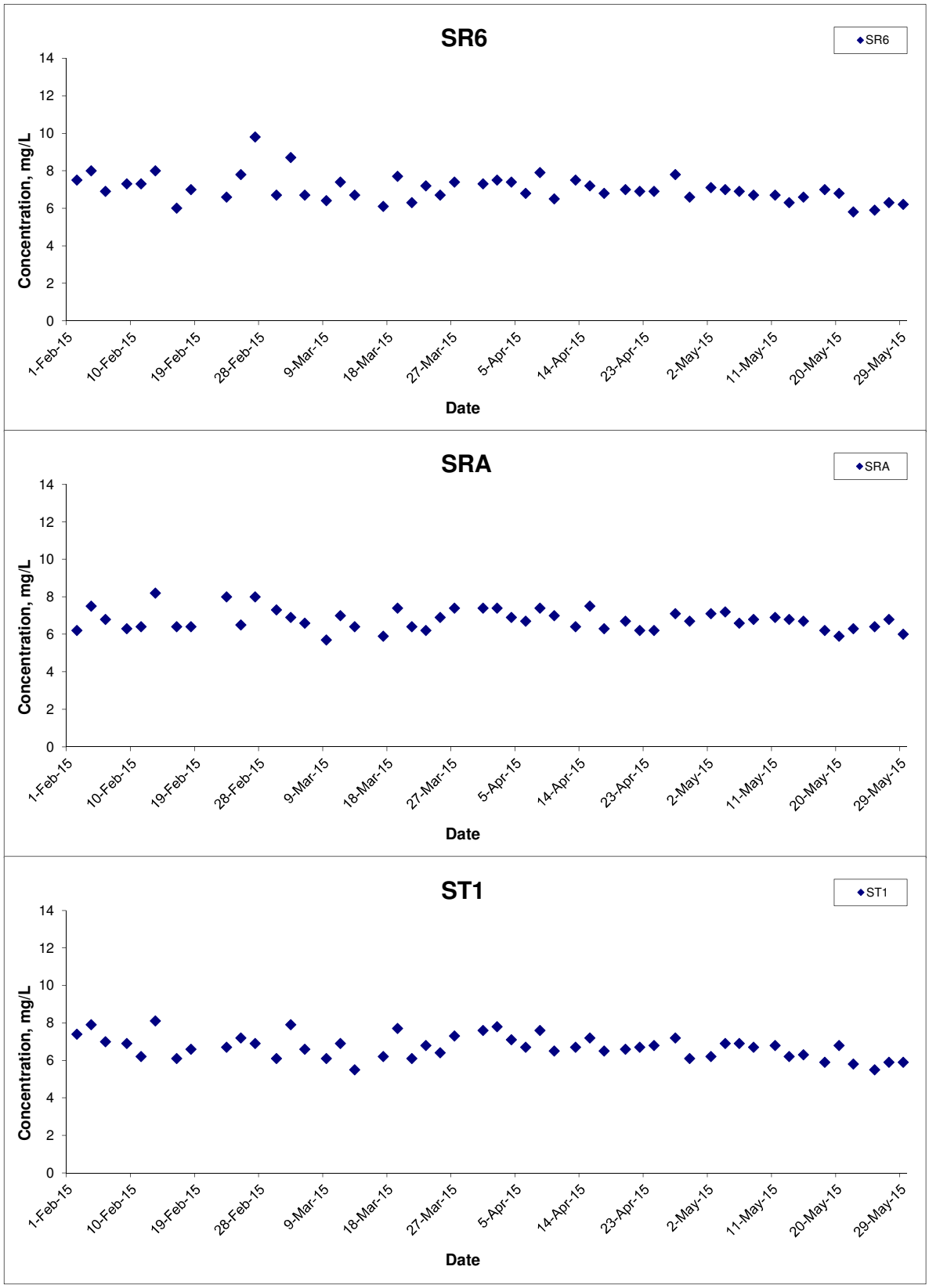
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



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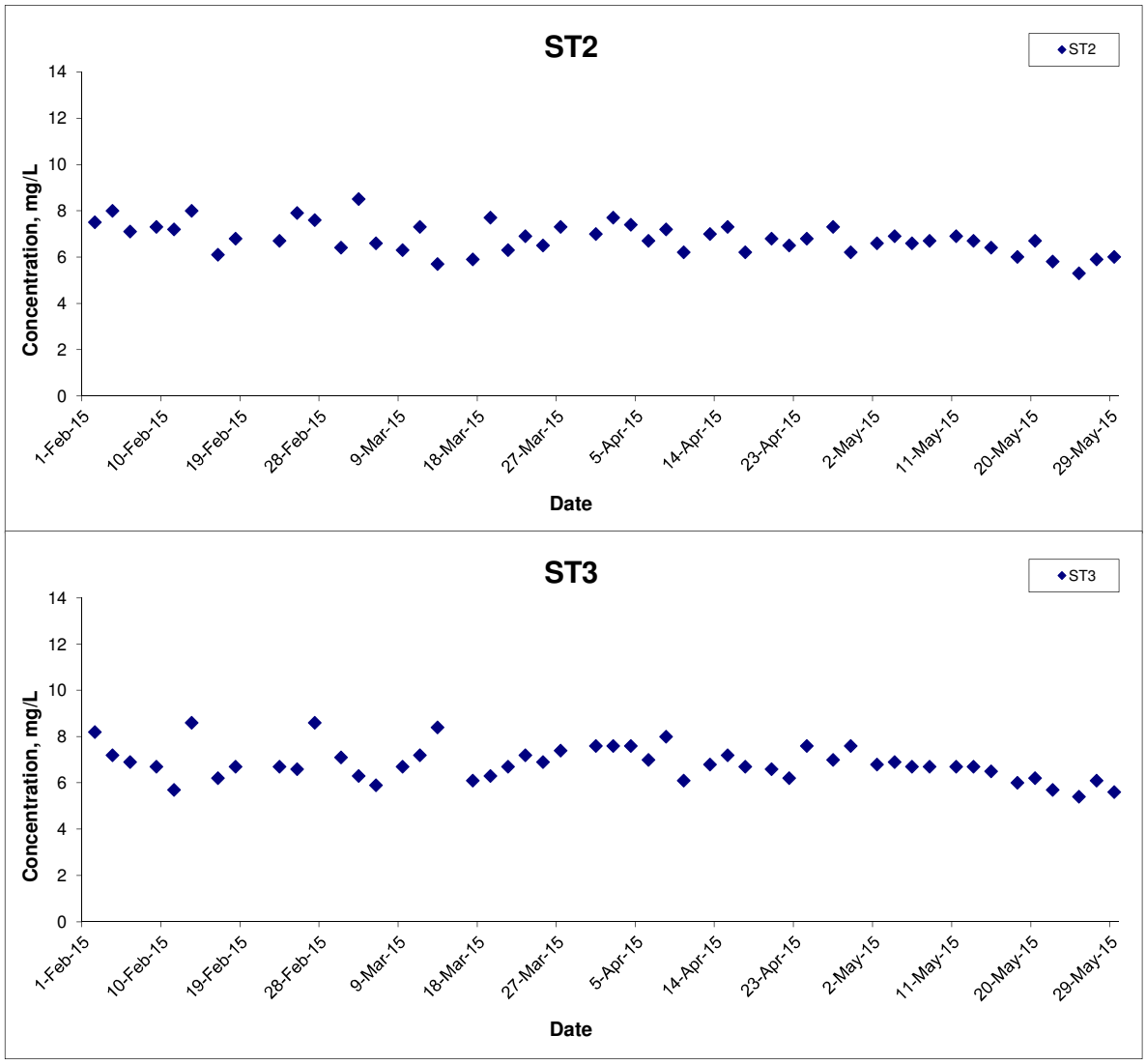
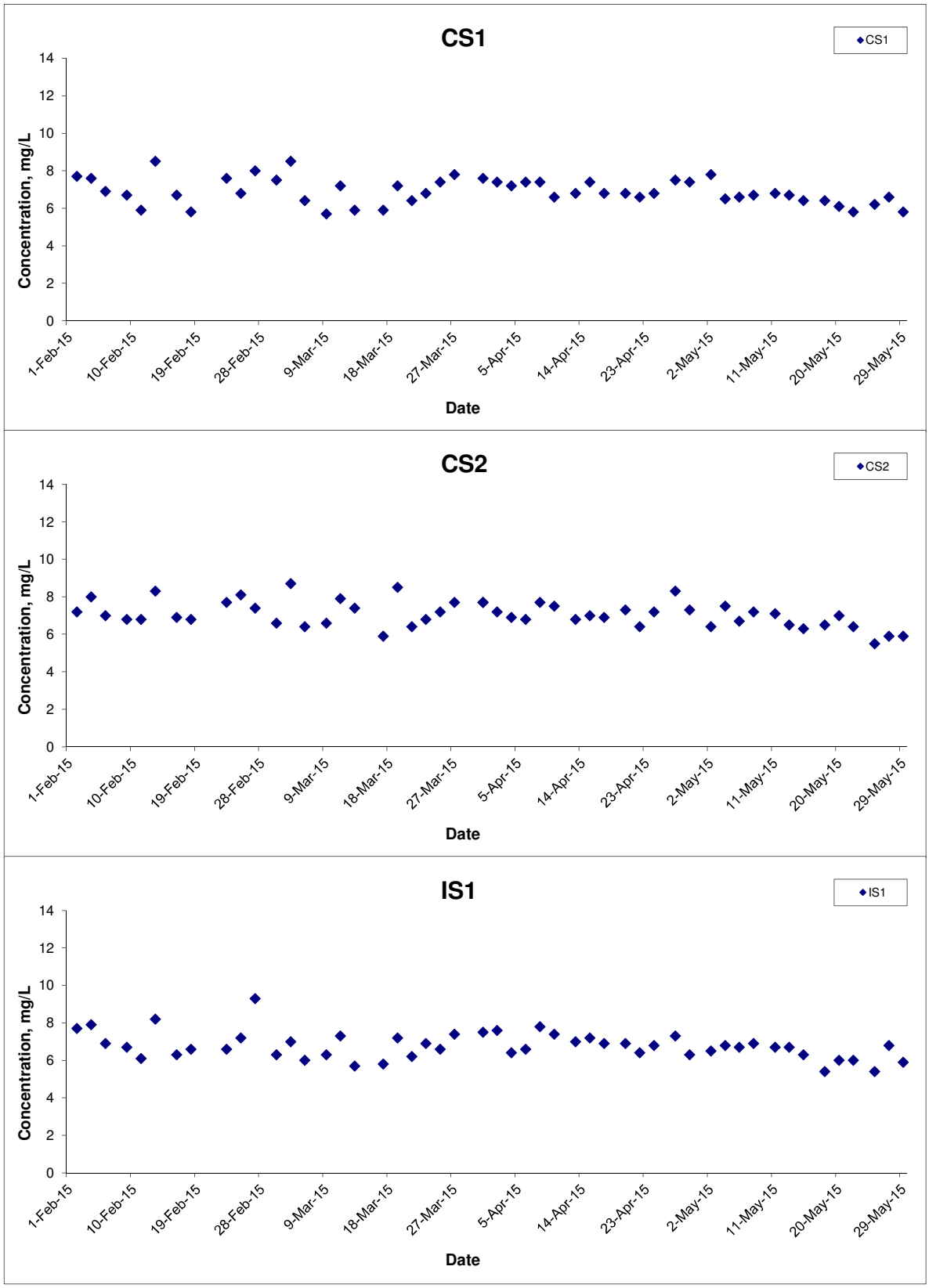
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S Date: May 15	Project No.: MA12014 Appendix: E	CINOTECH

Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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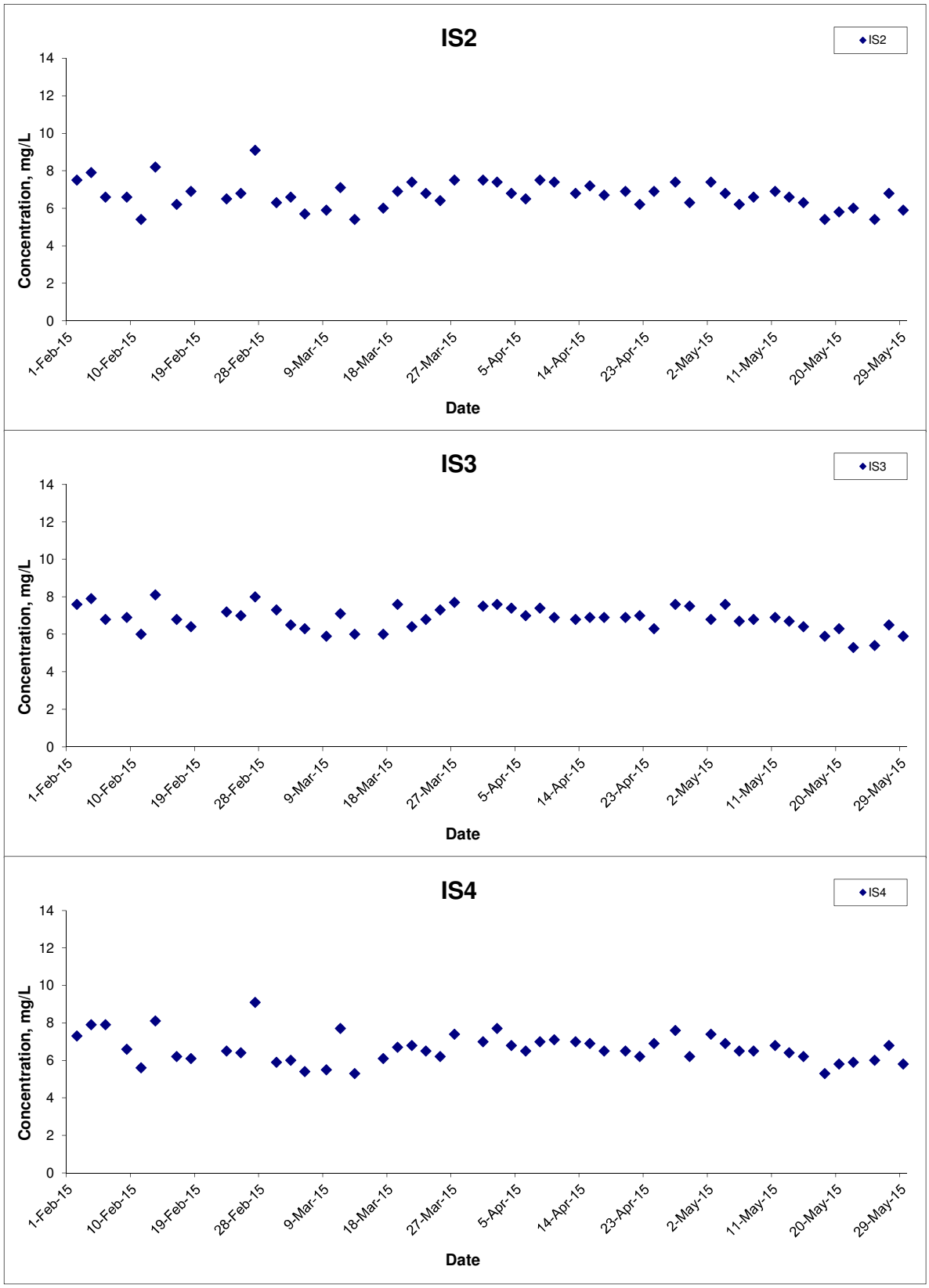
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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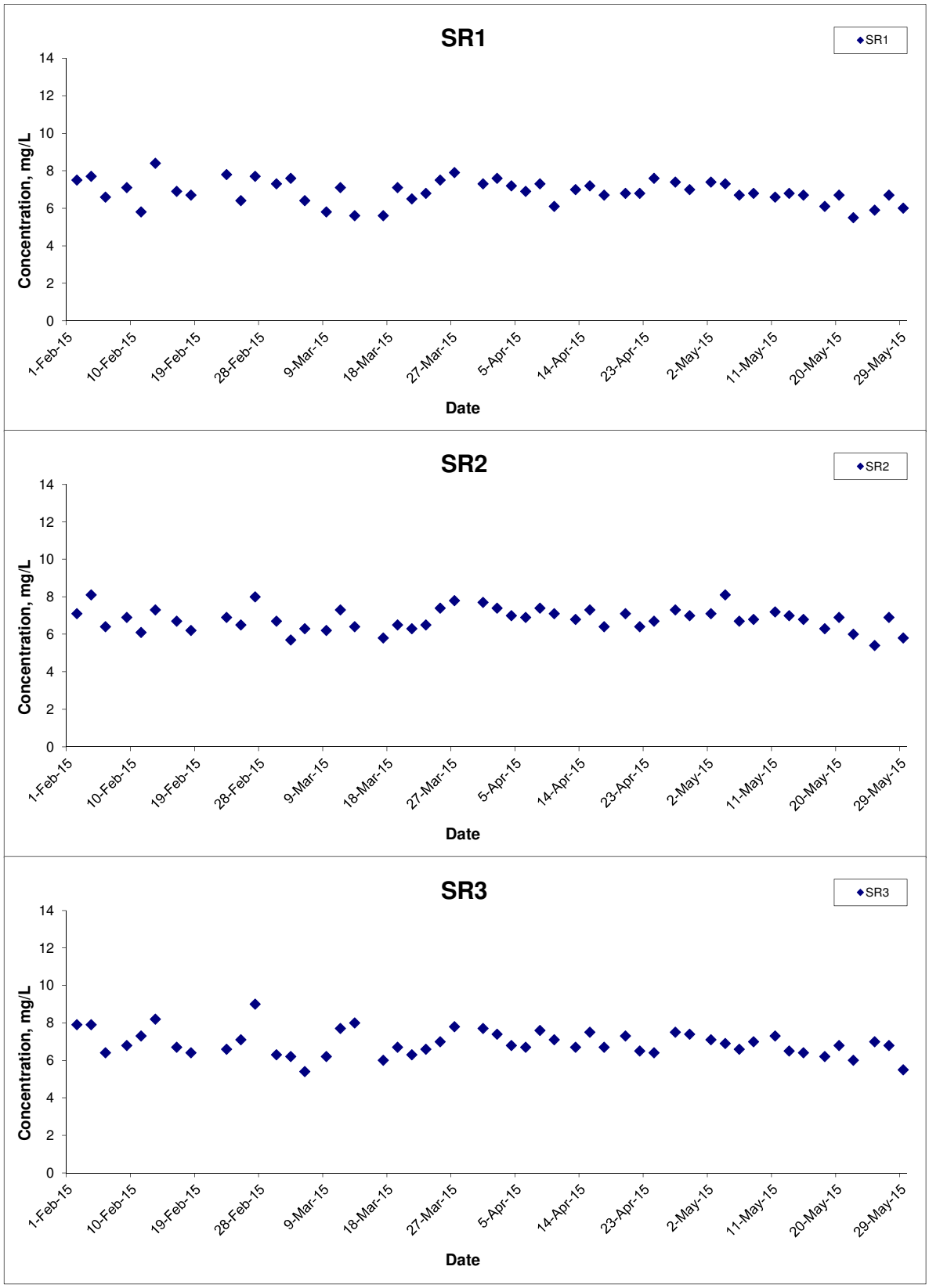
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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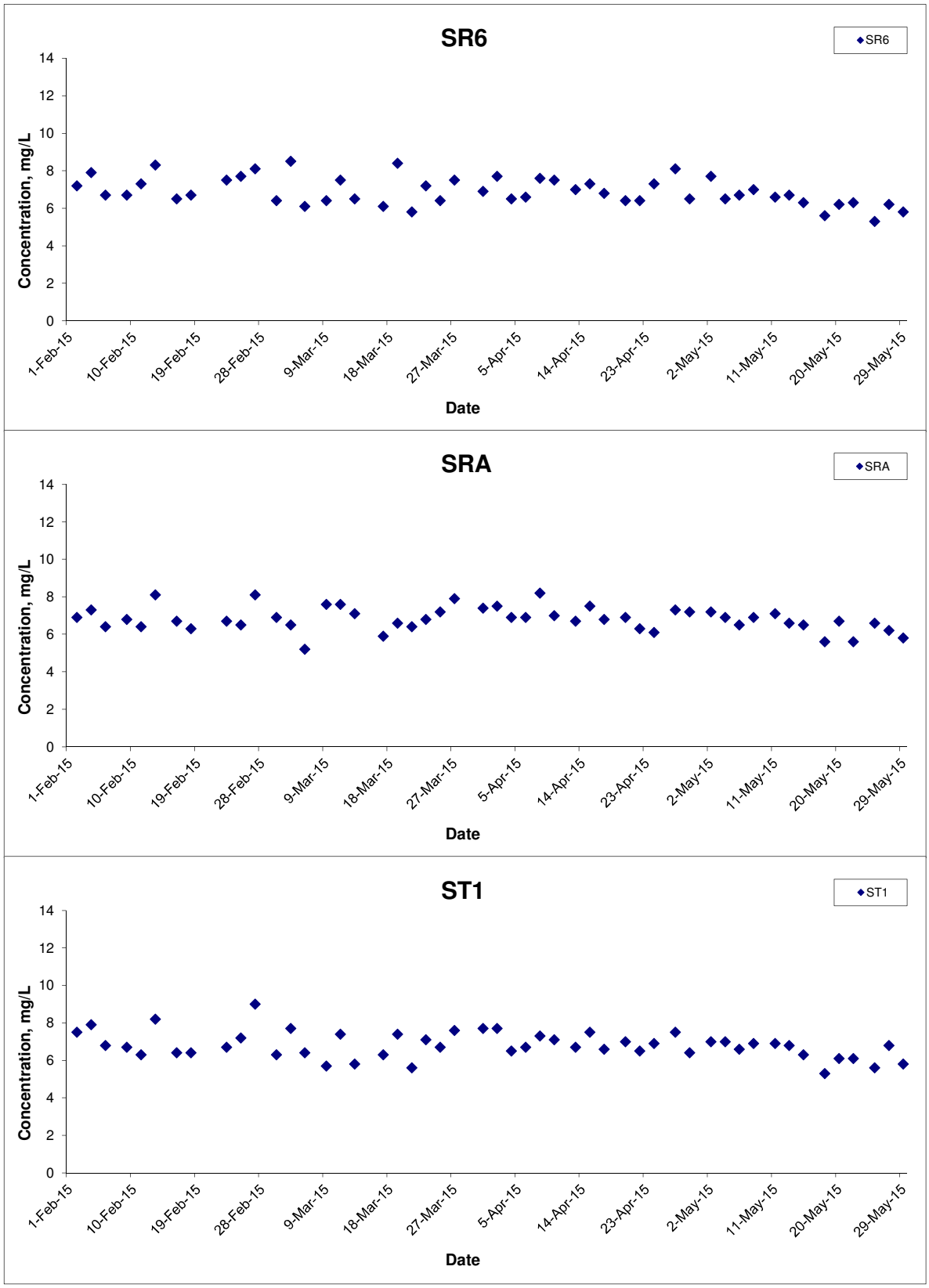
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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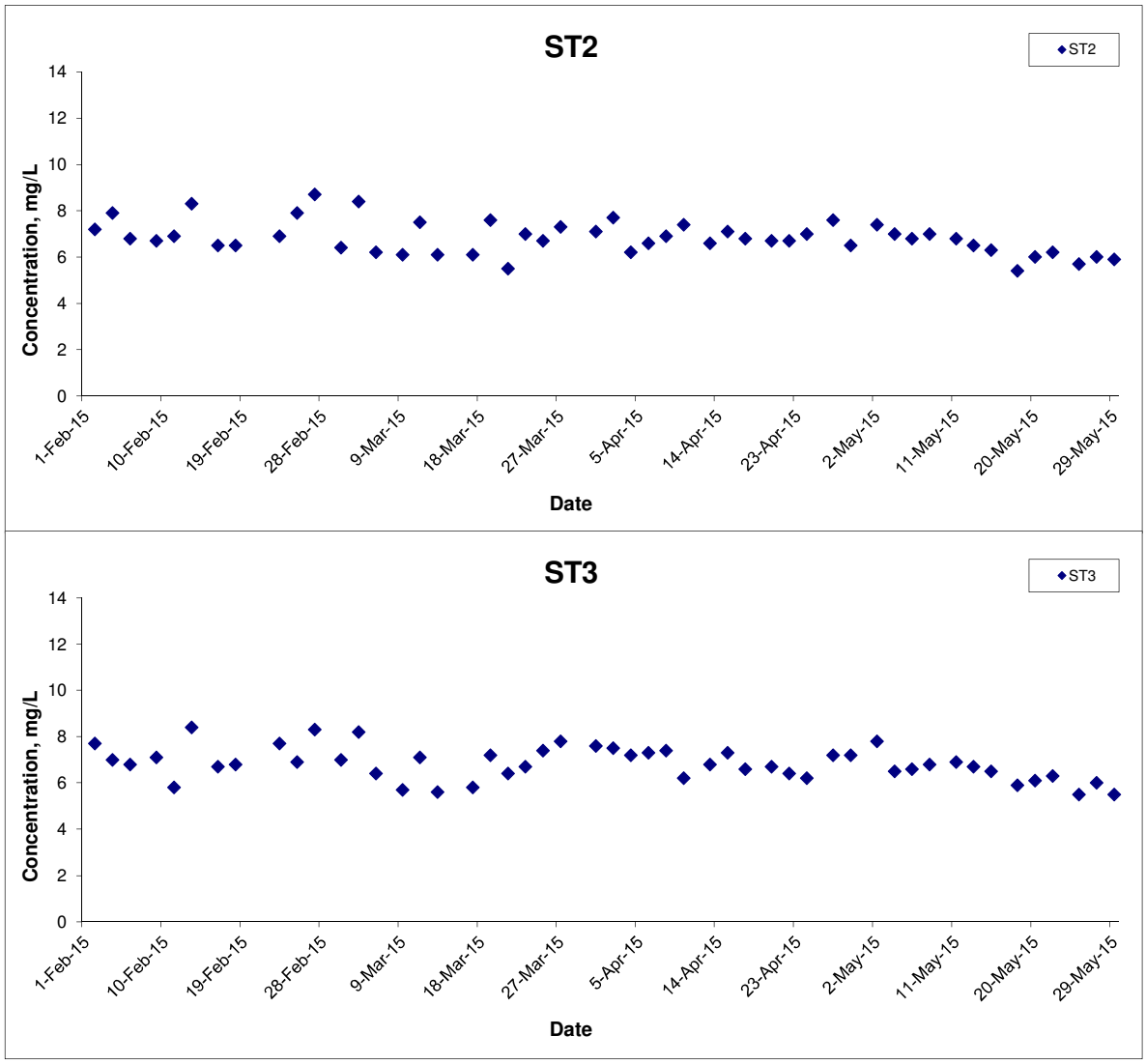
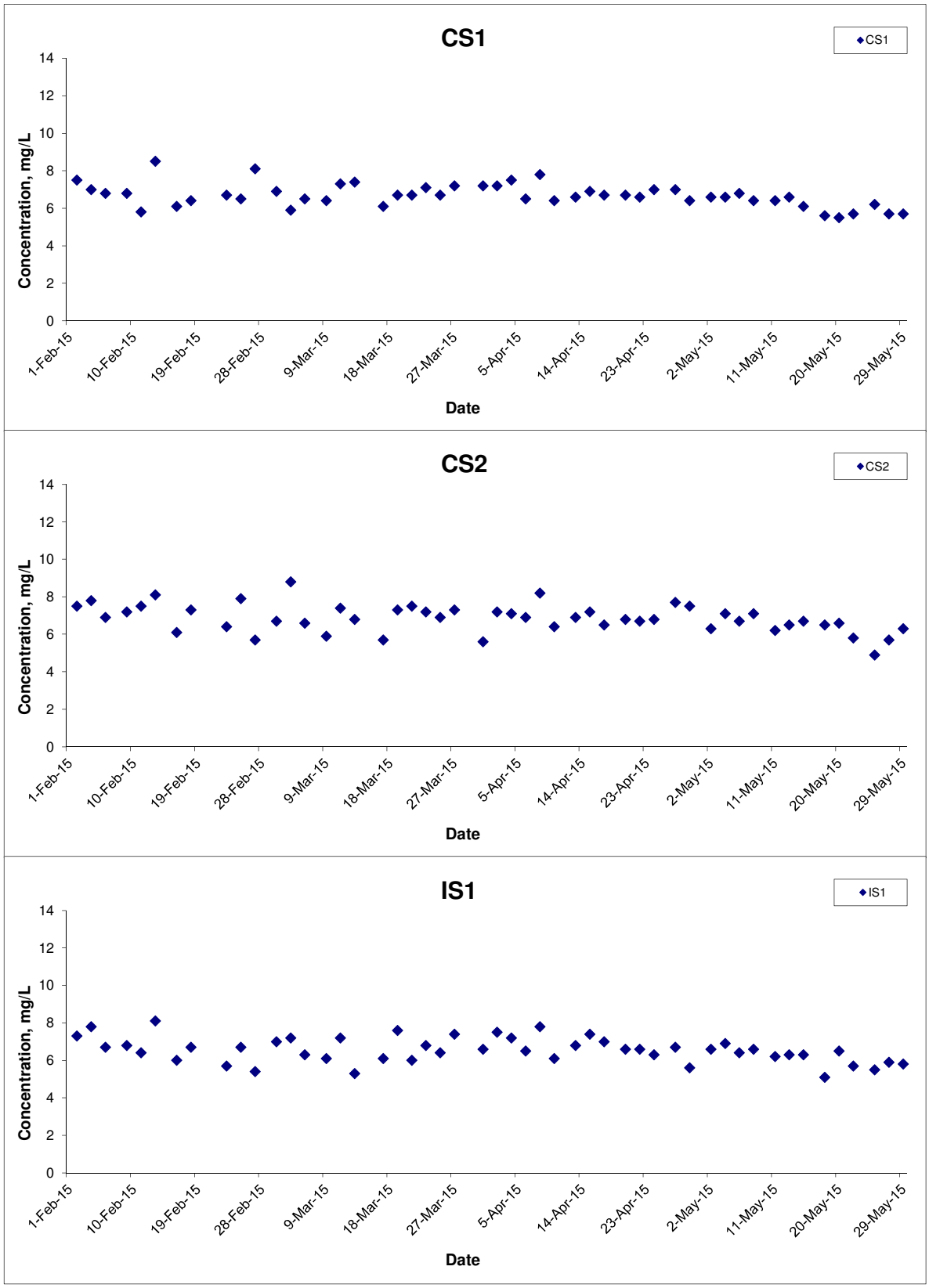
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



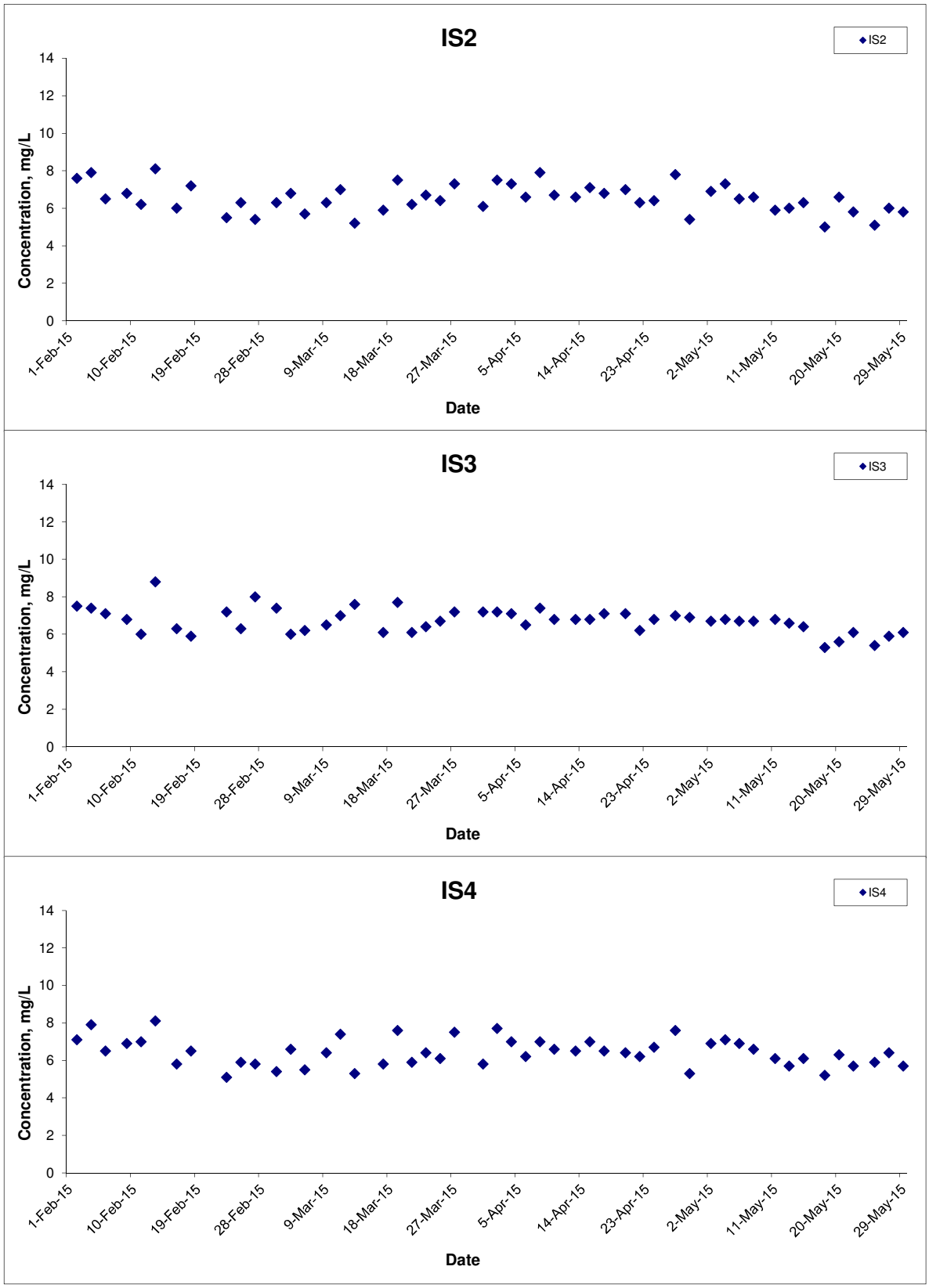
Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S Date: May 15	Project No.: MA12014 Appendix: E	CINOTECH

