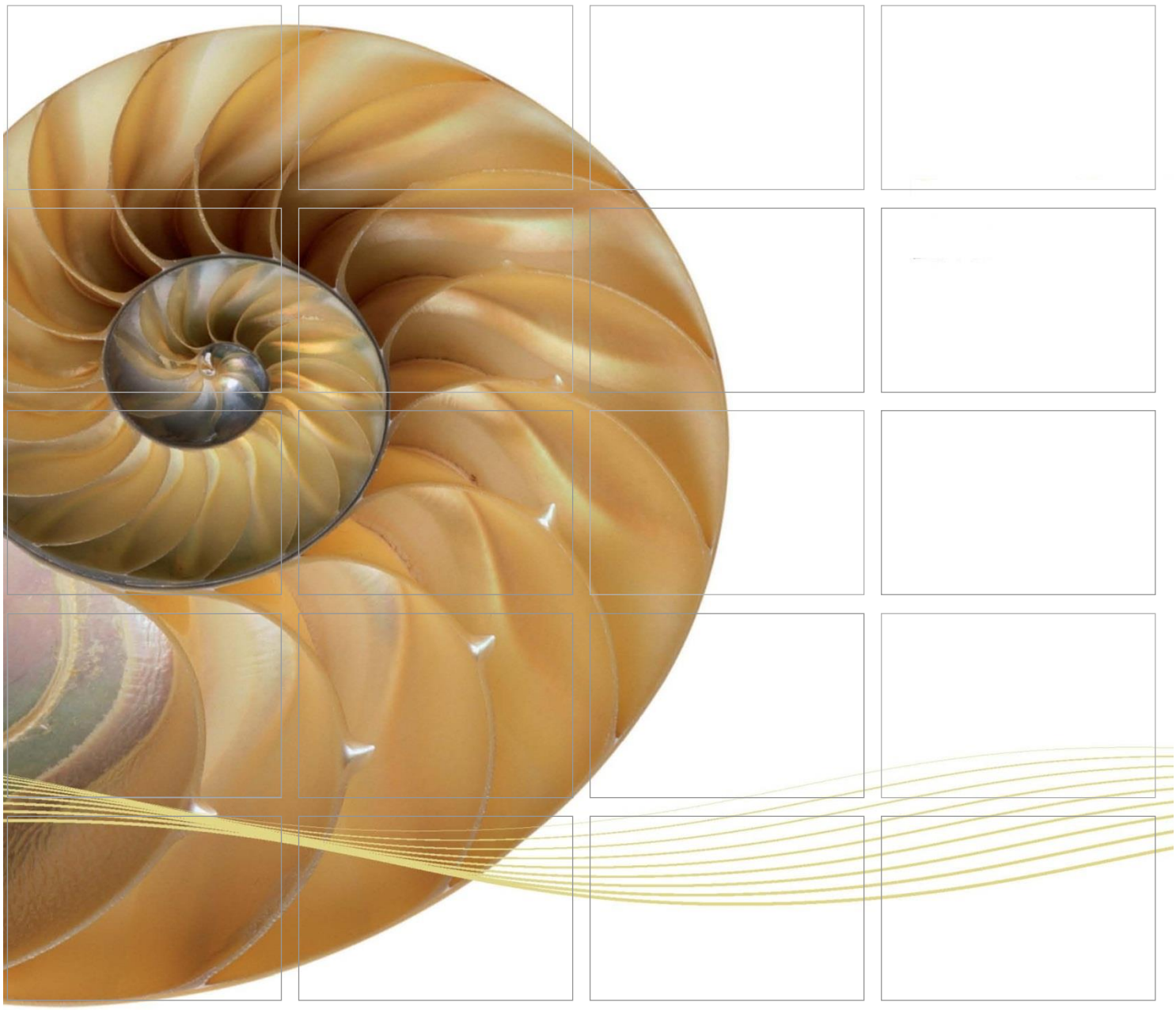
Report



Contract No. HY/2012/07
Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section

Twenty-third Quarterly Environmental Monitoring & Audit (EM&A) Report

13 January 2020

Environmental Resources Management
2507, 25/F, One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon, Hong Kong
Telephone 2271 3000
Facsimile 2723 5660

www.erm.com

ERM

The business of sustainability

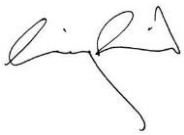
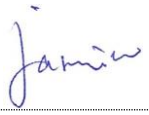
Contract No. HY/2012/07
Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section

Twenty-second Quarterly Environmental Monitoring & Audit (EM&A) Report

Environmental Resources Management

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

Document Code:
0215660_23rd Qtr EM&A_20200113.doc

Client:	Project No:
Gammon	0215660
Summary: This document presents the Twenty-third Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Southern Connection Viaduct Section.	Date: 13 January 2020 Approved by:  *Mr Craig Reid* *Partner* Certified by:  *Dr Jasmine Ng* *ET Leader*

Revision	Description	By	Checked	Approved	Date
	23rd Quarterly EM&A Report	VAR	JN	CAR	13/1/20

Distribution

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☒ Public

☐ Confidential

RAMBOLL

Ref.: HYDHZMBEEM00_0_7843L.20

21 January 2020

By Fax (3691 2899) and By Post

AECOM Asia Company Limited
Supervising Officer's Representative Office
780 Cheung Tung Road Lantau, Hong Kong

Attention: Mr. Daniel Ip

Dear Mr. Ip,

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/2012/07
TM-CLKL – Southern Connection Viaduct Section
23rd Quarterly EM&A Report for June 2019 - August 2019

Reference is made to the Environmental Team's submission of the quarterly EM&A report for June 2019 to August 2019 (ET's ref.: "*0215660_23rd Qtr EM&A_20200113.doc*" dated 13 January 2020) certified by the ET Leader and provided to us via e-mail on 14 January 2020.

Please be informed that we have no adverse comments on the captioned submission.

Thank you for your attention. Please feel free to contact the undersigned or the ENPO Leader, Mr. Y H Hui, should you require further information.

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

F. C. Tsang
Independent Environmental Checker
Tuen Mun-Chek Lap Kok Link

c.c.

HyD	Mr. Patrick Ng	(By Fax: 3188 6614)
HyD	Mr. Cheng Pan	(By Fax: 3188 6614)
AECOM	Mr. Conrad Ng	(By Fax: 3922 9797)
ERM	Dr. Jasmine Ng	(By Fax: 2723 5660)
Gammon	Mr. Roy Leung	(By Fax: 3520 0486)

Internal: DY, YH, RY, ENPO Site

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Ramboll Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.ramboll.com

TABLE OF CONTENTS

List of Appendices

Under *Contract No. HY/2012/07*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Southern Connection Viaduct Section of the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project) while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET). Ramboll Hong Kong Ltd. was employed by the HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) in accordance with *Environmental Permit No. EP-354/2009/A*. Further applications for variation of environmental permit (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

The southern landfall of TM-CLK Link lies alongside the Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) where a reclamation area is constructed by *Contract No. HY/2010/02* under *Environmental Permit No. EP-353/2009/K* and *EP-354/2009/D*. Upon the agreement and confirmation between the Supervising Officer Representatives and Contractors of *HY/2010/02* and *HY/2012/07* in September 2015, part of the reclamation area for southern landfall under *EP-353/2009/K* and *EP-354/2009/D* was handed-over to *Contract No. HY/2012/07*. Another part of the southern landfall area under *EP-354/2009/D* was handed-over to *Contract No. HY/2012/07* after completion of reclamation works by *Contract No. HY/2010/02* in June 2016.

The construction phase of the Contract commenced on 31 October 2013 and will be tentatively completed by 2019. The impact monitoring of the EM&A programme, including air quality, noise, water quality and marine ecological monitoring as well as environmental site inspections, commenced on 31 October 2013.

This is the Twenty-third Quarterly EM&A Report presenting the EM&A works carried out during the period from 1 June to 31 August 2019 for the Southern Connection Viaduct Section in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, major activities in the reporting period included:

<u>June 2019</u>

Marine-based Works

- Reinstatement of seawall at Seafront

Land-based Works

- At-grade works at HKBCF; and

- Landscaping softwork.

July 2019

Land-based Works

- Reinstatement of seawall at Seafront.

August 2019

There are no major works undertaken in August 2019.

A summary of monitoring and audit activities conducted in the reporting period is listed below:

24-hour TSP monitoring	16 sessions
1-hour TSP monitoring	17 sessions
Noise monitoring	17 sessions
Water quality monitoring	36 sessions
Dolphin monitoring	6 sessions
Joint Environmental site inspection	13 sessions

Breaches of Action and Limit Levels for Air Quality

One (1) Limit Level exceedance of 1-hour TSP was recorded for construction air quality monitoring in the reporting period. No exceedance of Action and Limit Levels of 24-hour TSP was recorded in the reporting period.

Breaches of Action and Limit Levels for Noise

No exceedance of Action and Limit Levels was recorded for construction noise monitoring in the reporting period.

Breaches of Action and Limit Levels for Water Quality

A total of thirty one (31) Action Level exceedances and three (3) Limit Level exceedances of bottom-depth dissolved oxygen (DO) and fifteen (15) Action Level exceedance of surface and middle-depth DO were recorded for water quality impact monitoring in the reporting period.

Impact Dolphin Monitoring

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June to August 2019. No unacceptable impact from the construction activities of the TM-CLKL Southern Connection Viaduct Section on Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphins) was noticeable from general observations during the dolphin monitoring in this reporting quarter.

Daily marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. Exclusion zone monitoring was undertaken in June 2019 and no sighting of the Chinese White Dolphin was recorded. No marine works were undertaken in July and August 2019, therefore, daily 250m marine mammal exclusion zone monitoring was not undertaken in July and August 2019. No Passive Acoustic Monitoring (PAM) was implemented as the marine piling works were not carried out outside the daylight hours in this reporting period.

Environmental Complaints, Non-compliance & Summons

There was no environmental complaint, notification of summons or successful prosecution recorded in the reporting period.

Reporting Change

There was no reporting change in this reporting period.

Upcoming Works for the Next Reporting Period

Works to be undertaken in the coming quarter include the following:

September 2019

There are no major works to be undertaken in the next monitoring period of September 2019.

October 2019

There are no major works to be undertaken in the next monitoring period of October 2019.

November 2019

There are no major works to be undertaken in the next monitoring period of November 2019.

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are mainly associated with waste management issue.

1 INTRODUCTION

1.1 BACKGROUND

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong – Zhuhai – Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau – Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

An Environmental Impact Assessment (EIA) of TM-CLKL (the Project) was prepared in accordance with the EIA Study Brief (No. *ESB-175/2007*) and the *Technical Memorandum of the Environmental Impact Assessment Process* (*EIAO-TM*). The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number: *AEIAR-146/2009*), an Environmental Permit (*EP-354/2009*) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (*EP-354/2009A*) was issued on 8 December 2010. Further applications for variation of environmental permit (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Contract No. HY/2012/07*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Southern Connection Viaduct Section of TM-CLKL ("the Contract") while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET). Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) in accordance with *Environmental Permit No. EP-354/2009/A*.

The southern landfall of TM-CLK Link lies alongside the Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) where a reclamation area is constructed by *Contract No. HY/2010/02* under *Environmental Permit No. EP-353/2009/K* and *EP-354/2009/D*. Upon the agreement and confirmation between the Supervising Officer Representatives and Contractors of *HY/2010/02* and *HY/2012/07* in September 2015, part of the reclamation area for southern landfall under *EP-353/2009/K* and *EP-354/2009/D* was handed-over to *Contract No. HY/2012/07*. Another part of the

southern landfall area under *EP-354/2009/D* was handed-over to *Contract No. HY/2012/07* after completion of reclamation works by *Contract No. HY/2010/02* in June 2016.

The construction phase of the Contract commenced on 31 October 2013 and will be tentatively be completed by 2019. The impact monitoring phase of the EM&A programme, including air quality, noise, water quality and marine ecological monitoring as well environmental site inspections, commenced on 31 October 2013.

The general layout plan of the Contract components is presented in *Figures 1.1 & 1.2a to l.*

1.2 SCOPE OF REPORT

This is the Twenty-third Quarterly EM&A Report under the *Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section.* This report presents a summary of the environmental monitoring and audit works from 1 June to 31 August 2019.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Contract is shown in *Appendix A*. The key personnel contact names and contact details are summarized in *Table 1.1* below.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
HyD (Highways Department)	Project Coordinator	Stanley Chan	2762 3406	3188 6614
	Senior Engineer	Steven Shum	2762 4133	3188 6614
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Daniel Ip	3553 3800	2492 2057
	Resident Engineer	Chan Wah Fu	2293 6434	3691 2899
	Resident Engineer	Ivan Yim	3691 3950	3691 2899
ENPO / IEC (Ramboll Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Dr. F.C. Tsang	3465 2851	3465 2899
Contractor (Gammon Construction Limited)	Environmental Officer	Roy Leung	3520 0387	3520 0486
	24-hour Complaint Hotline		9738 4332	
ET (ERM-HK)	ET Leader	Dr. Jasmine Ng	2271 3311	2723 5660

大小磨刀
THE BROTHERS

鹿頸灣
LUK KENG BAY

鹿頸村
Luk Keng Tsuen

陰仔灣
YAM TSAI WAN

欣澳灣
YAN O WAN

陰仔
Yam Tsai

打棚埔
Ta Pang Po

欣澳篤
YAN O TUK

Site Office WA5

匙羹洲
TSZ KAN CHAU

東葉坑
Tung Yip Hang

深水角
Sham Shui Kok

四白坳
SZE PAK AU

犁壁山
LAI PIK SHAN

三白坳
SAM PAK AU

大輋峒
TAI CHE TUNG

濾水廠
Water Treatment Works

污水處理廠
Sewage Treatment Works

小蠔灣
SIU HO WAN

三白
Sam Pak

三白灣
SAM PAK WAN

牛頭灣
NGAU TAU WAN

鐵路車廠
Railway Depot

二白坳
YI PAK AU

時峰
Neo Horizon

尚堤
Chianti

津堤
Amalfi

海澄湖畔
Siena

頤峰

大白灣
DISCOVERY BAY
(TAI PAK WAN)