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
		Date: May 15	Appendix: E	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Title	Contract HY/2011/09 Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA12014	CINOTECH
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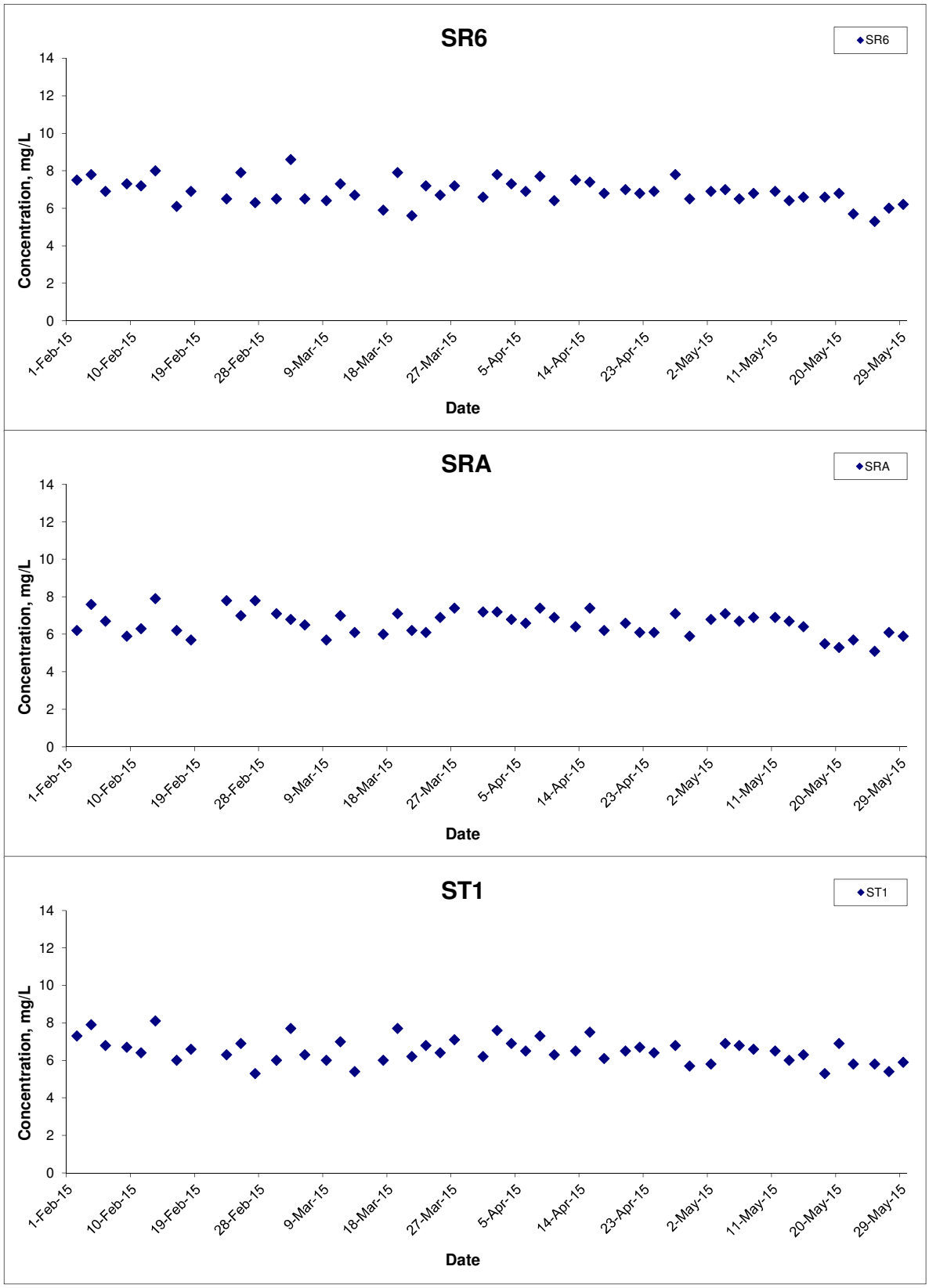
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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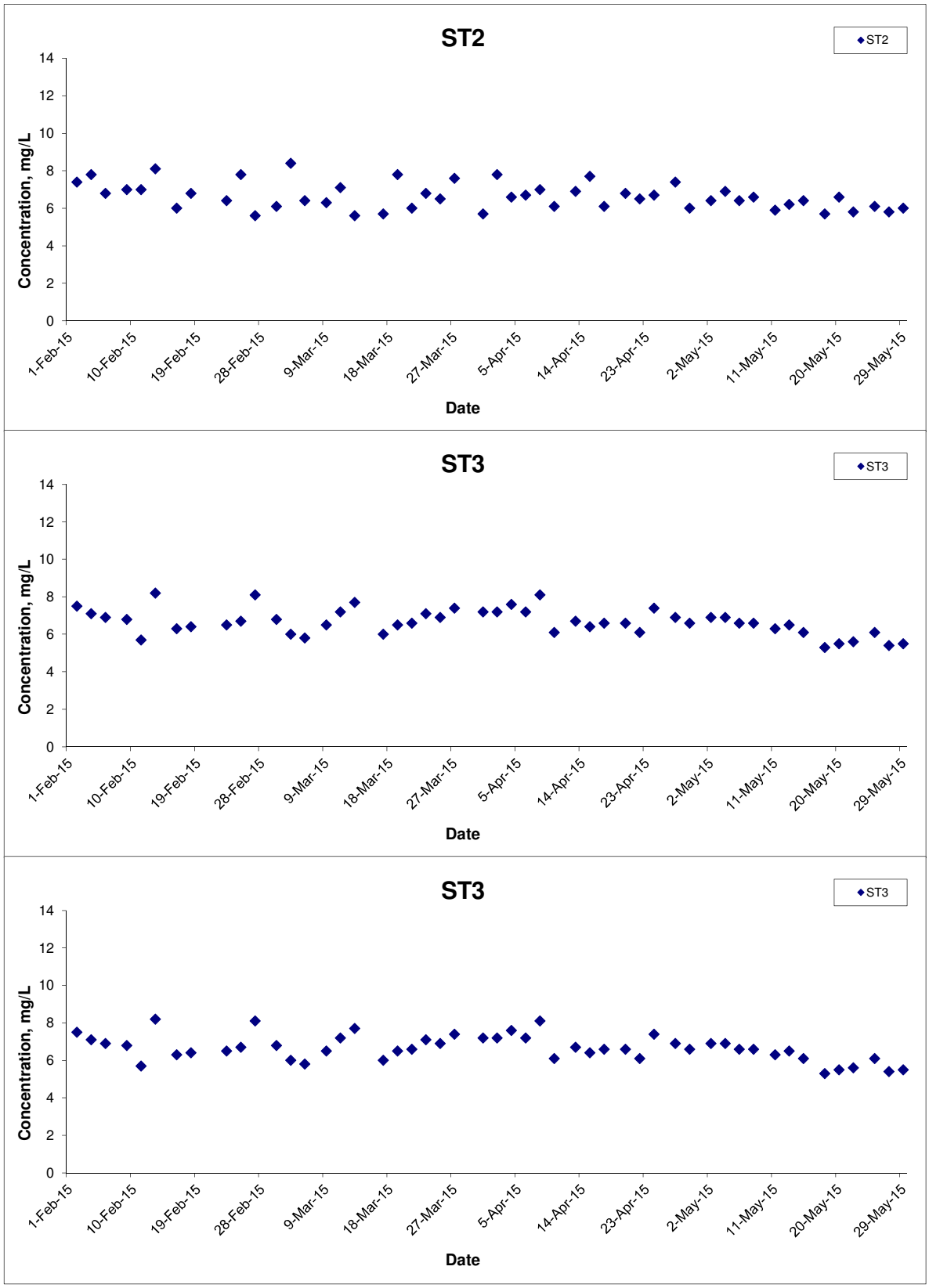
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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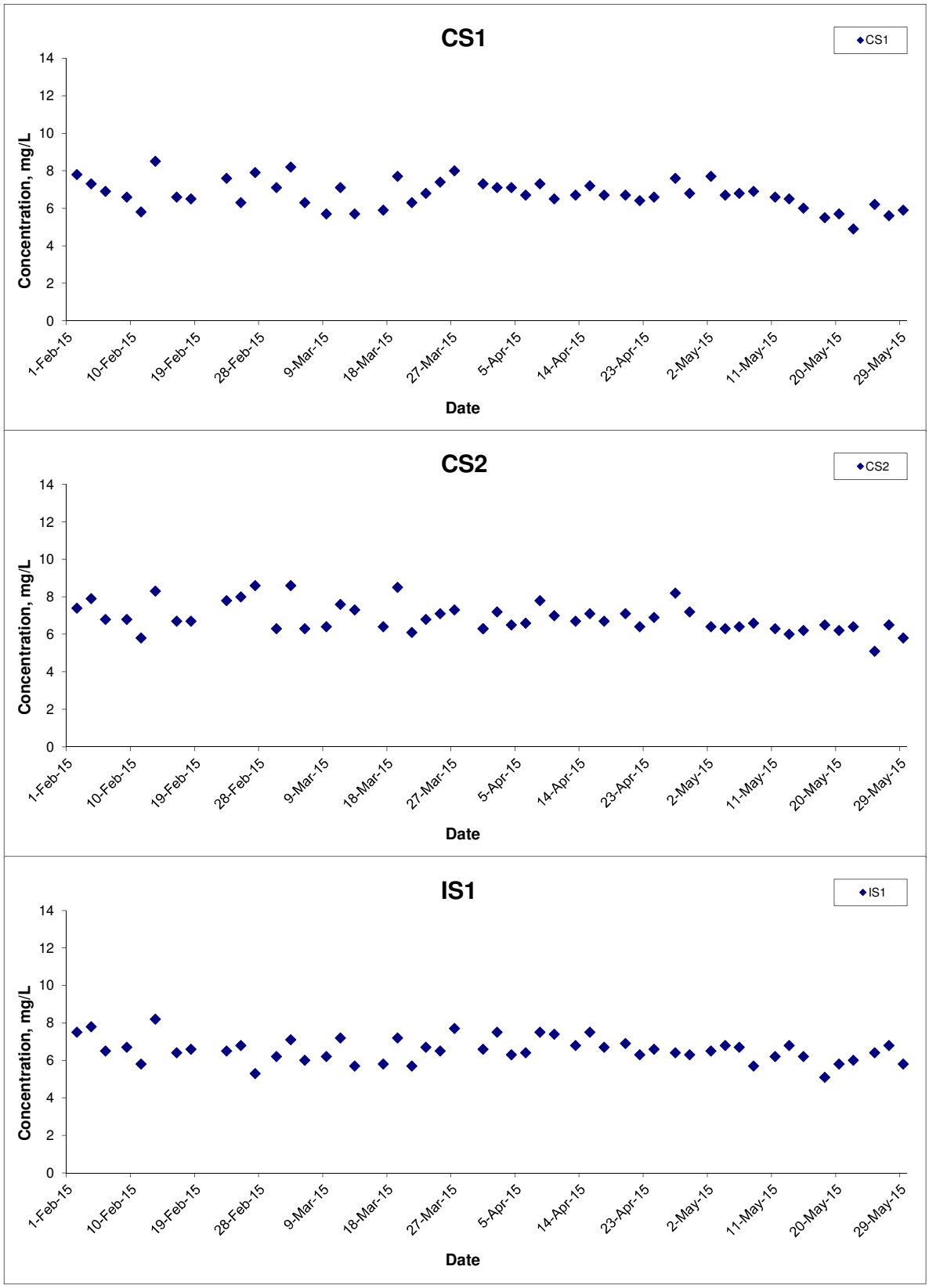
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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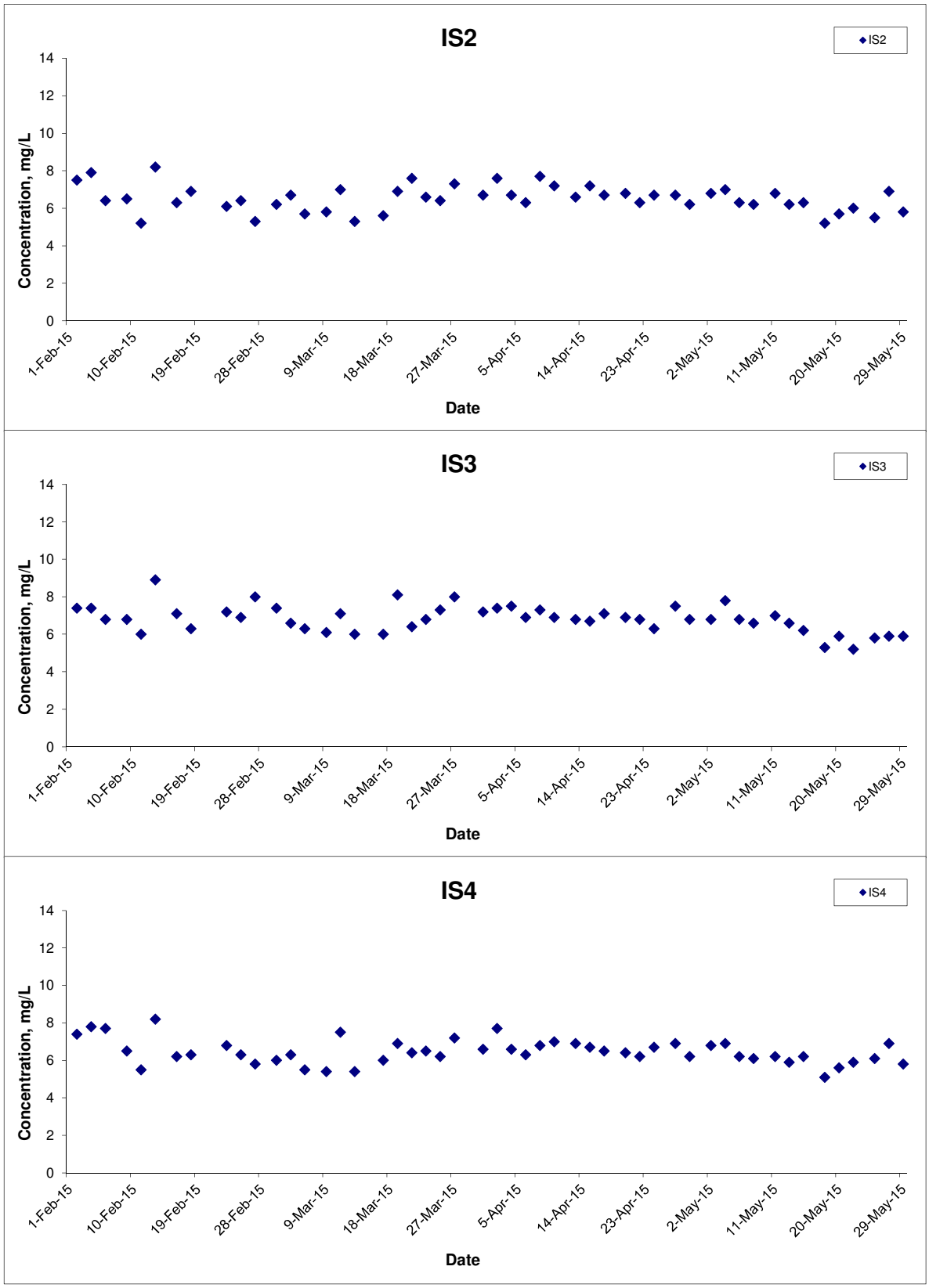
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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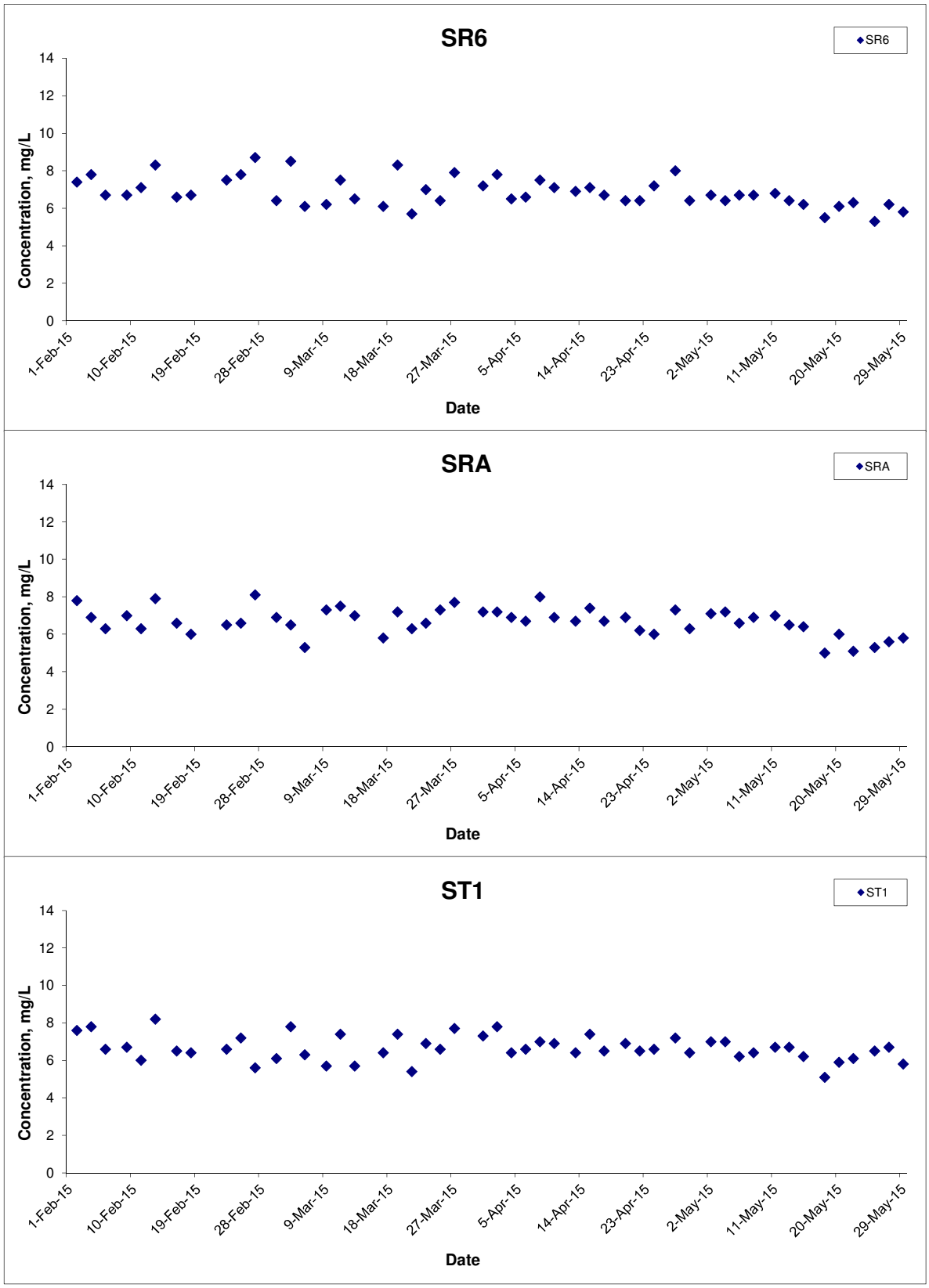
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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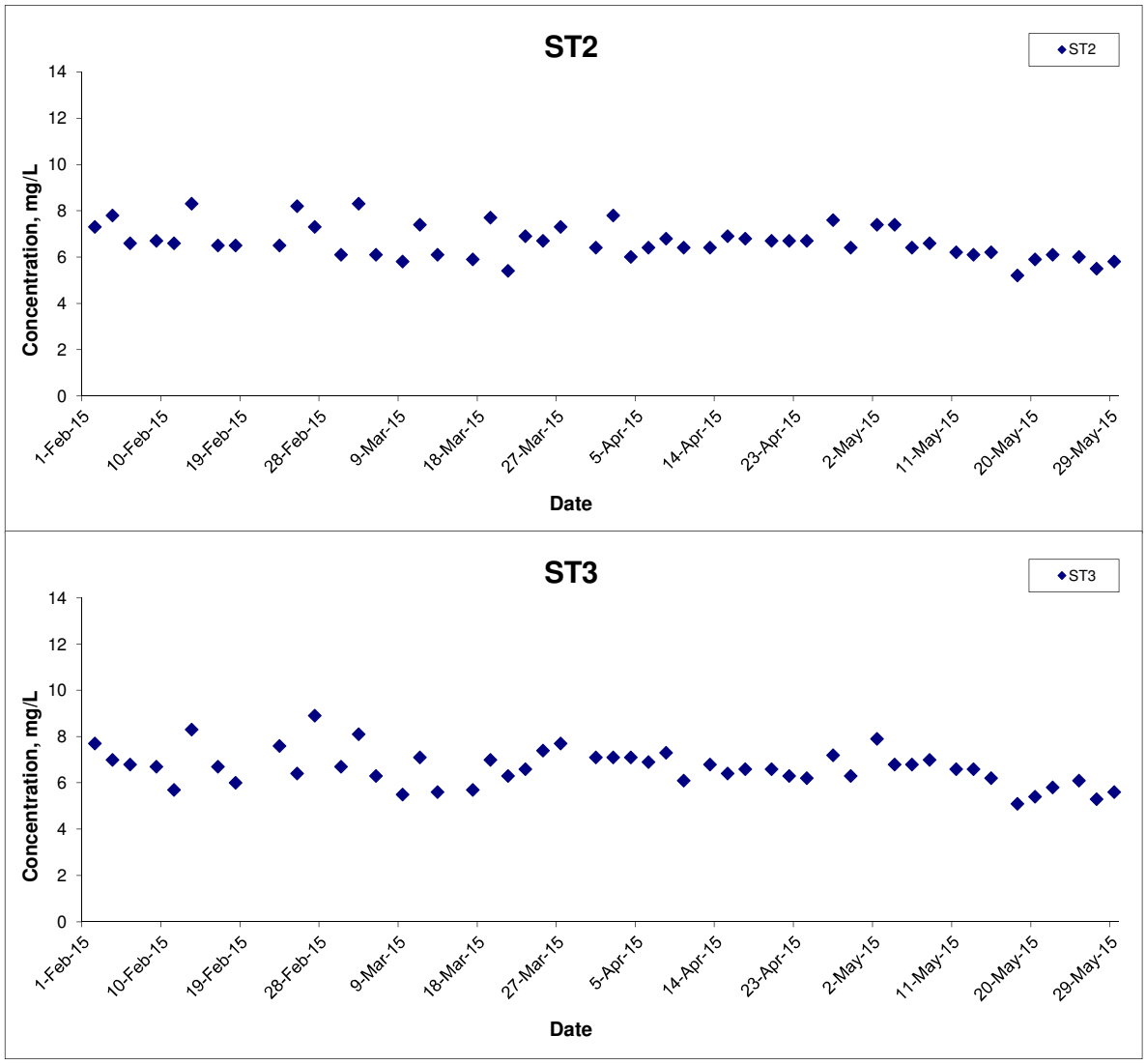
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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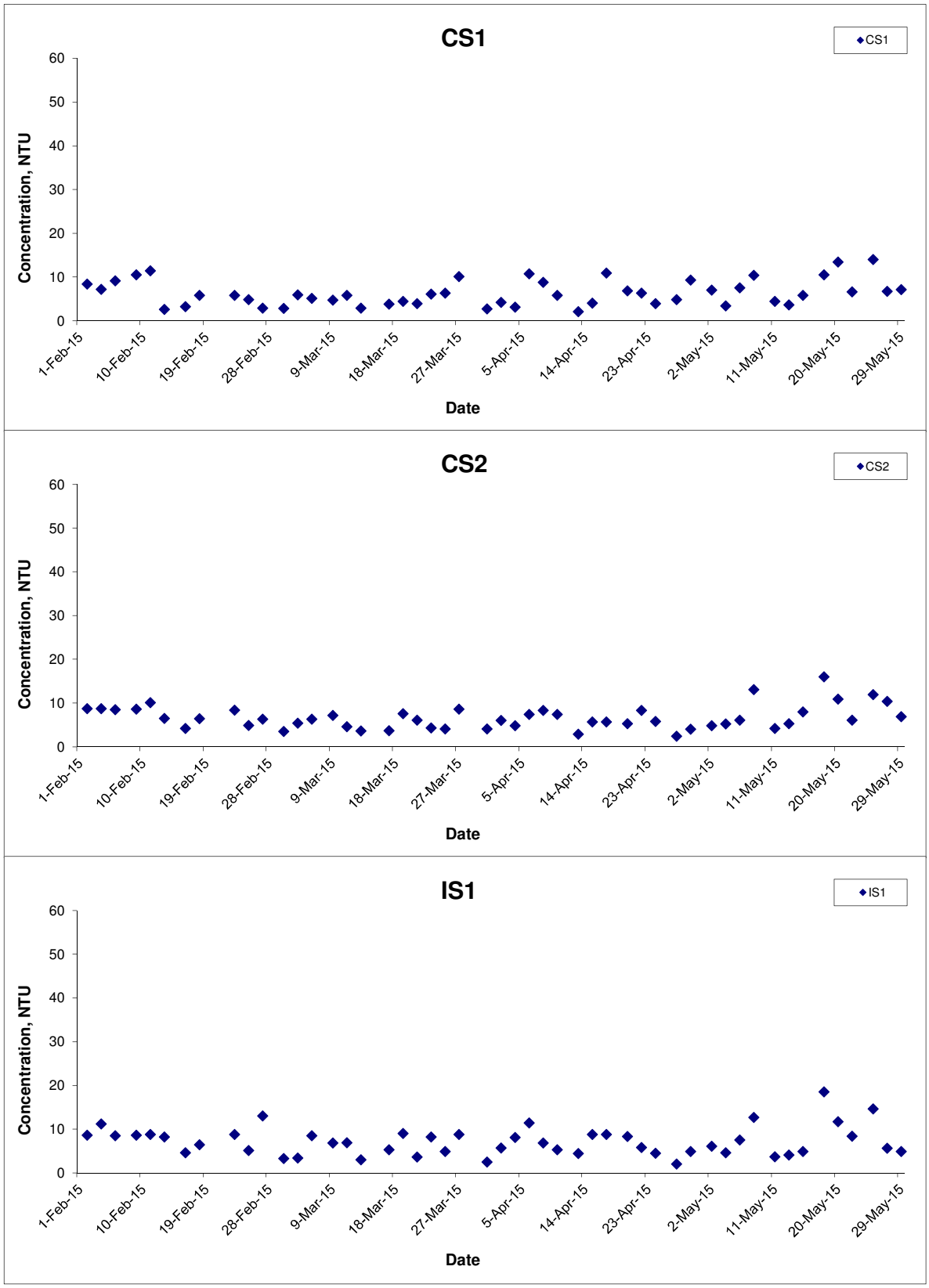
Turbidity (Depth-averaged) at Mid-Ebb Tide



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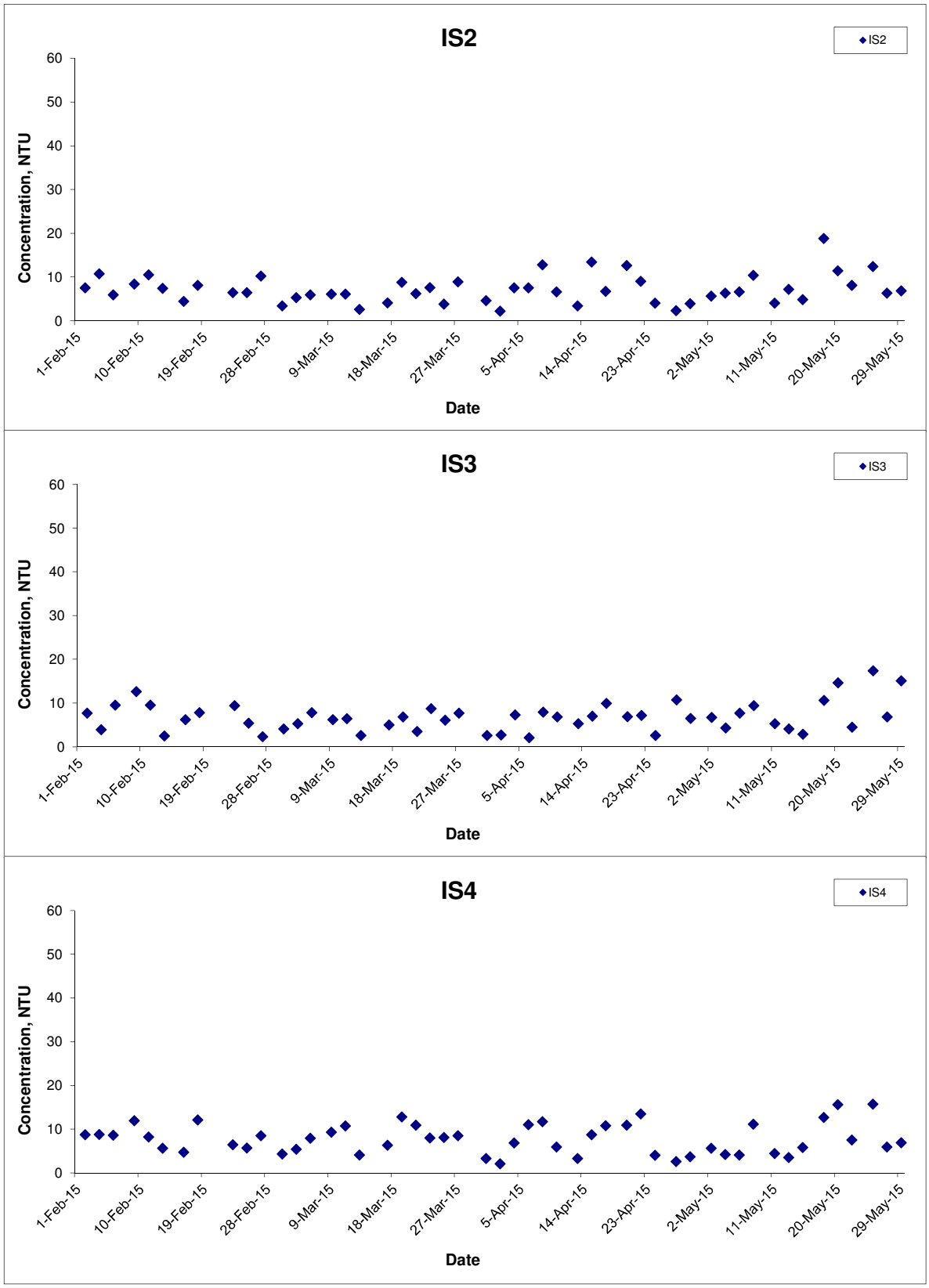
Turbidity (Depth-averaged) at Mid-Ebb Tide



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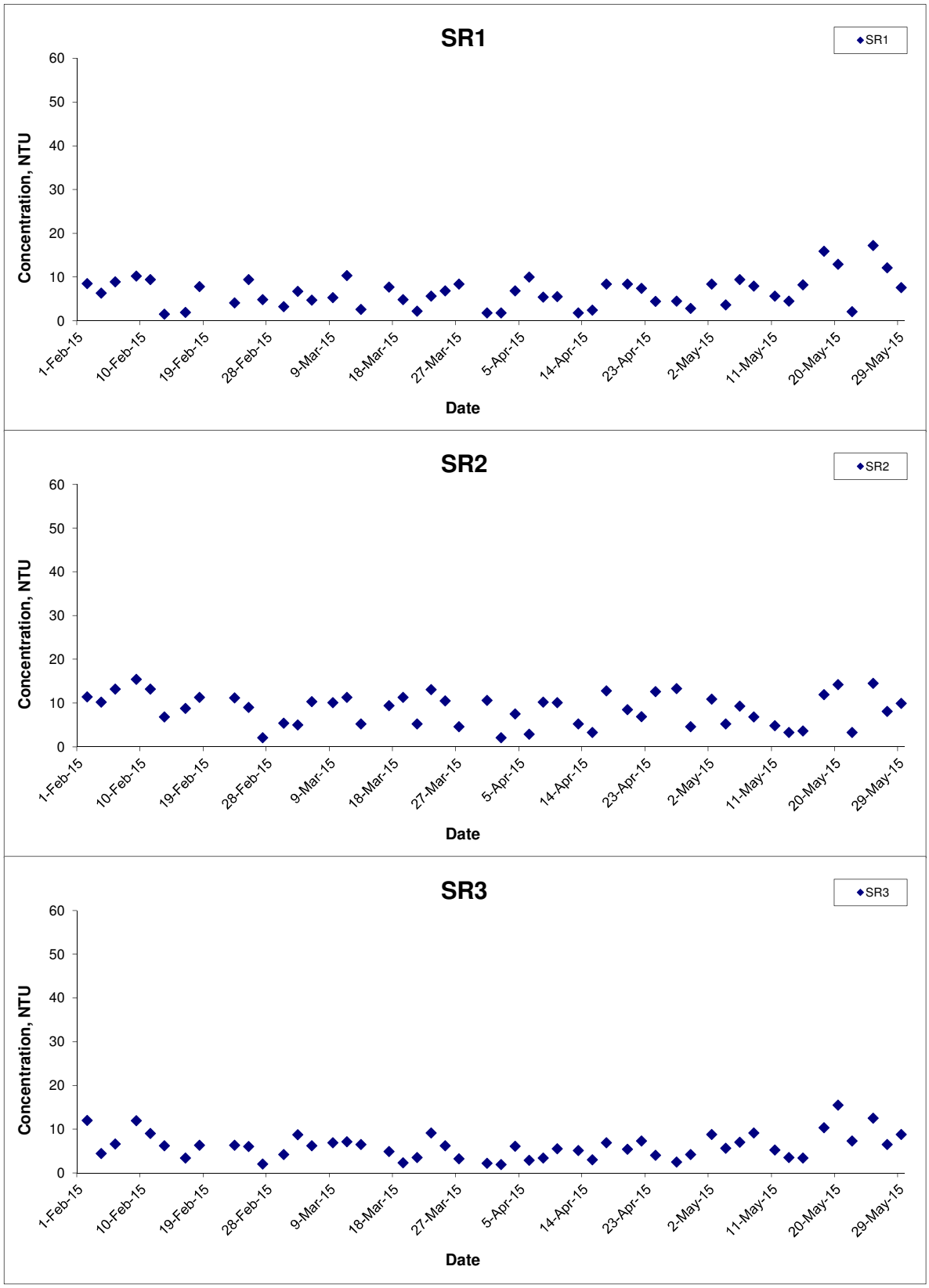

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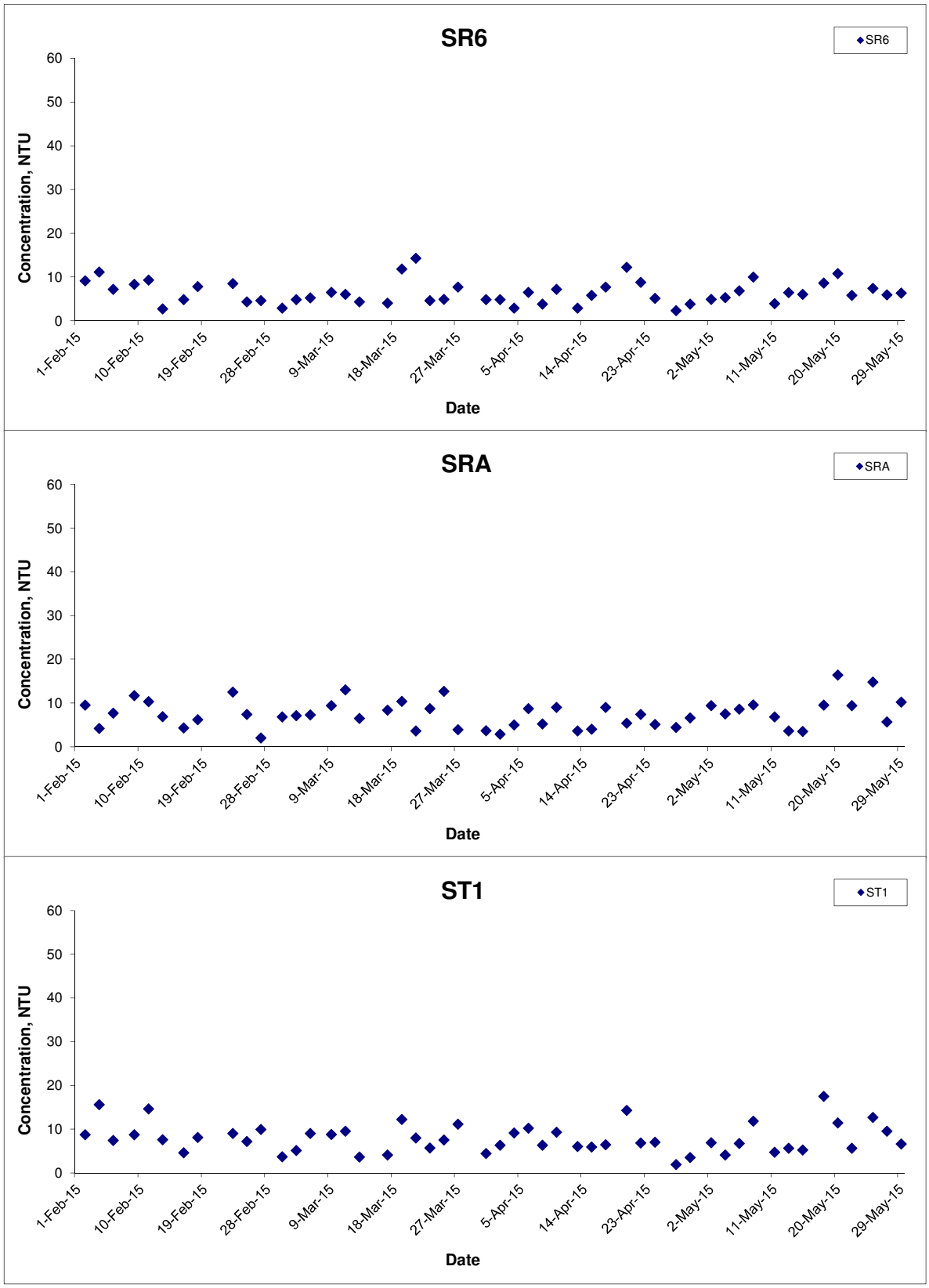

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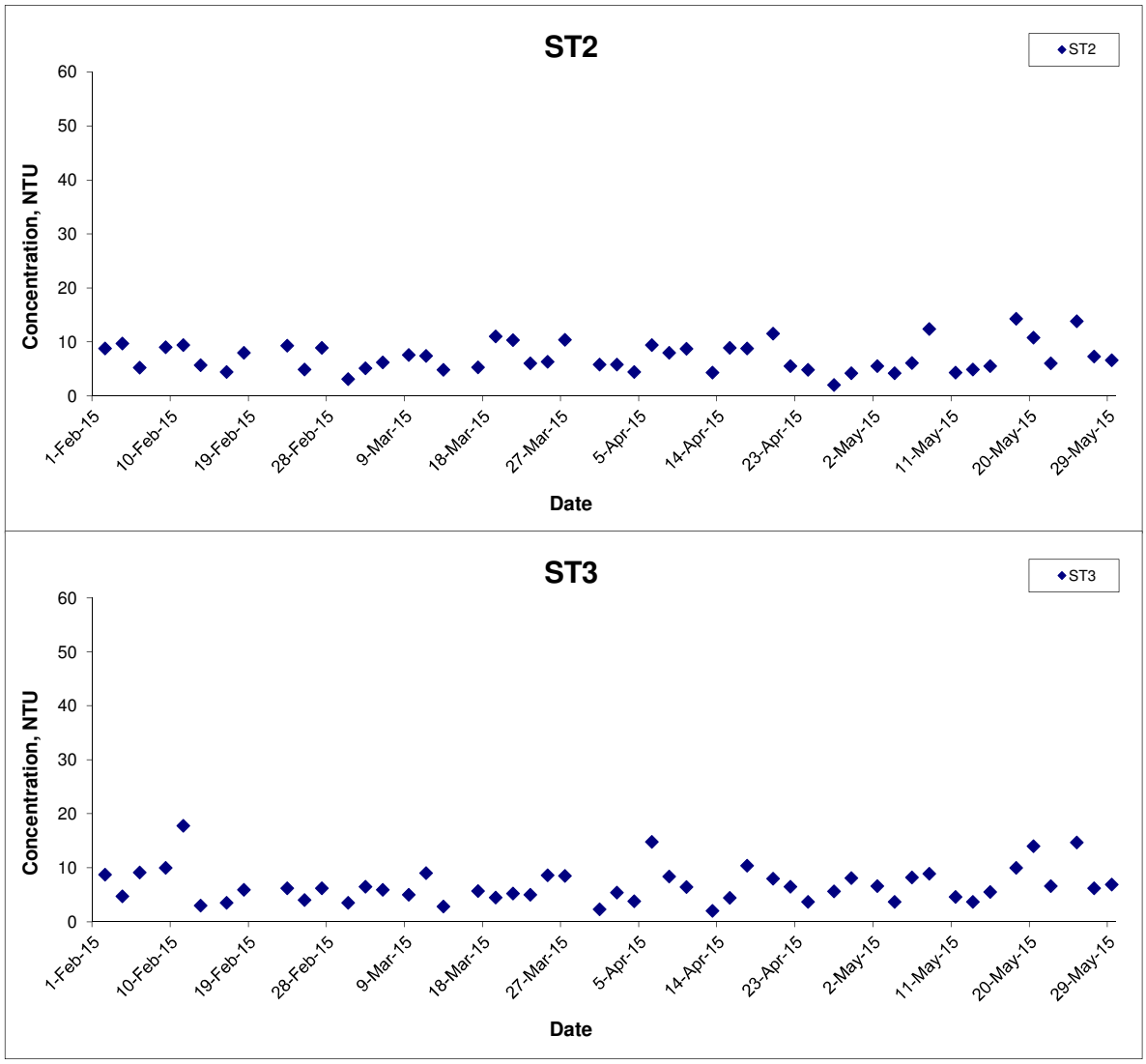
Turbidity (Depth-averaged) at Mid-Ebb Tide



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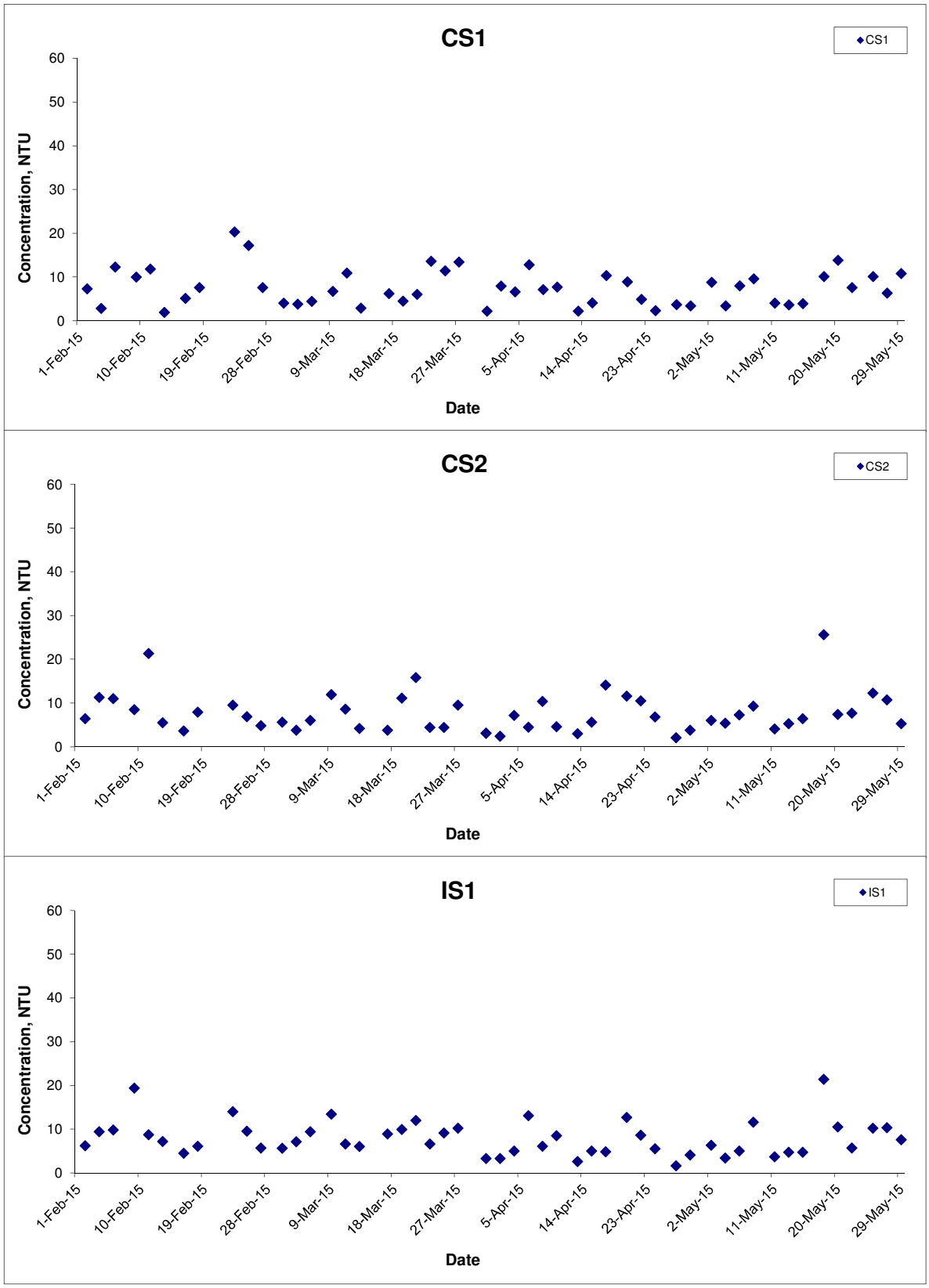
Turbidity (Depth-averaged) at Mid-Flood Tide



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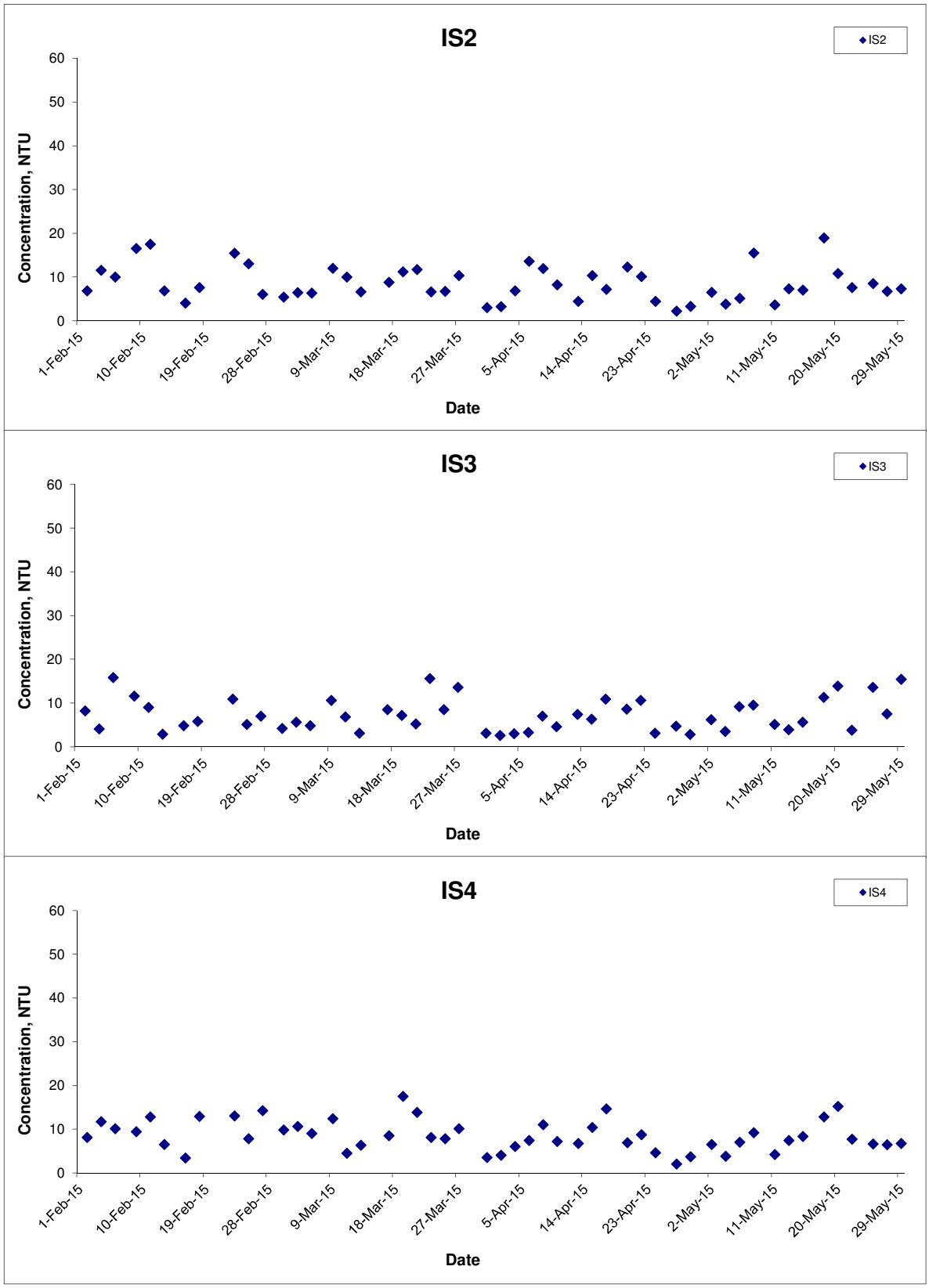
Turbidity (Depth-averaged) at Mid-Flood Tide



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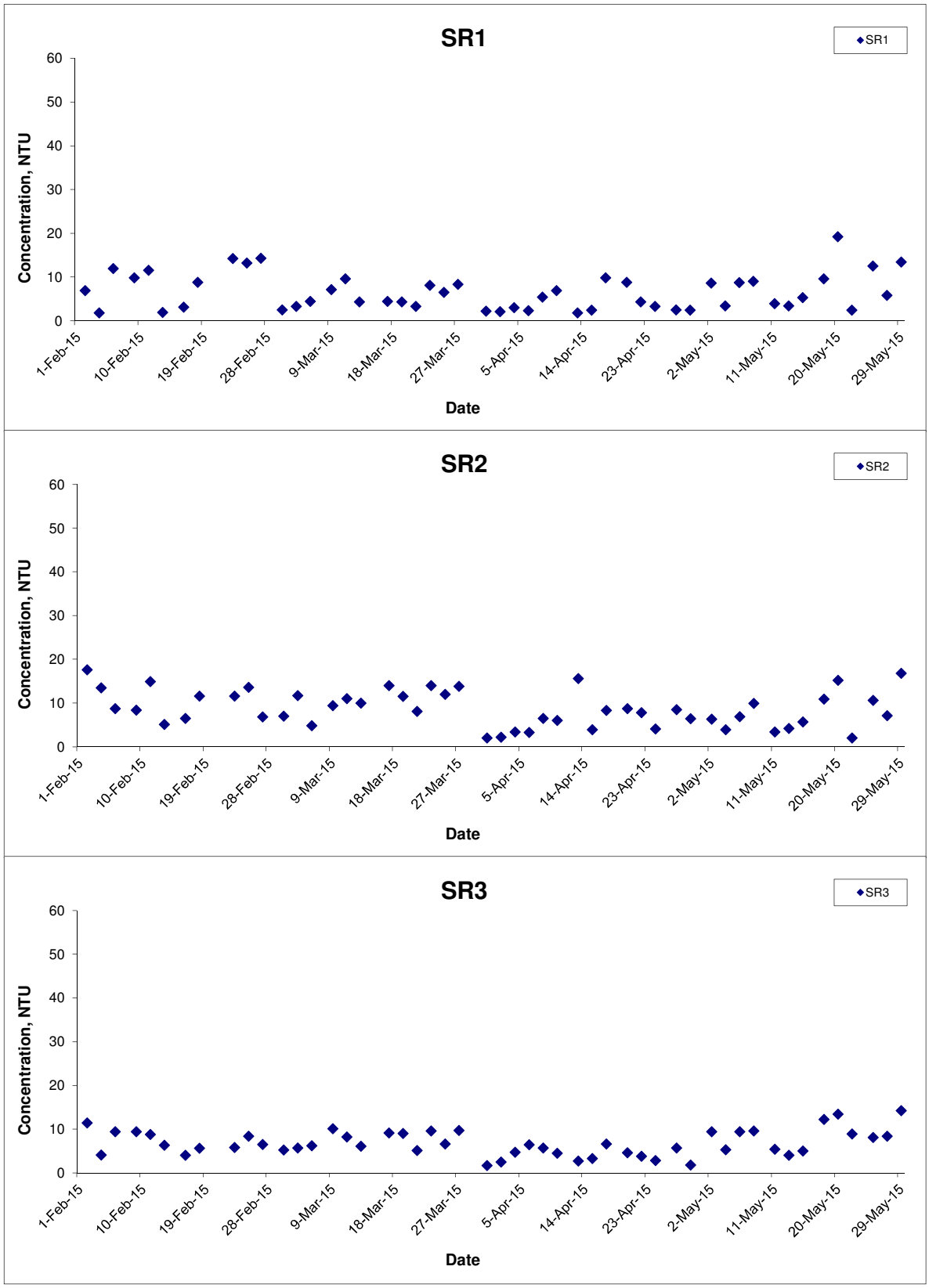
Turbidity (Depth-averaged) at Mid-Flood Tide



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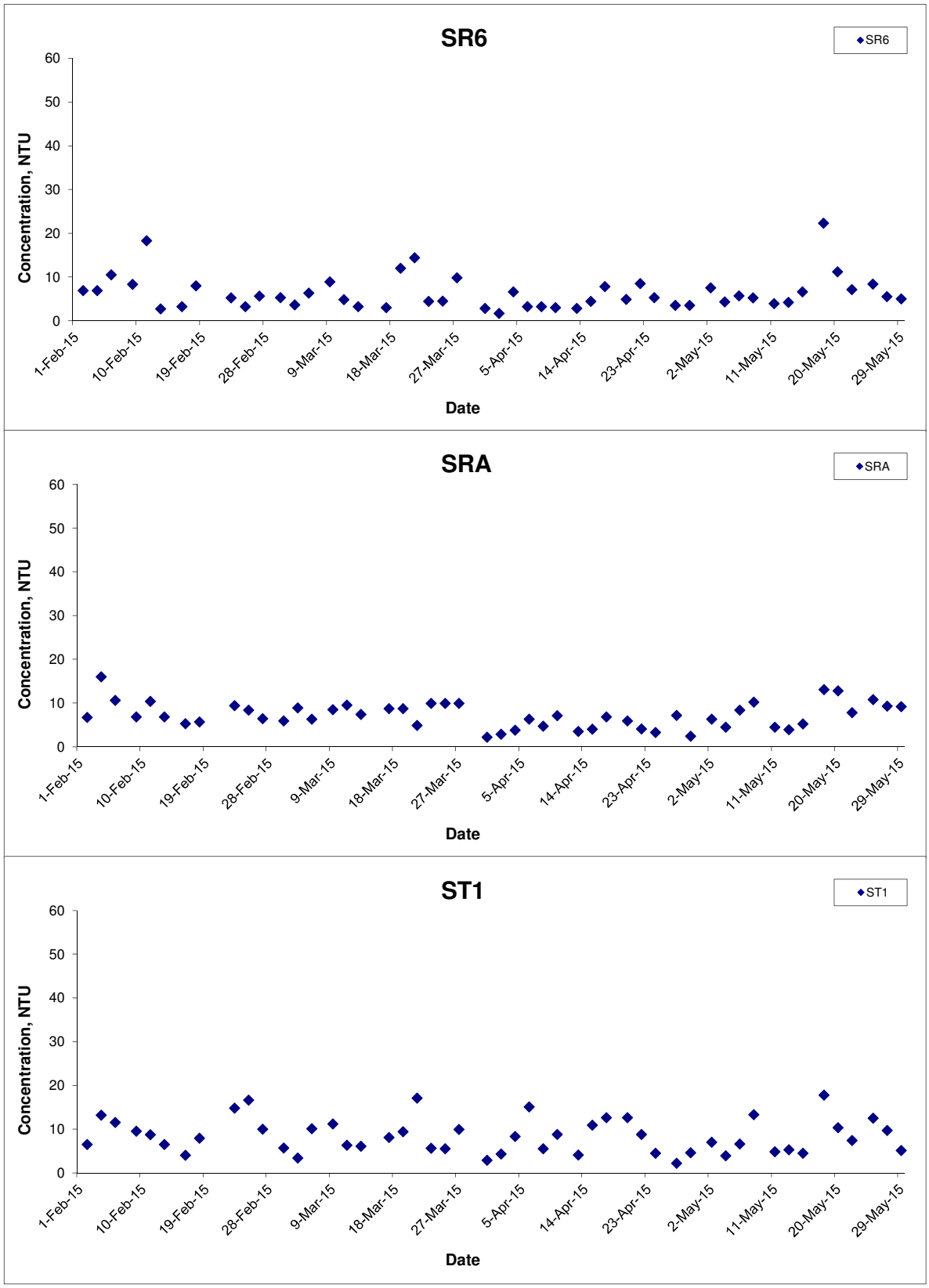

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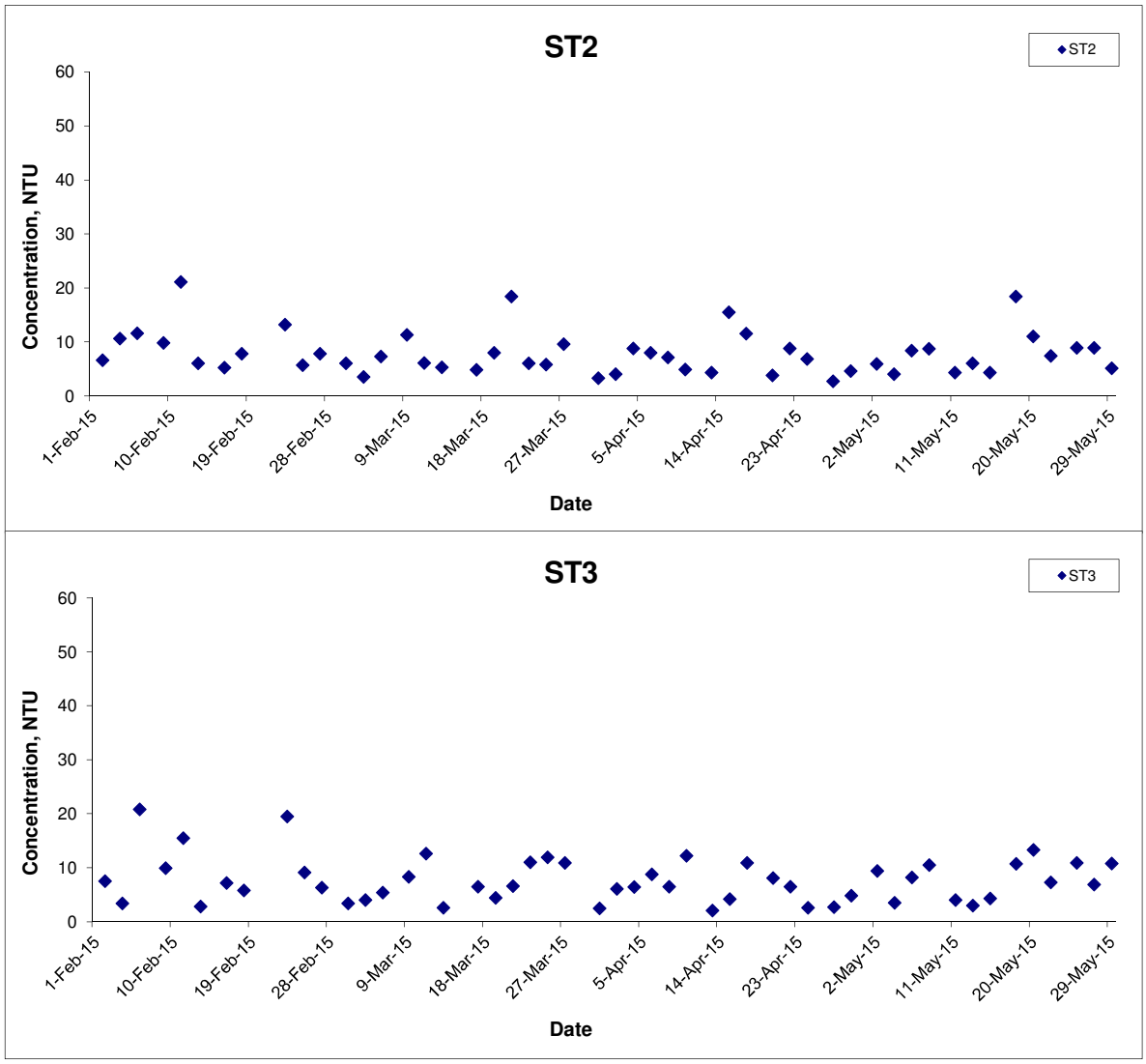
Turbidity (Depth-averaged) at Mid-Flood Tide



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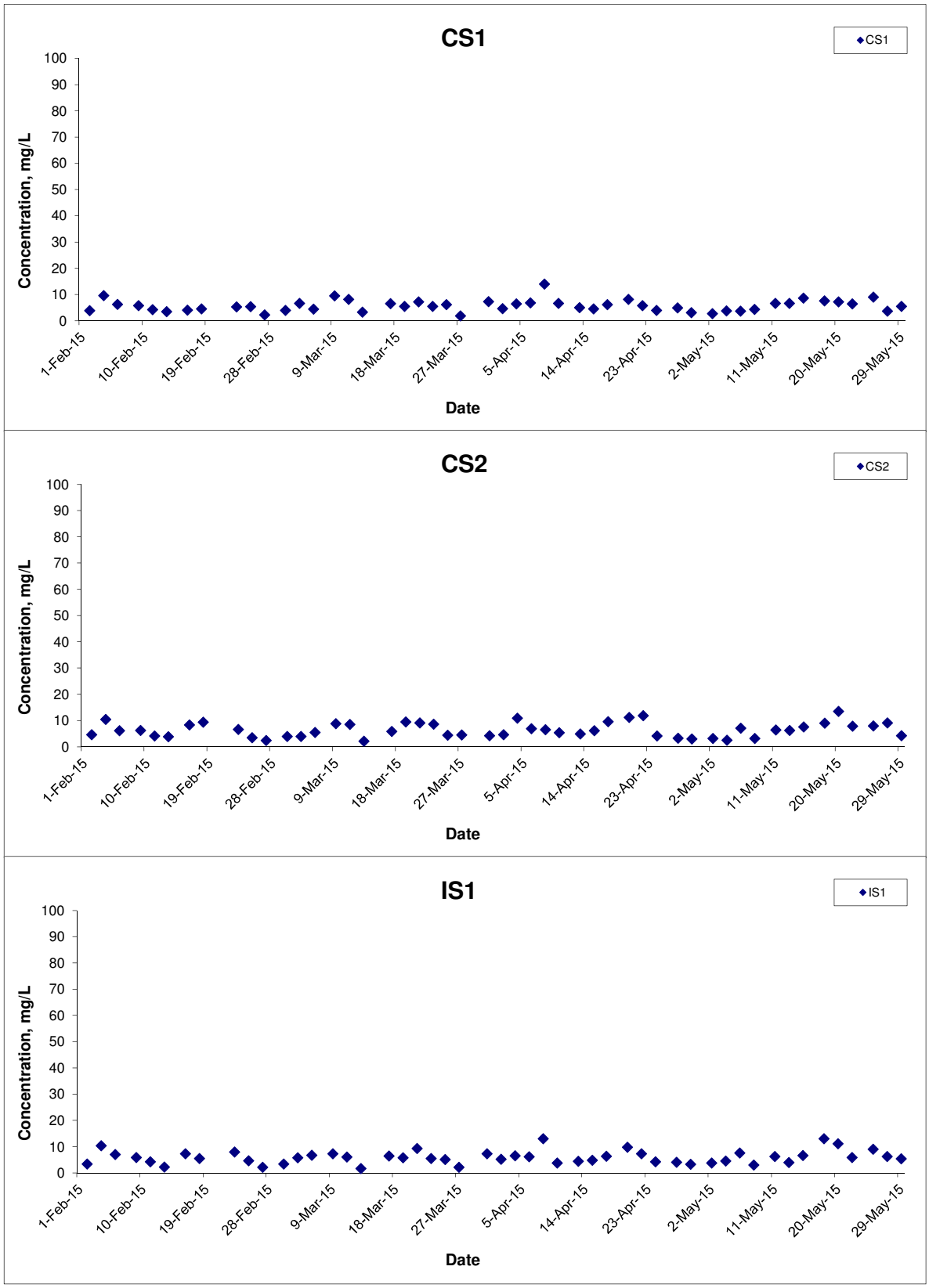
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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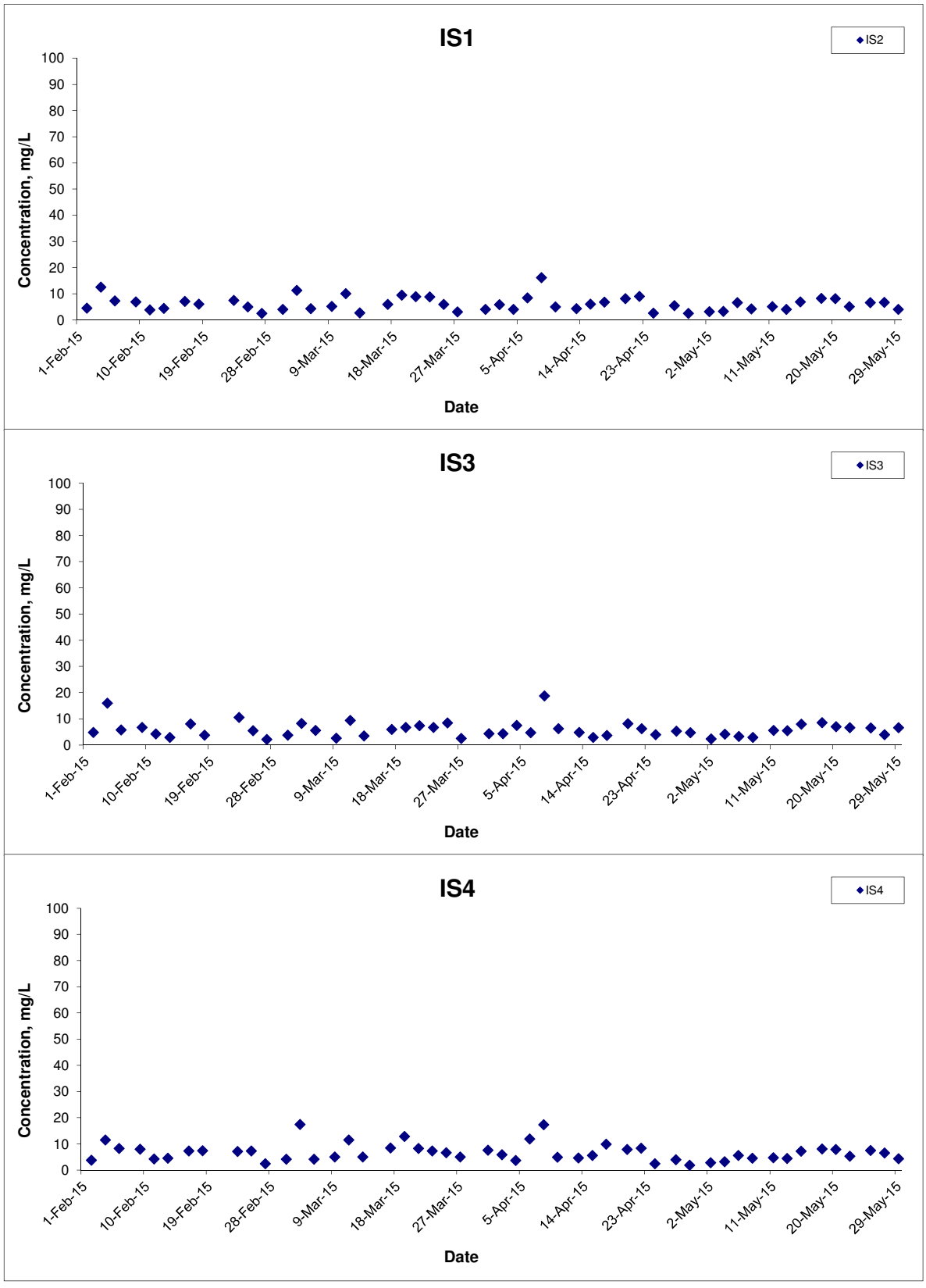