榴花峒
LAU FA TUNG

二白灣
YI PAK WAN

Greenvale Village

明翠台
Parkridge Village

蟹鉗咀
Hai Kam Tsui

蔚陽
Headland Village

愉景灣
Discovery Bay

老虎頭
LO FU TAU

碧濤

畔峰
Midvale Village

Beach Village

大白咀
Tai Pak Tsui

菜園灣
TSOI YUEN WAN

海堤居
La Costa

寶峰
Parkvale Village

大蠔灣
TAI HO WAN

白芒
Pak Mong

大蠔

海蝶居
La Vista

Hillgrove Village

海鬆居
La Serene

N

Kilometers

0 0.5 1

Key

Site Boundary

Figure 1.1

General Layout Plan of the Project

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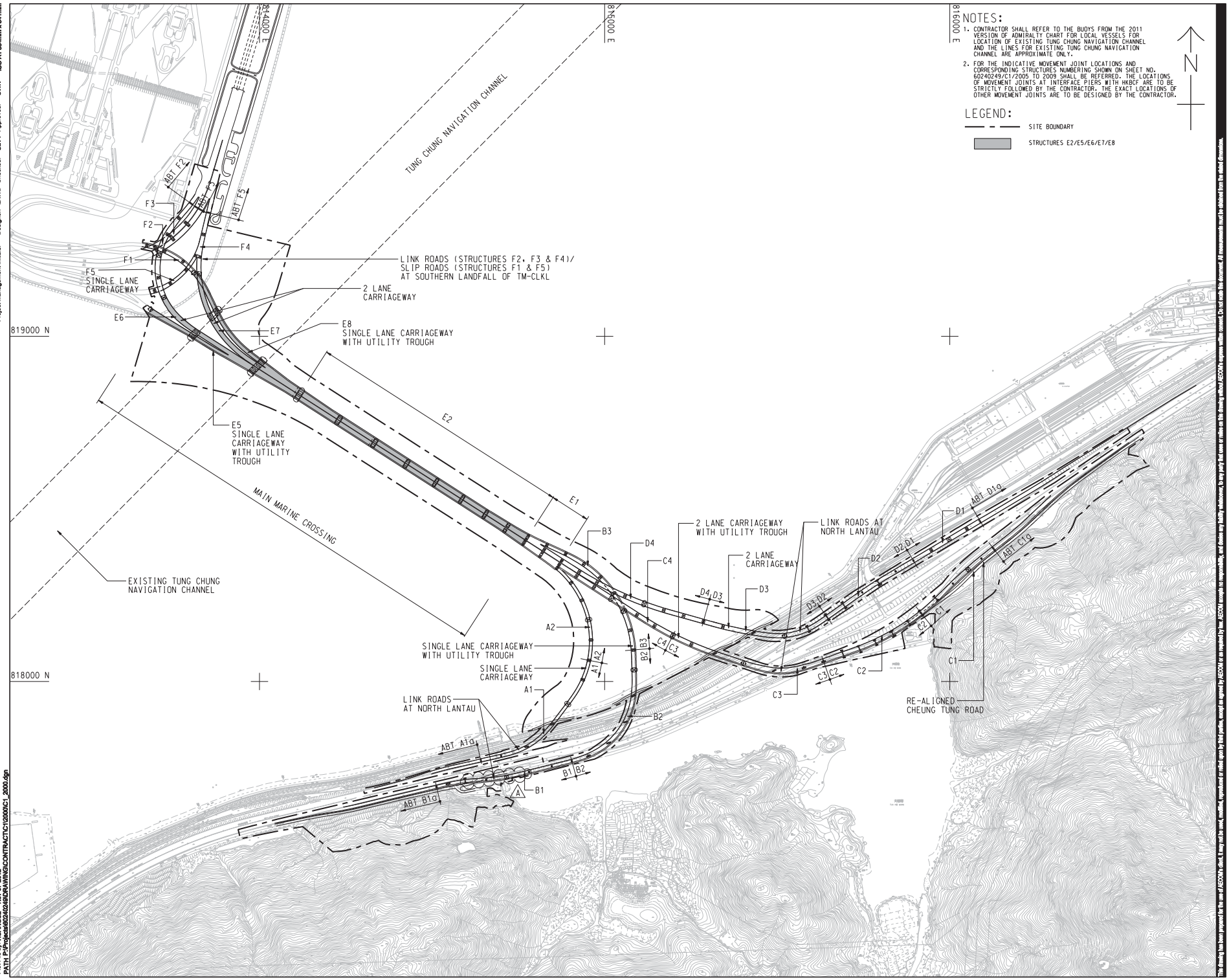
Environmental Resources Management

ERM



AECOM

PROJECT
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - SOUTHERN CONNECTION VIADUCT SECTION

CLIENT
路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

Figure 1.2a

ISSUE/REVISION

IR	DATE	DESCRIPTION	CHK.
A	NOV. 12	TENDER ADDENDUM NO. 1	CWN
-	OCT. 12	TENDER DRAWING	CWN

STATUS

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DIMENSION UNIT: METRES

KEY PLAN

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CONTRACT NO.: HY/2012/07

SHEET TITLE
SOUTHERN CONNECTION GENERAL LAYOUT PLAN

SHEET NUMBER
60240249/C1/2000A

Project Management Initials: Designer: LKWB Checked: SLYY Approved: CWN ISO A1 594mm x 841mm CWN

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KEY PLAN

NOTES

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LEGEND

- SITE BOUNDARY
- GF1 FAULT

EXISTING G.I.STATIONS :

- BOREHOLE BY GIU DATA EXCLUDING VC
- BOREHOLE BY GCL CONTRACT HY/2012/04
- BOREHOLE BY GCL CONTRACT NL8/97
- BOREHOLE BY GCL CONTRACT HY/2009/23
- TRIAL PIT BY GCL CONTRACT HY/2012/04
- SLOPE STRIPPING BY GCL CONTRACT HY/2012/04

PROPOSED G.I.STATIONS :

- PBH01 PROPOSED BOREHOLE
- TP01 PROPOSED TRIAL PIT
- CH01 PROPOSED COREHOLE
- SS01 SS02 PROPOSED SLOPE STRIPPING

MATCH LINE
FOR CONTINUATION
SEE DRG J3518/P/OAP/04/01101

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1 : 1000

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C	SUBMISSION	RC	09/13				

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Client: 路政署 HIGHWAYS DEPARTMENT, Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

Project Title: Contract No. HY/2012/07
Tuen Mun - Chek Lap Kok Link
Southern Connection Viaduct Section

Drawing title: **Figure 1.2b**

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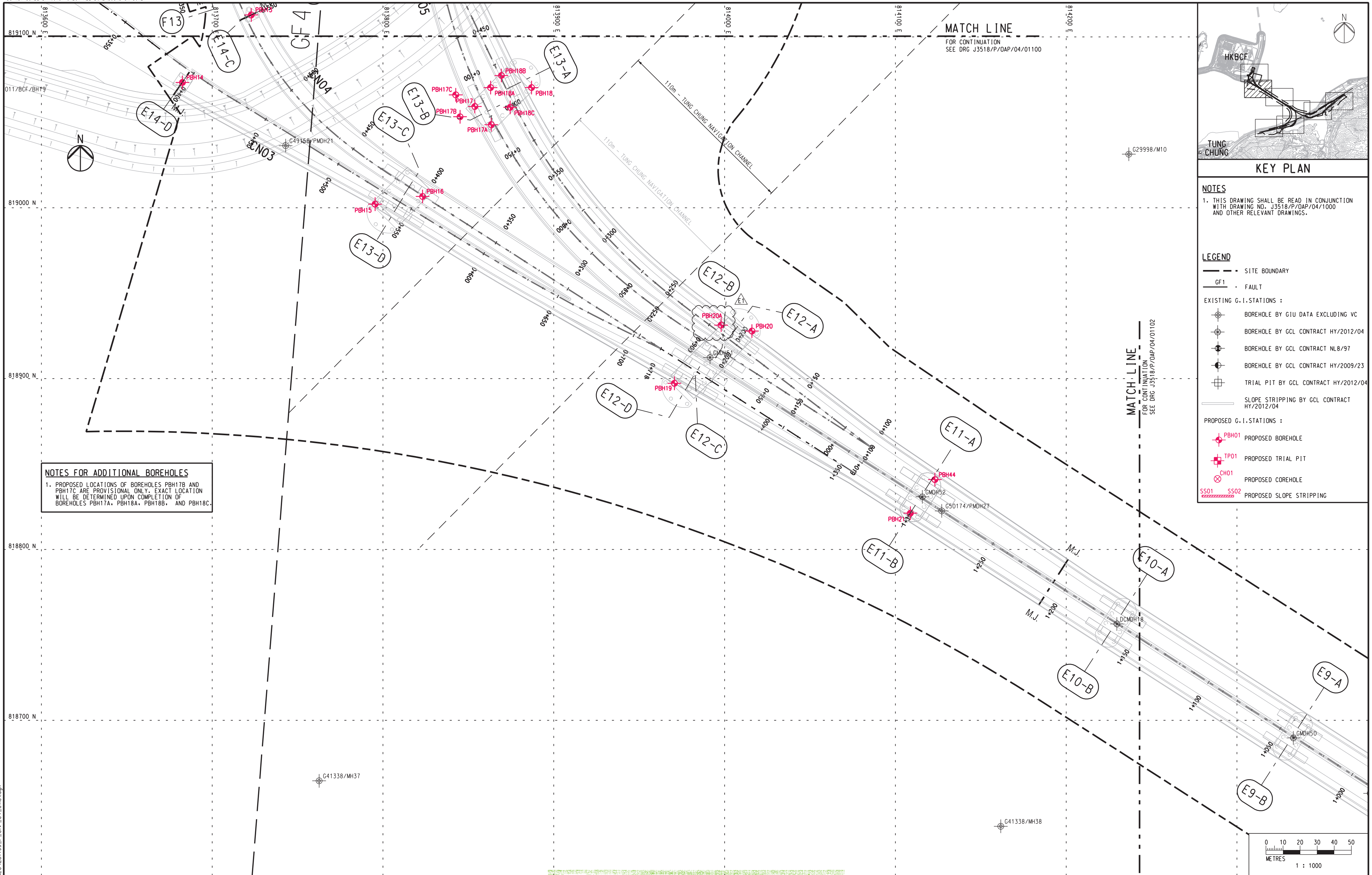

NOTES FOR ADDITIONAL BOREHOLES

1. PROPOSED LOCATIONS OF BOREHOLES PBH17B AND PBH17C ARE PROVISIONAL ONLY. EXACT LOCATION WILL BE DETERMINED UPON COMPLETION OF BOREHOLES PBH17A, PBH18A, PBH18B, AND PBH18C.

NOTES

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LEGEND

- SITE BOUNDARY
- GF1 FAULT

EXISTING G.I. STATIONS :

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- BOREHOLE BY GCL CONTRACT HY/2012/04
- BOREHOLE BY GCL CONTRACT NL8/97
- BOREHOLE BY GCL CONTRACT HY/2009/23
- TRIAL PIT BY GCL CONTRACT HY/2012/04
- SLOPE STRIPPING BY GCL CONTRACT HY/2012/04

PROPOSED G.I. STATIONS :

- PBH01 PROPOSED BOREHOLE
- TP01 PROPOSED TRIAL PIT
- CH01 PROPOSED COREHOLE
- SS01 SS02 PROPOSED SLOPE STRIPPING

Rev	Description	By	Date
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B	SUBMISSION	RC	07/13
C	SUBMISSION	RC	09/13
D	SUBMISSION	RC	10/13
E1	FOR INTERNAL REVIEW	RC	11/13

Drawn: RL Date: 07/13
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Client: 路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Supervising Officer: AECOM
Contractor: Gammon
Originator: ARUP

Project Title: Contract No. HY/2012/07
Tuen Mun - Chek Lap Kok Link
Southern Connection Viaduct Section

Drawing title:

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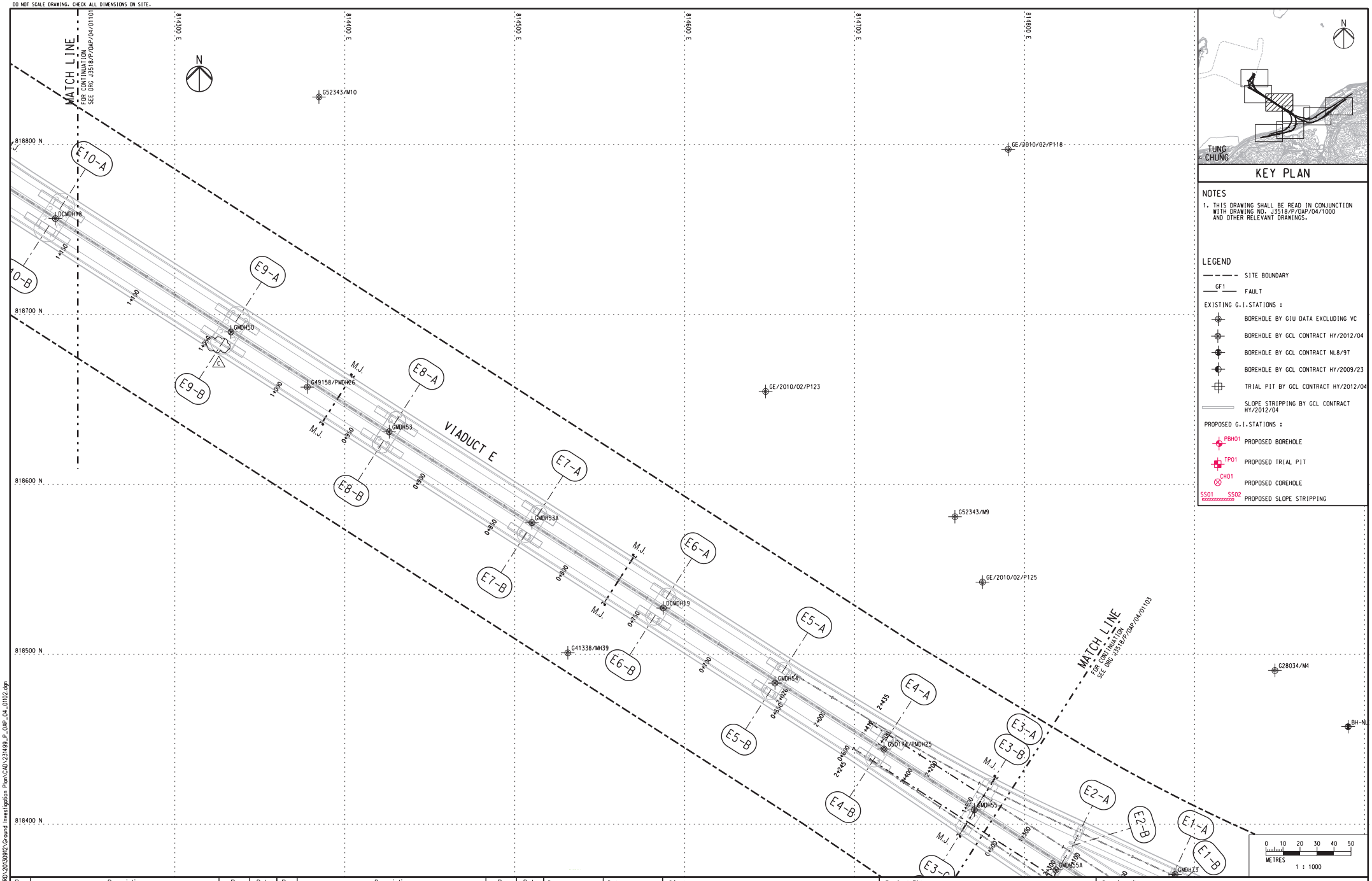

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Client: 路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理處 Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office

Project Title: Contract No. HY/2012/07
Tuen Mun - Chek Lap Kok Link
Southern Connection Viaduct Section