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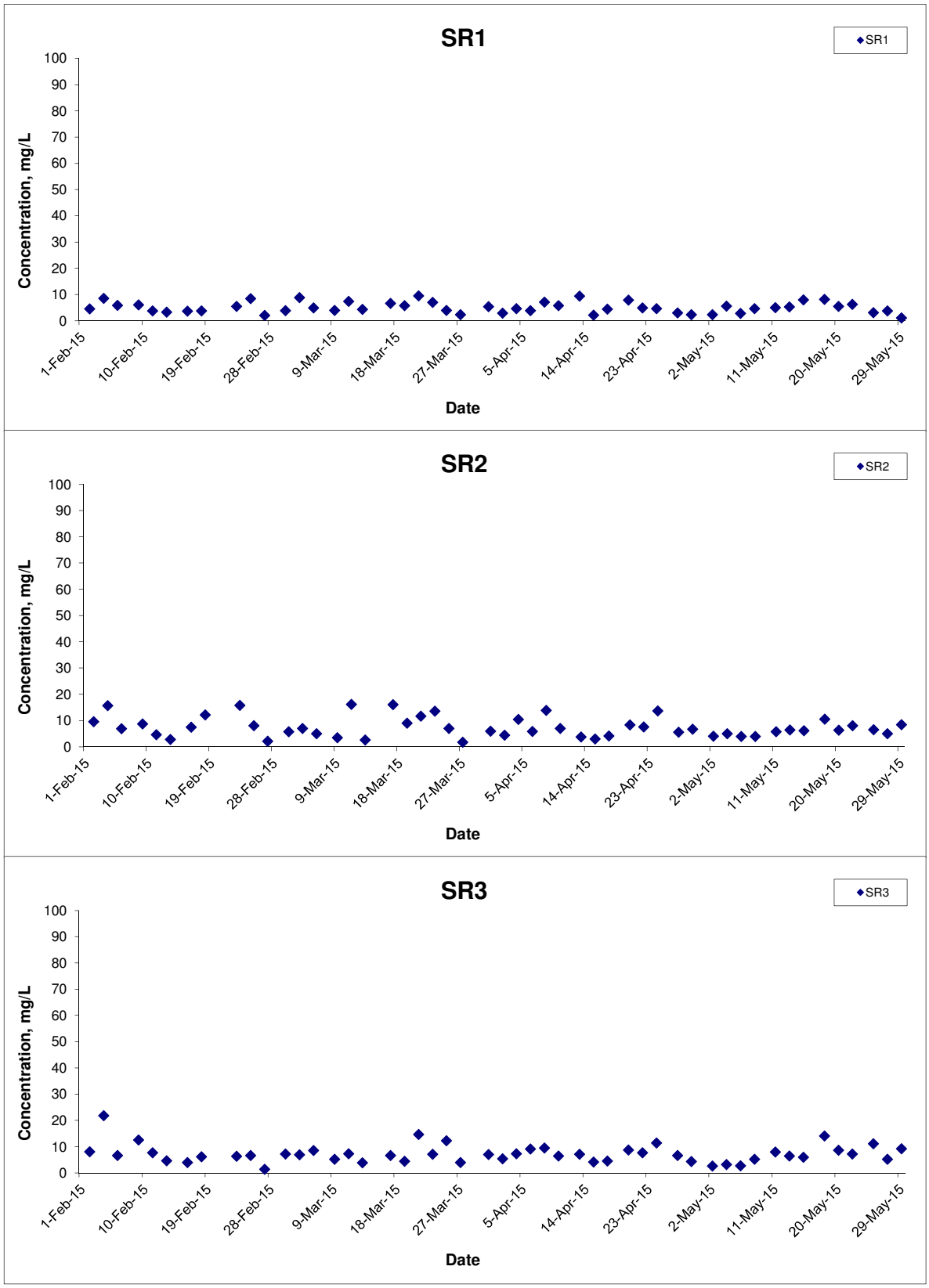

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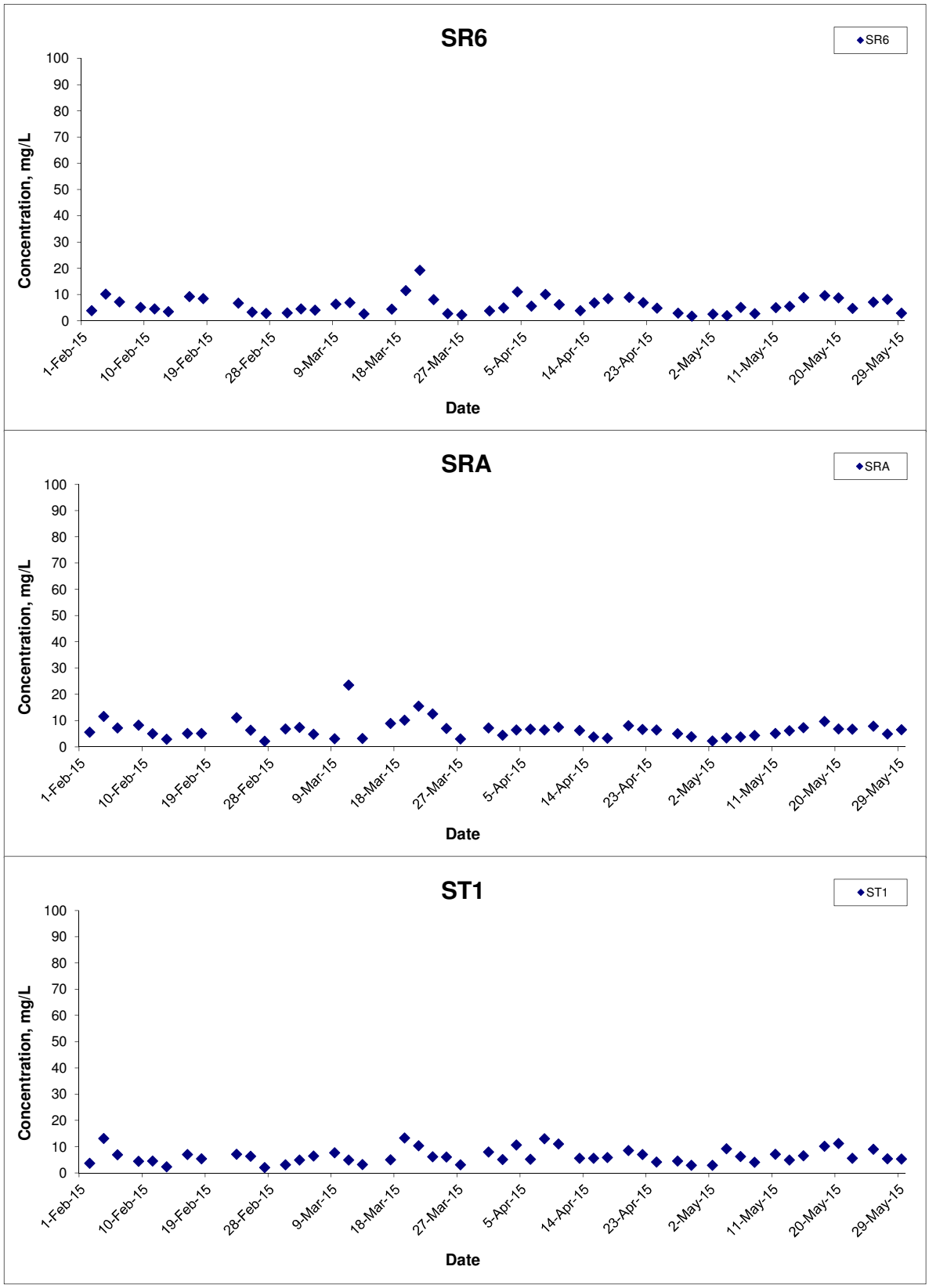

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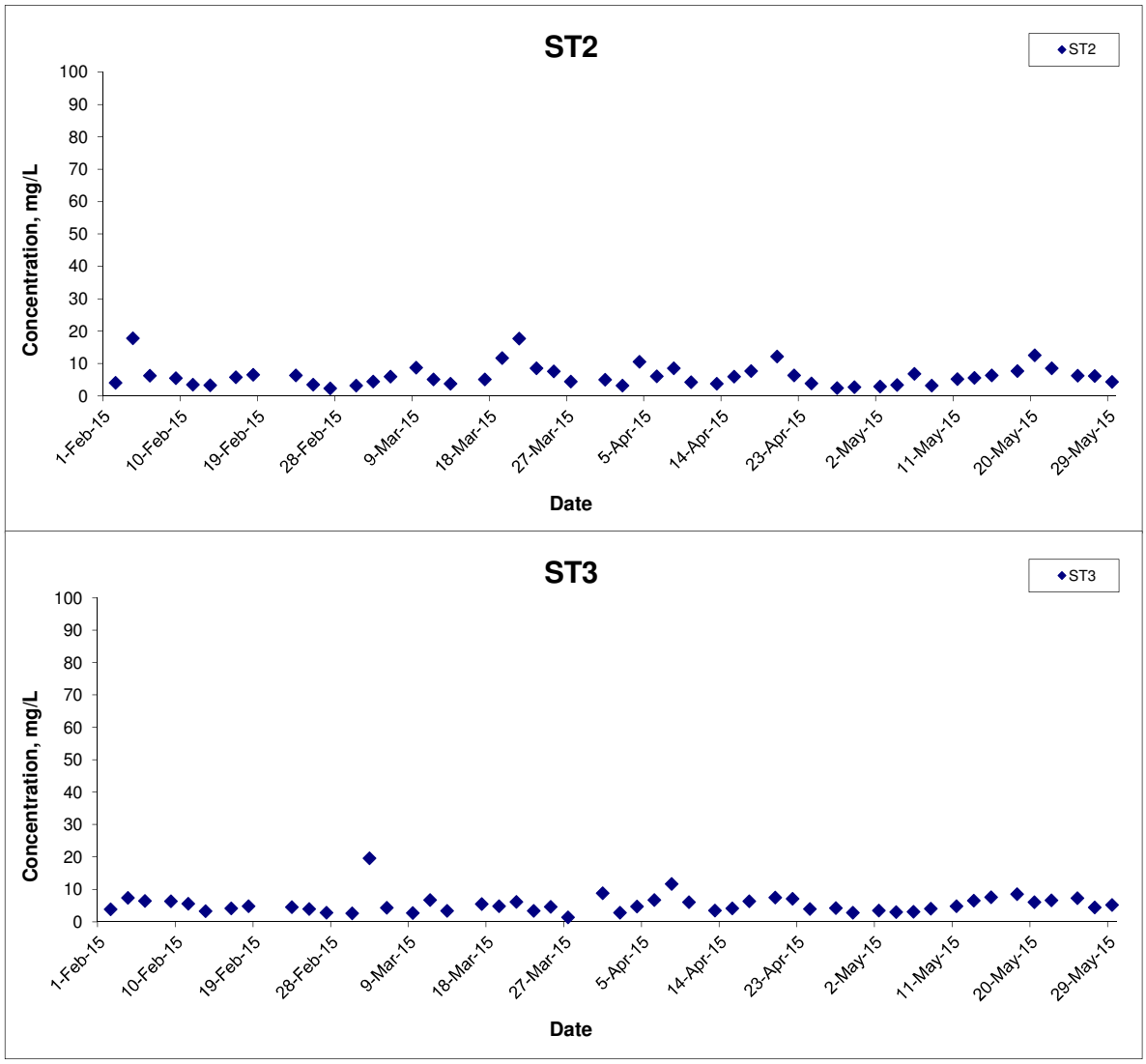
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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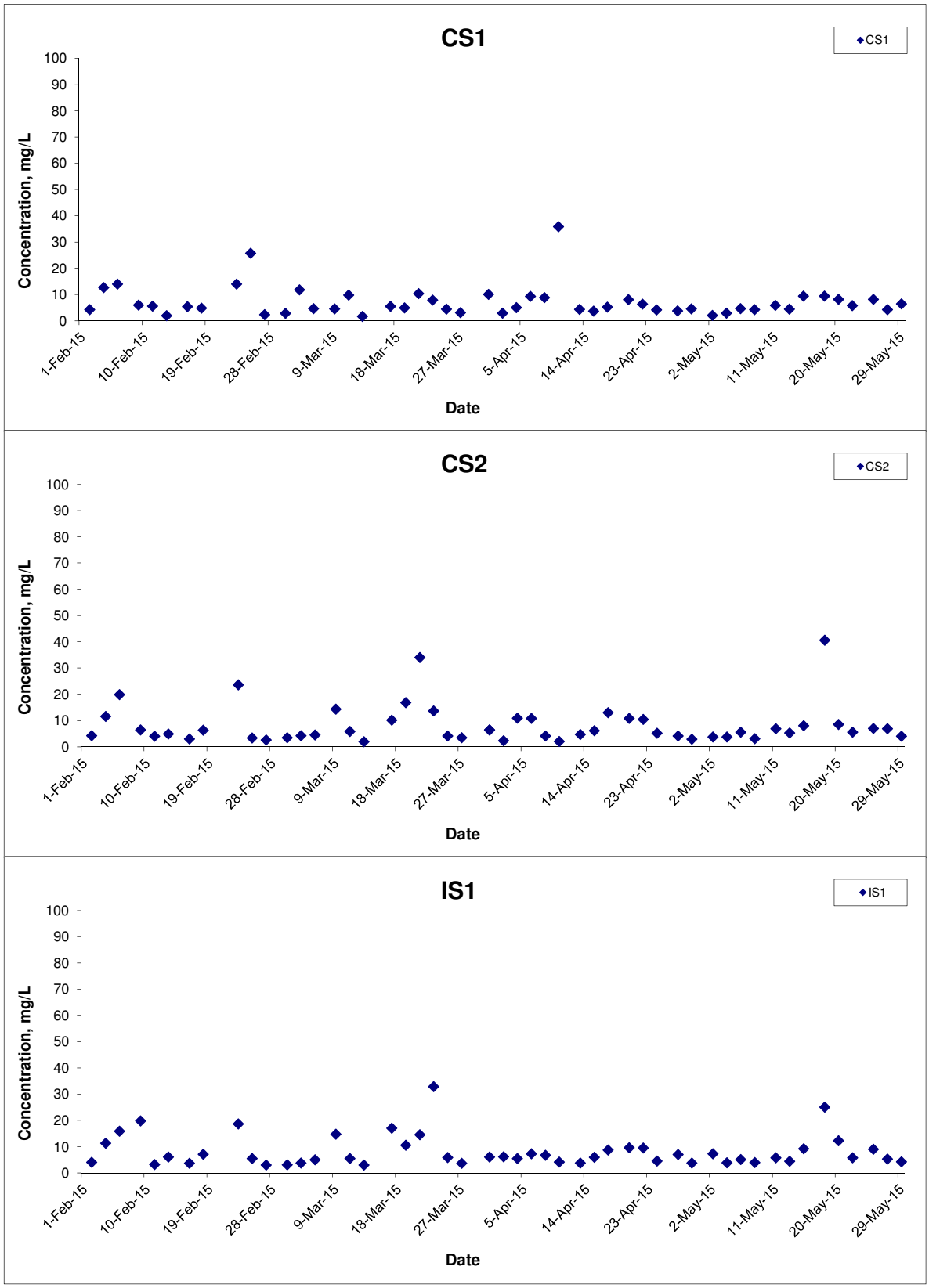
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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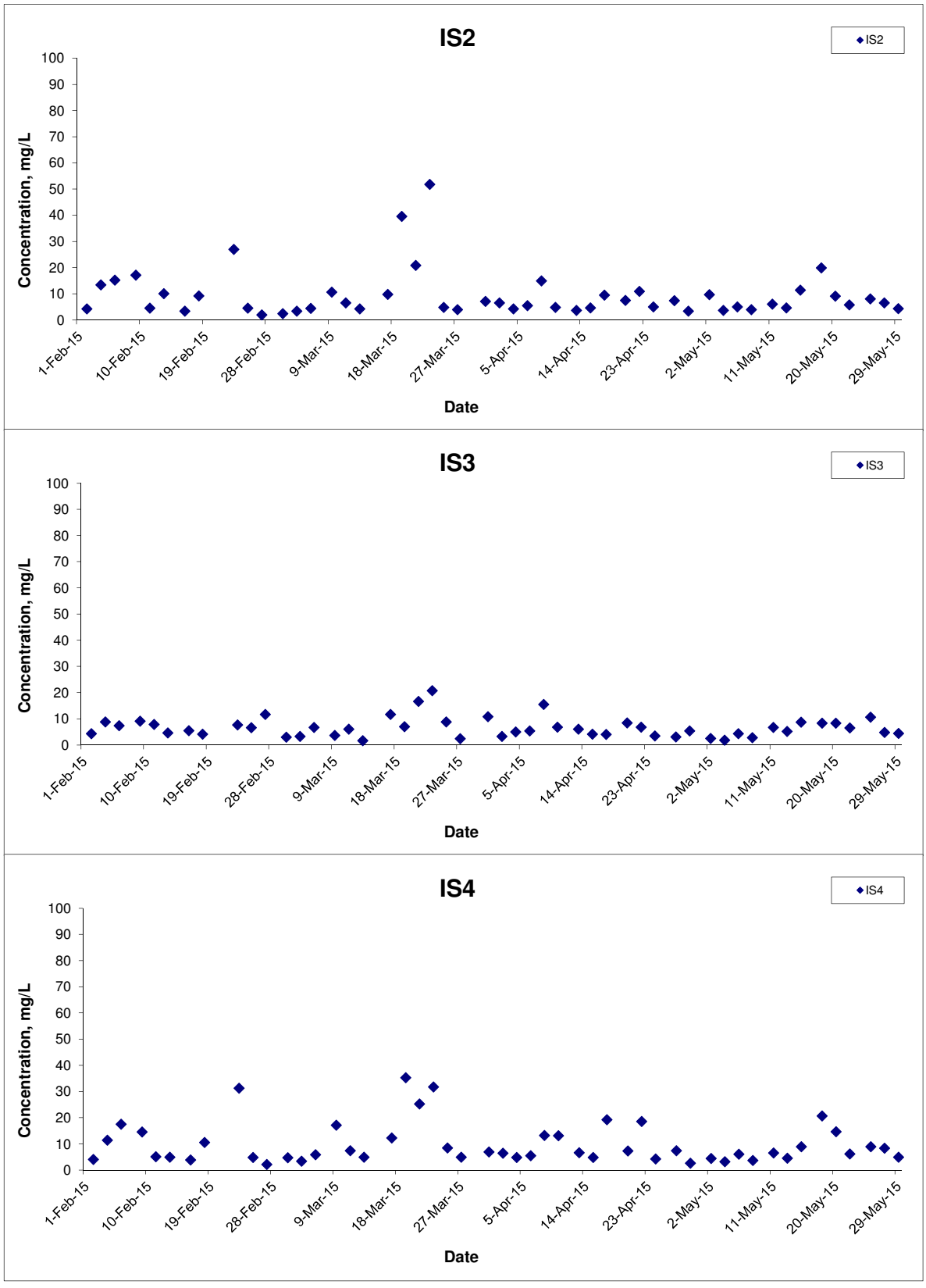

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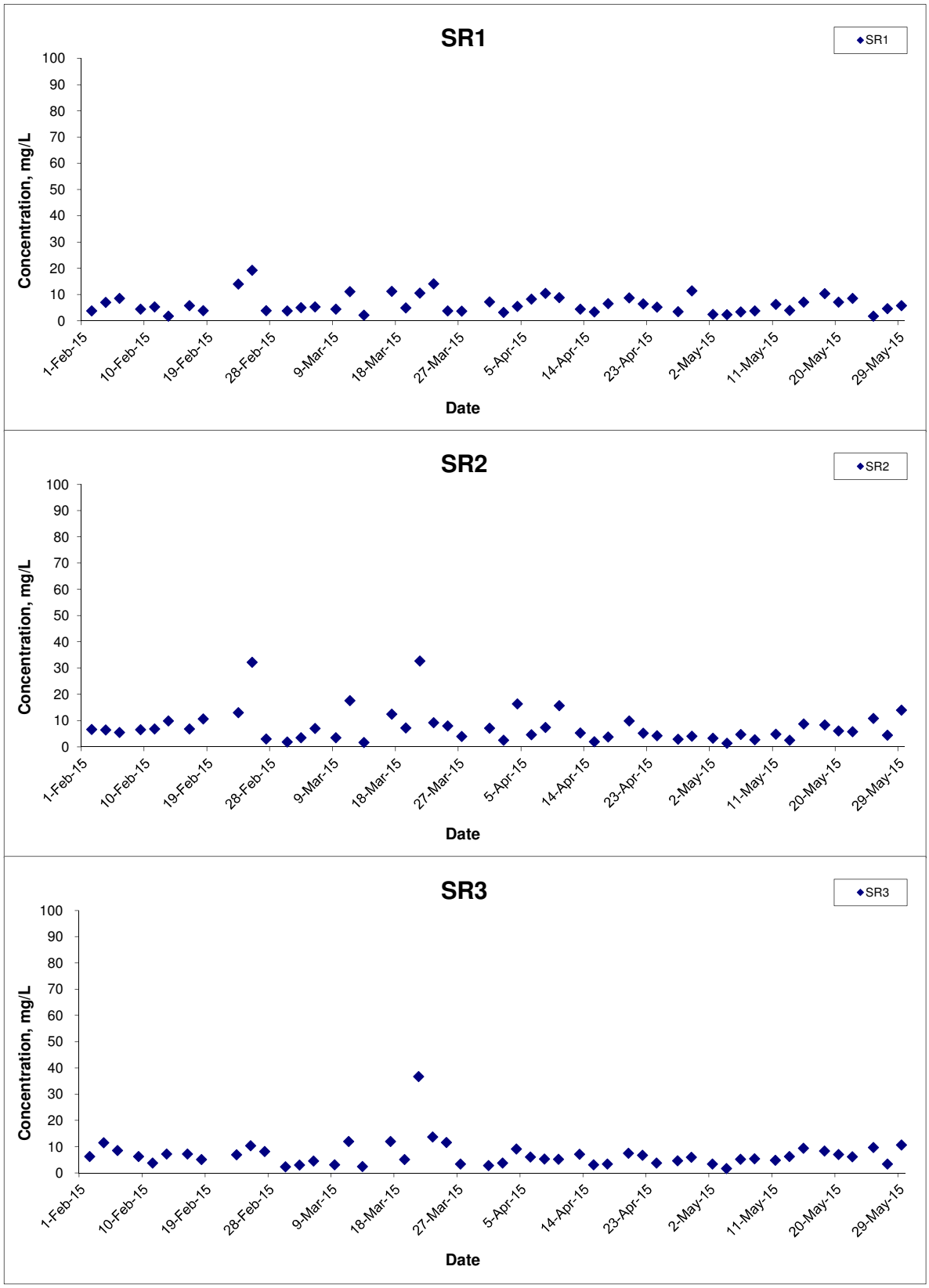

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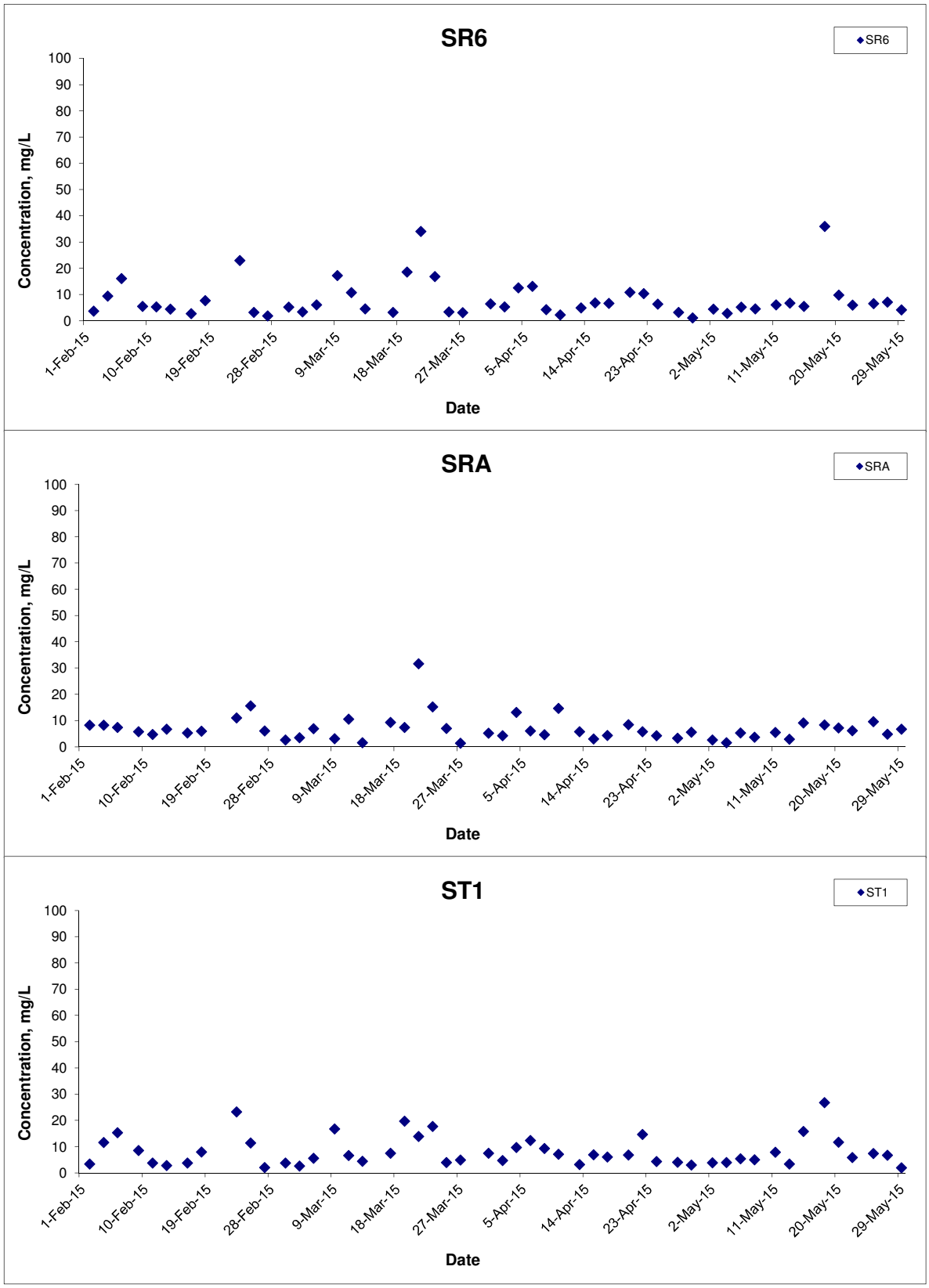

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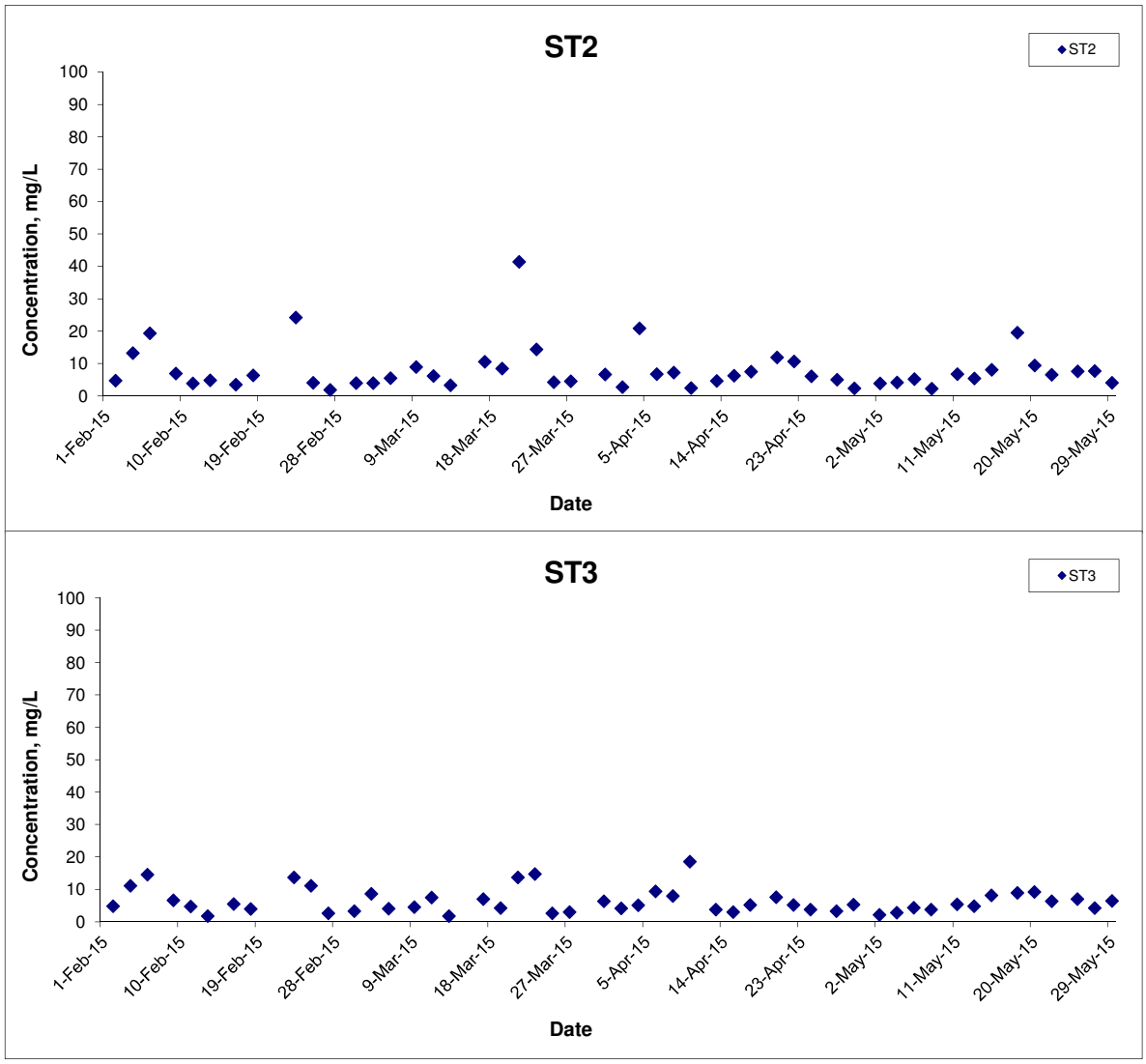

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APPENDIX F
DOLPHIN MONITORING REPORT
(LINE TRANSECT)

Contract No. HY/2011/09
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill Dolphin Monthly Monitoring

9th Quarterly Progress Report (March-May 2015)

Submitted by
Samuel K.Y. Hung, Ph.D., Hong Kong Cetacean Research Project

15 June 2015

1. Introduction

1.1. 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.

1.2. According to the updated Environmental Monitoring and Audit (EM&A) Manual (for HKLR), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the West Lantau survey area as in AFCD annual marine mammal monitoring programme.

1.3. Since November 2012, Hong Kong Cetacean Research Project (HKCRP) has been commissioned by Dragages – China Harbour – VSL JV (DCVJV) to conduct this 34-month dolphin monitoring study in order to collect data on Chinese White Dolphins during the construction phase (i.e. impact period) of the HKLR09 project in West Lantau (WL) survey area, and to analyze the collected survey data to monitor distribution, encounter rate, abundance, activities and occurrence of dolphin calves. Photo-identification will also be collected from individual Chinese White Dolphins to examine their individual range patterns and core area use.

1.4. From the monitoring results, any changes in dolphin occurrence within the study area will be examined for possible causes, and appropriate actions and additional mitigation measures will be recommended as necessary.

1.5. This report is the ninth quarterly progress report under the HKLR09 construction phase dolphin monitoring programme submitted to DCVJV, summarizing the results of the surveys findings during the period of March-May 2015.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in WL survey area (see Figure 1) twice per month throughout the entire construction period. The co-ordinates of all transect lines are shown in Table 1.

Table 1. Co-ordinates of transect lines in WL survey area

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	803750	818500		7	Start Point	800200	810450
1	End Point	803750	815500		7	End Point	801400	810450
2	Start Point	803750	815500		8	Start Point	801300	809450
2	End Point	802940	815500		8	End Point	799750	809450
3	Start Point	802550	814500		9	Start Point	799400	808450
3	End Point	803700	814500		9	End Point	801430	808450
4	Start Point	803120	813600		10	Start Point	801500	807450
4	End Point	801640	813600		10	End Point	799600	807450
5	Start Point	801100	812450		11	Start Point	800300	806500
5	End Point	802900	812450		11	End Point	801750	806500
6	Start Point	802400	811500		12	Start Point	801760	805450
6	End Point	800660	811500		12	End Point	800700	805450

2.1.2. The survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 17 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013).

For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{o} and 90^{o} (in relation to the bow, which is defined as 0^{o}). One to two additional experienced observers were available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

2.1.4. During on-effort survey periods, the survey team recorded effort data including time, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (*Garmin eTrex Legend*).

2.1.5. Data including time, position and vessel speed were also automatically and continuously logged by handheld GPS throughout the entire survey for subsequent review.

2.1.6. When dolphins were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin group to the transect line was later calculated from the initial sighting distance and angle.

2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as "primary" survey effort, while the survey effort being conducted along the connecting lines between parallel lines was labeled as "secondary" survey

effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected along primary and secondary lines were similar in survey areas around Lantau Island (Hung 2013). Therefore, primary and secondary survey effort were both presented as on-effort survey effort in this report.

2.2. Photo-identification Work

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.

2.2.2. One to two professional digital cameras (*Canon* EOS 7D and/or 60D models), each equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.

2.2.3. All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995.

2.2.4. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features (Jefferson 2000).

2.2.5. All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database.

2.3. Data analysis

2.3.1. Distribution Analysis – The line-transect survey data was integrated with the

Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin distribution using sighting positions. Location data of dolphin groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView© 3.1) to examine their distribution patterns in details. The dataset was also stratified into different subsets to examine distribution patterns of dolphin groups with different categories of group sizes, young calves and activities.

2.3.2. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in West Lantau (WL) survey area in relation to the amount of survey effort conducted during each month of monitoring survey. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.

Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone, and only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in West Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in West Lantau).

Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the entire quarterly period (i.e. March-May 2015).

2.3.3. Quantitative grid analysis on habitat use – To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly impact phase monitoring period were plotted onto 1-km^2 grids in WL survey area on GIS. Sighting densities (number of on-effort sightings per km^2) and dolphin densities (total number of dolphins from on-effort sightings per km^2) were then calculated for each 1 km by 1 km grid with the aid

of GIS. Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).

The newly-derived unit for sighting density was termed SPSE, representing the number of on-effort **s**ightings **p**er 100 units of **s**urvey **e**ffort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of **d**olphins **p**er 100 units of **s**urvey **e**ffort. Among the 1-km^2 grids that were partially covered by land, the percentage of sea area was calculated using GIS tools, and their SPSE and DPSE values were adjusted accordingly. The following formulae were used to estimate SPSE and DPSE in each 1-km^2 grid within the study area:

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

where 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% = percentage of sea area

2.3.4. Behavioural analysis – When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding, milling/resting, traveling, socializing) and recorded on sighting datasheets. This data was then input into a separate database with sighting information, which can be used to determine the distribution of behavioural data with a desktop GIS. Distribution of sightings of dolphins engaged in different activities and behaviours would then be plotted on GIS and carefully examined to identify important areas for different activities of the dolphins.

2.3.5. Ranging pattern analysis – Location data of individual dolphins that occurred during the three-month impact phase monitoring period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program

Animal Movement Analyst Extension, was loaded as an extension with ArcView© 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

3. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

3.1.1. During the period of March to May 2015, six sets of systematic line-transect vessel surveys were conducted to cover all transect lines in WL survey area twice per month.

3.1.2. From these surveys, a total of 196.44 km of survey effort was collected, with 86.9% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). The total survey effort conducted on primary lines was 130.31 km, while the effort on secondary lines was 66.13 km. Survey effort conducted on primary and secondary lines were both considered as on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.3. During the six sets of monitoring surveys in March to May 2015, a total of 29 groups of 97 Chinese White Dolphins were sighted. All except three sightings were made during on-effort search. Fourteen on-effort sightings were made on primary lines, while the other on-effort sightings were made on secondary lines. A summary table of the dolphin sightings is shown in Appendix II.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during monitoring surveys in March to May 2015 is shown in Figure 1. The dolphin groups were evenly distributed throughout the WL survey area, with higher concentrations of sightings to the north of Tai O Peninsula and near Kai Kung Shan (Figure 1). However, it appeared that they occurred less frequently at the southern end of the survey area.

3.2.2. Sighting distribution of dolphins in the present quarter was similar to the one during the baseline period, with some subtle differences. There appeared to be fewer dolphins sighted in the offshore waters of West Lantau survey area (especially in the northern portion of the survey area) during the present

monitoring quarter when compared to the dolphin distribution record in the baseline period (Figure 1).

3.2.3. Only one of the 29 dolphin groups was sighted near the HKLR09 alignment in WL survey area during the present quarter (Figure 1). When pooling the data from HKLR03 monitoring surveys in the same spring quarter of 2015, dolphins occurred less frequently along the HKLR09 alignment in the present quarter (including the section in NWL survey area), in contrast to their frequent occurrence there during the baseline monitoring period (i.e. autumn of 2011) (Figure 2). Such avoidance has been consistent in the past consecutive quarters during the construction period.

3.2.4. Distribution patterns of dolphin sightings in the past three spring quarters in 2013, 2014 and 2015 were also compared (Figure 3). There appeared to be an increase in dolphin usage to the north of Tai O Peninsula (i.e. adjacent to the HKLR09 alignment) and reduced dolphin occurrence at the southern end of the survey area near Fan Lau in spring 2015 when compared to the previous years (Figure 3).

3.3. Encounter rate

3.3.1. During the present three-month impact phase monitoring period (March – May 2015), the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) from West Lantau survey area are shown in Table 2. The average encounter rates deduced from the six sets of surveys from the present quarter were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (Table 3).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during the impact monitoring period (March-May 2015)

Survey Area	**Dolphin Monitoring**	**Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)**	**Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)**
		Primary Lines Only	**Primary Lines Only**
West Lantau	Set 1 (March 19th)	9.7	106.4
	Set 2 (March 27th)	18.7	56.1
	Set 3 (April 2nd)	12.2	12.2
	Set 4 (April 13th)	5.8	5.8
	Set 5 (May 7th)	15.1	65.3
	Set 6 (May 15th)	13.1	26.1

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (March to May 2015) and baseline monitoring period (September to November 2011) (Note: the encounter rates deduced from the baseline monitroing period have been recalculated based only on the survey effort and on-effort sighting data made along the primary transect lines under favourable conditions)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	March-May 2015	**September-November 2011**	**March-May 2015**	**September-November 2011**
West Lantau	12.42 ± 4.42	16.43 ± 7.70	45.32 ± 38.14	60.50 ± 38.47

3.3.2. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in WL were 15.2 sightings and 53.3 dolphins per 100 km of survey effort respectively during the present quarter.

3.3.3. A one-way ANOVA was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. For the comparison between the baseline period and the present quarter (i.e. ninth quarter of the impact phase), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.294 and 0.954 respectively. Therefore, no significant difference in dolphin encounter rate was detected between the baseline period and the present quarter.

3.3.4. Another comparison was made between the baseline period and the cumulative quarters in the impact phase (i.e. first nine quarters of the impact phase), and the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.508 and 0.999 respectively. As a result, no significant difference was found in the dolphin encounter rates between the baseline period and the cumulative quarters in the impact phase.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from 1-20 individuals per group in WL survey area between March-May 2015. The average dolphin group size for the three-month period was compared with the one deduced from the baseline period in September to November 2011, as shown in Table 4.

Table 4. Comparison of average dolphin group sizes from impact monitoring period (March-May 2015) and baseline monitoring period (September-November 2011)

	Average Dolphin Group Size	
	March – May 2015	**September – November 2011**
West Lantau	3.34 ± 3.81 (n = 29)	3.63 ± 2.97 (n = 46)

3.4.2. The average dolphin group size in the WL region during the present quarter was slightly lower than the one recorded in the three-month baseline period (Table 4). The majority of the dolphin groups (79.3%) were composed of 1-3 dolphins, but there were also six groups with more than 5 animals per group, and one very large group with 20 animals.

3.4.3. Distribution of dolphins with the larger groups during March to May 2015 is shown in Figure 4. These groups were scattered from the bridge alignment to Fan Lau waters with no particular concentration. Notably, the large group of 20 dolphins was located to the north of Kai Kung Shan. This distribution of larger dolphin groups was very different from the baseline period, when they mostly occurred to the northwest of Tai O Peninsula (near the bridge alignment) as well as near Kai Kung Shan and Peaked Hill (Figure 4).

3.5. Habitat use

3.5.1. From March to May 2015, the most heavily utilized habitats by the dolphins were mainly found near Tai O Peninsula, Kai Kung Shan and Fan Lau (Figures 5a & 5b). However, it should be cautioned that the amount of survey effort collected in each grid during the three-month period was fairly low (6 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern will be presented when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

3.5.2. When compared with the habitat use pattern recorded during the baseline period, it appears that the overall dolphin densities were lower in West Lantau waters, especially the waters adjacent to Tai O Peninsula, around Peaked Hill and near Fan Lau during the present quarter (Figure 6).

3.6. Mother-calf pairs

3.6.1. During the three-month impact phase monitoring period, only two unspotted juveniles (UJ) were sighted in WL survey area. The young calves comprised 2.0% of all animals sighted, which was less than one-third of the percentage

recorded during the baseline monitoring period (6.6%).

3.6.2. The infrequent occurrences of the two mother-calf pairs were located near Fan Lau and Tai O Peninsula (Figure 7). This was in stark contrast to the baseline period when calf occurrence was frequent and more concentrated near Tai O Peninsula at the northern portion of WL waters (Figure 7).

3.7. Activities and associations with fishing boats

3.7.1. During the three-month impact monitoring period, four dolphin sightings were associated with feeding activities between the HKLR09 bridge alignment and Peaked Hill (Figure 8), comprising 13.8% of the total number of dolphin sightings. This percentage was very similar to the percentage recorded during the baseline period (13.0%).

3.7.2. On the other hand, only one of the 29 sightings was associated with socializing activity near the HKLR09 bridge alignment (Figure 8), while no dolphin group was engaged in traveling or milling/resting activity during the present quarter.

3.7.3. Notably, distribution of the feeding and socializing activities during the present impact phase monitoring period was somewhat different from the one during the baseline period, with the main concentration of these activities occurred between Tai O and Peaked Hill during the baseline period but no particular concentration of these activities during the impact phase period (Figure 8).

3.7.4. During the three-month monitoring period, one of the dolphin groups was associated with an operating hang-trawler near the HKLR09 bridge alignment.

3.8. Summary of photo-identification works

3.8.1. From March to May 2015, over 2,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 33 individuals sighted 45 times altogether were identified (see the summary table in Appendix III and photographs of identified individuals in Appendix IV). Almost all identified individuals were sighted only once or twice during the three-month period, but one individual (WL72) were sighted three times.

3.8.3. Notably, two of these 33 individuals (i.e. NL123, NL285) were also sighted in North Lantau waters during the HKLR03 monitoring surveys in the same three-month period, showing some movements across the HKLR09 bridge

alignment. Moreover, as in previous quarters, some individuals that were consistently sighted in North Lantau waters in the past were identified in West Lantau waters (e.g. NL123, NL188, NL226, NL286). It is possible that some of these identified dolphins have shifted their range use into West Lantau due to the increased disturbance of HZMB-related construction works in North Lantau region, as documented in Hung (2014).

3.8.4. During the three-month period, four recognizable females, NL123, NL188, WL44 and WL171, were accompanied with their calves during their re-sightings.

3.9. Individual range use

3.9.1. Ranging patterns of the 33 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

3.9.4. For those that primarily used West Lantau waters as their home ranges, most of their re-sightings were made at a distance away from the HKLR09 alignment where they were frequently re-sighted in the past. It is possible that their range use in West Lantau waters have been somewhat affected by the HKLR09 construction activities with some moderate shift in range use.

4. Conclusion

4.1. During this quarter of dolphin monitoring, no adverse impact from the activities of the HKLR09 construction project on Chinese White Dolphins was noticeable from general observations.

4.2. Nevertheless, the dolphin usage in WL region should be continuously monitored, to further examine whether it has been significantly affected by the on-going construction activities in relation to the HZMB works.

5. References

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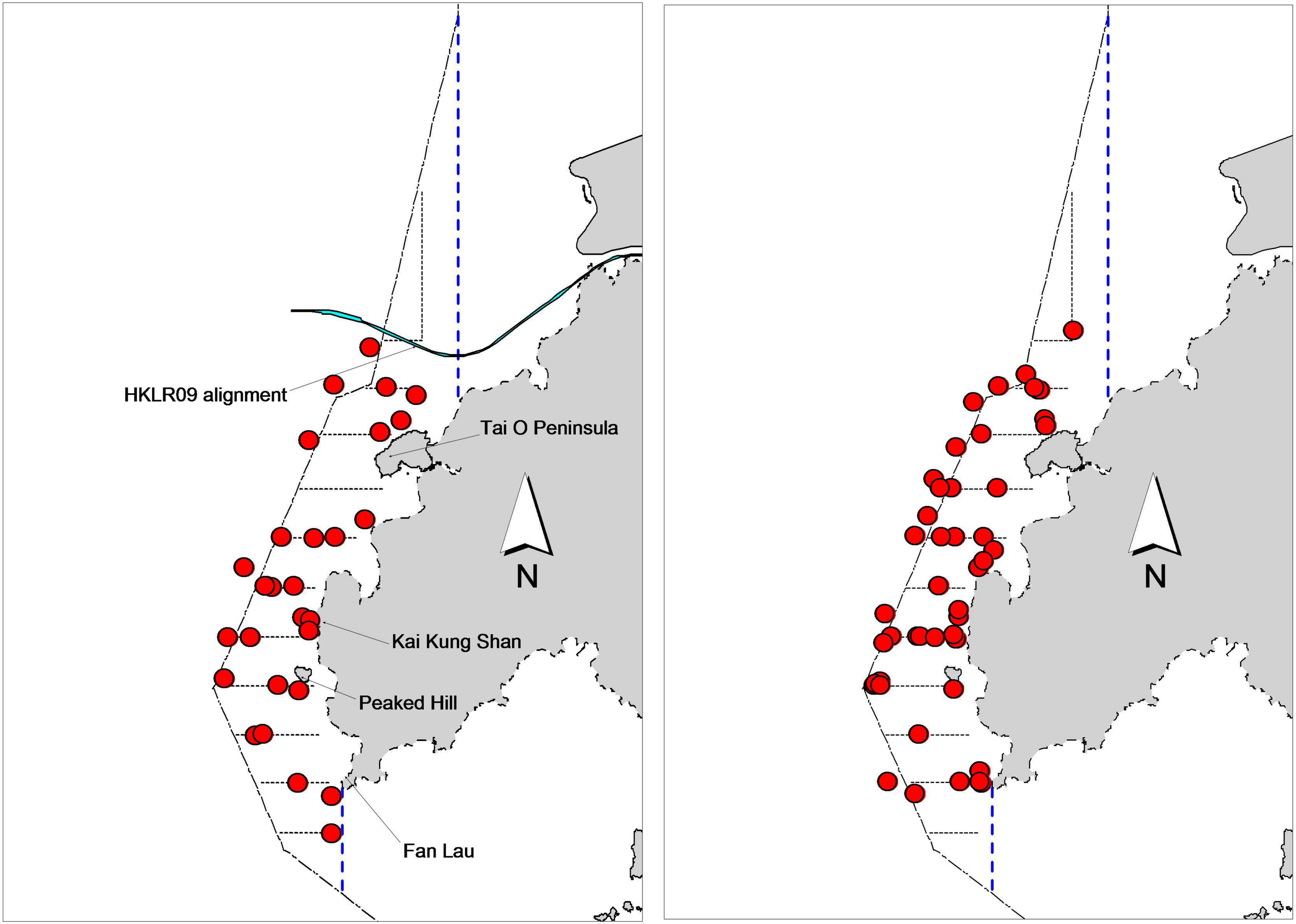


Figure 1. Distribution of Chinese white dolphin sightings in West Lantau during HKLR09 impact phase (left: March – May 2015) and baseline monitoring surveys (right: September – November 2011)

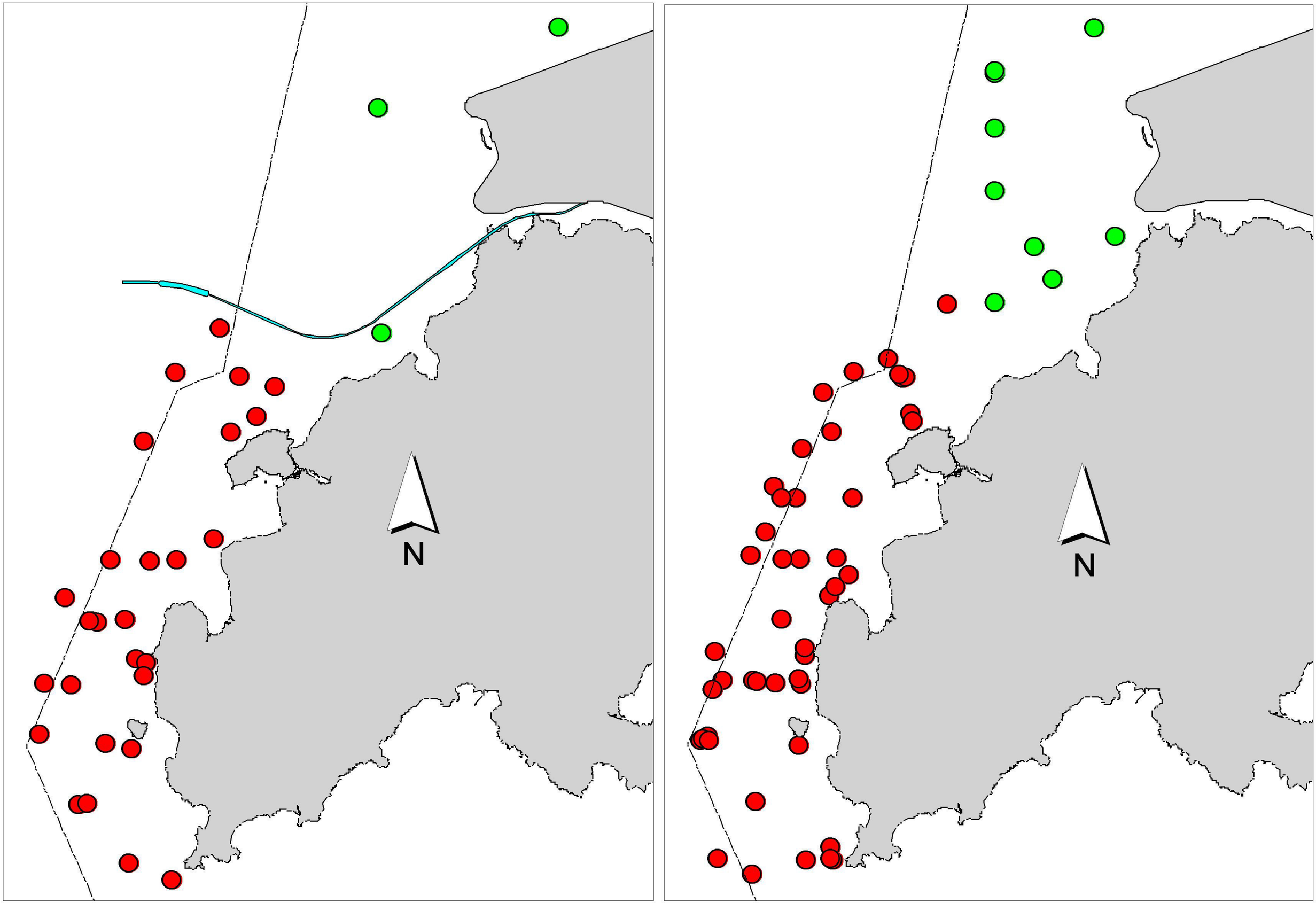


Figure 2. Distribution of Chinese white dolphin sightings from HKLR03 (in green) and HKLR09 surveys (in red) near the HKLR09 alignment during impact phase (left: March – May 2015) and baseline monitoring surveys (right: September – November 2011)

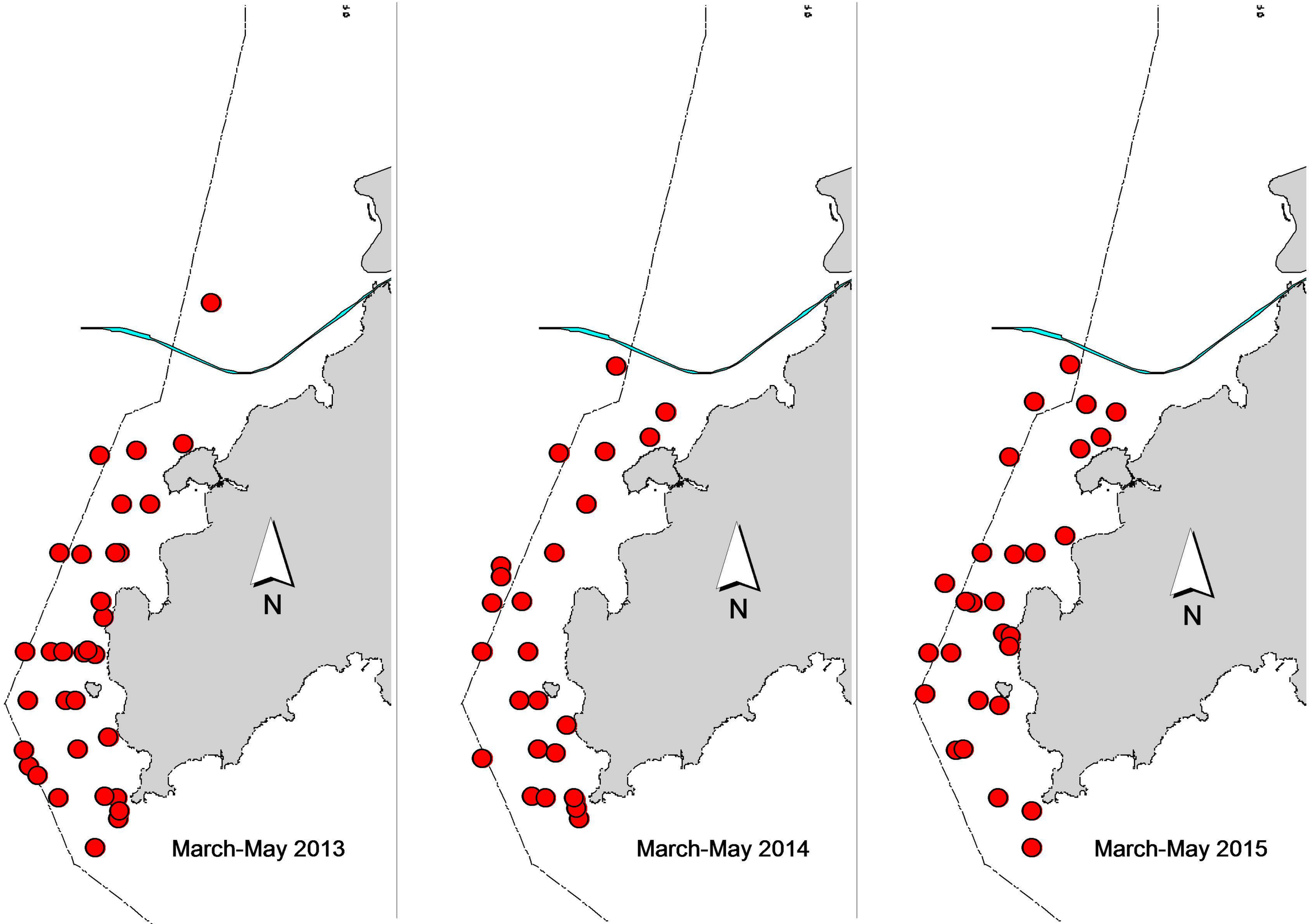


Figure 3. Comparisons on distribution of Chinese white dolphin sightings in West Lantau in the spring months of 2013, 2014 and 2015 during HKLR09 impact phase

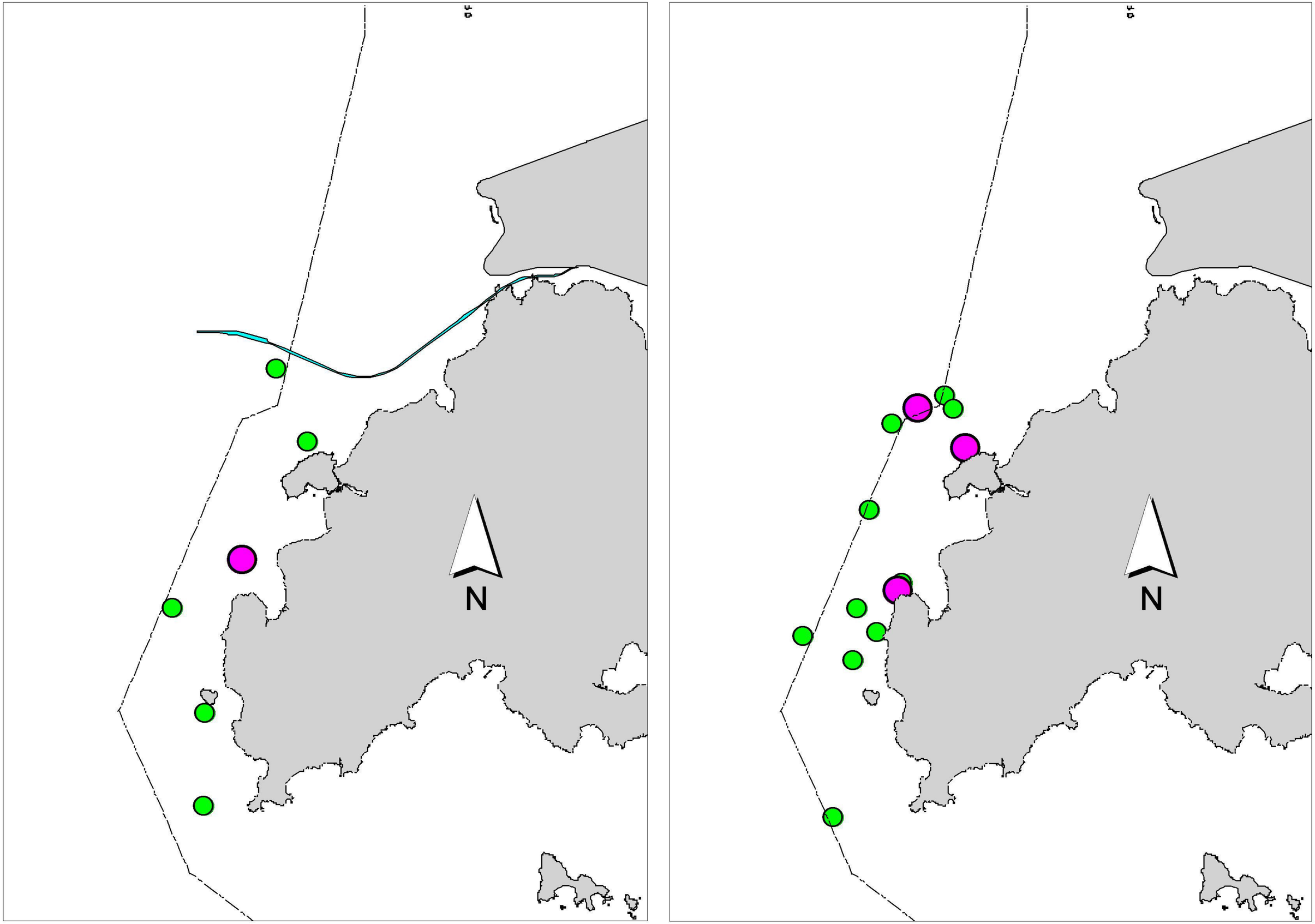


Figure 4. Distribution of Chinese white dolphins with larger group sizes during HKLR09 impact phase (left: March – May 2015) and baseline monitoring surveys (right: September – November 2011) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

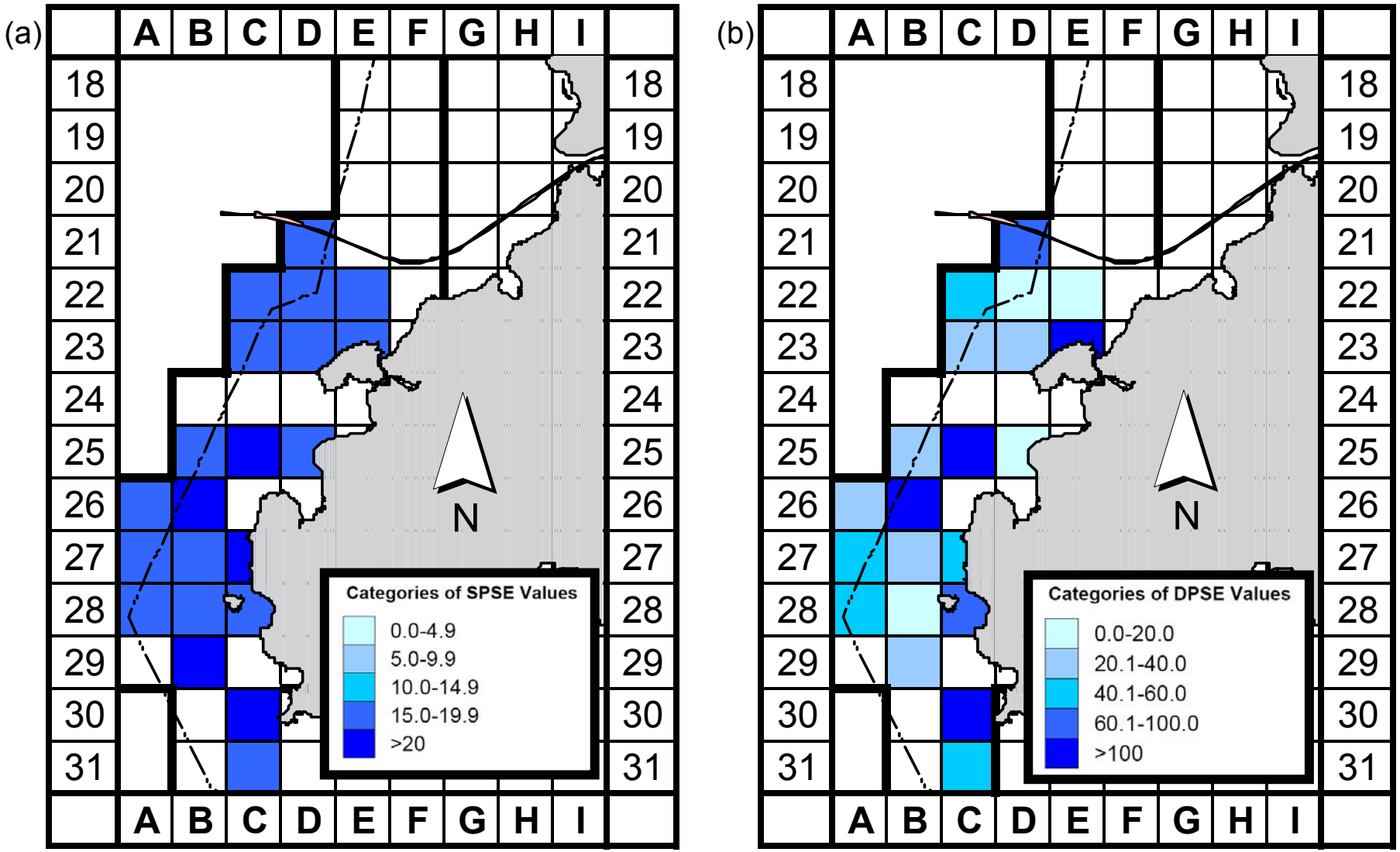


Figure 5a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area, using data collected during HKLR09 impact monitoring period (Mar-May 15) (SPSE = no. of on-effort sightings per 100 units of survey effort)

Figure 5b. Density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area, using data collected during HKLR09 impact monitoring period (Mar-May 15) (DPSE = no. of dolphins per 100 units of survey effort)

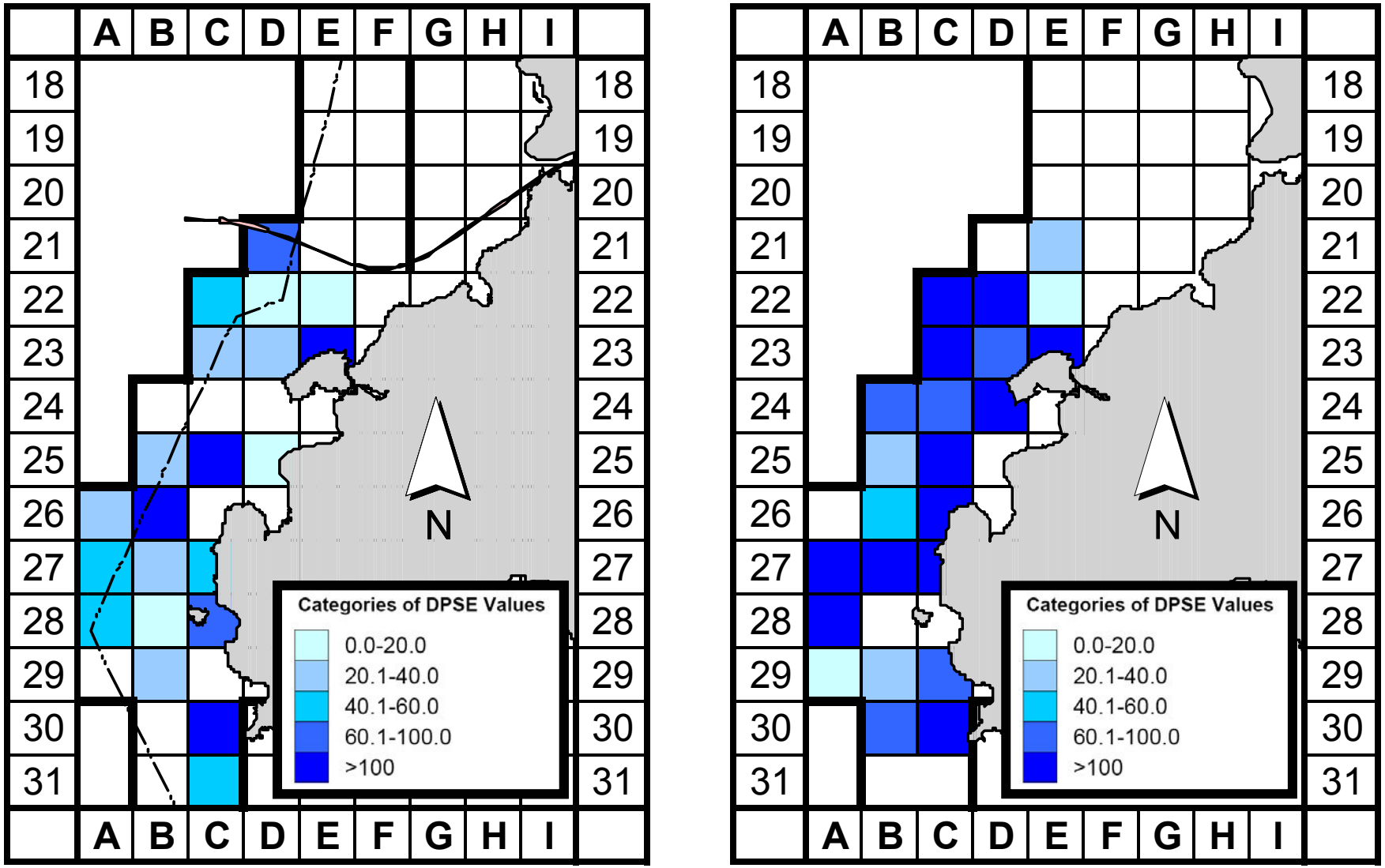
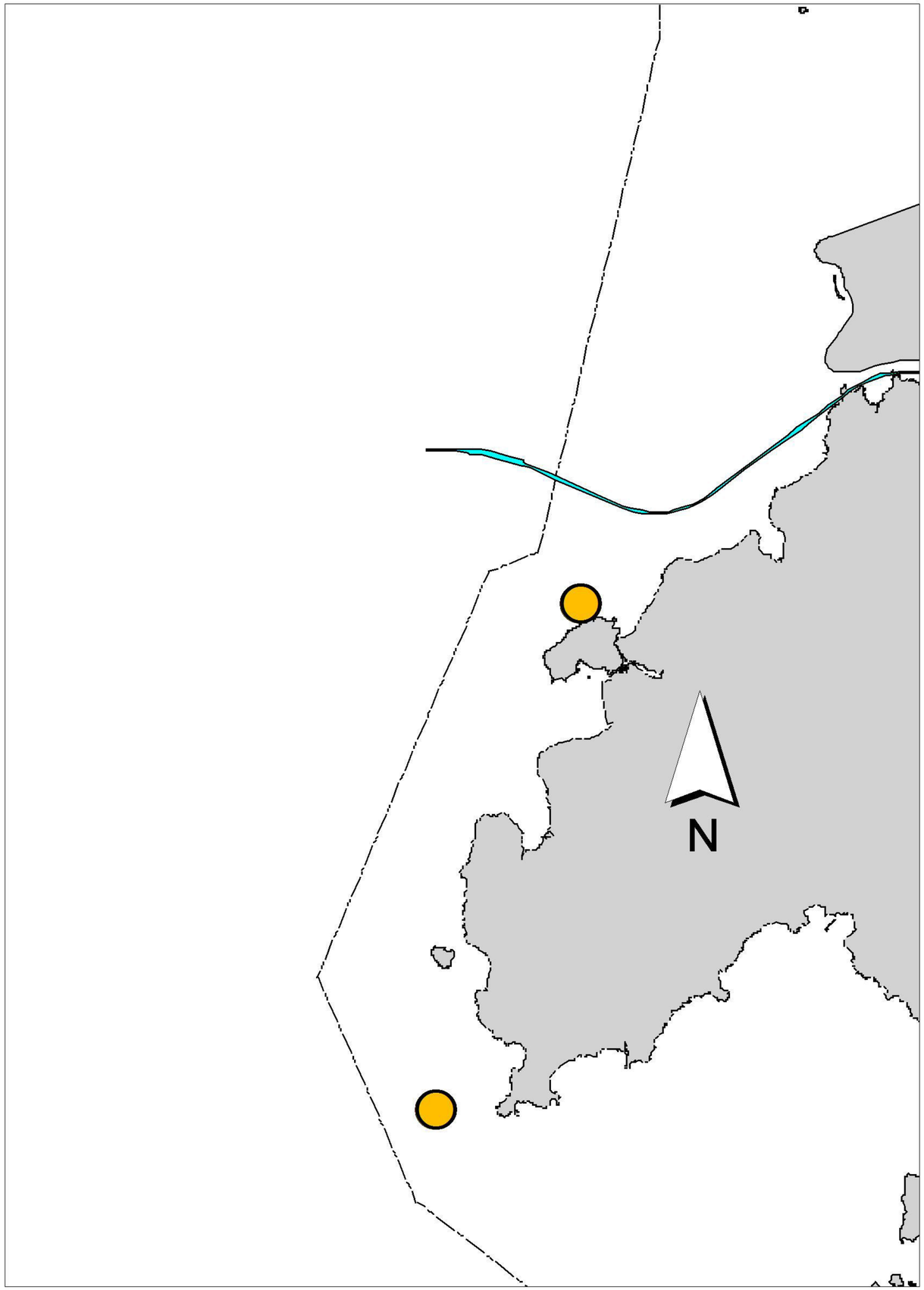