Supervising Officer: AECOM
Contractor: Gammon
Originator: ARUP

Drawing title: **Figure 1.2d**

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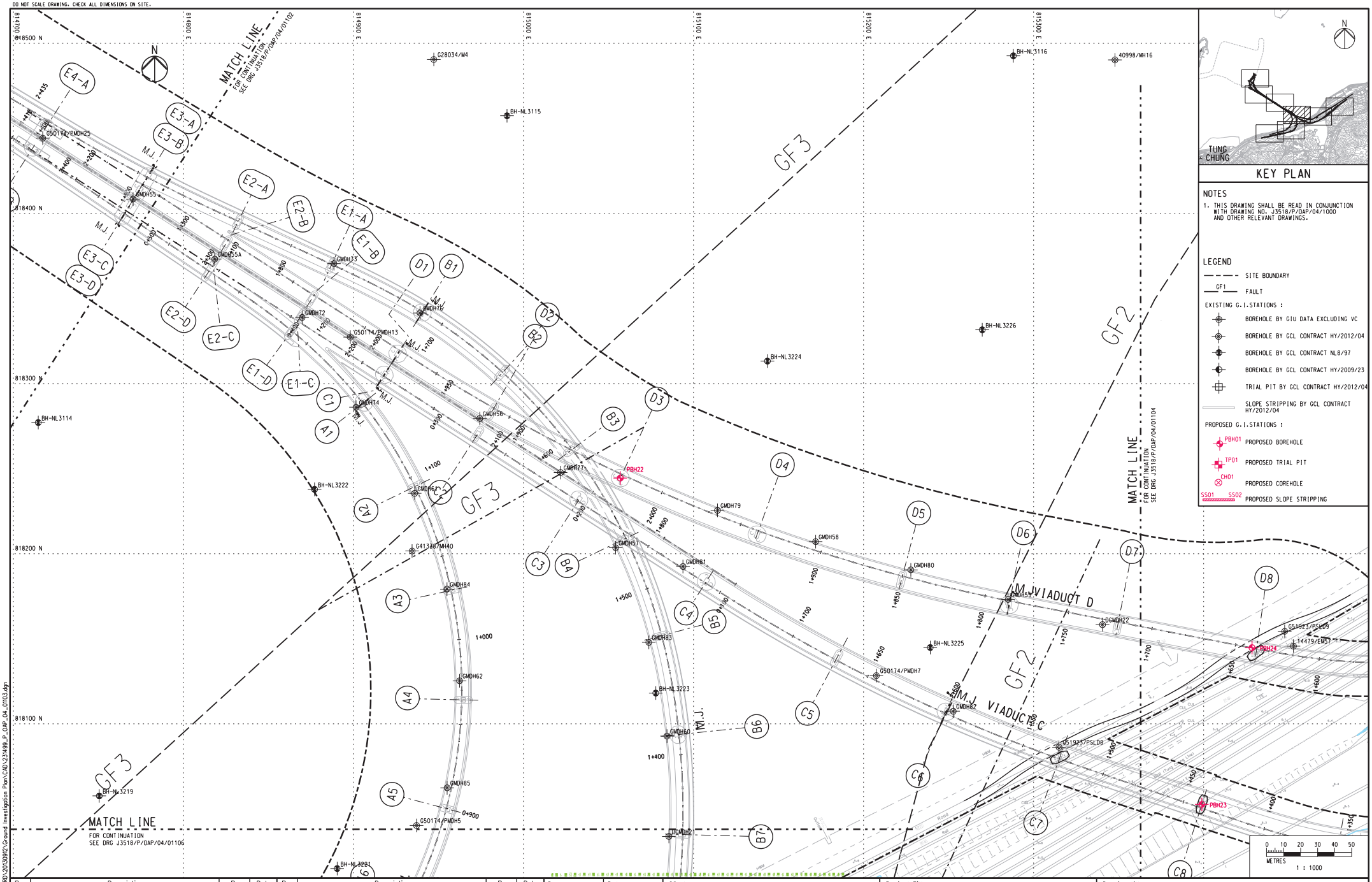

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C	SUBMISSION	RC	09/13				

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Client: 路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Project Title: Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section

Supervising Officer: AECOM
Contractor: Gammon
Originator: ARUP

Drawing title: **Figure 1.2e**

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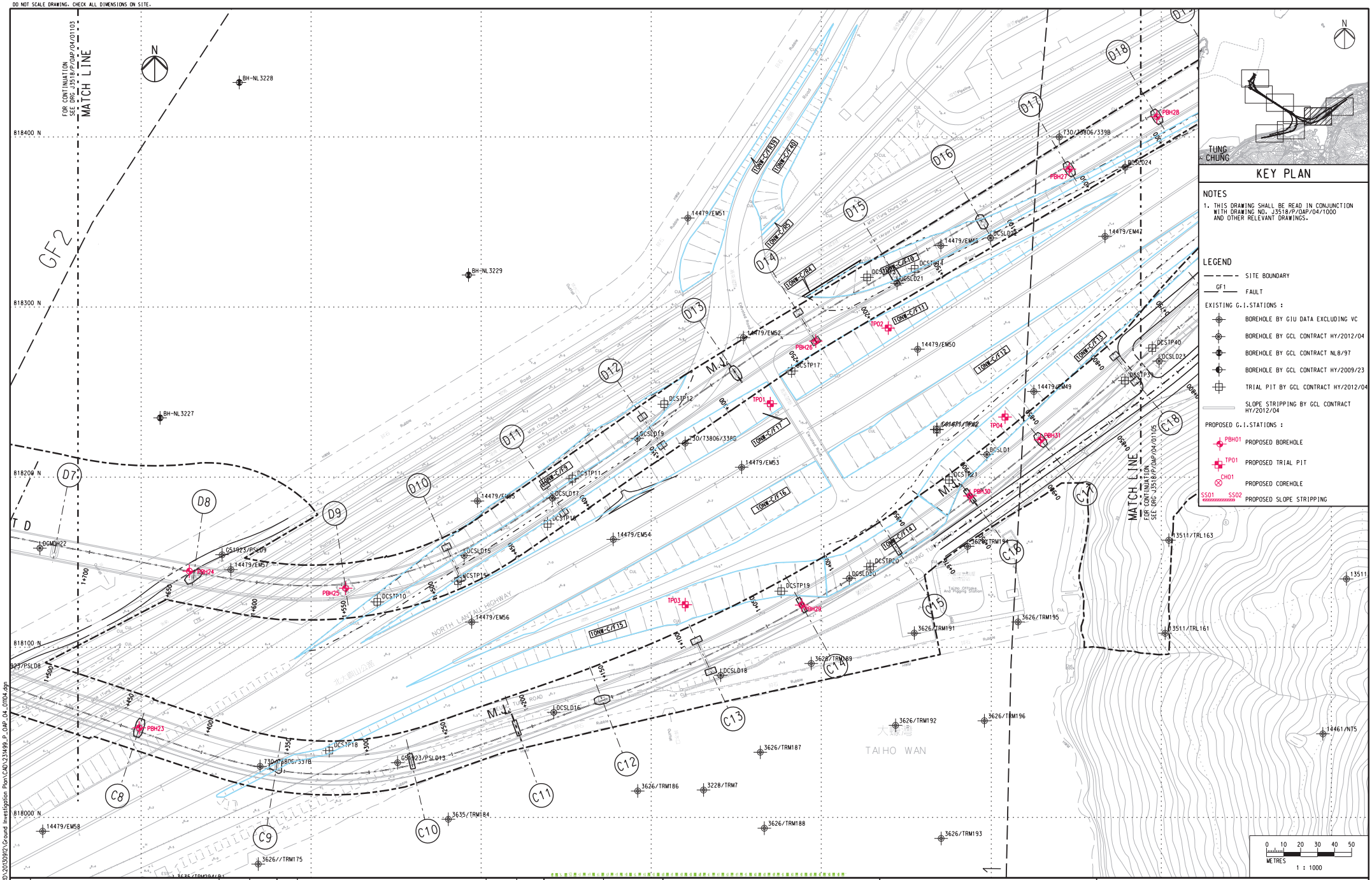

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Client: 路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Project Title: Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

Drawing title: **Figure 1.2f**

Drawing no. J3518/P/OAP/04/01104 Rev. C

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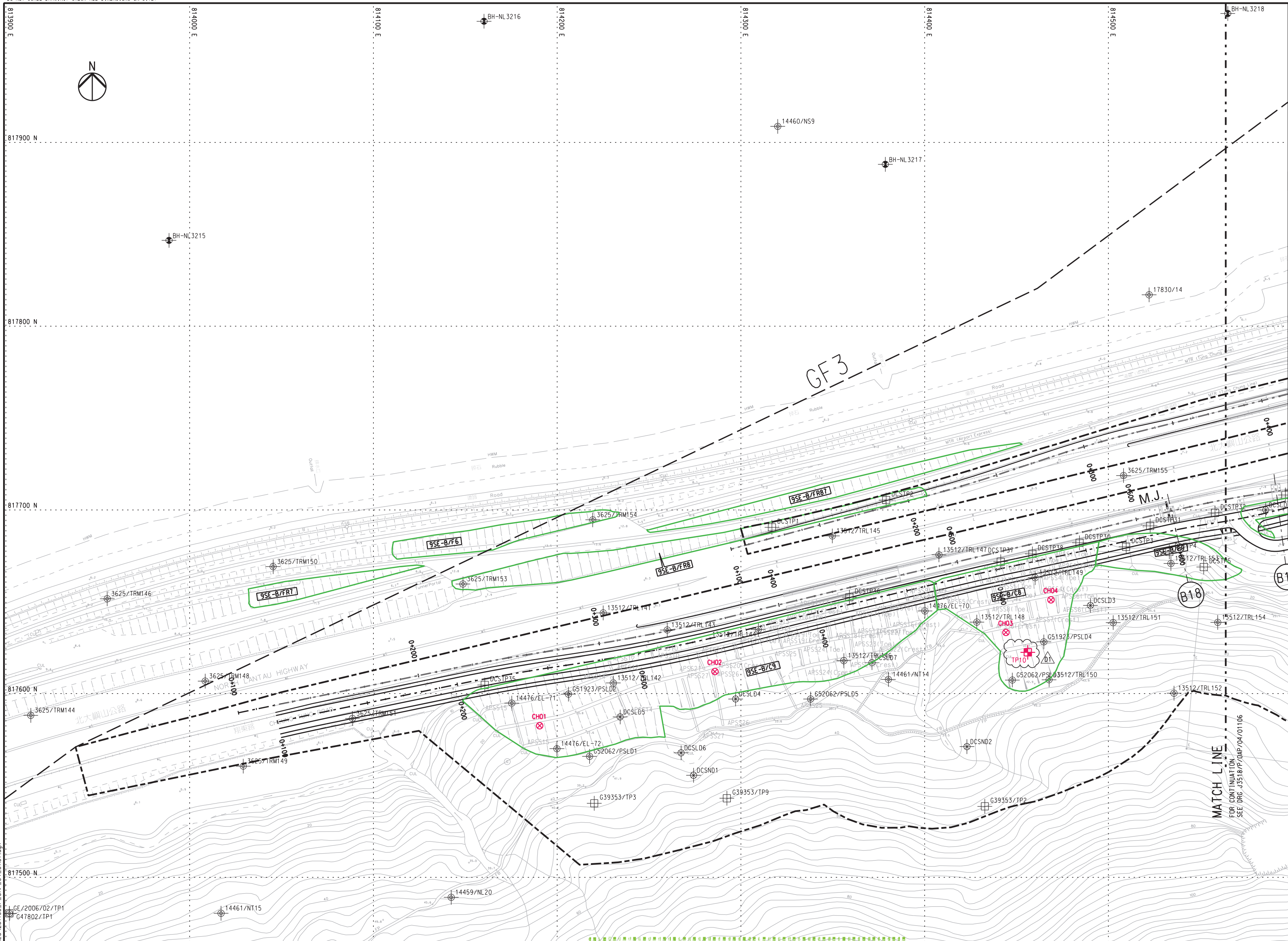

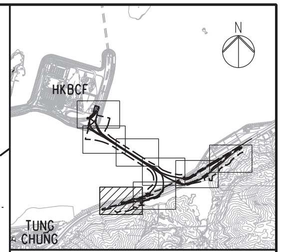

KEY PLAN

NOTES

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LEGEND

- SITE BOUNDARY
- GF1 FAULT

EXISTING G.I.STATIONS :

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- BOREHOLE BY GCL CONTRACT HY/2012/04
- BOREHOLE BY GCL CONTRACT NL8/97
- BOREHOLE BY GCL CONTRACT HY/2009/23
- TRIAL PIT BY GCL CONTRACT HY/2012/04
- SLOPE STRIPPING BY GCL CONTRACT HY/2012/04

PROPOSED G.I.STATIONS :

- PBH01 PROPOSED BOREHOLE
- TP01 PROPOSED TRIAL PIT
- CH01 PROPOSED COREHOLE
- SS01 SS02 PROPOSED SLOPE STRIPPING

Rev	Description	By	Date	Rev	Description	By	Date
A	SUBMISSION	RC	07/13				
B	SUBMISSION	RC	07/13				
C	SUBMISSION	RC	09/13				
D1	FOR INTERNAL REVIEW	RC	11/13				

Drawn	Date	Checked	Approved	Scale
RL	07/13	DS	DOP	1:1000 @ A1 / 1:2000 @ A3

Client: 路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

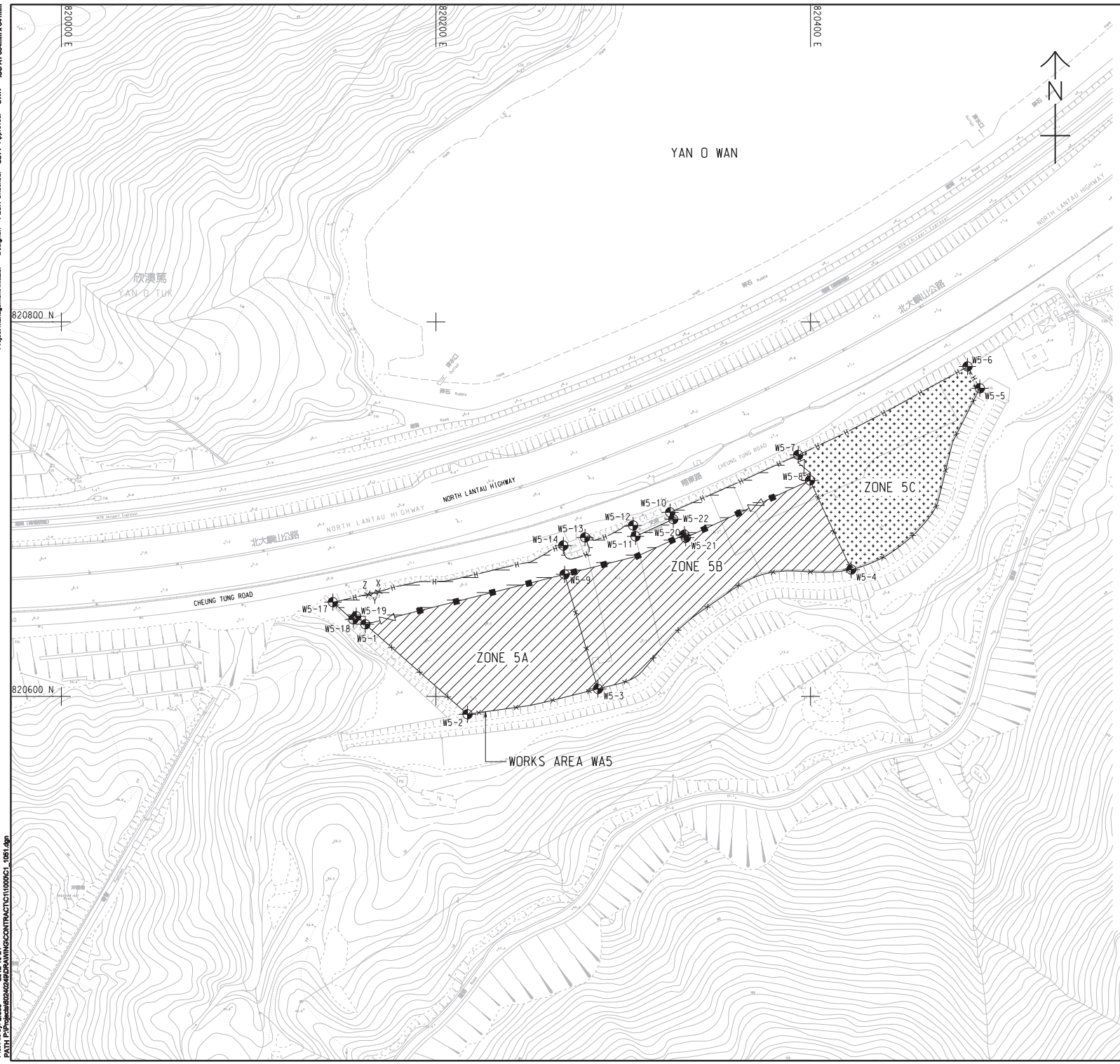
Project Title: Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section

Drawing title:

Figure 1.2g

Drawing no. J3518/P/OAP/04/01107 Rev. D1

Printed by : 07/11/2013
Filename : J:\231499\ARUP\GEO\231499_P_OAP_04_01107.dgn



NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE WORKS AREA KEY PLAN IN SHEET NO. 60240249/C1/1000.
2. THE SETTING OUT INFORMATION AND WORKS AREA CONDITIONS SHOWN IN THIS DRAWING ARE FOR REFERENCE ONLY. THE WORKS AREA BOUNDARY SHALL BE IN ACCORDANCE WITH THE ENGINEERING CONDITIONS FOR TEMPORARY GOVERNMENT LAND ALLOCATION NO. TIS 619. IN CASE OF DISCREPANCY BETWEEN THE BOUNDARY SHOWN ON THIS DRAWING AND THE BOUNDARY INDICATED ON THE ENGINEERING CONDITIONS, THE LATTER SHALL PREVAIL.
3. DEMARCATION OF THE WORKS AREA SHALL BE DETERMINED ON SITE.
4. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6110 AND H6111 FOR DETAILS OF HOARDING.
5. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6121 AND H6122 FOR DETAILS OF CHAIN LINK FENCE.
6. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NO. H6121 FOR DETAILS OF GATE.
7. CHAIN LINK FENCE SHALL BE ERECTED ALONG THE WORKS AREA BOUNDARY. THE ALIGNMENT AND EXTENT OF CHAIN LINK FENCE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE SUPERVISING OFFICER.
8. THE LOCATION AND WIDTH OF GATE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE SUPERVISING OFFICER.
9. NO STRUCTURES SHALL BE ERECTED OTHER THAN SUCH STRUCTURES NOT EXCEEDING TWO STOREYS IN HEIGHT, WHICH ARE APPROVED BY THE DISTRICT LANDS OFFICER AS BEING APPROPRIATE FOR THE USE OF THE SITE AS A WORKS AREA.
10. THE TENTATIVE OCCUPATION PERIOD SHALL BE REFERRED TO EMPLOYER'S REQUIREMENTS PART 2 AND PART 14 SECTION 1 CLAUSE 1.45A.
11. THE WORKS AREAS SHOWN ON THIS DRAWING ARE TO BE SHARE-USED AMONG THE CONTRACTS OF TM-CLKL RELATED CONTRACTS.THE AREAS HATCHED WITH ▨ ARE TENTATIVELY ALLOCATED FOR THE USE BY THIS CONTRACT.
12. THE COMMON AREA SHALL BE CONCRETE PAVED BY THE CONTRACTOR.

LEGEND:

- WORKS AREA UNDER THIS CONTRACT
- COMMON AREA (MAINTAINED UNDER THIS CONTRACT) TO BE SHARE-USED WITH OTHER CONTRACTS
- WORKS AREA FOR THIS CONTRACT TO BE EARLY HANDED OVER BY THE CONTRACTOR.
- H — HOARDING AND GATE (TO BE ERECTED AND MAINTAINED UNDER THIS CONTRACT)
- CHAIN LINK FENCE AND GATE (TO BE ERECTED AND MAINTAINED BY OTHERS)
- CHAIN LINK FENCE AND GATE (TO BE ERECTED AND MAINTAINED UNDER THIS CONTRACT)

SETTING OUT COORDINATES OF WORKS AREA WA5

POINT	COORDINATES	
	EASTING	NORTHING
W5-1	820162.308	820638.492
W5-2	820216.839	820590.455
W5-3	820286.496	820603.985
W5-4	820421.757	820667.742
W5-5	820490.425	820764.554
W5-6	820483.839	820776.180
W5-7	820393.451	820728.958
W5-8	820399.746	820715.343
W5-9	820268.674	820665.173
W5-10	820325.075	820698.276
W5-11	820306.587	820685.458
W5-12	820305.269	820691.287
W5-13	820279.580	820684.863
W5-14	820268.027	820680.572
X	820169.407	820655.859
Y	820166.601	820655.172
Z	820163.794	820654.484
W5-17	820144.957	820650.334
W5-18	820155.899	820641.093
W5-19	820157.432	820642.788
W5-20	820332.642	820686.314
W5-21	820333.350	820684.738
W5-22	820326.723	820694.608

AECOM

PROJECT
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - SOUTHERN CONNECTION VIADUCT SECTION

CLIENT
HIGHWAYS DEPARTMENT
路政署
Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK.
-	OCT. 12	TENDER DRAWING	CWN

STATUS

SCALE: A1 1 : 1000
DIMENSION UNIT: METRES

KEY PLAN

Figure 1.2h

PROJECT NO.: 60240249
CONTRACT NO.: HY/2012/07

SHEET TITLE
WORKS AREA AND HOARDING PLAN

SHEET 1 OF 2

SHEET NUMBER
60240249/C1/1051

Project Management Initials: Designer: PLCK Checked: SLYY Approved: CWN ISO A1 594mm x 841mm

Plot File by: LIUJ3 2012-10-24
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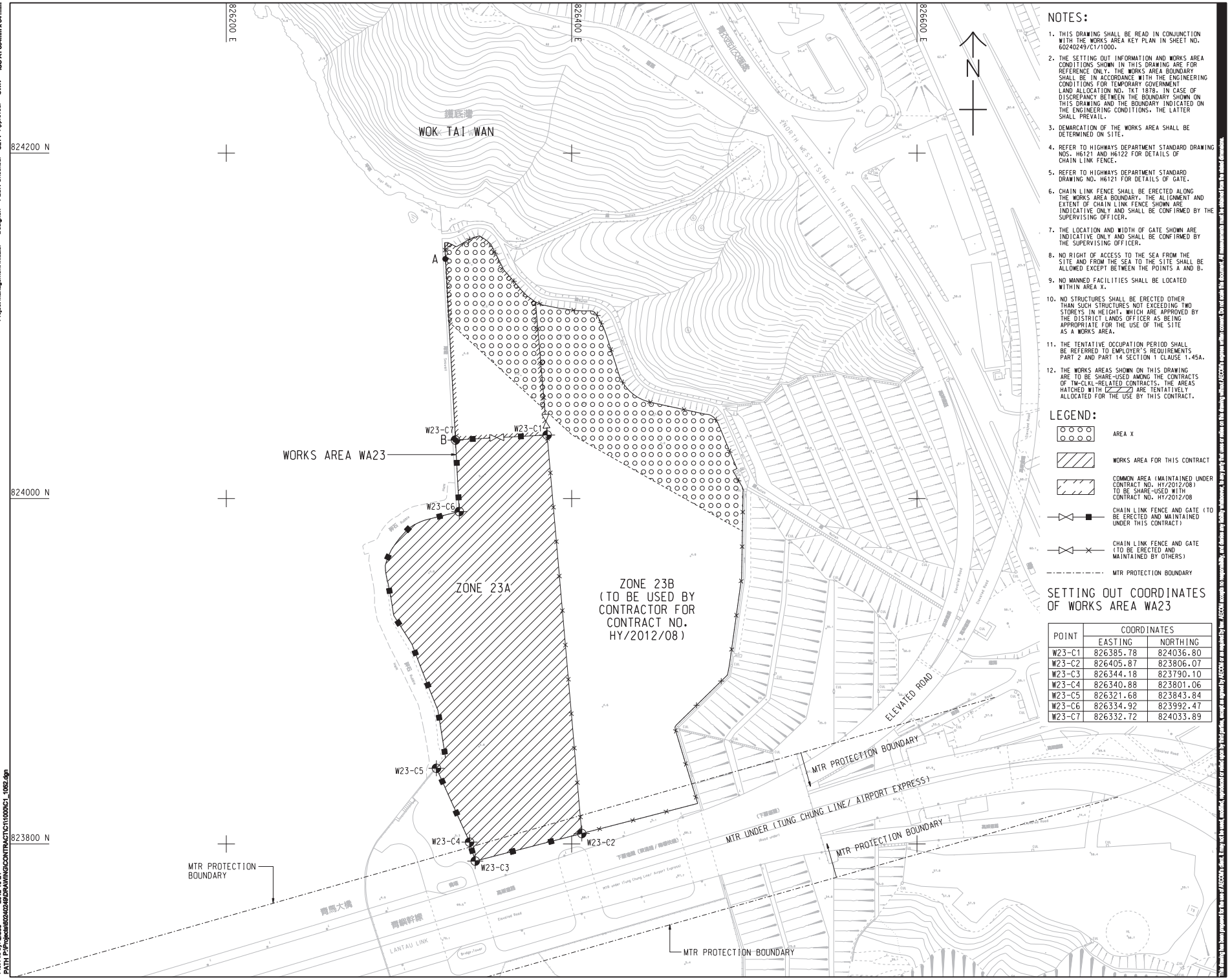

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE WORKS AREA KEY PLAN IN SHEET NO. 60240249/C1/1000.
2. THE SETTING OUT INFORMATION AND WORKS AREA CONDITIONS SHOWN IN THIS DRAWING ARE FOR REFERENCE ONLY. THE WORKS AREA BOUNDARY SHALL BE IN ACCORDANCE WITH THE ENGINEERING CONDITIONS FOR TEMPORARY GOVERNMENT LAND ALLOCATION NO. TKT 1878. IN CASE OF DISCREPANCY BETWEEN THE BOUNDARY SHOWN ON THIS DRAWING AND THE BOUNDARY INDICATED ON THE ENGINEERING CONDITIONS, THE LATTER SHALL PREVAIL.
3. DEMARCATION OF THE WORKS AREA SHALL BE DETERMINED ON SITE.
4. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6121 AND H6122 FOR DETAILS OF CHAIN LINK FENCE.
5. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NO. H6121 FOR DETAILS OF GATE.
6. CHAIN LINK FENCE SHALL BE ERECTED ALONG THE WORKS AREA BOUNDARY. THE ALIGNMENT AND EXTENT OF CHAIN LINK FENCE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE SUPERVISING OFFICER.
7. THE LOCATION AND WIDTH OF GATE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE SUPERVISING OFFICER.
8. NO RIGHT OF ACCESS TO THE SEA FROM THE SITE AND FROM THE SEA TO THE SITE SHALL BE ALLOWED EXCEPT BETWEEN THE POINTS A AND B.
9. NO MANNED FACILITIES SHALL BE LOCATED WITHIN AREA X.
10. NO STRUCTURES SHALL BE ERECTED OTHER THAN SUCH STRUCTURES NOT EXCEEDING TWO STOREYS IN HEIGHT, WHICH ARE APPROVED BY THE DISTRICT LANDS OFFICER AS BEING APPROPRIATE FOR THE USE OF THE SITE AS A WORKS AREA.
11. THE TENTATIVE OCCUPATION PERIOD SHALL BE REFERRED TO EMPLOYER'S REQUIREMENTS PART 2 AND PART 14 SECTION 1 CLAUSE 1.45A.
12. THE WORKS AREAS SHOWN ON THIS DRAWING ARE TO BE SHARE-USED AMONG THE CONTRACTS OF TM-CLKL-RELATED CONTRACTS. THE AREAS HATCHED WITH ▨ ARE TENTATIVELY ALLOCATED FOR THE USE BY THIS CONTRACT.

LEGEND:

- AREA X
- WORKS AREA FOR THIS CONTRACT
- COMMON AREA (MAINTAINED UNDER CONTRACT NO. HY/2012/08) TO BE SHARE-USED WITH CONTRACT NO. HY/2012/08
- CHAIN LINK FENCE AND GATE (TO BE ERECTED AND MAINTAINED UNDER THIS CONTRACT)
- CHAIN LINK FENCE AND GATE (TO BE ERECTED AND MAINTAINED BY OTHERS)
- MTR PROTECTION BOUNDARY

SETTING OUT COORDINATES OF WORKS AREA WA23

POINT	COORDINATES	
	EASTING	NORTHING
W23-C1	826385.78	824036.80
W23-C2	826405.87	823806.07
W23-C3	826344.18	823790.10
W23-C4	826340.88	823801.06
W23-C5	826321.68	823843.84
W23-C6	826334.92	823992.47
W23-C7	826332.72	824033.89

AECOM

PROJECT
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - SOUTHERN CONNECTION VIADUCT SECTION

CLIENT
HIGHWAYS DEPARTMENT
Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK.
-	OCT. 12	TENDER DRAWING	CWN

STATUS

SCALE: A1 1 : 1000
DIMENSION UNIT: METRES

KEY PLAN

Figure 1.2i

PROJECT NO.: 60240249
CONTRACT NO.: HY/2012/07

SHEET TITLE
WORKS AREA AND HOARDING PLAN

SHEET 2 OF 2

SHEET NUMBER
60240249/C1/1052

Project Management Initials: Designer: PLCK Checked: SLYY Approved: CWN ISO A1 594mm x 841mm

Plot File by: LIUJ3 2012-10-24
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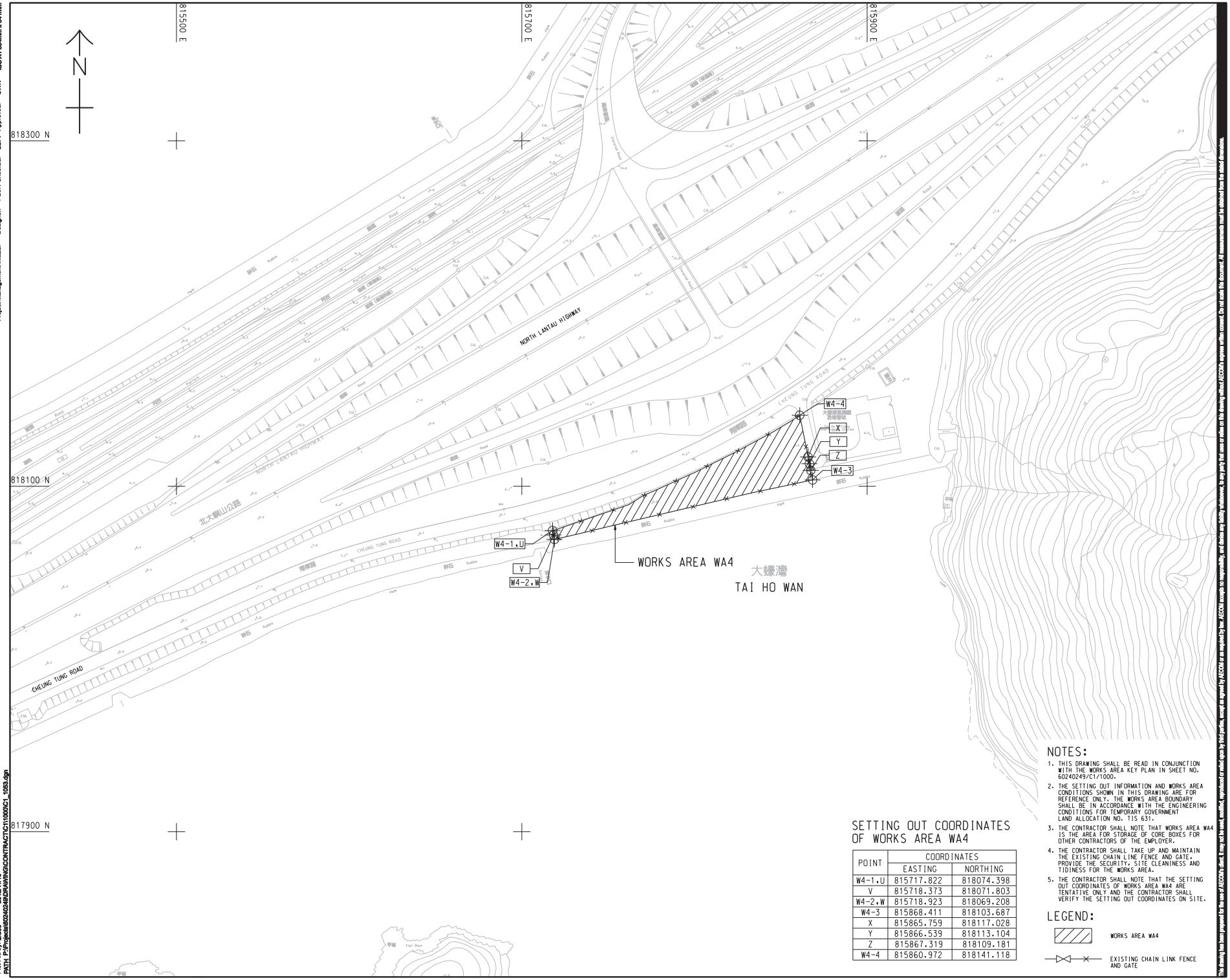


SETTING OUT COORDINATES OF WORKS AREA WA4

POINT	COORDINATES	
	EASTING	NORTHING
W4-1,U	815717.822	818074.398
V	815718.373	818071.803
W4-2,W	815718.923	818069.208
W4-3	815868.411	818103.687
X	815865.759	818117.028
Y	815866.539	818113.104
Z	815867.319	818109.181
W4-4	815860.972	818141.118

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE WORKS AREA KEY PLAN IN SHEET NO. 60240249/C1/1000.
2. THE SETTING OUT INFORMATION AND WORKS AREA CONDITIONS SHOWN IN THIS DRAWING ARE FOR REFERENCE ONLY. THE WORKS AREA BOUNDARY SHALL BE IN ACCORDANCE WITH THE ENGINEERING CONDITIONS FOR TEMPORARY GOVERNMENT LAND ALLOCATION NO. TIS 631.
3. THE CONTRACTOR SHALL NOTE THAT WORKS AREA WA4 IS THE AREA FOR STORAGE OF CORE BOXES FOR OTHER CONTRACTORS OF THE EMPLOYER.
4. THE CONTRACTOR SHALL TAKE UP AND MAINTAIN THE EXISTING CHAIN LINE FENCE AND GATE. PROVIDE THE SECURITY, SITE CLEANINESS AND TIDINESS FOR THE WORKS AREA.
5. THE CONTRACTOR SHALL NOTE THAT THE SETTING OUT COORDINATES OF WORKS AREA WA4 ARE TENTATIVE ONLY AND THE CONTRACTOR SHALL VERIFY THE SETTING OUT COORDINATES ON SITE.