Figure 6. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in West Lantau survey area between the impact monitoring period (March-May 2015; left) and baseline monitoring period (September-November 2011; right)
(DPSE = no. of dolphins per 100 units of survey effort)



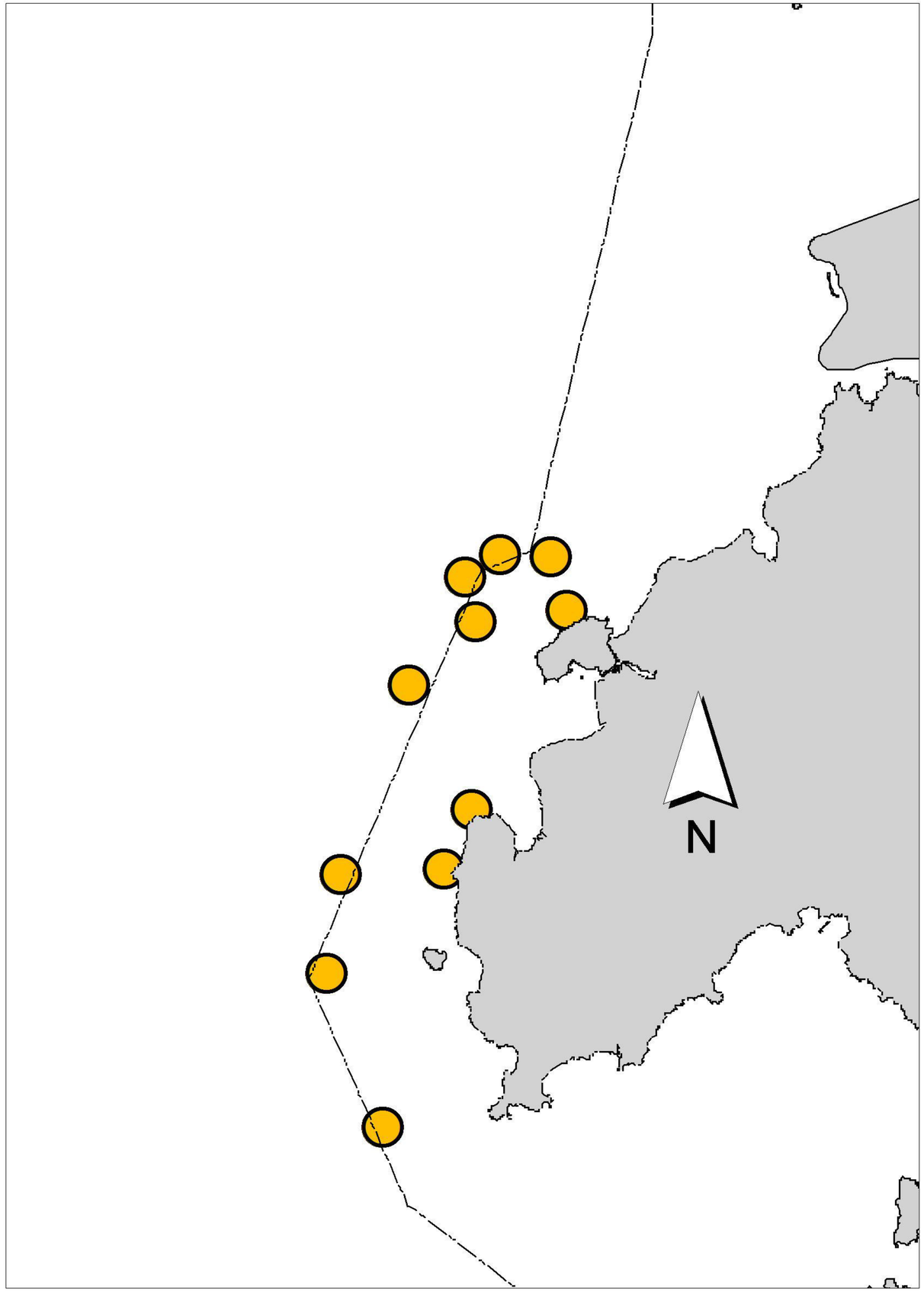


Figure 7. Distribution of young calves of Chinese white dolphins during HKLR09 impact phase (left: March – May 2015) and baseline monitoring surveys (right: September – November 2011)

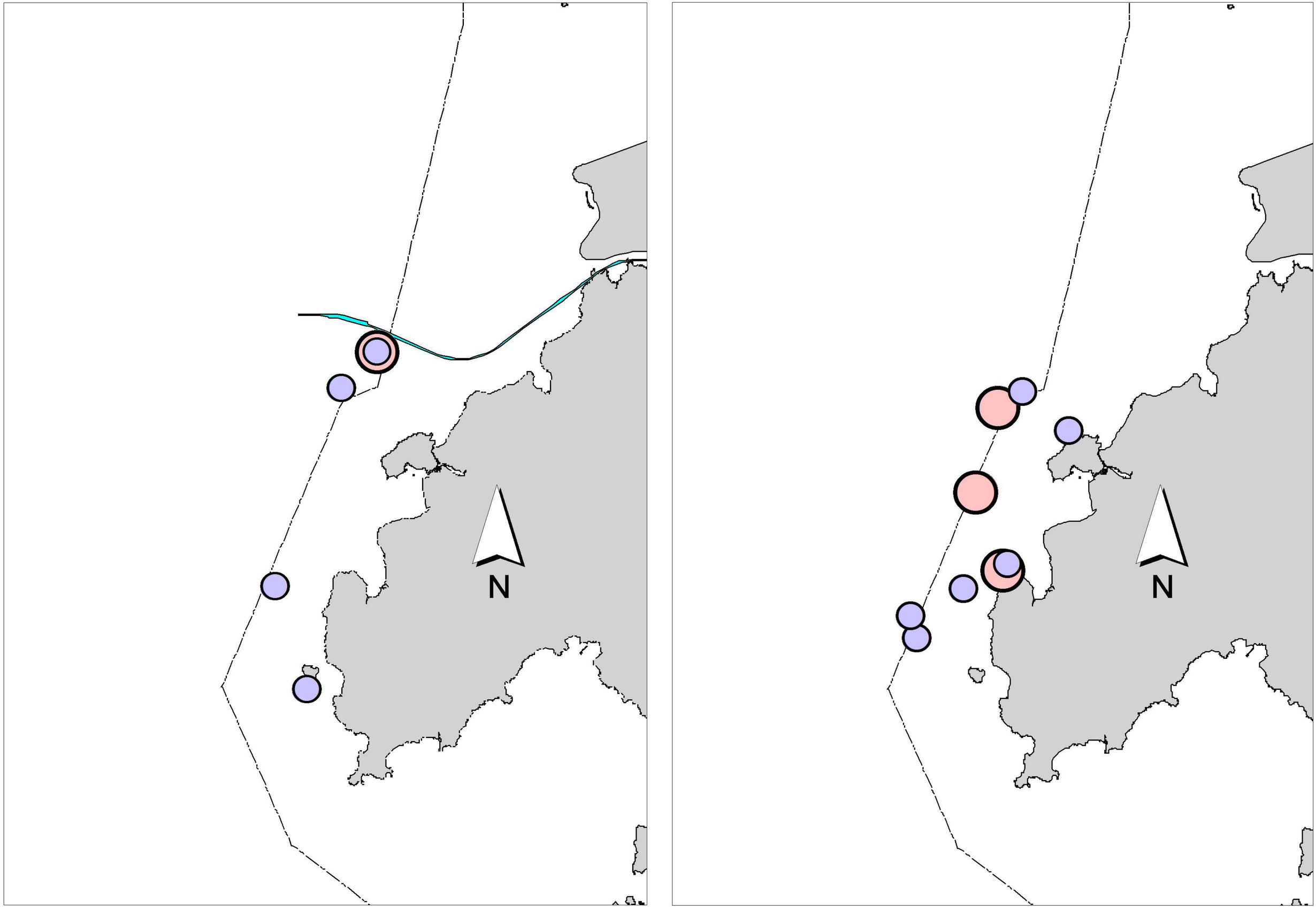


Figure 8. Distribution of dolphins engaged in feeding (in purple) and socializing (in pink) activities during HKLR09 impact phase (left: March – May 2015) and baseline monitoring surveys (right: September – November 2011)

Appendix I. HKLR09 Survey Effort Database (March-May 2015)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
19-Mar-15	W LANTAU	1	1.61	SPRING	STANDARD31516	HKLR	P
19-Mar-15	W LANTAU	2	11.36	SPRING	STANDARD31516	HKLR	P
19-Mar-15	W LANTAU	3	7.70	SPRING	STANDARD31516	HKLR	P
19-Mar-15	W LANTAU	1	1.12	SPRING	STANDARD31516	HKLR	S
19-Mar-15	W LANTAU	2	6.08	SPRING	STANDARD31516	HKLR	S
19-Mar-15	W LANTAU	3	4.44	SPRING	STANDARD31516	HKLR	S
27-Mar-15	W LANTAU	2	20.06	SPRING	STANDARD31516	HKLR	P
27-Mar-15	W LANTAU	3	1.34	SPRING	STANDARD31516	HKLR	P
27-Mar-15	W LANTAU	2	11.20	SPRING	STANDARD31516	HKLR	S
2-Apr-15	W LANTAU	2	2.21	SPRING	STANDARD31516	HKLR	P
2-Apr-15	W LANTAU	3	14.21	SPRING	STANDARD31516	HKLR	P
2-Apr-15	W LANTAU	4	4.76	SPRING	STANDARD31516	HKLR	P
2-Apr-15	W LANTAU	2	3.40	SPRING	STANDARD31516	HKLR	S
2-Apr-15	W LANTAU	3	6.72	SPRING	STANDARD31516	HKLR	S
2-Apr-15	W LANTAU	4	1.30	SPRING	STANDARD31516	HKLR	S
13-Apr-15	W LANTAU	2	2.05	SPRING	STANDARD31516	HKLR	P
13-Apr-15	W LANTAU	3	15.08	SPRING	STANDARD31516	HKLR	P
13-Apr-15	W LANTAU	4	5.11	SPRING	STANDARD31516	HKLR	P
13-Apr-15	W LANTAU	2	1.74	SPRING	STANDARD31516	HKLR	S
13-Apr-15	W LANTAU	3	5.45	SPRING	STANDARD31516	HKLR	S
13-Apr-15	W LANTAU	4	3.98	SPRING	STANDARD31516	HKLR	S
7-May-15	W LANTAU	2	1.82	SPRING	STANDARD31516	HKLR	P
7-May-15	W LANTAU	3	18.10	SPRING	STANDARD31516	HKLR	P
7-May-15	W LANTAU	4	2.28	SPRING	STANDARD31516	HKLR	P
7-May-15	W LANTAU	2	2.26	SPRING	STANDARD31516	HKLR	S
7-May-15	W LANTAU	3	6.96	SPRING	STANDARD31516	HKLR	S
7-May-15	W LANTAU	4	0.98	SPRING	STANDARD31516	HKLR	S
15-May-15	W LANTAU	2	2.70	SPRING	STANDARD31516	HKLR	P
15-May-15	W LANTAU	3	12.62	SPRING	STANDARD31516	HKLR	P
15-May-15	W LANTAU	4	7.30	SPRING	STANDARD31516	HKLR	P
15-May-15	W LANTAU	2	1.31	SPRING	STANDARD31516	HKLR	S
15-May-15	W LANTAU	3	9.19	SPRING	STANDARD31516	HKLR	S

Appendix II. HKLR09 Chinese White Dolphin Sighting Database (March-May 2015)

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

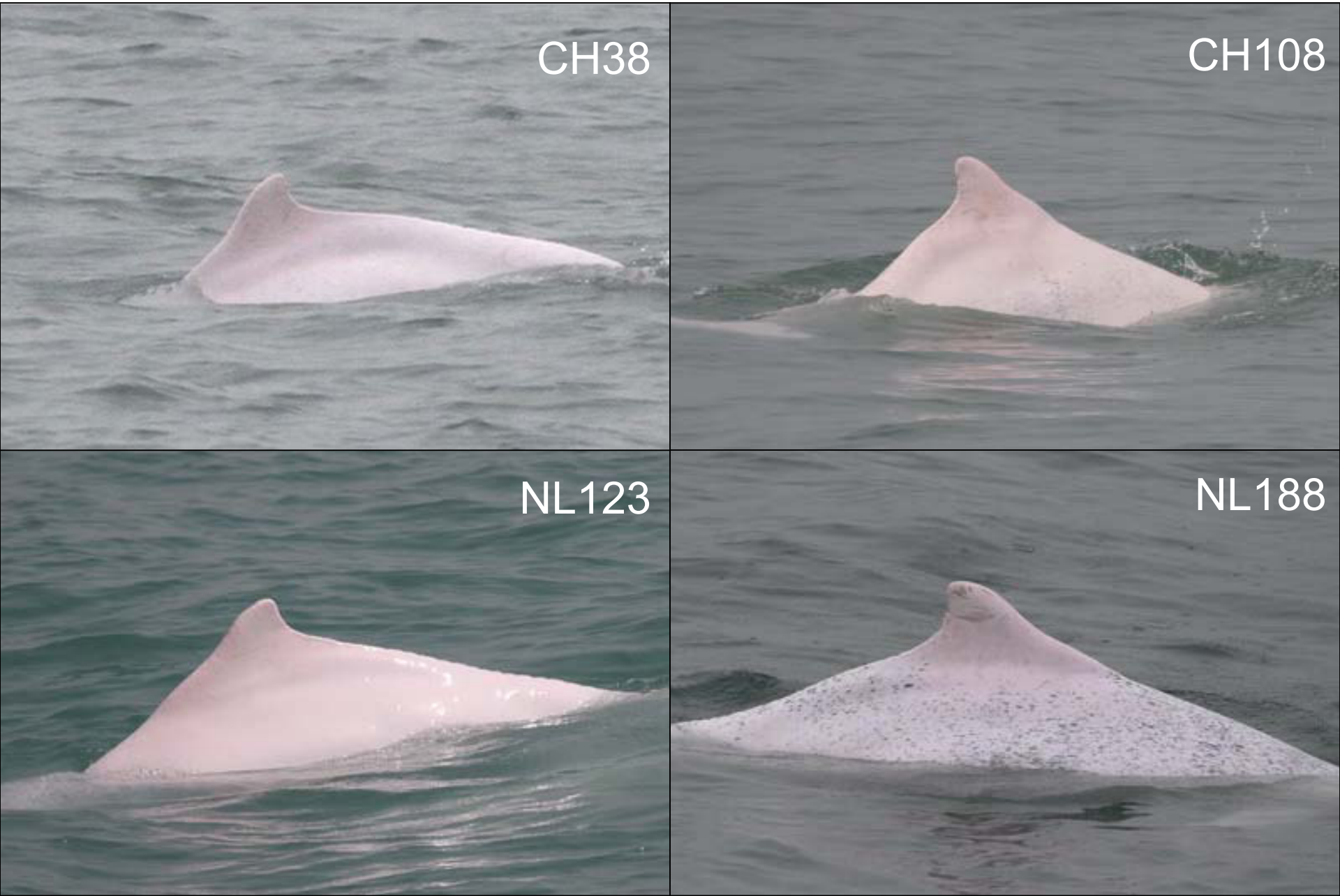
DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
19-Mar-15	1	1130	20	W LANTAU	2	590	ON	HKLR	811467	801880	SPRING	NONE	P
19-Mar-15	2	1218	2	W LANTAU	3	242	ON	HKLR	809411	800040	SPRING	NONE	P
27-Mar-15	1	1119	1	W LANTAU	2	97	ON	HKLR	811446	801416	SPRING	NONE	P
27-Mar-15	2	1128	2	W LANTAU	2	70	ON	HKLR	811469	800715	SPRING	NONE	P
27-Mar-15	3	1149	6	W LANTAU	2	178	ON	HKLR	810462	800393	SPRING	NONE	P
27-Mar-15	4	1218	3	W LANTAU	2	179	ON	HKLR	809412	799566	SPRING	NONE	P
27-Mar-15	5	1226	3	W LANTAU	2	94	ON	HKLR	808582	799481	SPRING	NONE	S
2-Apr-15	1	1125	1	W LANTAU	3	1280	ON	HKLR	807429	800159	SPRING	NONE	P
2-Apr-15	2	1126	1	W LANTAU	3	212	ON	HKLR	807439	800324	SPRING	NONE	P
2-Apr-15	3	1142	5	W LANTAU	3	228	ON	HKLR	808335	801089	SPRING	NONE	S
2-Apr-15	4	1217	2	W LANTAU	3	342	ON	HKLR	809829	801175	SPRING	NONE	S
2-Apr-15	5	1228	3	W LANTAU	3	ND	OFF	HKLR	810440	800496	SPRING	NONE	
13-Apr-15	1	1031	5	W LANTAU	2	505	ON	HKLR	815308	802631	SPRING	HANG	S
13-Apr-15	2	1222	1	W LANTAU	3	208	ON	HKLR	808435	800636	SPRING	NONE	P
7-May-15	1	1040	3	W LANTAU	3	9	ON	HKLR	814567	801856	SPRING	NONE	S
7-May-15	2	1108	1	W LANTAU	3	148	ON	HKLR	814342	803618	SPRING	NONE	S
7-May-15	3	1117	9	W LANTAU	2	144	ON	HKLR	813844	803297	SPRING	NONE	S
7-May-15	4	1138	2	W LANTAU	2	147	ON	HKLR	813580	802843	SPRING	NONE	P
7-May-15	5	1225	3	W LANTAU	3	335	ON	HKLR	810472	800981	SPRING	NONE	P
7-May-15	6	1243	1	W LANTAU	3	27	ON	HKLR	809774	801340	SPRING	NONE	S
7-May-15	7	1335	8	W LANTAU	3	260	ON	HKLR	806452	801054	SPRING	NONE	P
15-May-15	1	1254	3	W LANTAU	3	142	ON	HKLR	805432	801794	SPRING	NONE	P
15-May-15	2	1258	3	W LANTAU	3	66	ON	HKLR	806174	801806	SPRING	NONE	S
15-May-15	3	1354	2	W LANTAU	3	ND	OFF	HKLR	809552	801298	SPRING	NONE	
15-May-15	4	1403	1	W LANTAU	3	ND	OFF	HKLR	810462	800362	SPRING	NONE	
15-May-15	5	1408	2	W LANTAU	3	184	ON	HKLR	810851	799920	SPRING	NONE	S
15-May-15	6	1423	1	W LANTAU	3	465	ON	HKLR	811820	802530	SPRING	NONE	S
15-May-15	7	1453	2	W LANTAU	3	237	ON	HKLR	813428	801307	SPRING	NONE	S
15-May-15	8	1510	1	W LANTAU	2	183	ON	HKLR	814499	802979	SPRING	NONE	P

Appendix III. Individual dolphins identified during HKLR09 monitoring surveys in March-May 2015

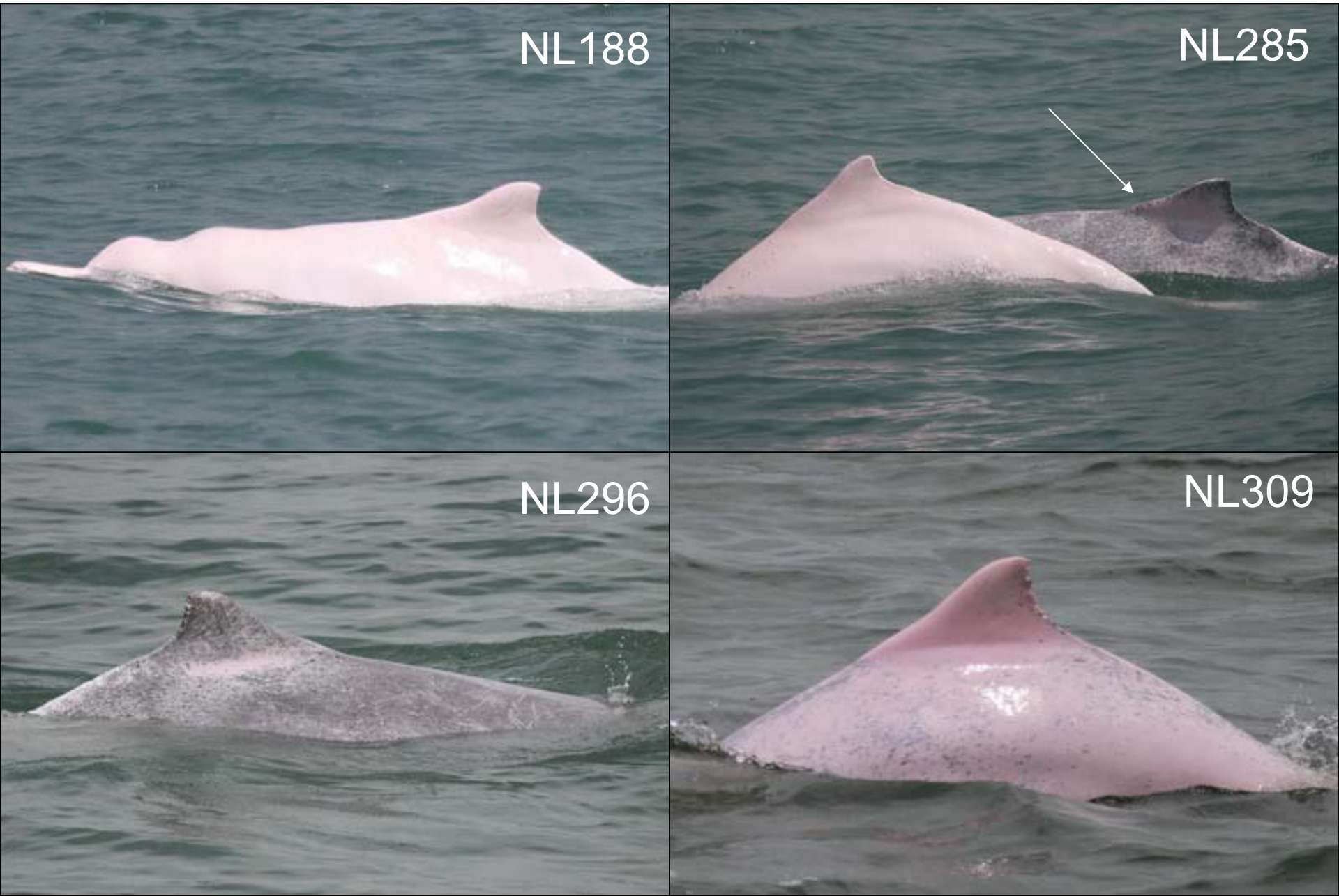
ID#	DATE	STG#	AREA
CH38	27/03/15	5	W LANTAU
CH108	19/03/15	1	W LANTAU
	15/05/15	2	W LANTAU
NL123	13/04/15	1	W LANTAU
NL188	27/03/15	2	W LANTAU
	27/03/15	3	W LANTAU
NL226	13/04/15	1	W LANTAU
NL285	13/04/15	1	W LANTAU
NL296	19/03/15	1	W LANTAU
NL309	07/05/15	2	W LANTAU
NL311	07/05/15	3	W LANTAU
SL44	19/03/15	1	W LANTAU
WL42	19/03/15	1	W LANTAU
	07/05/15	7	W LANTAU
WL44	19/03/15	1	W LANTAU
WL47	19/03/15	1	W LANTAU
WL61	19/03/15	1	W LANTAU
	07/05/15	6	W LANTAU
WL72	19/03/15	1	W LANTAU
	02/04/15	3	W LANTAU
	15/05/15	2	W LANTAU
WL79	07/05/15	1	W LANTAU
WL92	19/03/15	1	W LANTAU
	07/05/15	7	W LANTAU
WL109	02/04/15	3	W LANTAU
WL114	19/03/15	1	W LANTAU
WL116	07/05/15	7	W LANTAU
WL118	19/03/15	1	W LANTAU
	07/05/15	7	W LANTAU
WL120	07/05/15	3	W LANTAU

ID#	DATE	STG#	AREA
WL122	13/04/15	2	W LANTAU
WL123	02/04/15	3	W LANTAU
WL131	19/03/15	1	W LANTAU
	02/04/15	3	W LANTAU
WL142	19/03/15	1	W LANTAU
WL152	02/04/15	3	W LANTAU
	07/05/15	7	W LANTAU
WL165	07/05/15	3	W LANTAU
WL171	19/03/15	1	W LANTAU
	19/03/15	2	W LANTAU
WL191	19/03/15	1	W LANTAU
WL207	07/05/15	3	W LANTAU
WL214	07/05/15	3	W LANTAU
WL233	19/03/15	1	W LANTAU
	27/03/15	3	W LANTAU

Appendix IV. Thirty-three individual dolphins that were identified during March-May 2015 under HKLR09 impact phase monitoring surveys

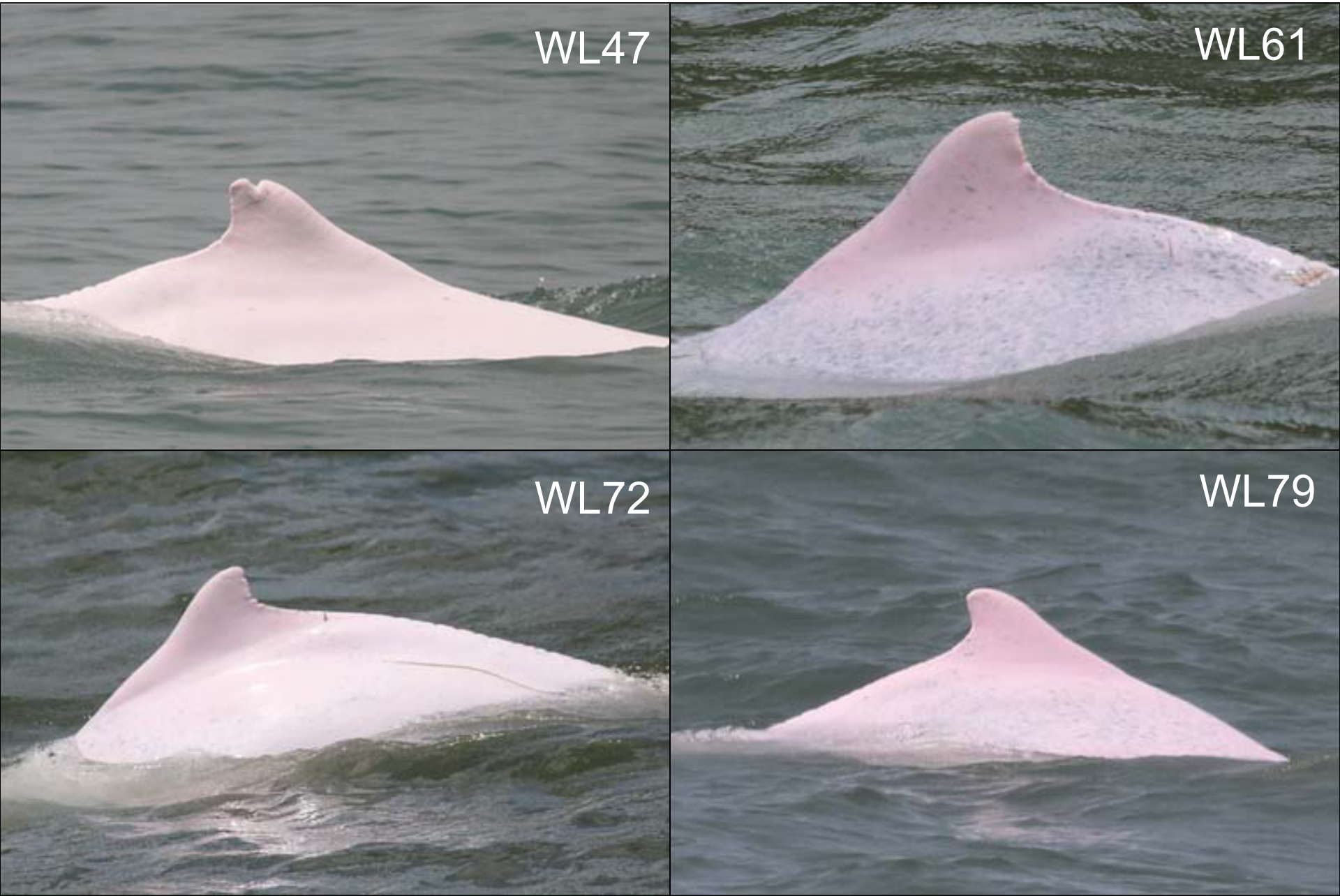


Appendix IV. (cont'd)



Appendix IV. (cont'd)

Appendix IV. (cont'd)



Appendix IV. (cont'd)

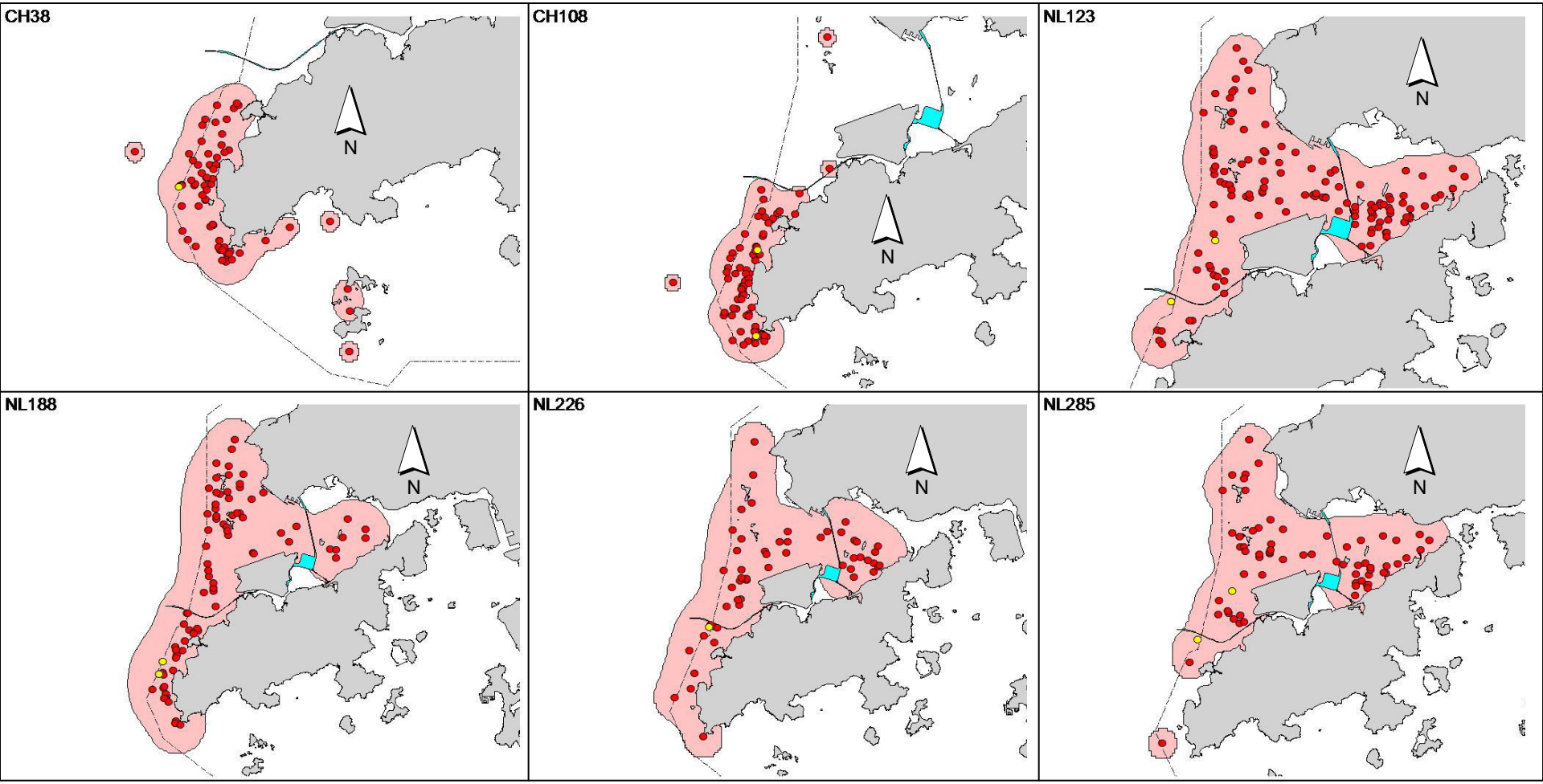
Appendix IV. (cont'd)