LEGEND:

WORKS AREA WA4

EXISTING CHAIN LINK FENCE AND GATE

AECOM

PROJECT
TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE
TUEN MUN - CHEK LAP KOK LINK - SOUTHERN CONNECTION VIADUCT SECTION

CLIENT
HIGHWAYS DEPARTMENT
Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

Figure 1.2j

ISSUE/REVISION

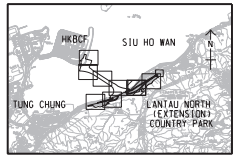
VR	DATE	DESCRIPTION	CHK.
-	NOV. 12	TENDER ADDENDUM NO. 1	CWN

STATUS

SCALE: A1 1 : 1000

DIMENSION UNIT: METRES

KEY PLAN



PROJECT NO.: 60240249

CONTRACT NO.: HY/2012/07

SHEET TITLE
WORKS AREA WA4

SHEET NUMBER
60240249/C1/1053

Project Management Initials: Designer: PLCK Checked: SLYY Approved: CWN ISO A1 594mm x 841mm

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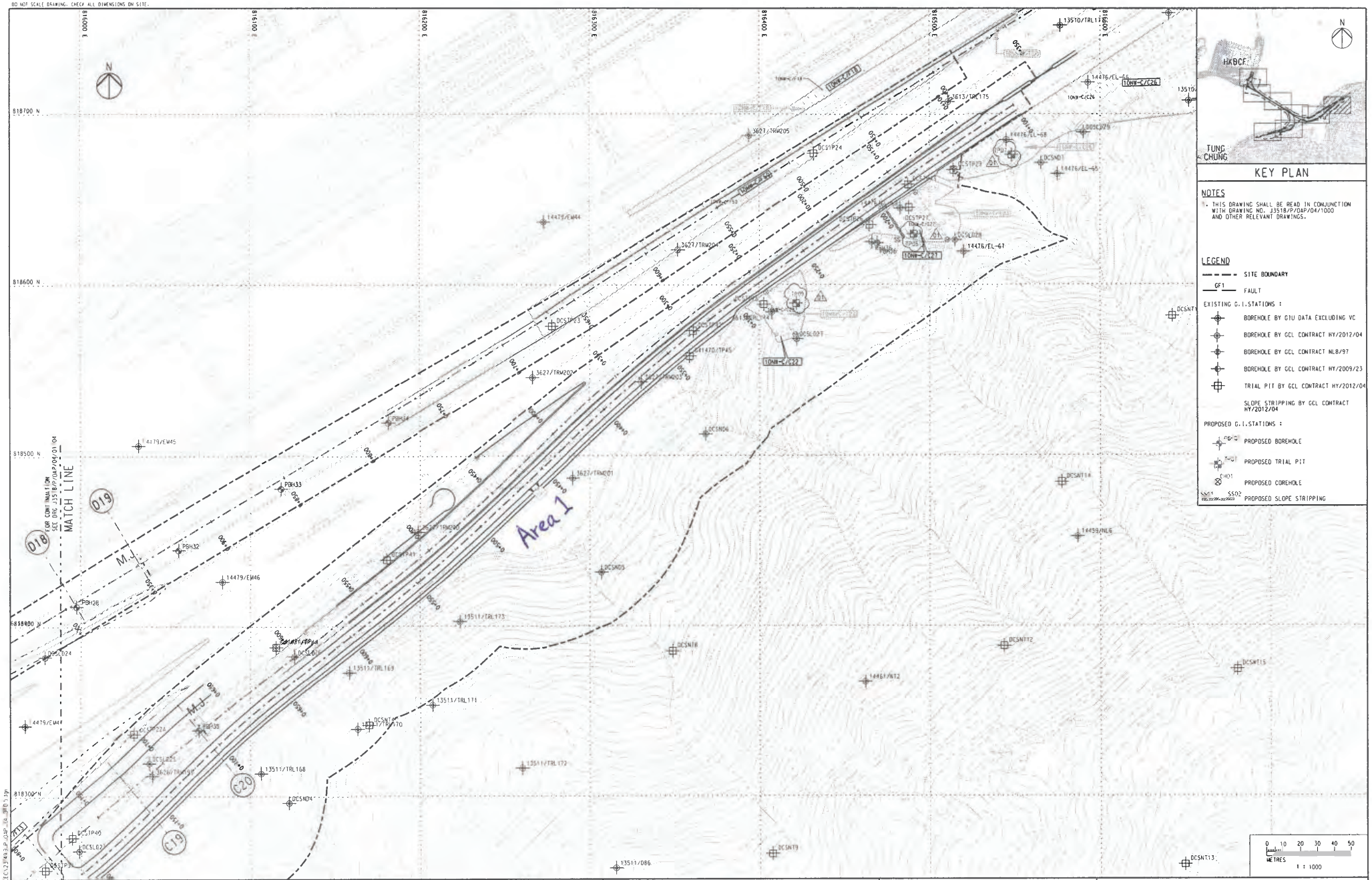

Rev.	Description	By	Date	Rev.	Description	By	Date
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B	[illegible]	RL	07/13				
C	[illegible]	RL	09/13				
D1	ETA INTERNAL REVIEW	RL	10/13				

Drawn: RL	Date: 07/13
Checked: DS	Approved: DOP
Scale: 1:1000 @ A1 / 1:2000 @ A3	

Client: 路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Project Title: Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section

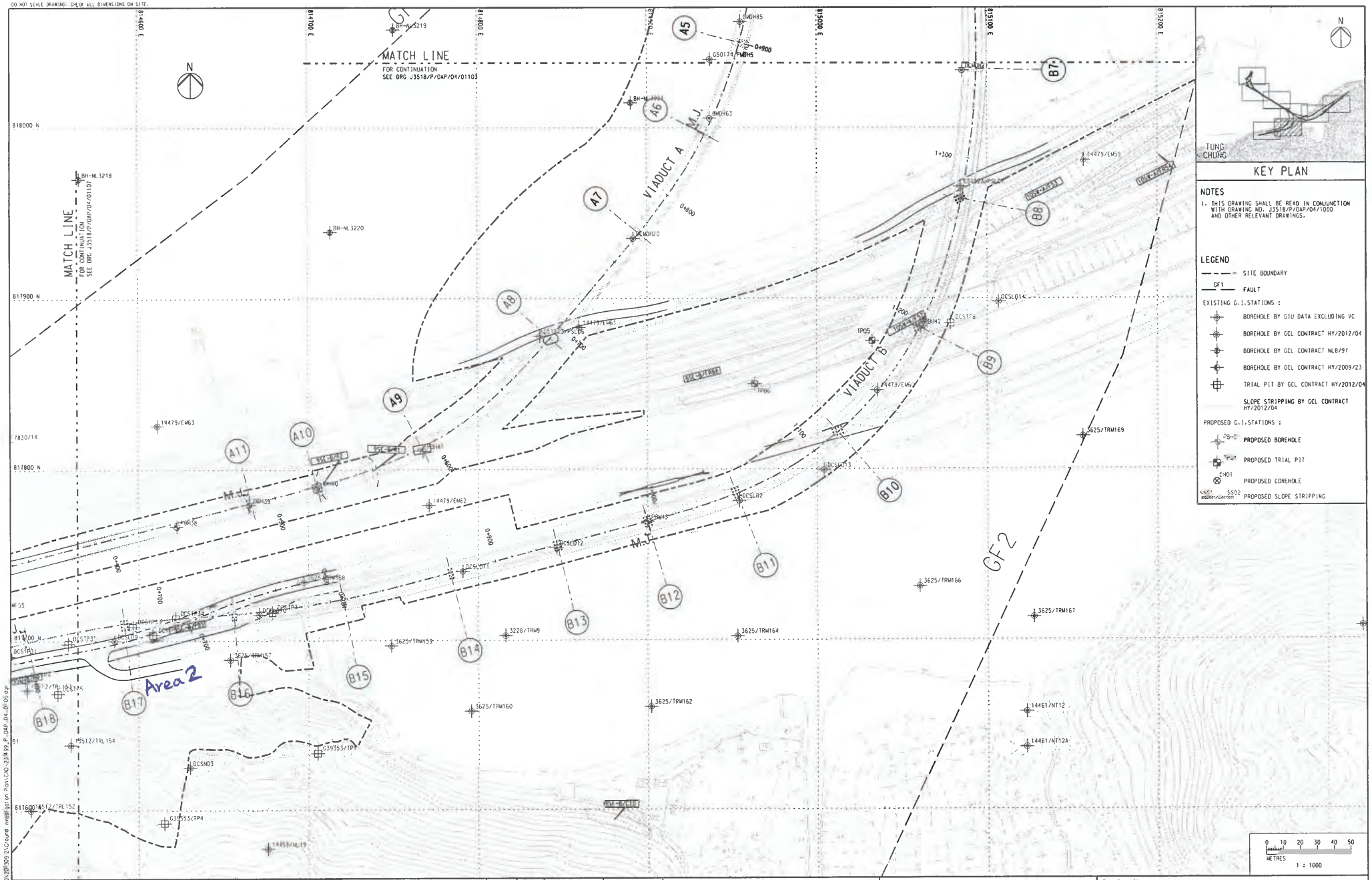
Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

Drawing title: **Figure 1.2k**

Drawing no. J3518/P/OAP/04/01105 Rev. D1



Rev	Description	By	Date
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B	[illegible]	RC	07/13
C	[illegible]	RC	09/13

Drawn	RL
Date	07/13
Checked	DS
Approved	DOP
Scale	1:1000 @ A1 / 1:2000 @ A3

Client: 路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Project Title: Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

Drawing title: **Figure 1.2I**

Drawing no. J3518/P/OAP/04/01106 Rev C

Plotted by [illegible] on 19/07/2013
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1.4 SUMMARY OF CONSTRUCTION WORKS

The construction phase of the Contract commenced on 31 October 2013. The rolling construction programme for the period of June to August 2019 is shown in *Appendix B*.

As informed by the Contractor, details of the major works carried out in this reporting period are listed below:

June 2019

Marine-based Works

- Reinstatement of seawall at Seafront

Land-based Works

- At-grade works at HKBCF; and
- Landscaping softwork.

July 2019

Land-based Works

- Reinstatement of seawall at Seafront.

August 2019

There are no major works undertaken in August 2019.

The locations of the construction activities are shown in *Figure 1.3*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.4*.

The environmental mitigation measures implementation schedule is presented in *Appendix C*.

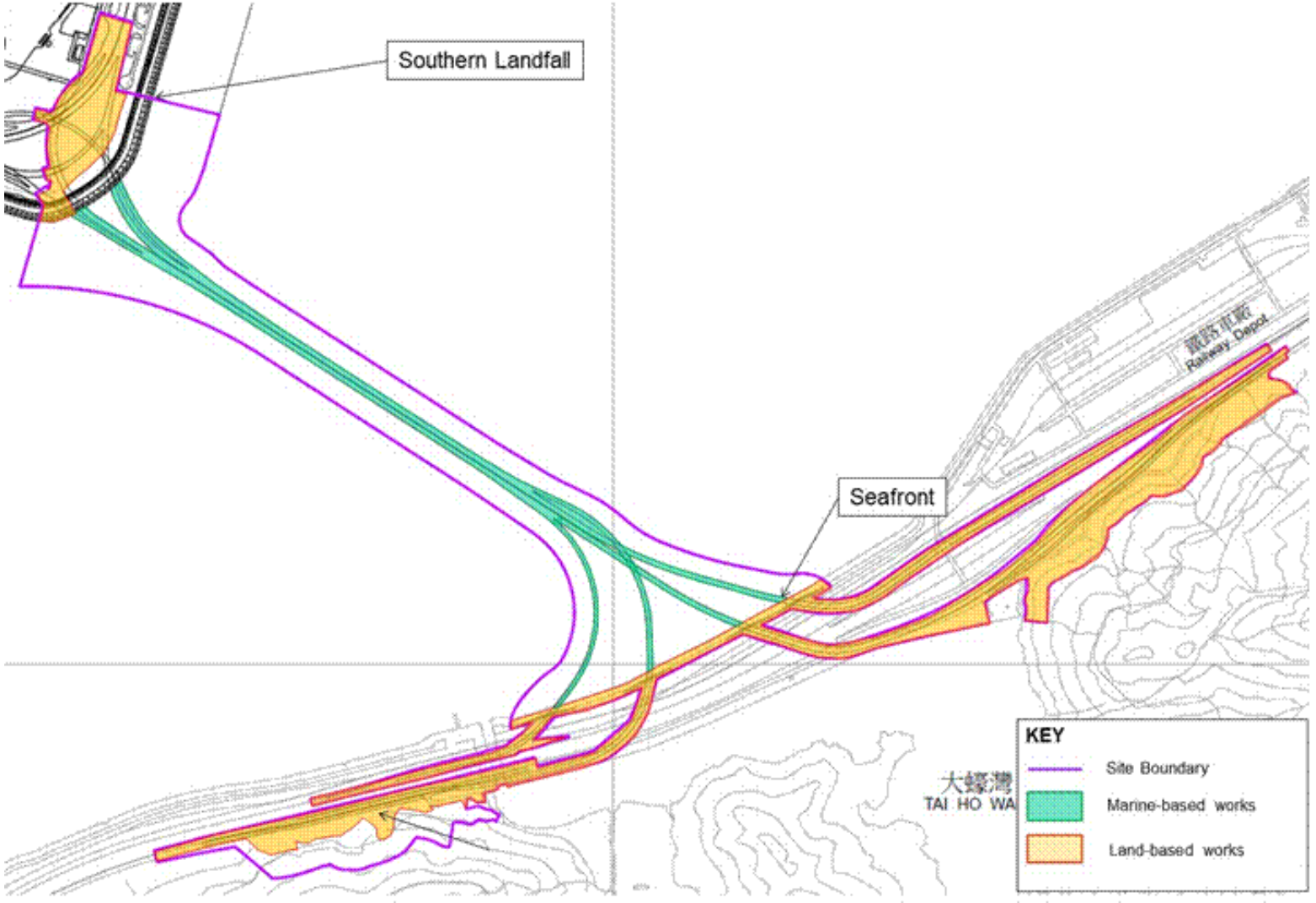
1.5 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

The EM&A programme required environmental monitoring for air quality, noise, water quality and marine ecology as well as environmental site inspections for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts. The EM&A requirements and related findings for each component are described in the following sections, which include:

- Monitoring parameters;
- Monitoring schedules for the reporting months and forthcoming months;
- Action and Limit levels for all environmental parameters;

- Event Action Plan;
- Results and observations;
- Environmental mitigation measures, as recommended in the approved EIA Report; and
- Environmental requirement in contract documents.

Figure 1.3 Locations of Construction Activities in the Reporting Period



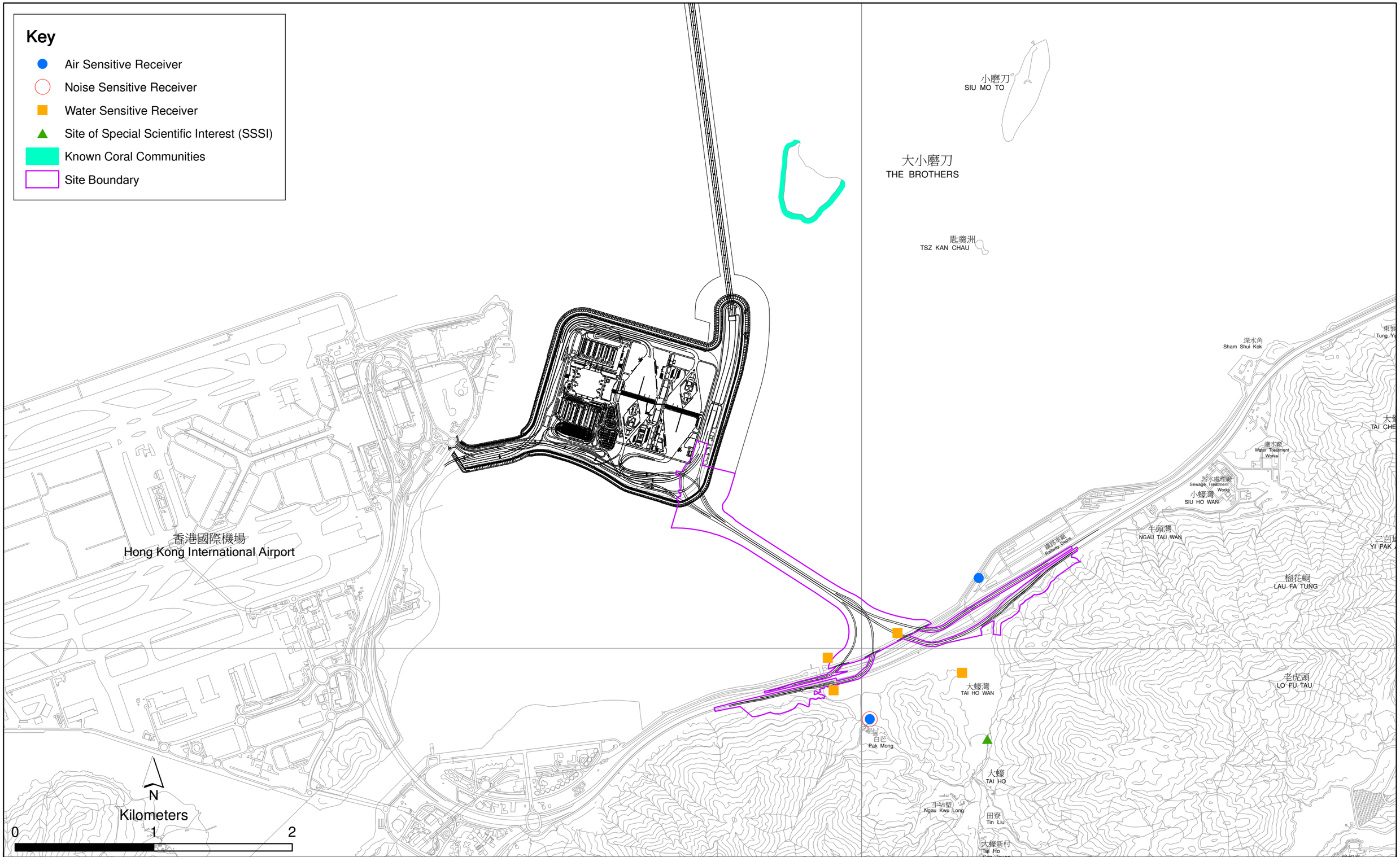


Figure 1.4

Environmental Sensitive Receivers in the Vicinity of Contract No. HY/2012/07
Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_Environmental_Sensitive_Receiver.mxd
Date: 18/5/2015

Environmental Resources Management

ERM

The EM&A programme required environmental monitoring for air quality, noise, water quality and marine ecology as well as environmental site inspections for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts. The EM&A requirements and related findings for each component are summarized in the following sections.

2.1 AIR QUALITY

The baseline air quality monitoring undertaken by the HZMB Projects during October 2011 included the two monitoring stations ASR9A and ASR9C for this Project. Thus, the baseline monitoring results and Action/Limit Level presented in HZMB Baseline Monitoring Report [1] are adopted for this Project.

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual, impact 1-hour TSP monitoring was conducted three (3) times every six (6) days while the highest dust impact was expected. Impact 24-hour TSP monitoring was carried out once every six (6) days. The Action and Limit Levels of the air quality monitoring is provided in *Appendix D*.

1-hour TSP and 24-hour TSP monitoring were conducted at 2 alternative air quality monitoring stations, ASR8A (Area 4) and ASR9 (entrance of MTR Depot) during the reporting period in accordance with the requirement of the Updated EM&A Manual. The monitoring stations are indicated in *Figure 2.1* and details are presented in *Table 2.1*.

High Volume Samplers (HVSs) were used for carrying out 1-hour and 24-hour TSP monitoring during the reporting period. The HVSs meets all requirements of the Updated EM&A Manual. Brand and model of the equipment are given in *Table 2.2*.

Wind data monitoring equipment was installed at Area 4 during the reporting period for logging wind speed and wind direction. The wind sensor was setup such that it was clear of obstructions or turbulence caused by building. The wind data monitoring equipment is recalibrated at least once every six months.

(1) *Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation*. Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.

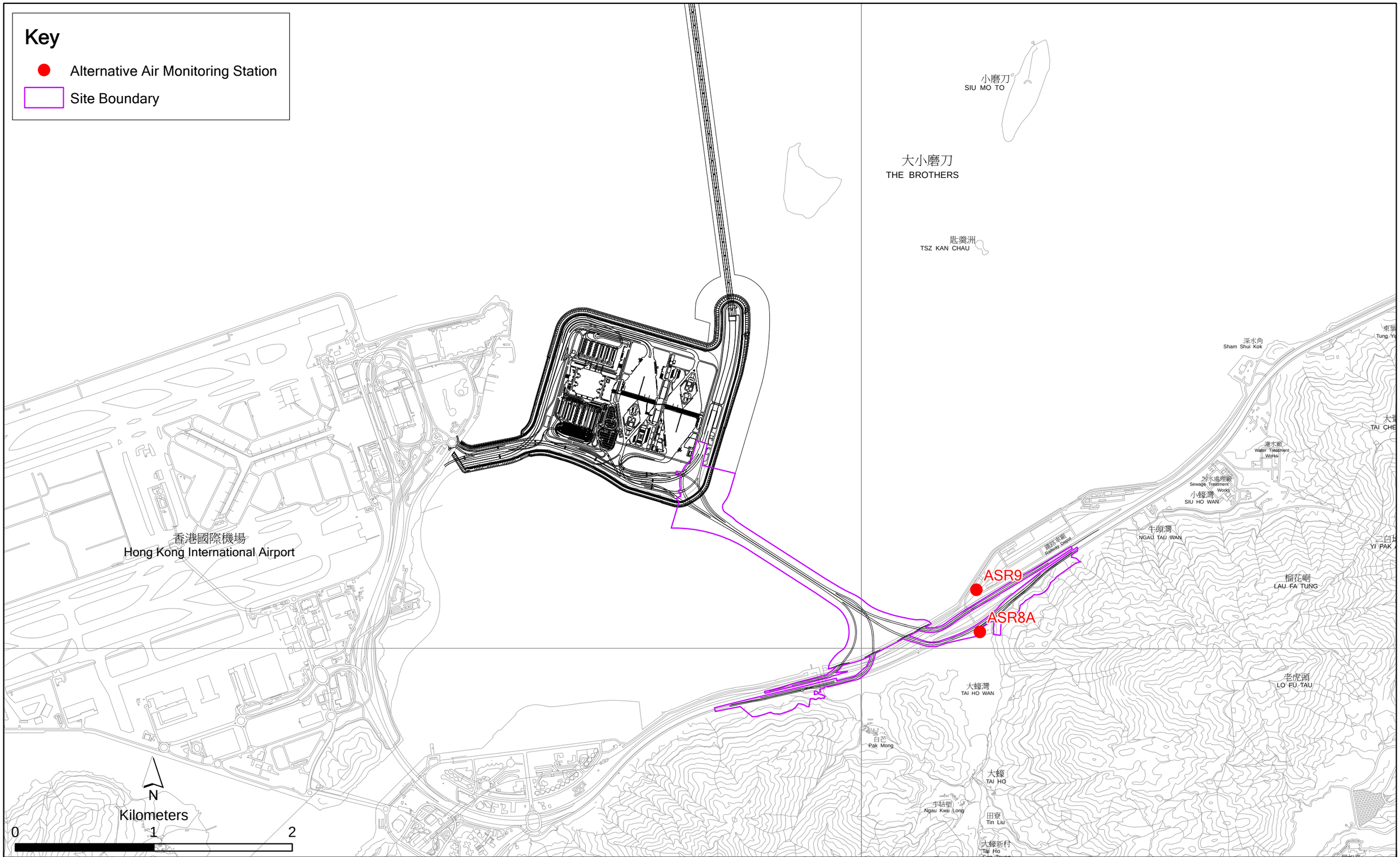


Figure 2.1

Locations of Air Quality Monitoring Stations

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Date: 7/1/2015

Environmental Resources Management

ERM

Table 2.1 ***Locations of Impact Air Quality Monitoring Stations and Monitoring Dates in this Reporting Period***

Monitoring Station (1)	Monitoring Period (2)	Location	Description	Parameters & Frequency
ASR8A	4, 10, 13, 19, 25 and 28 June 2019 4, 10, 16, 22, 25 and 31 July 2019 6, 12, 15, 21 and 27 August 2019	Area 4	On ground at the works area, Area 4	• 1-hour Total Suspended Particulates (1-hour TSP, $\mu g/m^3$), 3 times per day every 6 days • 24-hour Total Suspended Particulates (24-hour TSP, $\mu g/m^3$), daily for 24-hour every 6 days
ASR9	4, 10, 13, 19, 25 and 28 June 2019 4, 10 and 16 July 2019	MTR Depot	On the ground nearby MTR Depot entrance	

Note:

(1) Air Quality Monitoring Stations ASR9A and ASR9C at Siu Ho Wan MTRC Depot proposed in accordance with the Updated EM&A were relocated to ASR9 and ASR8A respectively.

(2) Air quality monitoring of 1-hour and 24-hour TSP at ASR9 was cancelled on 22, 25, 31 July and in August due to power shortage while air quality monitoring of 24-hour TSP at ASR8A was cancelled on 31 July 2019 due to adverse weather.

Table 2.2 ***Air Quality Monitoring Equipment***

Equipment	Brand and Model
High Volume Sampler (1-hour TSP and 24-hour TSP)	Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Sampler (Model No. TE-5170)
Wind Sensor	Global Water (Wind Speed Sensor: WE550; Wind Direction Sensor: WE570)
Wind Anemometer for calibration	Lutron (Model No. AM-4201)

2.1.2 Action & Limit Levels

The Action and Limit Levels of the air quality monitoring are provided in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

2.1.3 Monitoring Schedule for the Reporting Quarter

The schedules for air quality monitoring in the reporting quarter are provided in Appendix E. Air quality monitoring of 1-hour and 24-hour TSP at ASR9 was cancelled on 22, 25, 31 July and in August due to power shortage while air quality monitoring of 24-hour TSP at ASR8A was cancelled on 31 July 2019 due to adverse weather. There are no construction works under this Contract starting in August 2019. EPD have approved the temporary suspension of Air Quality Monitoring on 28 August 2019.

2.1.4 Results and Observations

The monitoring results for 1-hour TSP and 24-hour TSP are summarized in *Tables 2.3* and *2.4*, respectively. Monitoring results are presented graphically in *Appendix F*. Detailed impact air quality monitoring results and

meteorological information were reported in the *Sixty-eighth* to *Seventieth Monthly EM&A Reports*.

Table 2.3 Summary of 1-hour TSP Monitoring Results in this Reporting Period

Month	Station	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
June 2019	ASR 8A	35	14-95	394	500
	ASR 9	109	14-752	393	500
July 2019	ASR 8A	48	14-138	394	500
	ASR 9	63	15-96	393	500
August 2019	ASR 8A	53	14-144	394	500

Table 2.4 Summary of 24-hour TSP Monitoring Results in this Reporting Period

Month	Station	Average ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
June 2019	ASR 8A	25	16-39	178	260
	ASR 9	62	22-152	178	260
July 2019	ASR 8A	29	19-42	178	260
	ASR 9	41	33-48	178	260
August 2019	ASR 8A	34	26-39	178	260

The major dust sources in the reporting period include construction activities under the Contract as well as nearby traffic emissions.

One (1) Limit Level exceedance of 1-hour TSP was recorded for air quality monitoring in this reporting period. No exceedance of Action and Limit Levels of 24-hour TSP was recorded in the reporting period. The exceedance was considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix L*. No action is thus required to be undertaken in accordance with the Event Action Plan presented in *Appendix J*.

2.2 NOISE MONITORING

The baseline noise monitoring undertaken by the HZMB Projects during the period of 18 October to 1 November 2011 included the monitoring station NSR1 for this Project. Thus, the baseline monitoring results and Action/ Limit Level presented in *HZMB Baseline Monitoring Report* (1) are adopted for this Project.

2.2.1 *Monitoring Requirements and Equipment*

In accordance with the Updated EM&A Manual, impact noise monitoring should be conducted once per week during the construction phase of the Contract.

Noise monitoring was conducted at the alternative noise monitoring station, NSR1A (Pak Mong Village Pavilion) during the reporting period in accordance with the requirement of Updated EM&A Manual. *Figure 2.2* shows the location of the monitoring station. *Table 2.5* describes the details of the monitoring station.

Noise monitoring was performed using sound level meter at the designated monitoring station in the reporting quarter. The deployed sound level meter complies with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. Brand and model of the equipment is given in *Table 2.6.*

(1) *Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation.* Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.