Appendix IV. (cont'd)

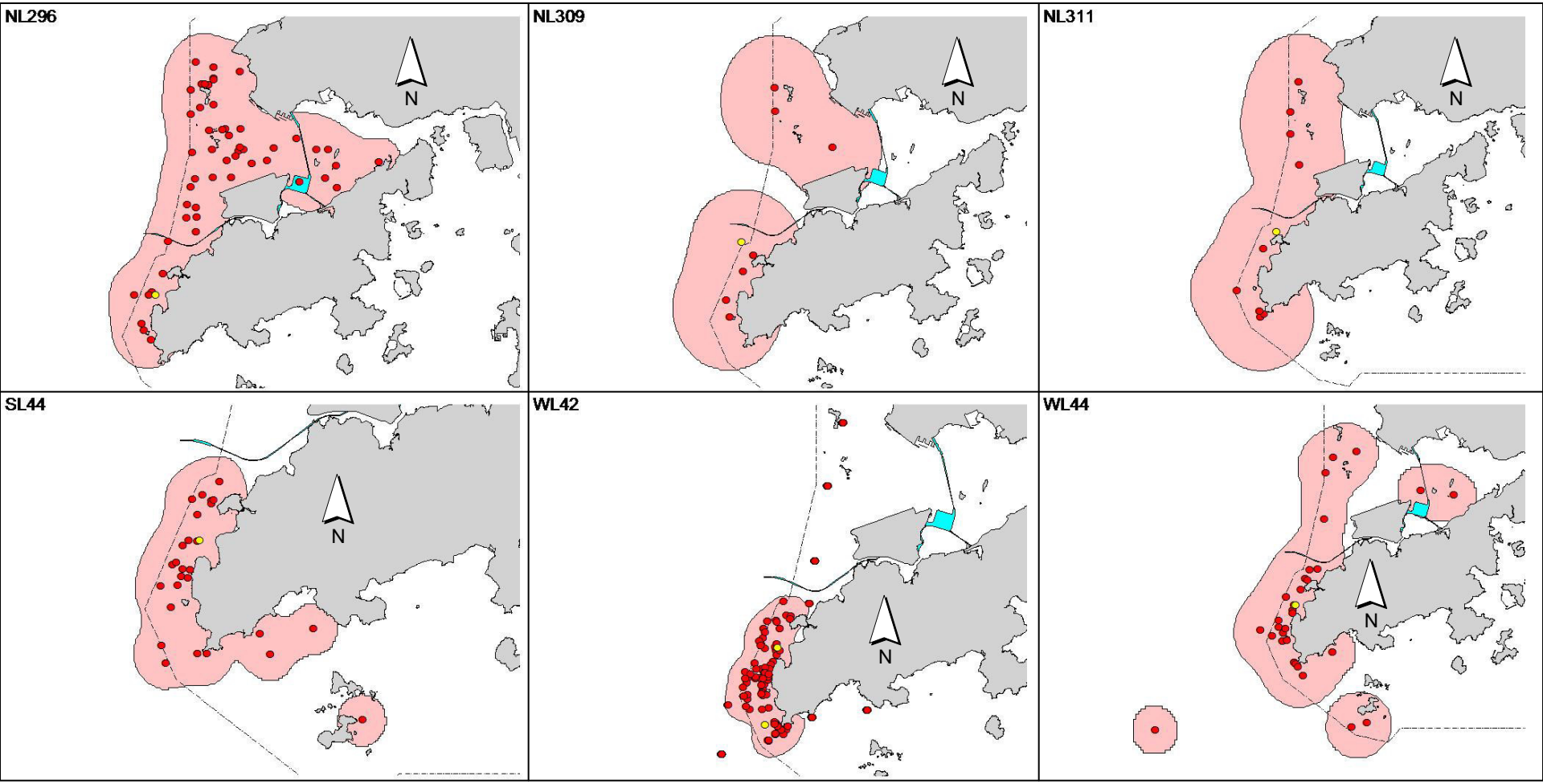
Appendix IV. (cont'd)

Appendix IV. (cont'd)

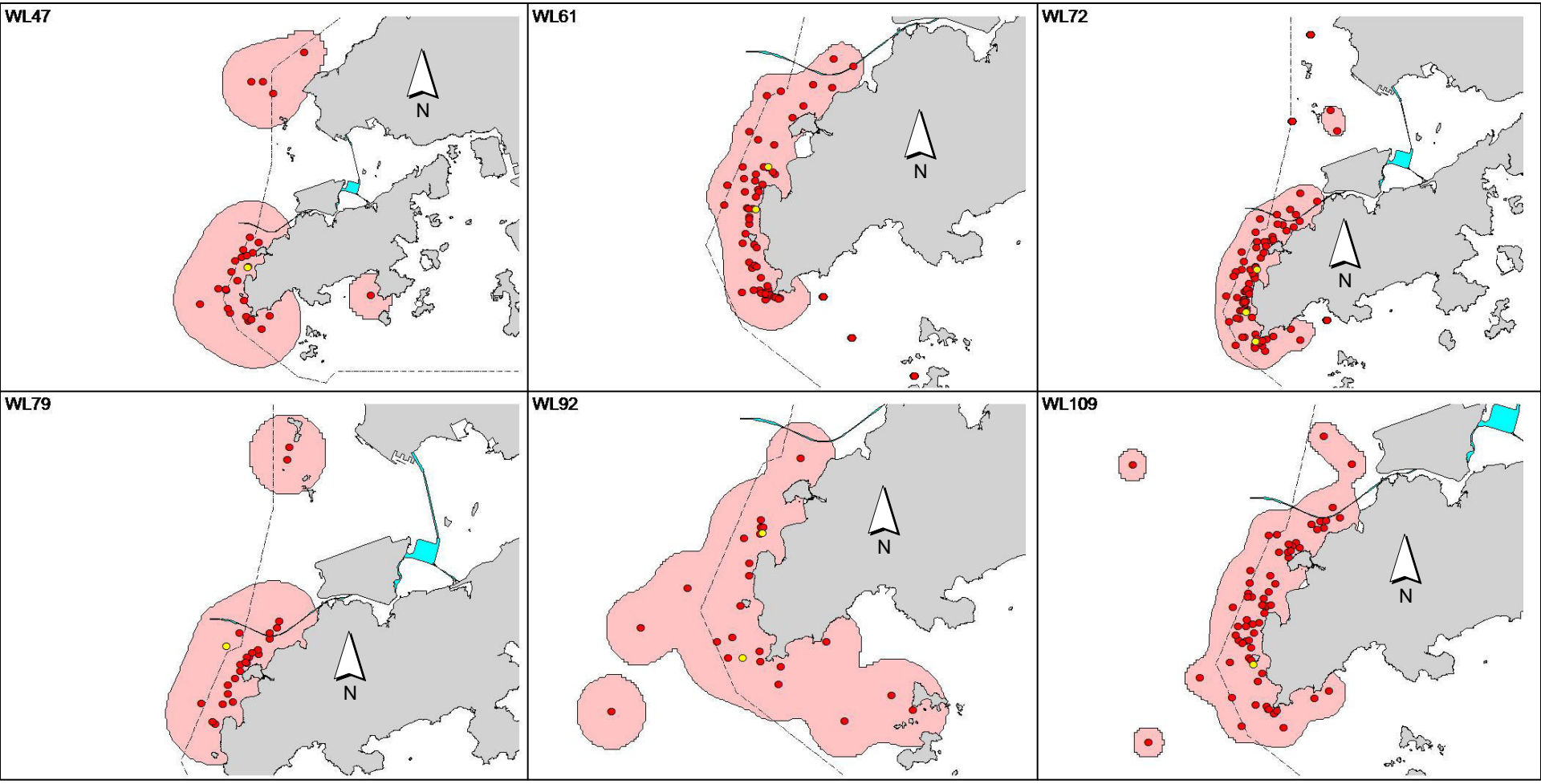
Appendix V. Ranging patterns (95% kernel ranges) of 33 individual dolphins that were sighted during HKLR09 impact phase monitoring period (note: yellow dots indicates sightings made in March-May 2015)



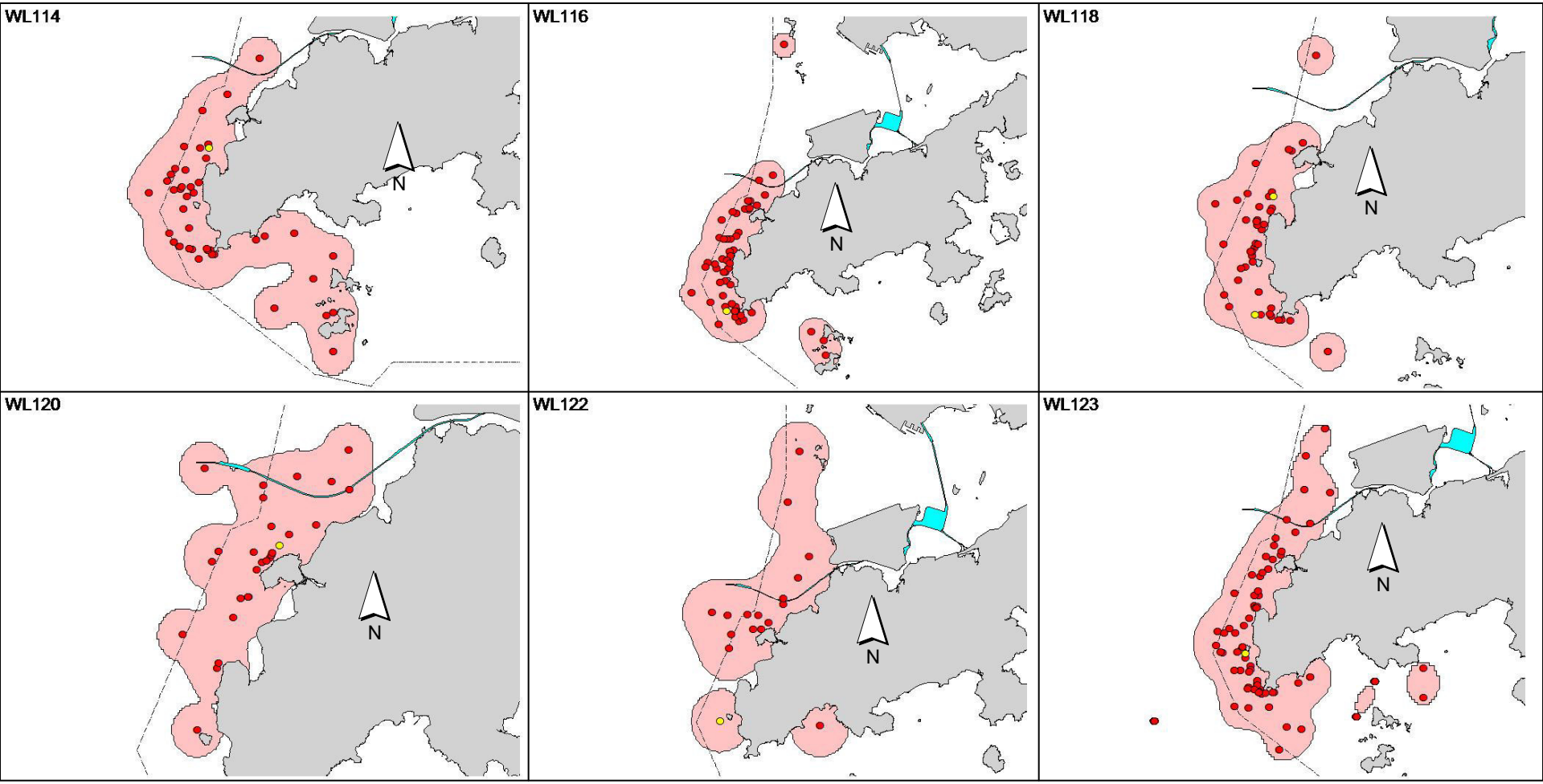
Appendix V. (cont'd)



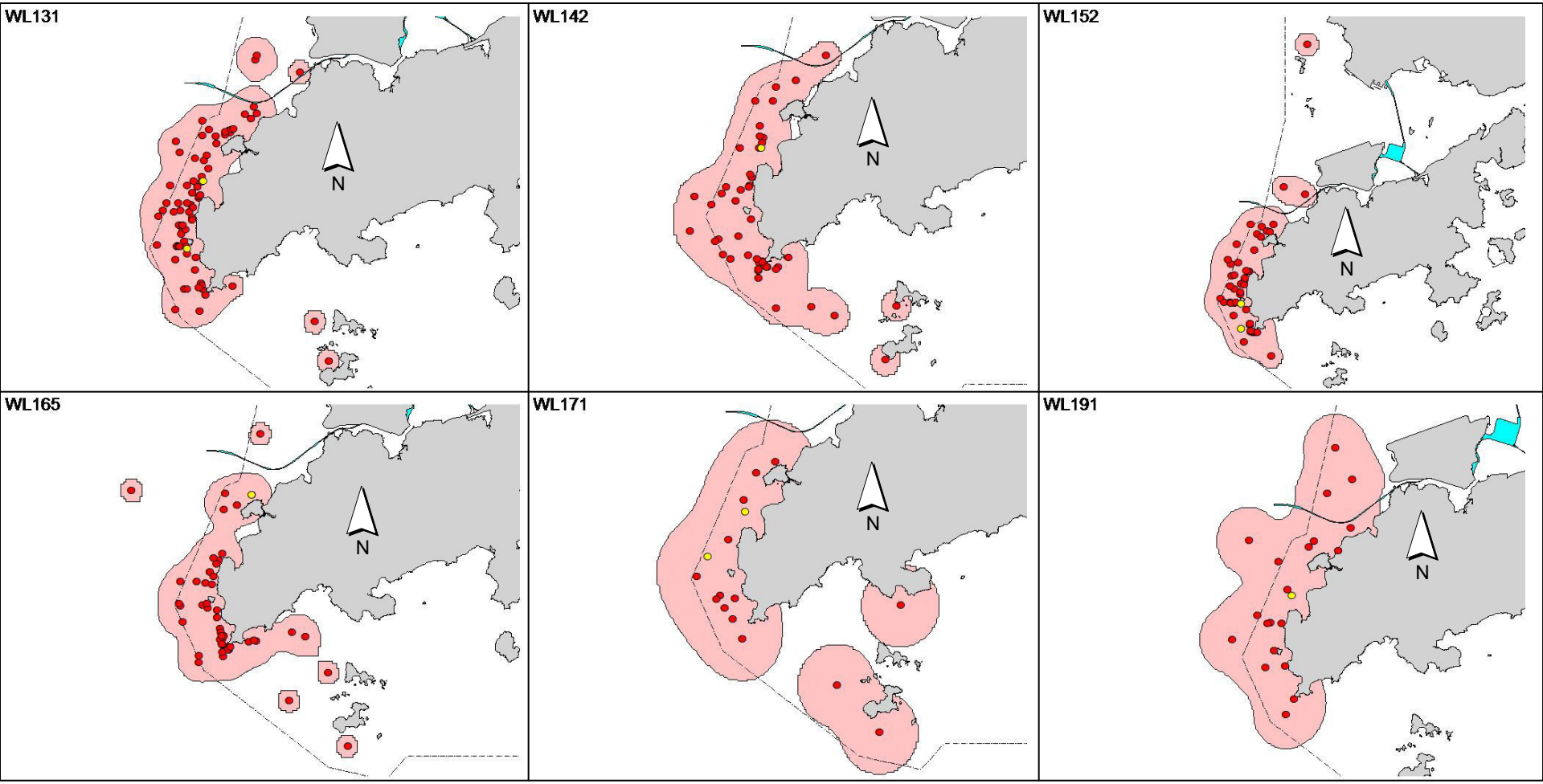
Appendix V. (cont'd)



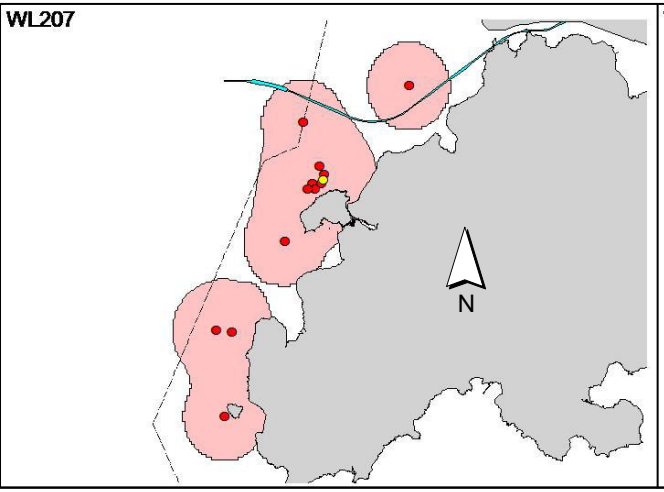
Appendix V. (cont'd)

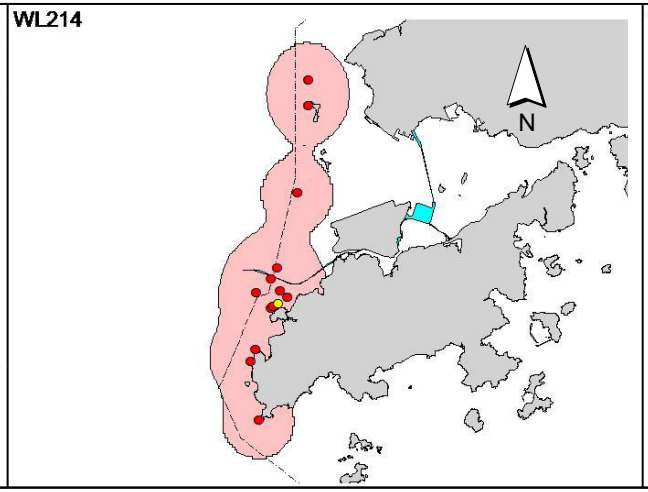


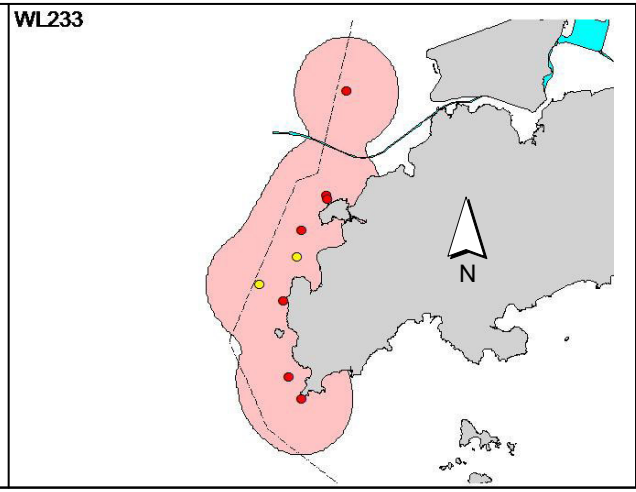
Appendix V. (cont'd)



Appendix V. (cont'd)







APPENDIX G
EVENT ACTION PLANS

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	SO	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and SO; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2.Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and SO; 3. Advise the SO on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and SO; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor;	1. Submit proposals for remedial to SO within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

LIMIT LEVEL				
1.Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform SO, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the SO on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2.Exceedance for two or more consecutive samples	1. Notify IEC, SO, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and SO to discuss	1. Discuss amongst SO, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SO accordingly; 3. Supervise the implementation of	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SO until the exceedance

	the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results; 8. If exceedance stops, cease additional monitoring.	remedial measures.	5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	is abated.

Abbreviations: ET – Environmental Team, IEC – Independent Environmental Checker, SO – Supervising Office

Event / Action Plan for Construction Noise

EVENT	ACTION			
	ET	**IEC**	**SO**	**CONTRACTOR**
Action Level	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Notify IEC and Contractor; 3. Report the results of investigation to the IEC, SO and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the SO accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, SO, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;	1. Discuss amongst SO, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the SO accordingly; 3. Supervise the implementation of	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals;

EVENT	ACTION			
	ET	**IEC**	**SO**	**CONTRACTOR**
	6. Inform IEC, SO and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SO informed of the results; 8. If exceedance stops, cease additional monitoring.	remedial measures.	noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the SO until the exceedance is abated.

Event and Action Plan for Water Quality

Event	ET Leader	IEC	SO	Contractor
Action level being exceeded by one sampling day	Repeat *in situ* measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor and SO; Check monitoring data, all plant, equipment and Contractor's working methods.	Check monitoring data submitted by ET and Contractor's working methods.	Confirm receipt of notification of non-compliance in writing; Notify Contractor.	Inform the SO and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Action level;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the SO accordingly; Supervise the implementation of mitigation measures.	Discuss with IEC on the proposed mitigation measures; Ensure mitigation measures are properly implemented; Assess the effectiveness of the implemented mitigation measures.	Inform the Supervising Officer and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of additional mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO; Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, SO and Contractor;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the SO accordingly.	Confirm receipt of notification of failure in writing; Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to review the working methods.	Inform the SO and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET,

Event	ET Leader	IEC	SO	Contractor
				IEC and SO.
Limit level being exceeded by two or more consecutive sampling days	Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, SO and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, SO and Contractor; Ensure mitigation measures are implemented;	Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SO accordingly; Supervise the implementation of mitigation measures.	Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Ensure mitigation measures are properly implemented; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	Take immediate action to avoid further exceedance; Submit proposal of mitigation measures to SO within 3 working days of notification and discuss with ET, IEC and SO; Implement the agreed mitigation measures; Resubmit proposals of mitigation measures if problem still not under control; As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Event Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	1. Repeat statistical data analysis to confirm findings. 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences. 3. Identify source(s) of impact. 4. Inform the IEC, ER/SOR and Contractor, 5. Check monitoring data. 6. Review to ensure all the dolphin protective measure are fully and properly implemented and advise on additional measures if necessary.	1. Check monitoring data submitted by ET and Contractor. 2. Discuss monitoring results and findings with the ET and the Contractor.	1. Discuss monitoring data with the IEC and any other measures proposed by the ET. 2. If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing. 2. Discuss with the ET and the IEC to propose measures to the IEC and the ER/SOR. 3. Implement the agreed measures.

Event	ET Leader	IEC	ER / SOR	Contractor
Limit Level	1. Repeat statistical data analysis to confirm findings. 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences. 3. Identify source(s) of impact. 4. Inform the IEC, ER/SOR and Contractor of findings, 5. Check monitoring data. 6. Repeat reviewing to ensure all the dolphin protective measure are fully and properly implemented and advise on additional measures if necessary. 7. If the ET proves that the source of impact is caused by any of the construction activity by the works contract, the ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor for necessity of additional dolphin monitoring, and/or any other potential mitigation measures (eg, consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activities…etc), and submit to the IEC a proposal of additional dolphin monitoring and/or	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor, and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures, and advise ER/SOR of the results and findings accordingly.	1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If ER/SOR is satisfied with proposals for additional dolphin monitoring and/or any other mitigation measures submitted by the ET and Contractor and verified by the IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

	mitigation measures where necessary.			

APPENDIX H
UPDATED ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
Air Quality							
S5.5.6.1	A1	1) The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	^
S5.5.6.2	A2	2) Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	^ ^ ^ ^ ^
S5.5.6.2	A2	• When there are open excavation and reinstatement works, hoarding	Good construction site	Contractor	All construction	Construction	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;	practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.		sites	stage	^ ^ ^ N/A ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
S5.5.6.2	A2	• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.	Good construction site practices to control the dust impact at the nearby sensitive receivers to within the relevant criteria.	Contractor	All construction sites	Construction stage	N/A N/A N/A
S5.5.6.3	A3	3) The Contractor should undertake proper watering on all exposed spoil (with at least 8 times per day) throughout the construction phase.	Control construction dust	Contractor	All construction sites	Construction stage	*
S5.5.6.4	A5	5) Implement regular dust monitoring under EM&A programme during the construction stage.	Monitor the 24 hr and 1hr TSP levels at the representative dust monitoring stations to ensure compliance with relevant criteria throughout the construction period.	Contractor	Selected representative dust monitoring station	Construction stage	^
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty	Monitor the 24 hr and 1hr TSP levels at the representative dust	Contractor	Selected representative dust	Construction stage	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; • Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.	monitoring stations to ensure compliance with relevant criteria throughout the construction period.		monitoring station		^ ^ ^ ^ ^ ^ ^
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points.	Control construction dust	Contractor	All construction sites	Construction stage	N/A N/A N/A N/A
Construction Noise (Air borne)							
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the	Control construction airborne	Contractor	All construction	Construction	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		following: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	noise by means of good site practices		sites	stage	^ ^ ^ ^ ^ ^
S6.4.11	N2	2) Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites	Construction stage	^
S6.4.12	N3	3) Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	Screen the noisy plant items to be used at all construction sites	Contractor	For plant items listed in Appendix 6D of the EIA report at all construction sites	Construction stage	*
S6.4.13	N4	4) Select “Quiet plants” which comply with the BS 5228 Part 1 or TM	Reduce the noise levels of	Contractor	For plant items	Construction	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		standards.	plant items		listed in Appendix 6D of the EIA report at all construction sites	stage	
S6.4.14	N5	5) Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	^
	N6	6) Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction stage	^
Waste Management (Construction Waste)							
S8.3.8	WM1	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	^ ^ ^ N/A ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation					^ ^
S8.3.9 - S8.3.11	WM2	*C&D Waste* • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	^ *

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		areas of the sites should be considered for such segregation and storage.					
S8.2.12-S8.3.15	WM3	*Chemical Waste* • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.					
S8.3.16	WM4	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	Proper handling of sewage from worker to avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	^
S8.3.17	WM5	*General Refuse* • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans,	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	* ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.					*
Water Quality (Construction Phase)							
S9.11.1 – S9.11.1.2	W1	• Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of dredging/backfilling, as well as protection measures. Details of the measures are provided below and summarised in the Environmental Mitigation Implementation Schedule in EM&A Manual. • Export for dredged spoils from NWWCZ avoiding exerting high demand on the disposal facilities in the NWWCZ and, hence, minimise potential cumulative impacts; • For the marine viaducts of HKLR, the bored piling will be undertaken within a metal casing; • where public fill is proposed for filling below -2.5mPD, the fine content in the public fill will be controlled to 25%; • single layer silt curtains will be applied around all works; • during the first two months of dredging work for HKLR, the silt-removal efficiency of the silt-curtains shall be verified by examining the results of water quality monitoring points. The water quality monitoring points to be selected for the above shall be those close to the locations of the initial period of dredging work. Details in this regard shall be determined by the ENPO to be established,	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	^ ^ ^ N/A ^ N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		taking account of the Contractor's proposed actual locations of his initial period of dredging work. • silt curtain shall be fully maintained throughout the works. In addition, dredging operations should be undertaken in such a manner as to minimise resuspension of sediments. Standard good dredging practice measures should, therefore, be implemented including the following requirements which should be written into the dredging contract. • trailer suction hopper dredgers shall not allow mud to overflow; • use of Lean Material Overboard (LMOB) systems shall be prohibited; • mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted; • barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material; • any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; • loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved; • adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;					* N/A N/A ^ ^ ^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• all vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • the works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.					^ ^
S9.11.1.3	W2	<u>*Land Works*</u> General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; • storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including	To control construction water quality	Contractor	During seawall dredging and filling	Construction stage	* N/A ^ *

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; • all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; • wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel;					^ ^ ^ ^ ^ ^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal; • the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and • surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.					^ N/A * ^ ^ ^
S9.14	W3	Implement a water quality monitoring programme	Control water quality	Contractor	At identified monitoring location	During construction period	^
Ecology (Construction Phase)							
S10.7	E1	• Good site practices to avoid runoff entering woodland habitats in Scenic Hill	Avoid potential disturbance on habitat of Romer's Tree	Designer; Contractor	Scenic Hill	During construction	^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Reinstate works areas in Scenic Hill • Avoid stream modification in Scenic Hill	Frog in Scenic Hill				N/A ^
S10.7	E2	• Use closed grab in dredging works. • Install silt curtain during the construction. • Limit dredging and works fronts. • Good site practices • Strict enforcement of no marine dumping. • Site runoff control • Spill response plan	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^ ^ ^ ^ ^
S10.7	E3	• Reprovision of replacement Artificial Reefs (of the same volume as the existing ARs inside Marine Exclusion Zone)	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S10.7	E4	Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Prevent Sedimentation from Land-based works areas	Contractor	Land-based works areas	During construction	^
S10.7	E5	Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time	Prevent disturbance to terrestrial fauna and habitats	Contractor	Land-based works areas	During construction	^
S10.7	E6	• Dolphin Exclusion Zone; • Dolphin watching plan	Minimize temporary marine habitat loss impact to dolphins	Contractor	Marine works	During marine works	^ ^
S10.7	E7	• Decouple compressors and other equipment on working vessels • Avoidance of percussive piling • Marine underwater noise monitoring	Minimise marine noise impacts on dolphins	Contractor	Marine works	During marine works	^ ^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• Temporal suspension of drilling bored pile casing in rock during peak dolphin calving season in May and June					N/A
S10.7	E8	• Control vessel speed • Skipper training. • Predefined and regular routes for working vessels; avoid Brothers Islands.	Minimise marine traffic disturbance on dolphins	Contractor	Marine traffic	During marine works	^ ^ ^
S10.10	E9	• Dolphin vessel monitoring	Minimise marine traffic disturbance on dolphins	Contractor	North Lantau and West Lantau	Prior to construction, during construction, and 1 year after operation	^
Fisheries							
S11.7	F1	• Reprovision of replacement Artificial Reefs(of the same volume as the existing ARs inside Marine Exclusion Zone)	Mitigate water quality impacts on the existing ARs	Project proponent	To be determined	Construction phase or operation phase	N/A
S11.7	F2	• Reduce re-suspension of sediments • Limit dredging and works fronts. • Good site practices • Strict enforcement of no marine dumping • Spill response plan	Minimise marine water quality impacts	Contractor	Seawall,	During construction	^ ^ ^ ^ ^
Landscape & Visual (Construction Phase)							
S14.3.3.3	LV2	Mitigate both Landscape and Visual Impacts • G1. Grass-hydroseed bare soil surface and stock pile areas.	Minimise visual & landscape impact	Contractor	HKLR	Construction stage	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
		• G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge or footbridge to screen bridge and traffic. • G3. For HKLR, providing aesthetic design on the viaduct, tunnel portals, at-grade roads (e.g. subtle colour tone and slim form for viaduct, featured form of tunnel portals, roadside planting along at-grade roads and landscape berm on) to beautify the HKLR alignment. • G5. Vegetation reinstatement and upgrading to disturbed areas. • G6. Maximize new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed. • G7. Provide planting area around peripheral of and within HKLR for tree screening buffer effect. • G8. Plant salt tolerant native tree and shrubs etc along the planter strip at affected seawall. • G9. Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance "natural-look" of the new coastline (see Figure 14.4.2 for example).					N/A N/A N/A N/A N/A N/A N/A
S14.3.3.3	LV3	<u>Mitigate Visual Impacts</u> • V1.Minimize time for construction activities during construction period. • V2.Provide screen hoarding at the portion of the project site / works areas / storage areas near VSRs who have close low-level views to the Project during HKLR construction.					^ ^

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	Implementation Status
EM&A							
S15.2.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	^
S15.5 - S15.6	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Contractor	All construction sites	Construction stage	^ ^ ^

Remarks: ^ Compliance of mitigation measure

* Recommendation was made during site audit but improved/rectified by the contractor

N/A Not Applicable at this stage as no such site activities were conducted in the reporting month (e.g. concrete batching plan, barging point, seawall dredging and filling, bored piling, landscaping works etc)

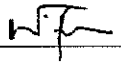
APPENDIX I
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150303
Date	3 March 2015 (Tuesday)
Time	9:50-11:05

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
150303-R03	• Storage of construction materials at near the trees should be avoid (P100).	C30
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150303-R01	• Clear the accumulated construction wastes at near P107.	F4ii.
150303-R02	• Clear the mixture of water and oil at the drip tray at P87.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150224), all environmental deficiencies were improved/rectified by contractor during the site inspection.	

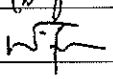
	Name	Signature	Date
Recorded by	Ivy Tam		3 March 2015
Checked by	Dr. Priscilla Choy		3 March 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150310
Date	10 March 2015 (Tuesday)
Time	9:45-11:30 and 13:30-16:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150310-R03	• The silt curtain at P98 and P95 should be used to surround the works area to avoid the gap.	B24 & B25
150310-R04	• Regular check and provide well maintenance for the silt curtain at P68 to ensure it can function properly.	B25
	B. Ecology	
150310-R02	• Clear the construction wastes / materials at near the trees at P99 – P102.	C30
	C. Air Quality	
150310-R01	• The unpaved area at near P113 should be watered regularly to avoid dust generation.	D5, 6, 8 & 14
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150303), follow up action is required for the item 150303-R02 which is renamed as 150310-R02.	

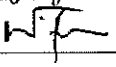
	Name	Signature	Date
Recorded by	Ivy Tam		10 March 2015
Checked by	Dr. Priscilla Choy		10 March 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150317
Date	17 March 2015 (Tuesday)
Time	9:15-12:20 and 13:30-15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150317-R01	• To seal the hole at the bunded area at barge (B22595Y) near P29.	B16
150317-R03	• Properly deploy the silt curtain at P72, P99, P86 and P68.	B24 & B25
	B. Ecology	
150317-R04	• Clear the construction materials at near the trees at P113, P102 and P100.	C30
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150317-R02	• Clear the construction wastes at the side of pile cap of P27.	F4ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150310), follow up action is required for the item 150310-R02 and 150310-R04 which are renamed as 150317-R04 and 150317-R03 respectively.	

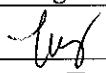
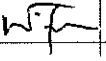
	Name	Signature	Date
Recorded by	Ivy Tam		17 March 2015
Checked by	Dr. Priscilla Choy		17 March 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150331
Date	31 March 2015 (Tuesday)
Time	9:15-12:10 and 13:30-15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150331-R01	• Properly deploy the silt curtain at P68, P72, P86, P99 and P103.	B25
150331-R02	• Clear the waste materials at near the rockfill platform at P68.	B21
150331-R07	• Clear the sedimentation tank to ensure it can function properly at Portion C.	B3iv.
	B. Ecology	
150331-R05	• Clear the construction wastes / materials at near the trees at P87, between P88 & P89, between P94 & P95, P102 and P113.	C30
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
150331-R04	• To repair the noise enclosure at P70.	E7
	E. Waste / Chemical Management	
150331-R03	• Clear the accumulated general refuse at platform at P70.	F1i. & F1iii.
150331-R06	• To clear the oil spillage at near P109.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150323), follow up action is required for the item 150323-R03 which is renamed as 150331-R04. For the item 150317-R03 and 150317-R04 which are also renamed as 150331-R01 and 150331-R05 respectively and follow up action is also required.	

	Name	Signature	Date
Recorded by	Ivy Tam		31 March 2015
Checked by	Dr. Priscilla Choy		31 March 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150323
Date	23 March 2015 (Monday)
Time	10:00-11:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150323-R02	• The silt curtain at P71 and P70 should be used to surround the works area to avoid the gap.	B25
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
150323-R01	• The unpaved site area at near P113 should be watered regularly to avoid dust generation.	D5, D6, D14
	D. Noise	
150323-R03	• To repair the noise enclosure at P70.	E7
	E. Waste / Chemical Management	
150323-R04	• Clear the concrete debris and used cement bags at P50.	F4ii.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150317), follow up action is required for the item 150317-R03 and 150317-R04.	

	Name	Signature	Date
Recorded by	Ivy Tam		23 March 2015
Checked by	Dr. Priscilla Choy		23 March 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150409
Date	9 April 2015 (Thursday)
Time	9:30-11:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150409-R03	• Properly deploy the silt curtain at P99 and P103.	B25
150409-R04	• Clear the sedimentation tank to ensure it can function properly at Portion C.	B3iv.
	B. Ecology	
150409-R02	• Clear the construction wastes / materials at near the trees at P113, P102, between P94&P95, between P88&P89 and P87.	C30
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150409-R01	• Clear the oil spillage at near the generator at P114 and area near P109.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150331), follow up action is required for the item(s) 150331-R01 , 150331-R04, 150331-R05, 150331-R06 and 150331-R07.	

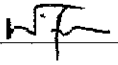
	Name	Signature	Date
Recorded by	Ivy Tam		9 April 2015
Checked by	Dr. Priscilla Choy		9 April 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150414
Date	14 April 2015 (Tuesday)
Time	9:15-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
	• No environmental deficiency was identified during site inspection.	
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150414-R01	• Clear the oil spillage at near the mobile crane at WA4.	F8
150414-R02	• Properly store the chemical containers at near the drainage channel at WA7.	F3i.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150409), follow up action is required for the item(s) 150409-R01 (150331-R06) and 150409-R02 (150331-R05).	

	Name	Signature	Date
Recorded by	Ivy Tam		14 April 2015
Checked by	Dr. Priscilla Choy		14 April 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150421
Date	21 April 2015 (Tuesday)
Time	9:15-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150421-R02	• Properly deploy the silt curtain to avoid the gap at P106.	B25
	B. Ecology	
150421-R04	• Clear the construction materials / wastes at near the trees at P102 and between P96 & P97.	C30
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150421-R01	• Properly clear the oil spillage at the area near P109.	F8
150421-R03	• Properly store the chemical containers at near the trees between P102 and P103.	F3i.
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150414), all environmental deficiencies were improved/rectified by contractor during the site inspection. However, follow up action is still required for the item(s) 150409-R01 (150331-R06) and 150409-R02 (150331-R05).	

	Name	Signature	Date
Recorded by	Ivy Tam		21 April 2015
Checked by	Dr. Priscilla Choy		21 April 2015

Contract HY/2011/09

Hong Kong-Zhuhai-Macao Bridge

Hong Kong Link Road-Section between HKSAR Boundary and Scenic Hill

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150429
Date	29 April 2015 (Wednesday)
Time	9:30-12:05

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality	
150429-O01	• Wastewater from the works area at P82 was observed discharging to the marine water. The Contractor was reminded to provide sufficient mitigation measures to rectify this deficiency as soon as possible. (e.g. check and repair the silt curtain, pump out the excess wastewater for treatment, erect bunds to surround the works area etc.)	B16 & B22
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150421), follow up action is required for the item(s) 150421-R03 and 150421-R04 (150409-R02 and 150331-R05).	

	Name	Signature	Date
Recorded by	Ivy Tam		29 April 2015
Checked by	Dr. Priscilla Choy		29 April 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150505
Date	5 May 2015 (Tuesday)
Time	9:15-12:00 and 13:30-15:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150505-R01	• Provide mitigation measures to avoid leakage of wastewater to the sea at P18.	B16
150505-R04	• Properly deploy the silt curtain at P106 and P107.	B25
	B. Ecology	
150505-R03	• Clear the construction wastes / materials at near the trees at P113, P102, between P96 & P97, between P94&P95, between P88&P89 and P87.	C31
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150505-R02	• Clear the general refuse which was not disposed properly at P18.	F1iii.
150505-R05	• Clear the oil spillage at the area near P108.	F8
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150429), all environmental deficiencies were improved/rectified by contractor during the site inspection. However, follow up action is still required for the item(s) 150421-R03 and 150421-R04 (150409-R02 and 150331-R05).	

	Name	Signature	Date
Recorded by	Ivy Tam		5 May 2015
Checked by	Dr. Priscilla Choy		5 May 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150512
Date	12 May 2015 (Tuesday)
Time	9:15-11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150512-R04	• Properly deploy the silt curtain at P106 and P107.	B25
	B. Ecology	
150512-R01	• Clear the construction wastes / materials at near the trees at P113.	C31
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150515-R02	• Clear the accumulated construction wastes at the area near P106.	F4ii.
150515-R03	• Clear the waste oil and stagnant water at the drip tray near P105 and P87.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150505), follow up action is required for the item(s) 150505-R03 and 150505-R04 which are renamed as 150512-R01 and 150512-R04 respectively.	

	Name	Signature	Date
Recorded by	Ivy Tam		12 May 2015
Checked by	Dr. Priscilla Choy		12 May 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150518
Date	18 May 2015 (Monday)
Time	9:30-12:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150518-O01	• Muddy water was pumped to the sea directly at between P81 and P82. The Contractor has turned off the pump immediately during the site inspection. Anyway, the Contractor was reminded to pump the muddy water from site for treatment before discharging out.	B3i.
150518-R03	• Provide sand bag bund to surround the gully at near P83.	B4
	B. Ecology	
	• No environmental deficiency was identified during site inspection.	
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
150518-R02	• Clear the general refuse / construction wastes accumulated at the area near P83.	F1i., F1iii. &F4ii.
150518-R04	• Clear the mixture of chemical oil and stagnant water which is nearly overflow at the drip tray at P18.	F9
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150512), follow up action is required for the item(s) 150512-R01 and 150512-R02.	

	Name	Signature	Date
Recorded by	Ivy Tam		18 May 2015
Checked by	Dr. Priscilla Choy		18 May 2015

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	150526
Date	26 May 2015 (Tuesday)
Time	13:00-16:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	**Remarks/Observations**	**Related Item No.**
	A. Water Quality	
150526-R01	• Clear the sedimentation tank to ensure it can function properly at Portion C.	B3iv.
	B. Ecology	
150526-R02	• Clear the construction wastes / materials at near the trees near P113.	C31
	C. Air Quality	
	• No environmental deficiency was identified during site inspection.	
	D. Noise	
	• No environmental deficiency was identified during site inspection.	
	E. Waste / Chemical Management	
	• No environmental deficiency was identified during site inspection.	
	F. Permits/Licences	
	• No environmental deficiency was identified during site inspection.	
	G. Others	
	• Follow-up on previous site audit session (Ref. No. 150518), all environmental deficiencies were improved/rectified by contractor during the site inspection. However, follow up action is still required for the item(s) 150512-R01 and 150512-R02.	

	Name	Signature	Date
Recorded by	Ivy Tam		26 May 2015
Checked by	Dr. Priscilla Choy		26 May 2015

APPENDIX J
WASTE GENERATION IN THE REPORTING PERIOD

Appendix: C6 Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No.: HY/2011/09

Monthly Summary Waste Flow Table for 2015 (Year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated[11]	Hard Rock and Large Broken Concrete[6]	Reused in the Contract[8,9]	Reused in other Projects[5,8,9]	Disposed as Public Fill[7]	Imported Fill[6,7,8,9]	Metals[12]	Paper/ cardboard packaging	Plastics[3]	Chemical Waste	Others, e.g. general refuse[8,9]
	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
Jan	4.101	0.000	0.000	0.000	4.101	0.000	0.070	0.485	0.000	0.000	0.566
Feb	3.823	0.000	0.000	0.000	3.823	0.000	0.000	0.550	0.000	0.000	0.241
Mar	0.681	0.000	0.000	0.000	0.681	0.000	0.096	0.729	0.000	0.793	0.299
Apr	0.406	0.000	0.000	0.000	0.406	0.000	0.049	0.909	0.000	0.000	0.202
May	0.176	0.000	0.000	0.000	0.176	0.000	0.005	1.096	0.000	0.000	0.267
Jun											
Sub-Total	9.186	0.000	0.000	0.000	9.186	0.000	0.220	3.769	0.000	0.793	1.573
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	9.186	0.000	0.000	0.000	9.186	0.000	0.220	3.769	0.000	0.793	1.573

Forecast of Total Quantities of C&D Materials to be Generated from the Contract [10]										
Total Quantity Generated[11]	Hard Rock and Large Broken Concrete[6]	Reused in the Contract[8,9]	Reused in other Projects[5,8,9]	Disposed as Public Fill[7]	Imported Fill[6,7,8,9]	Metals	Paper/ cardboard packaging	Plastics[3]	Chemical Waste	Others, e.g. general refuse[8,9]
(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
229.311	0.000	3.200	73.111	100.000	53.000	1.500	23.273	0.000	7.532	6.818

Notes:

(1) The performance targets are given in ER Appendix 8J Clause 14 and the EM&A Manual.

(2) The waste flow table shall also include C&D materials to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m^3. (ER Part 8 Clause 8.8.5 (d) (ii) refers).

(5) The materials reused in other Project shall not be treated as waste under the Waste Disposal Ordinance (CAP354).

(6) According to the EIA Appendix 8B, the density of rock (bulked) is 2.0 tonnes/m^3.

(7) According to the EIA Appendix 8B, the density of soil (bulked) is 1.8 tonnes/m^3.

(8) Assuming the loading quantities of a 30-tonne truck is 8.0m^3.

(9) Assuming the loading quantities of a 24-tonne truck is 6.5m^3.

(10) The forcast of C&D materials to be generated from the Contract is sourced from the works program in December 2014.

(11) The volume of Total Quantity Generated means the volume of Hard Rock and Large Broken Concrete+Disposed as Public Fill+Imported Fill-Reused in the Contract-Reused in other Projects

(12) The density of metal is 7,850 kg/m^3.

APPENDIX K
SUMMARY OF EXCEEDANCE

Contract No. HY/2011/09
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road –
Section between HKSAR Boundary and Scenic Hill

Exceedance Report

(A) Exceedance Report for Air Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Air Quality	1-hr TSP	0	0	0	0
	24-hr TSP	0	0	0	0

(B) Exceedance Report for Construction Noise
(NIL in the reporting period)

(C) Exceedance Report for Water Quality

Environmental Monitoring	Parameter	No. of Exceedance		No. of Exceedance related to the Construction Activities of this Contract	
		Action Level	Limit Level	Action Level	Limit Level
Water Quality	Dissolved Oxygen (DO) (Surface & Middle)	0	0	0	0
	Dissolved Oxygen (DO) (Bottom)	0	0	0	0
	Turbidity	0	0	0	0
	Suspended Solids (SS)	8	6	0	0

(D) Exceedance Report for Line-transect Vessel Surveys
(NIL in the reporting period)

APPENDIX L
COMPLAINT LOG

Appendix L - Complaint Log

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2013-04-001	Near Tung Chung New Development Pier	8 April 2013	EPD received the complaint on 8 April 2013. The complainant complained about oil was dumped from various vessels operating for Hong Kong-Zhuhai-Macao Bridge Hong Kong (HZMB HK) Projects near Tung Chung New Development Pier over the past few months.	1) The vessels photos in the complainant's photo are not the working vessels under Contract No. HK/2011/09. 2) No oil dumped from Contract No. HK/2011/09's working vessels was observed according to ET's site inspection conducted on 9 April 2013 at near Tung Chung New Development Ferry Pier. 3) Joint site inspection (DCVJV and ARUP) was conducted on 10 April 2013 and confirmed that Contract No. HY/2011/09's vessels are not involved the complaint case. 4) DCVJV will keep remind their boat crews not discharging contaminated effluent directly into the sea.	Closed
Com-2013-05-001	WA6	2 May 2013	ARUP received the complaint on 2 May 2013. The complainant alleged the noise nuisance was generated from the Works Area WA6 at around 13:00 on 1 May 2013 (Wednesday).	The site diary report was reviewed and confirmed that no works were carried out at WA6 on 1 May 2013. In addition, no noise was heard from WA6 according to the security guard who on duty at WA6 on 1 May 2013. Based on the information provided, the complaint regarding the construction noise at WA6 is not considered justifiable.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2013-05-002	WA6	18 May 2013	ARUP received the complaint on 18 May 2013. The complainant advised that the noise nuisance due to loading of metal parts at barge near the seawall of Works Area WA6 early morning (around8:45a.m) on 18 May 2013 (Saturday).	Based on the record of site activities at WA6 on 18 May 2013, 4 metal plates and 2 oxygen-acetylene set were lifted onto a derrick boat "Chiu Kee" by a crane near seawall at WA6 in the morning on that day. Such operation was commenced around 8:40a.m and completed in 10 minutes during the normal construction working hour (0700 – 1900 Monday to Saturday). However, the duration of aforesaid activities is very short and infrequent. Nevertheless, the Contractor was reminded to strengthen their site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures for the complaint including but not limited to:- •To place wooden planks or rubber mats on ground for loading and unloading heavy or metal objects; and •To deploy professional personnel to supervise the works.	Closed
Com-2013-05-003	Near Tung Chung New Development Pier	18 May 2013	EPD received the public complaint on 18 May 2013. This complaint was a follow-up of a previous complaint received by EPD on 8	After receiving the complaint, additional site inspection was conducted at near Tung Chung New Development Pier on 30 May 2013 to investigate whether oil	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			April 2013 (Com-2013-04-001). The complainant complained again about the oil was dumped from various vessels operating for Hong Kong-Zhuhai-Macao Bridge Hong Kong (HZMB HK) Projects near Tung Chung New Development Pier over the past months.	dumped was due to Contract No. HY/2011/09's vessels. During the site inspection, three working vessels under Contract No.HY/2011/09 was anchored off near Tung Chung New Development Pier. No oil dumped from Contract No. HY/2011/09's vessels were observed and the water around the vessels was clear. The following mitigation measures have been implemented by DCVJV: • DCVJV has sent the letter to the shipping agent to remind them to ensure the vessels under Contract No. HY/2011/09 are in good condition and any oil dumped to sea should be avoided to prevent water pollution. • Provide training to the vessel skippers for prevention of pollution from ships. • DCVJV requested vessel skippers to provide engine oil disposal records The vessel skippers assured to us that all waste lubricants were sent to waste collectors regularly and no oil discharge into seawater.	
Com-2013-07-001	Southeast Quay of Chek Lap Kok near the junction of Chek Lap Kok South Road and Scenic Road	17 July 2013	The complaint was received by EPD on 17th July 2013. According to the EPD's letter, the complainant was concerned for the noise nuisance generated from the	In response to the complaint, ET conducted two times site inspections at Southeast Quay at Chek Lap Kok between 18:45 and 20:30 hours on 23 July 2013 and 20:30 to 22:30 hours on 30 July 2013.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			operation of concrete lorry mixers during evening and night-time period at Southeast Quay of Chek Lap Kok.	During the inspections, the Ro-Ro barge was observed anchored off Southeast Quay at Chek Lap Kok but no concrete lorry mixer was observed throughout the inspection. On 23 July 2013, at about 19:35, one tug boat was observed travelling to Southeast Quay, Chek Lap Kok and left at about 19:40. On 30 July 2013, no tug boat and concrete lorry mixers were observed during the inspection. According to the Contractor, there was no concreting works for the pier sites on 23 July 2013 and therefore no loading and unloading operation at Southeast Quay at Chek Lap Kok. Concreting works were performed at Pier 0 on 30 July 2013. As the Contractor anticipated the arrival time of tug boat and flap-top barge at Southeast Quay will exceed 23:00 hours after the concreting works, they decided to arrange the tug boat and flap-top barge with concrete	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				lorry mixers anchored off around Pier 66 after 23:00 hours. So, no loading and unloading operation at Southeast Quay at Chek Lap Kok was observed. Further night time site inspection was conducted on 22 August 2013 during the loading and unloading operation at Southeast Quay of Chek Lap Kok, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS0895-13.	
Com-2013-11-001	Chek Lap Kok (CLK) South Road	16 November 2013	The complaint was received by project customer services on 16th November 2013 regarding the dust problem at Chek Lap Kok (CLK) South Road.	After receiving the complaint, ET conducted the site inspection on 19 and 29 November 2013 to check the appropriate environmental protection and pollution control measures which are properly implemented by the Contractor under HY/2011/09 (DCVJV). The observation are summarized as below:- • Dust generation works was conducted by the other Contractor at South East Quay • Proper watering of haul road to avoid dust generation during vehicle / plant equipment movement. • Vehicle washing facilities provided	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				at every site exit at CLK South Road and South Perimeter Road. • No dark smoke was observed emitting from the plant equipments. Based on the information collected, the complaint of dust problem at Check Lap Kok South Road is considered not related to Contract No. HY/2011/09 as dust suppression measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.	
Com-2014-01-001	Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09	3 January 2014	The complaint was received by EPD on 3rd January 2014. According to the EPD's letter, a resident in Tai O District was concerned for the noise nuisance occasionally arising from the hammering or hitting of metals from Contract No. HY/2011/09.	In response to the complaint, ET conducted an ad hoc night time site inspection at P0, P18 and P19 on 14 January 2014 between around 23:00 and 00:30 hours of 15 January 2014. In accordance with the site activities record and site inspections, the construction works conducted under Contract No. HY/2011/09 complied with the conditions in the CNP No. GW-RS1108-13. Nevertheless, the Contractor was advised to strictly follow the conditions of the permit because any deviation from the	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit. In addition, the following environmental mitigation measures were recommended: • Review and adjust the lighting directions of the barge, under safety consideration, to avoid potential visual impacts to residents in vicinities; • To ensure the equipment are maintaining in good operation condition; and • To strengthen site supervision and provide training for the workers regularly to increase awareness of their environmental responsibilities to minimize the noise impact to the nearby residents and the specific mitigation measures.	
Com-2014-01-002	Hong Kong-Zhuhai-Macao Bridge	16 January 2014	The complaint was received by HyD's PR Team on 16 January 2014 that the complainant advised that the heavy exhaust fume affecting Tung Chung Crescent.	After receiving the complaint, ET conducted the site inspection on 21 January 2014 to check all the plant equipments which were operated for the construction works and air quality	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				mitigation measures. Based on the information collected, the complaint of heavy exhausts affecting Tung Chung Crescent is considered not related to Contract No. HY/2011/09 due to the following reason(s):- 1) The work sites at Portion C and South East Quay at Portion A under Contract No. HY/2011/09 are approximately 800m from Tung Chung Crescent. Any unpleasant smell of exhaust fume would not be anticipated. 2) No heavy smoke was observed emitting from plants / equipment during the site inspection on 21 January 2014. 3) The vehicles and equipments were switched off while not in use. 4) All plant and equipment were well maintained and in good operating condition. 5) Air quality mitigation measures has been properly implemented by the Contractor on site to prevent dust nuisance from the construction activities.	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
Com-2014-03-001	Oil Spillage at near Sha Lo Wan	5 March 2014	The complaint was received by EPD on 5 March 2014. The complainant suspected the oil leakage from the works area of Contract No. HY/2011/09 near Sha Lo Wan	Based on ET site inspection, no oil spillage from the works area under Contract No. HY/2011/09 at near Sha Lo Wan was observed. In addition, spill kits are ready on site in order to dealing with spillage cases promptly. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Provide training for the workers regularly regarding the mitigation measures on waste / chemical management. • Provide sufficient chemical spillage kit (e.g. oil absorbent) to all vessels and working platform. • Regular check the condition of vessels and plant equipments to ensure no leakage of oil.	Closed
Com-2014-03-002	Construction Noise in the vicinity of the waters outside Sha Lo Wan	11 March 2014	The complaint was received by EPD on 11 March 2014. According to the EPD's letter, the complainant was concerned for the mobile crane which operating in the vicinity of the waters outside Sha Lo Wan after 23:00.	In accordance with an ad hoc site inspection on 18 March 2014, no construction works were conducted during the restricted hours. The 1st investigation report has been submitted to EPD on 21 March 2014 and the 2nd investigation report was submitted to EPD on 26 June 2014. The Contractor was advised to strictly	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				follow the conditions of the permit because any deviation from the conditions may lead to cancellation of the permit, subsequent prosecution action and the Authority's refusal to issue further permit. Nevertheless, the Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community: · To space out noisy equipment and position it as far away as possible from the sensitive receivers; · To avoid concurrent uses of noisy equipment near the sensitive area; · To ensure the equipment are maintaining in good operation condition; · To turned off any idle equipment on site; and · To enclose the noisy part of the machine by acoustic insulation material if feasible. · To arrange tailor-made training for the Production Team including the management and foremen to explain to them the conditions and requirements listed on the CNP. · To delegate one Engineer for ensuring that all construction activities and PMEs used are in full compliance with the CNP	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				and legislative requirements.	
Com-2014-04-001	Construction marine works by the company Bauer Hong Kong in Tung Chung	14 April 2014	The complaint was received by Agriculture, Fisheries and Conservation Department (AFCD) on 14 April 2014, the complainant complained that the dead dolphin was found under a platform at construction marine works by the company Bauer Hong Kong in Tung Chung (Macau Bridge Piling Works)	In accordance with the photos showing a date of 27 November 2013 (08:00 – 08:25a.m.) which provided by the complainant, the dolphin was observed has been dead for some time and shows signs of decomposition. It was difficult to determine the cause of death of the deceased dolphin based on the photographs and the dead dolphin was found a few months ago. By examining the photos, it is found that the body was beside a barge, not under a working platform. In addition, the dead dolphin was found in the early morning in which the marine construction works have not been commenced. Therefore, from the above information the dead dolphin is considered to be washed to the work site. However, there is no significant increase of cetacean stranding were found in Hong Kong since the commencement of Contact No. HY/2011/09. In regard to the complaint, the following recommendations were made:	Closed

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				➢ In case stranded cetaceans are found, the AFCD shall be contacted immediately and provide the following information to facilitate AFCD's investigation: 1. Name and telephone number; 2. Date and time of discovery; 3. Location (as specific as possible); 4. Status of the stranded animal (i.e. alive, freshly dead, slightly decomposed, rotten, mummified); 5. Type and size of the stranded animal. ➢ To implement Dolphin Exclusion Zone during the installation of bored pile casing located in the waters to the west of Airport. ➢ To implement Dolphin Watching Plan after the bored piling casing is installed.	
Com-2014-05-001	At the shore of Sha Lo Wan	13 May 2014	The complaint was received by EPD on 13 May 2014. According to the EPD's email, the complainant was concerned about the sand material that was excavated on the shore of Sha Lo Wan for the construction of Hong Kong -	After receiving the complaint from a Sha Lo Wan's village resident, the sub-contractor was instructed to stop the sand excavation and leave immediately. In addition, all sands excavated from the shore of Sha Lo Wan were returned back to the original area on 13 May 2014.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			Zhuhai - Macao Bridge (HZMB) Project on 11 May 2014.	Nevertheless, the Contractor was advised to arrange tailor-made training for Production Team including the management and foremen to explain to them the conditions and requirements listed on the Environmental Permit. In addition, indicative poles and flags are recommended to put within the site boundary to identify the extent of land areas in Sha Lo Wan / Sha Lo Wan (West) Archaeological site.	
Com-2014-05-002	At the shore of Sha Lo Wan	27 May 2014	The complaint was received by EPD on 27 May 2014. According to the EPD's email, the complainant was concerned about the dumping rubbles along the shore area of Sha Lo Wan on 27 May 2014.	The complaint investigation report for the complaint of dumping rubbles along the shore area of Sha Lo Wan was submitted to EPD on 4 June 2014. EPD and AFCD provided their comments on 5 and 9 June 2014 respectively. A meeting among DCVJV, ARUP, IEC, ET, EPD and AFCD was held on 17 June 2014. According to the meeting, further information is required to include in the complaint investigation report and the report was submitted to EPD on 4 March 2015.	Complaint investigation report is under review by EPD

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Com-2014-05-003	Pier 39 to 50	29 May 2014	ARUP received the complaint on 29 May 2013. The complainant advised that the workers disposed hundreds of kg of waste spoils (concrete and earth) into the sea every day in the existing locations of HZMB site area.	Based on the investigation findings, the waste spoils (concrete and earth) were disposed to HY/2010/02 Project according to approved WMP. The following recommendations were made: • To check for any accumulation of waste spoils (concrete and earth) on site. • To cover the wastes skip with waste spoils before removing from site. • To carry out inspection of pier(s) regularly to ensure the frontline staff loads inert materials to approved barge properly. • To clean the waste storage areas regularly and do not cause dust nuisance.	Closed
Com-2014-08-001	Near Sha Lo Wan	27 August 2014	ARUP received the complaint on 27 August 2013. The complainant was concerned about the dust on the surface of the roro-barge.	Based on the investigation findings, dusty materials at the ro-ro barge at P63 and dust generation when vehicles passing by at the roro-barge at Southeast Quay were observed. The following recommendations were made: • To check for any accumulation of dusty materials at roro-barge. • To cover the stockpile of dusty materials before removing from site. • To clean the surface of roro-barge	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				regularly and do not cause dust and water quality nuisance. • To maintain the surface of roro-barge wet especially during the vehicle movements. Water misting is considered an acceptable measure to control dust emissions. • To check and replace the worn sand bags at the surface of roro-barge to prevent the turbid water from entering to the sea when watering the barge surface.	
Com-2014-11-001	HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	11 November 2014	The complaint was received by EPD on 11 November 2014. According to the EPD's email, the complaint was received from one of the green groups Sea Shepherd. They complained that the residual concrete had been washed off from the deck surface of a flat-top barge into the sea, and marine littering had been spotted by a worker of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	Based on the investigation findings, residue concrete or wastewater contaminated with concrete overflowing/spilling into the sea from the roro barge and marine littering were suspected. The following recommendations were made: ➢ Properly clear the concrete stains on the three ro-ro barges (e.g. hand-held equipments such as shovel etc). Tarpaulin sheet is also recommended to provide when clearing the concrete stains at the edge of roro barge to prevent these removed materials from getting into the sea. The worker should also pay special care to remove the concrete stains to	Closed
Com-2014-11-002	HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill	18 November 2014	The complaint was received by EPD on 18 November 2014. According to the EPD's email, it was alleged that residual concrete		Closed

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	(Contract No. HY/2011/09)		had been poured out directly from the concrete lorry mixers on a roro barge into the sea during night-time by the workers of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill (Contract No. HY/2011/09)	minimize the water quality nuisance. ➢ Keep cleanliness of the surface of roro-barge and do not cause water quality nuisance. ➢ To check and reinforce the concrete / sand bag bund between baffles erected near the edge of the three ro-ro barges to avoid accidental leakage of wastewater from the deck regularly. ➢ Keep all debris/ aggregate away from the edge of ro-ro barge to prevent them from falling into the sea. ➢ Provide sufficient skips for temporary storage of concrete residue/wastewater. ➢ To check for any accumulation of residual waste concrete at the waste skip on roro-barge. ➢ Provide spare and sufficient sand bags at each roro barges to confine the concerned area in the event of accidental spillage of concrete when discharge the concrete from the concrete lorry mixers to pump truck. ➢ Provide absorptive materials to absorb the wastewater in case of accidental spillage of wastewater	

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				during washing concrete lorry mixers or other equipments. ➢ Assign trained staff to ensure proper management of environmental matters on each of the ro-ro barges in particular the handling of concrete residue/wastewater generated during operation. ➢ Keep record for collection of skip or temporary storage tank for wastewater and excess concrete. ➢ Ensure sufficient garbage bag / rubbish bin are provided at working barge / pier site. ➢ Provide training for the workers regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental protection.	
Com-2014-11-003	Floating Concrete Batching Plant (FCBP)	28 November 2014	The complaint was received by EPD on 28 November 2014. The complaint was received from one of the green groups Green Lantau Association. They complained about the hauling of the floating concrete batching plant (FCBP) by the tug boat to the site of Contract No. HY/2011/09 from the north-	Based on the information collected, the following conclusions were drawn: 1) It is suspected that the wake following the FCBP was resulted from disturbance to the bottom sediment when it was traveling during the lowest tide on that day. 2) The FCBP was traveling within the	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
			east side had disturbed the seabed causing an increase of turbidity in marine waters at around noon of 15 November 2014.	site area and the maximum number of movement of a floating plant (and therefore tug boat) is two times per day. Average duration of each movement is around 1 hour/day. Therefore, the disturbance to the bottom sediment is considered temporary, localized and infrequent. 3) No illegally discharge of wastewater or domestic wastewater to the sea from FCBP. 4) Relevant environmental mitigation measures as shown in EP-352/2009/C were properly implemented. 5) No deterioration of marine water quality based on the marine water quality monitoring results on 15 November 2014. Nevertheless, DCVJV was also recommended the mitigation measures as below: • The vessel skipper should pay special care about the movement of deep draught vessel to avoid seabed disturbance. (e.g. speed restrictions) • In case of sediment plume was found behind vessel, the vessel skipper	

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				should further reduce vessel speed. • Minimum clearance of 0.6m should be maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash. (Reference: EIA-081/2002 - Construction of Lung Kwu Chau Jetty)	
Com-2014-12-001	Shores of Po Chue Tam and Shek Tsai Po, Tai O	7 December 2014	The complaint was received from one of the green groups Green Lantau Association. They complained about some waste materials (including a number of grey plastic mats and buoys) suspected in relation to the HZMB works have recently washed up on the shores of Po Chue Tam and Shek Tsai Po, Tai O	The owner of objects found on the shores could not be identified. DCVJV has taken initiative to remove these materials after receiving the complaint. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Gather up and remove debris to keep the work site orderly. • Maintain site housekeeping. Designate areas for waste materials and provide containers. • Secure loose or light material that is stored on open floors. • Do not permit rubbish to fall freely from any level of the pier sites. • Provide training for the workers	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental protection.	
Com-2014-12-002	Site Office of HZMB-HKLR – Section between HKSAR Boundary and Scenic Hill	2 December 2014	Highways Department (HyD) received a public complaint from a resident of Le Bleu Duex on 2 December 2014. According to the email from ARUP dated 3 December 2014, the complainant advised that the noise nuisance due to the metal parts were dropped onto the ground by people repetitively and loading or unloading a boat at the pier. The complaint was quoted, "*A resident living in Le Bleu Duex addressed a complaint to CE of HyD at about 20:04 hrs last night. He complained about the noise nuisance coming from site office since 19:30 hrs last night. Repetitively metal parts had been dropped on the ground by people who seem to*	Based on the information collected, the noise generated is considered due to the metal parts were dropped onto the ground at the seashore area near Le Bleu Duex. The metal pipe was unloaded at non-designated area and no powered mechanical equipment was used for unloading works at WA6 during restricted hour. The Contractor was reminded to take sufficient noise mitigation measures to minimize the environmental impact on the nearby community as recommended in the approved EIA report and the specific mitigation measures for the complaint including but not limited to:- • To place wooden planks or rubber mats on ground for loading and unloading heavy or metal objects; and • To deploy professional personnel to	Closed

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			be loading or unloading a boat at the pier. Noise was still going on right now at 20:04."	supervise the works.	
Com-2014-12-003	Along the shore from Yat Tung to Tai O	24 December 2014	The complainant was concerned about the increase of marine refuse (water bottles and debris) along the shore from Yat Tung to Tai O suspected in relation to the HZMB works.	The owner of marine refuse found on the shores could not be identified. DCVJV has taken initiative to remove these wastes after receiving the complaint. DCVJV will also take the initiative to clear the marine refuse along the shore from Yat Tung to Tai O, if necessary. Nevertheless, DCVJV was also recommended the mitigation measures as below: • Gather up and remove debris to keep the work site orderly. • Maintain site housekeeping. Designate areas for waste materials and provide containers. • Secure loose or light material that is stored on open floors. • Do not permit rubbish to fall freely from any level of the pier sites. • Provide training for the workers regularly regarding the water quality mitigation measures and waste management to increase their awareness of environmental	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/ Mitigation Action	Status
				protection.	

APPENDIX M
SUMMARY OF SUCCESSFUL PROSECUTION

Appendix M - Summary of Successful Prosecution

Date of Successful Prosecution	Details of the Successful Prosecution	Status	Follow Up
20 October 2014	The non-compliance of construction noise permit (CNP) numbered GW-RS1217-13 that use of powered mechanical equipment not permitted in the CNP on 15 March 2014 between the hours of 7p.m. and 7a.m. at Pier 72.	The subcontractor was fined.	To ensure the construction works would comply with the CNP during restricted hours, a Permit-to-work system was formulated to control daily operation of the CNPs.