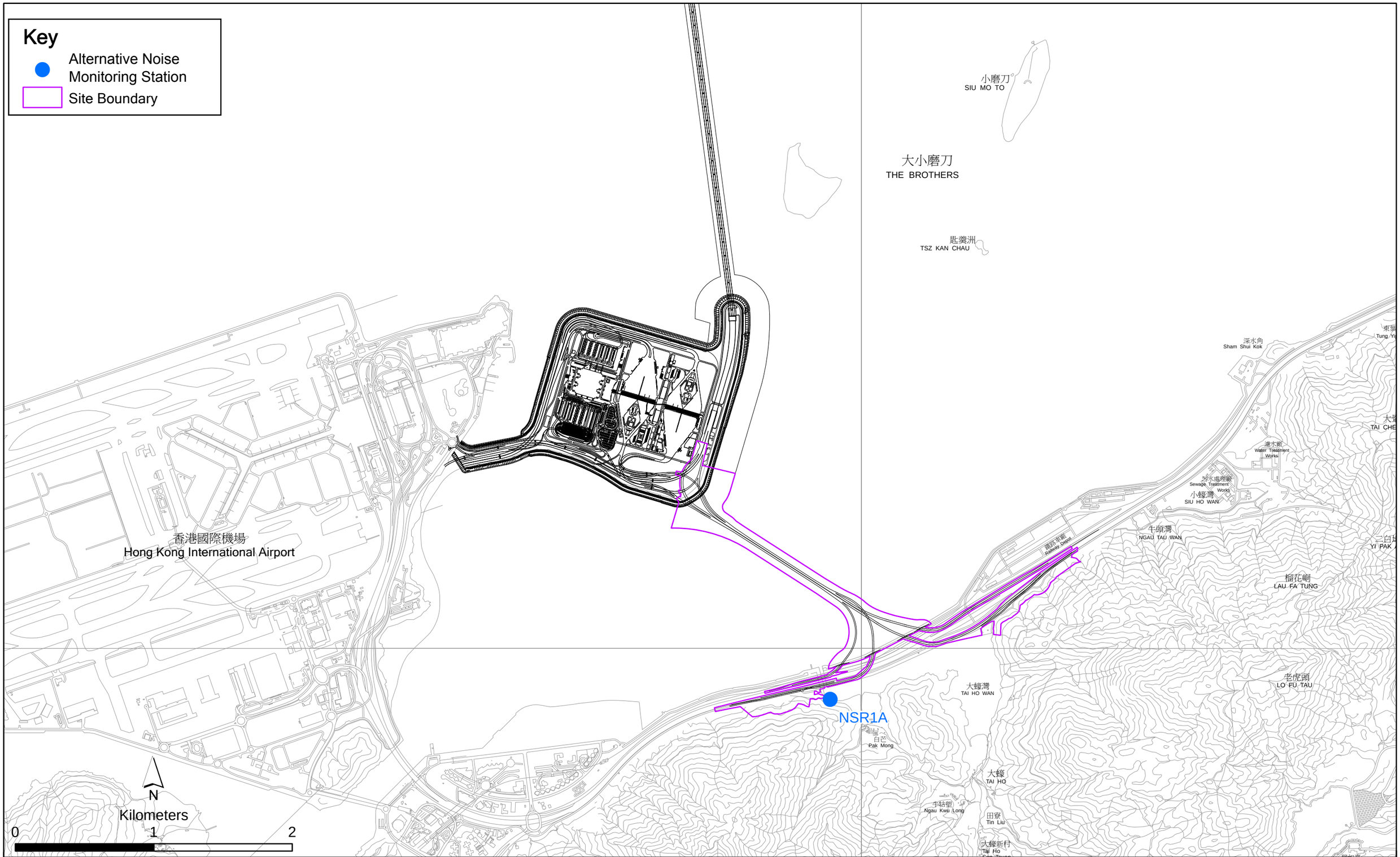

Figure 2.2

Location of Noise Monitoring Station

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Table 2.5 ***Location of Impact Noise Monitoring Station and Monitoring Dates in this Reporting Period***

Monitoring Station	Monitoring Period	Location	Parameters & Frequency
NSR1A	4, 10, 13, 19, 25 and 28 June 2019 4, 10, 16, 22, 25 and 31 July 2019 6, 12, 15, 21 and 27 August 2019	Pak Mong Village Pavilion	• 30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays (Monday to Saturday). L_{eq}, L_{10} and L_{90} would be recorded. • At least once a week

Note:

(1) Noise Monitoring Station NSR1 at Pak Mong Village proposed in accordance with the Updated EM&A Manual was relocated to NSR1A.

Table 2.6 ***Noise Monitoring Equipment***

Equipment	Brand and Model
Integrated Sound Level Meter	Rion NL-52
Acoustic Calibrator	Rion NC-73

2.2.2 Action and Limit Levels

The Action and Limit levels of the noise monitoring are provided in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

2.2.3 Monitoring Schedule for the Reporting Quarter

The schedule for construction noise monitoring in the reporting period is provided in *Appendix E*. EPD have approved the temporary suspension of Impact Noise Monitoring on 28 August 2019.

2.2.4 Results and Observations

The monitoring results for noise monitoring are summarized in *Table 2.7*. Monitoring results are presented graphically in *Appendix G* and detailed impact noise monitoring results are reported in the *Sixty-eighth* to *Seventieth Monthly EM&A Reports.*

Table 2.7 ***Summary of Construction Noise Monitoring Results at NSR1A in the Reporting Period***

Month	Average , dB(A), L_{eq} (30mins)	Range, dB(A), L_{eq} (30mins)	Limit Level, dB(A), L_{eq} (30mins)
June 2019	63	62-63	75
July 2019	63	62-65	75
August 2019	63	62-63	75

Major noise sources during the noise monitoring included noise from nearby traffic noise and aircraft noise.

All noise monitoring results were below the Action and Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event Action Plan presented in *Appendix J*.

2.3 WATER QUALITY MONITORING

The baseline water quality monitoring undertaken by the HZMB Projects between 6 and 31 October 2011 included all monitoring stations except SR4a for the Project. Thus, the baseline monitoring results except for station SR4a and Action/Limit Level presented in HZMB Baseline Monitoring Report (1) are adopted for this Project. Baseline water quality monitoring was conducted at station SR4a from 29 August to 24 September 2013.

2.3.1 Monitoring Requirements and Equipment

Impact water quality monitoring was carried out to ensure that any deterioration of water quality was detected, and that timely action was taken to rectify the situation. Impact water quality monitoring was undertaken three days per week during the construction period at seven water quality monitoring stations in accordance with the Updated EM&A Manual.

Results of water quality monitoring were adopted from the published EM&A data of *Contract No. HY/2012/08 Tuen Mun-Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section* (2) in July and August 2019.

The locations of the monitoring stations under the Contract are shown in *Figure 2.3* and *Table 2.8*.

Table 2.8 Locations of Water Quality Monitoring Stations and the Corresponding Monitoring Requirements

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850	• Temperature(°C) • pH(pH unit) • Turbidity (NTU) • Water depth (m) • Salinity (ppt) • Dissolved Oxygen (DO) (mg/L and % of saturation) • Suspended Solid (SS) (mg/L)	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	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Contract.
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497			
IS8	Impact Station(Close to HKBCF construction site)	814251	818412			

(1) *Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation*. Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.

(2) Published EM&A data for water quality monitoring by Contract No. HY/2012/08 are available at: http://www.hzmbenpo.com/

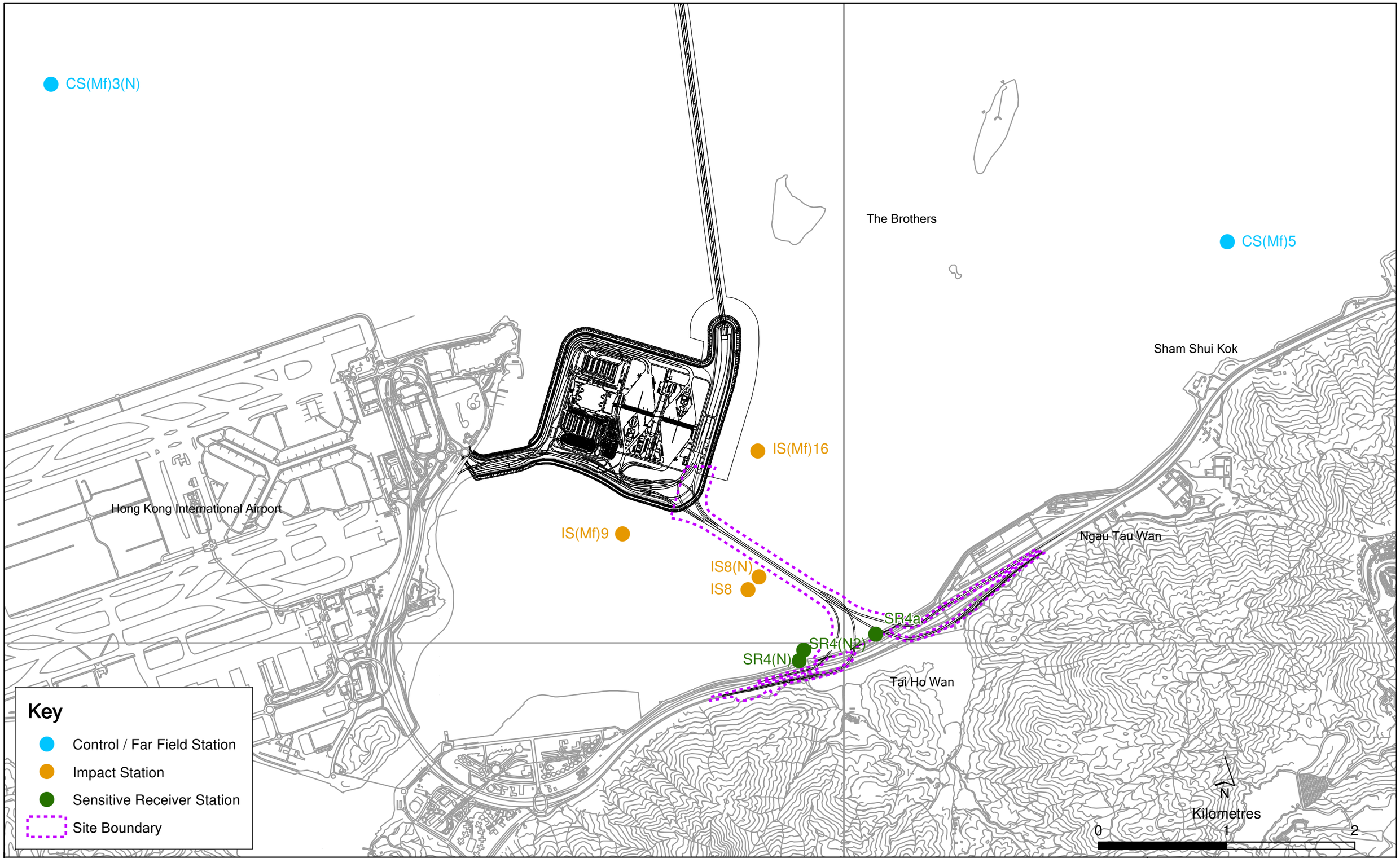

Figure 2.3

Locations of Water Quality Monitoring Stations

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Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS8 (N)	Impact Station (Close to HKBCF construction site)	814413	818570		depth less than 6m, mid-depth may be omitted.	
SR4(N)	Sensitive receiver (Tai Ho Inlet)	814705	817859			
SR4(N2)	Sensitive receiver (Tai Ho Inlet)	814688	817996			
SR4a	Sensitive receiver	815247	818067			
CS(Mf)3(N)	Control Station	808814	822355			
CS(Mf)5	Control Station	817990	821129			

Notes:
In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded.
Water Quality Monitoring Station CS(Mf)3 was relocated to CS(Mf)3(N) since 2 May 2017.
Water Quality Monitoring Station SR4 was relocated to SR4(N) since 2 March 2018.
Water Quality Monitoring Station SR4(N) was relocated to SR4(N2) since 12 June 2019
Water Quality Monitoring Station IS8 was relocated to IS8(N) since 12 June 2019.

Table 2.9 summarizes the equipment used in the impact water quality monitoring programme.

Table 2.9 Water Quality Monitoring Equipment

Equipment	Brand and Model
Multi-parameters (Dissolved Oxygen, Salinity, Turbidity, Temperature, pH)	YSI ProDSS
Positioning Equipment	Furuno GP-170
Water Depth Detector	Lowrance Mark 5x / Garmin Striker 4
Water Sampler	WildCo Vertical Alpha Bottles 1120-2.2L /1120-3.2L Aquatic Research Instrument Vertical/Horizontal Point Water Sampler 2.2L / 3.0L

2.3.2 Action & Limit Levels

The Action and Limit Levels of the water quality monitoring are provided in *Appendix D*.

2.3.3 Monitoring Schedule for the Reporting Quarter

The schedules for water quality monitoring in the reporting quarter are provided in *Appendix E*. Water quality monitoring on 7 June 2019 was cancelled due to suspension of marine works during holiday. EPD have

approved the temporary suspension of Water Quality Monitoring on 30 August 2019 as all marine-based construction activities under this Contract has been completed.

2.3.4 Results and Observations

In this reporting period, a total of 36 monitoring events for impact water quality monitoring were conducted at monitoring stations in the reporting period. Monitoring results are presented graphically in *Appendix H* and detailed impact water quality monitoring results were reported in the *Sixty-eighth* to *Seventieth Monthly EM&A Reports*.

A total of thirty one (31) Action Level exceedances and three (3) Limit Level exceedances of bottom-depth dissolved oxygen (DO) and fifteen (15) Action Level exceedance of surface and middle-depth DO were recorded for water quality impact monitoring in the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix L*. No actions was required to be undertaken in accordance with the Event Action Plan as presented in *Appendix J*.

2.4 DOLPHIN MONITORING

2.4.1 Monitoring Requirements

Impact dolphin monitoring is required to be conducted by a qualified dolphin specialist team to evaluate whether there have been any effects on the Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphin) from the Contract. In order to fulfil the EM&A requirements and make good use of available resources, the on-going impact line transect dolphin monitoring data collected by HyD's *Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge. Hong Kong Link Road - Section between Scenic Hill and Hong Kong Boundary Crossing Facilities* on the monthly basis is adopted to avoid duplicates of survey effort.

2.4.2 Monitoring Equipment

Table 2.10 summarizes the equipment used for the impact dolphin monitoring.

Table 2.10 Dolphin Monitoring Equipment

Equipment	Model
Global Positioning System (GPS)	Garmin 18X-PC Geo One Phottix
Camera	Nikon D90 300m 2.8D fixed focus Nikon D90 20-300m zoom lens
Laser Binoculars	Infinitor LRF 1000
Marine Binocular	Bushell 7 x 50 marine binocular with compass and reticules
Vessel for Monitoring	65 foot single engine motor vessel with viewing platform 4.5m above water level

2.4.3 Monitoring Parameter, Frequencies & Duration

Dolphin monitoring should cover all transect lines in Northeast Lantau (NEL) and the Northwest Lantau (NWL) survey areas twice per month throughout the entire construction period. The monitoring data should be compatible with, and should be made available for, long-term studies of small cetacean ecology in Hong Kong. In order to provide a suitable long-term dataset for comparison, identical methodology and line transects employed in baseline dolphin monitoring was followed in the impact dolphin monitoring.

2.4.4 Monitoring Location

The impact dolphin monitoring was carried out in the NEL and NWL along the line transect as depicted in *Figure 2.4*. The co-ordinates of all transect lines are shown in *Table 2.11* below (1).

(1) Proposal on the changes of transect lines for dolphin monitoring was approved by EPD on 28 July 2017 (Reference number: (19) in EP2/G/A/129 Pt. 8).

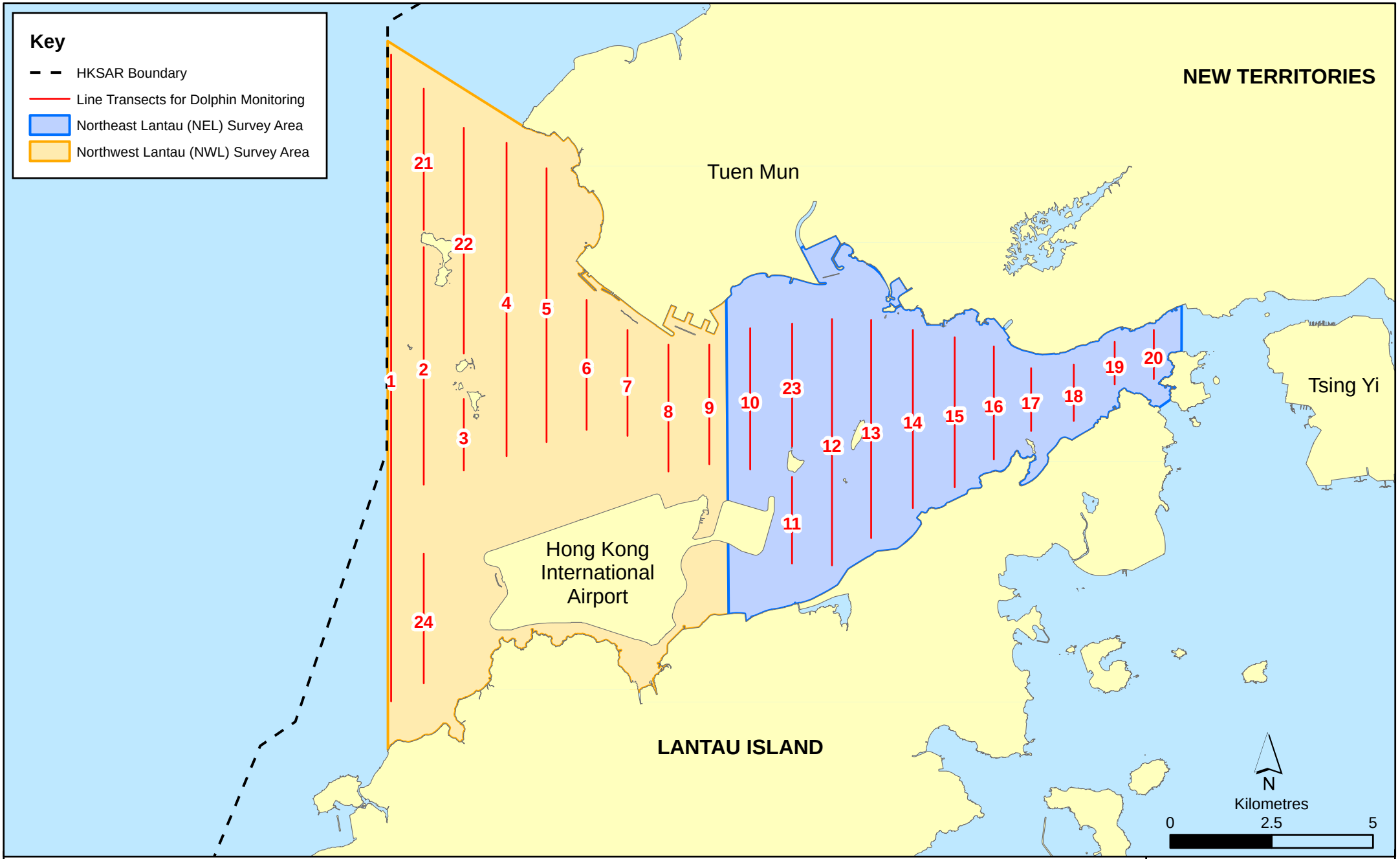

Figure 2.4

Layout of Transect Lines of Dolphin Monitoring in Northwest and Northeast Lantau Areas

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Date: 21/9/2017

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Table 2.11 Impact Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805476	820800	14	Start Point	817537	820220
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24	Start Point	805476	815900
12	End Point	815542	824882	24	End Point	805476	819100

2.4.5 Action & Limit Levels

The Action and Limit levels of dolphin impact monitoring are shown in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

2.4.6 Monitoring Schedule for the Reporting Period

The dolphin monitoring schedules for the reporting period are shown in *Appendix E*.

2.4.7 Results & Observations

A total of 785.23 km of survey effort was collected, with 96.0% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas,

287.33 km and 497.90 km of survey effort were conducted in NEL and NWL survey areas respectively. The total survey effort conducted on primary lines was 577.21 km, while the effort on secondary lines was 208.02 km. Survey effort conducted on both primary and secondary lines were considered as on-effort survey data. The survey efforts are summarized in *Appendix I*.

During the six sets of monitoring surveys in June to August 2019, a total of four (4) groups of eight (8) Chinese White Dolphins were sighted. Three (3) dolphin sightings were made during on-effort and two (2) on-effort dolphin sightings were made on primary lines. In this quarterly period, all dolphin groups were sighted in NWL, no sighting of dolphin was sighted in NEL. Summary table of the dolphin sightings is shown in *Appendix II of Appendix I*.

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) in the reporting period with the results presented in *Tables 2.12* and *2.13*.

Table 2.12 Individual Survey Event Encounter Rates

Survey Area	**Survey period**	**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
NEL	Set 1: 3rd / 6th Jun 2019	0.0	0.0
	Set 2: 10th / 13th Jun 2019	0.0	0.0
	Set 3: 16th /18th Jul 2019	0.0	0.0
	Set 4: 22nd/ 24th Jul 2019	0.0	0.0
	Set 5: 13th / 14th Aug 2019	0.0	0.0
	Set 6: 20th/ 26th/ 29th Aug 2019	0.0	0.0
NWL	Set 1: 3rd / 6th Jun 2019	3.73	9.32
	Set 2: 10th / 13th Jun 2019	0.00	0.00
	Set 3: 16th /18th Jul 2019	0.00	0.00
	Set 4: 22nd/ 24th Jul 2019	0.00	0.00
	Set 5: 13th / 14th Aug 2019	0.00	0.00
	Set 6: 20th/ 26th/ 29th Aug 2019	0.00	0.00

Note: Dolphin Encounter Rates are deduced from the six sets of surveys (two surveys in each set) in the reporting period in Northeast (NEL) and Northwest Lantau (NWL)

Table 2.13 Quarterly Average Encounter Rates

Survey Area	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)	
	June - August 2019	**September - November 2011**	**June - August 2019**	**September - November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	0.62 ± 1.52	9.85 ± 5.85	1.55 ± 3.80	44.66 ± 29.85

Note: encounter rates deduced from the baseline monitoring period (September – November 2011) have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions

Group size of Chinese White Dolphins ranged from one (1) to four (4) individuals per group in North Lantau region during June to August 2019. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in *Table 2.14*.

Table 2.14 Comparison of Quarterly Average Group Sizes

	Average Dolphin Group Size	
	June to August 2019	**September - November 2011**
Overall	2.00 ± 1.41 (n = 4)	3.72 ± 3.13 (n = 66)
Northeast Lantau	---	3.18 ± 2.16 (n = 17)
Northwest Lantau	2.00 ± 1.41 (n = 4)	3.92 ± 3.40 (n = 49)

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June to August 2019.

During this quarter of dolphin monitoring, no unacceptable impact from the activities of this Contract on Chinese White Dolphins was noticeable from the general observations.

Although the dolphins infrequently occurred along the alignment of TM-CLKL Southern Connection Viaduct in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in both NEL and NWL, and many individuals have shifted away from the important habitat around the Brothers Islands.

It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

2.4.8 Marine Mammal Exclusion Zone Monitoring

Daily marine mammal exclusion zone monitoring was undertaken in June 2019. No sighting of Chinese White Dolphin was recorded in the monitoring period during the exclusion zone monitoring. No marine works were undertaken in July and August 2019, therefore, daily 250 m marine mammal exclusion zone monitoring was not undertaken in July and August 2019.

Passive Acoustic Monitoring (PAM) was decommissioned in this reporting period as no marine piling works was carried out outside the daylight hours since September 2015. Daytime marine mammal exclusion zone was still in effect to cater for temporary staging installation and uninstallation works.

2.5 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. Thirteen (13) site inspections were carried out in the reporting quarter on 5, 12, 18 and 27 June, 4, 10, 17, 25 and 29 July and 7, 15, 22 and 29 August 2019.

Key observations during the site inspections in this reporting period are summarized in *Table 2.15*.

Table 2.15 Specific Observations Identified during the Weekly Site Inspection in this Reporting Period

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
5 June 2019	Viaduct D • General refuse was observed. • Silt was observed in the U-channel	Viaduct D • The Contractor was reminded to clear general refuse. • The Contractor was reminded to clear the silt inside U-channel.
12 June 2019	WA4 • Chemical without drip tray.	WA4 • The Contractor was reminded to place chemicals in drip tray and remove empty chemical container off site.
18 June 2019	Seafront • The silt curtain should be properly extended. Viaduct D • Accumulated refuse should be cleared. • Chemical without drip tray.	Seafront • The Contractor was reminded to properly extend the silt curtain. Viaduct D • The Contractor was reminded to clear accumulated refuse. • The Contract was reminded to place chemical in drip tray.
27 June 2019	Seafront • NRMM label should be displayed on the excavator.	Seafront • The Contractor was reminded to display the NRMM label on the excavator.

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
4 July 2019	WA1 • Tyre marks were observed at the exit of the works area. • Accumulated waste should be cleared. WA2 • Rubbish and dirt was observed in the U-channel.	WA1 • The Contractor was reminded to clear the tyre marks at the exit of the works area. • The Contractor was reminded to clear the accumulated waste. WA2 • The Contractor was reminded to clear the rubbish and dirt in the U-channel.
10 July 2019	No observation.	No observation.
17 July 2019	Viaduct D • General refuse is observed on the ground.	Viaduct D • The Contractor was reminded to clear general refuse on the ground.
25 July 2019	BCF • Accumulated general refuse should be cleared or disposed in rubbish bin.	BCF • The Contractor was reminded to clear accumulated general refuse or dispose them in the rubbish bin.
29 July 2019	CEDD Track • Soil stockpile should be covered with tarpaulin or removed.	CEDD Track • The Contractor was reminded to cover soil stockpile with tarpaulin or to remove the soil stockpile.
7 August 2019	BCF • Accumulated water in the drip tray should be discharged.	BCF • The Contractor was reminded to discharge accumulated water in the drip tray.
15 August 2019	Seafront • Chemical container was observed without drip tray. • General refuse was observed on the ground.	Seafront • The Contractor was reminded to place chemical container in drip tray. • The Contractor was reminded to place general refuse in capped rubbish bin.
22 August 2019	WA1 • Accumulated waste should be cleared. • Chemical container should be placed in drip tray.	WA1 • The Contractor was reminded to clear accumulated refuse. • The Contractor was reminded to place chemical container in drip tray.
29 August 2019	BCF • Accumulated refuse should be cleared or disposed in capped rubbish bin.	BCF • The Contractor was reminded to clear accumulated refuse or disposed refuse in capped rubbish bin.

The Contractor has rectified all of the observations identified during environmental site inspections in the reporting period.

2.6 WASTE MANAGEMENT STATUS

The Contractor has submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

Wastes generated during this reporting period include mainly construction wastes (inert and non-inert), recyclable materials, chemical waste and marine sediment. Reference has been made to the waste flow table prepared by the Contractor (*Appendix K*). The quantities of different types of wastes are summarized in *Table 2.16.*

Table 2.16 Quantities of Different Waste Generated in the Reporting Period

Month/ Year	Inert C&D Materials [a] (m^3)	Imported Fill (m^3)	Inert Construction Waste Re-used (m^3)	Non-inert Construction Waste [b] (kg)	Recyclable Materials [c] (kg)	Chemical Wastes (kg)	Marine Sediment (m^3)		
							Category L	Category M (M_p & M_f)	Category H
June 2019	356	0	315	39,960	0	0	0	0	0
July 2019	0	0	0	17,100	0	0	0	0	0
August 2019	0	0	0	31,050	0	0	0	0	0

Notes:

(a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill.

(b) Non-inert construction wastes include general refuse disposed at landfill.

(c) Recyclable materials include metals, paper, cardboard, plastics, timber, felled trees and others.

The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/ recycle of C&D materials and wastes. The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*.

2.7 ENVIRONMENTAL LICENSES AND PERMITS

The status of environmental licensing and permit is summarized in *Table 2.17* below.

Table 2.17 Summary of Environmental Licensing and Permit Status

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-353/2009/K	11-Apr-16	N/A	HyD	Hong Kong Boundary Crossing Facilities
Environmental Permit	EP-354/2009/D	13-Mar-15	N/A	HyD	Tuen Mun- Chek Lap Kok Link
Construction Dust Notification	361571	05-Jul-13	N/A	GCL	
Construction Dust Notification	362093	17-Jul-13	N/A	GCL	For Area 23
Chemical Waste Registration	5213-951-G2380-17	12-Jun-14	N/A	GCL	Viaducts A, B, C, D & E
Chemical Waste Registration	5213-961-G2380-13	10-Oct-13	N/A	GCL	Chemical waste produced in Contract No. HY/2012/07 (Area 1 adjacent to Cheng Tung Road, Siu Ho Wan)
Chemical Waste Registration	5213-961-G2380-14	10-Oct-13	N/A	GCL	Chemical waste produced in Contract No. HY/2012/07 (Area 2 adjacent to Cheung Tung Road, Pak Mong Village)
Chemical Waste Registration	5213-974-G2588-03	04-Nov-13	N/A	GCL	Chemical waste produced in Contract No. HY/2012/07 (WA5 adjacent to Cheung Tung Road, Yam O)
Construction Waste Disposal Account	7017735	10-Jul-13	N/A	GCL	-
Construction Waste Disposal Account	7019470	03-Mar-14	N/A	GCL	Vessel CHIT Account
Construction Noise Permit for night works and works in general holidays	GW-RS0149-19	19 February 2019	15 July 2019	GCL	Broad Permit for Whole Site Areas
Construction Noise Permit for night works and works in general holidays	GW-RS0507-19	13 June 2019	11 December 2019	GCL	Broad Permit for Whole Site Areas
Construction Noise Permit for night works and works in general holidays	GW-RW012-19	23 January 2019	13 June 2019	GCL	General works at WA5
Construction Noise Permit for night works and works in general holidays	GW-RW0266-19	21 June 2019	13 December 2019	GCL	General works at WA5
Construction Noise Permit for night works and works in general holidays	GW-RS0728-19	16 August 2019	25 October 2019	GCL	Defect repairing at under-bridge of Viaduct A, B, C and D

2.8 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

In response to the site audit findings, the Contractor has carried out corrective actions.

A summary of the Environmental Mitigation and Enhancement Measure Implementation Schedules (EMIS) is presented in *Appendix C*. The necessary mitigation measures were implemented properly for this Contract.

2.9 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

One (1) Limit Level exceedance of 1-hour TSP was recorded for construction air quality monitoring in the reporting period. No exceedance of Action and Limit Levels of 24-hour TSP was recorded in the reporting period.

No Action or Limit Level exceedance for construction noise monitoring was recorded during the reporting period.

A total of thirty one (31) Action Level exceedances and three (3) Limit Level exceedances of bottom-depth dissolved oxygen (DO) and fifteen (15) Action Level exceedance of surface and middle-depth DO were recorded for water quality impact monitoring in the reporting period.

The construction impact on depth-averaged SS was assessed by comparing the quarterly mean values of depth-averaged SS with the relevant ambient mean values (*Table 2.18*). The monitoring results showed that the quarterly means of depth-averaged SS at all sampling stations during both mid-ebb and mid-flood tides were well below the corresponding ambient means. The depth-averaged SS results suggest that the Contract did not cause unacceptable impact on water quality in the reporting period.

Table 2.18 Comparison between Quarterly Mean and Ambient Mean Values of Depth-averaged Suspended Solids

Station	Baseline Mean		Ambient Mean [a]		Quarterly Mean (June to August 2019)	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
CS(Mf)3(N) [b]	9.2	12.8	12.0	16.6	5.6	6.5
CS(Mf)5	9.2	11.5	11.9	14.9	5.8	5.1
SR4(N)/ SR4(N2) [c][d]	10.3	12.3	13.4	16.0	7.6	6.6
SR4a	9.1	9.8	11.9	12.7	6.9	6.3
IS8/ IS8(N) [e]	11.3	13.5	14.6	17.6	7.8	6.6
IS(Mf)9	10.9	14.3	14.2	18.5	6.6	6.5
IS(Mf)16	11.4	10.3	14.8	13.4	7.8	7.1

Notes:

(a) Ambient mean value is defined as a 30% increase of the baseline mean value

(b) Water Quality Monitoring Station CS(Mf)3 was relocated to CS(Mf)3(N) since 2 May 2017.

(c) Water Quality Monitoring Station SR4 was relocated to SR4(N) since 2 March 2018.

(d) Water Quality Monitoring Station SR4(N) was relocated to SR4(N2) since 12 June 2019.

One (1) Limit Level exceedance was recorded for impact dolphin monitoring in this reporting quarter. Following the review of the monitoring data and marine works details as per the procedure stipulated in the Event and Action Plan of the Updated EM&A Manual, no unacceptable impact was associated with the construction works under this Contract that may have affected the dolphin usage in the North Lantau region. Investigation findings were detailed in *Appendix L*.

2.10 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

The Environmental Complaint Handling Procedure is provided in *Figure 2.5*.

There was no complaint, notification of summons or successful prosecution recorded in the reporting period.

Statistics on complaint, notification of summons of successful prosecution are summarized in *Appendix L*.

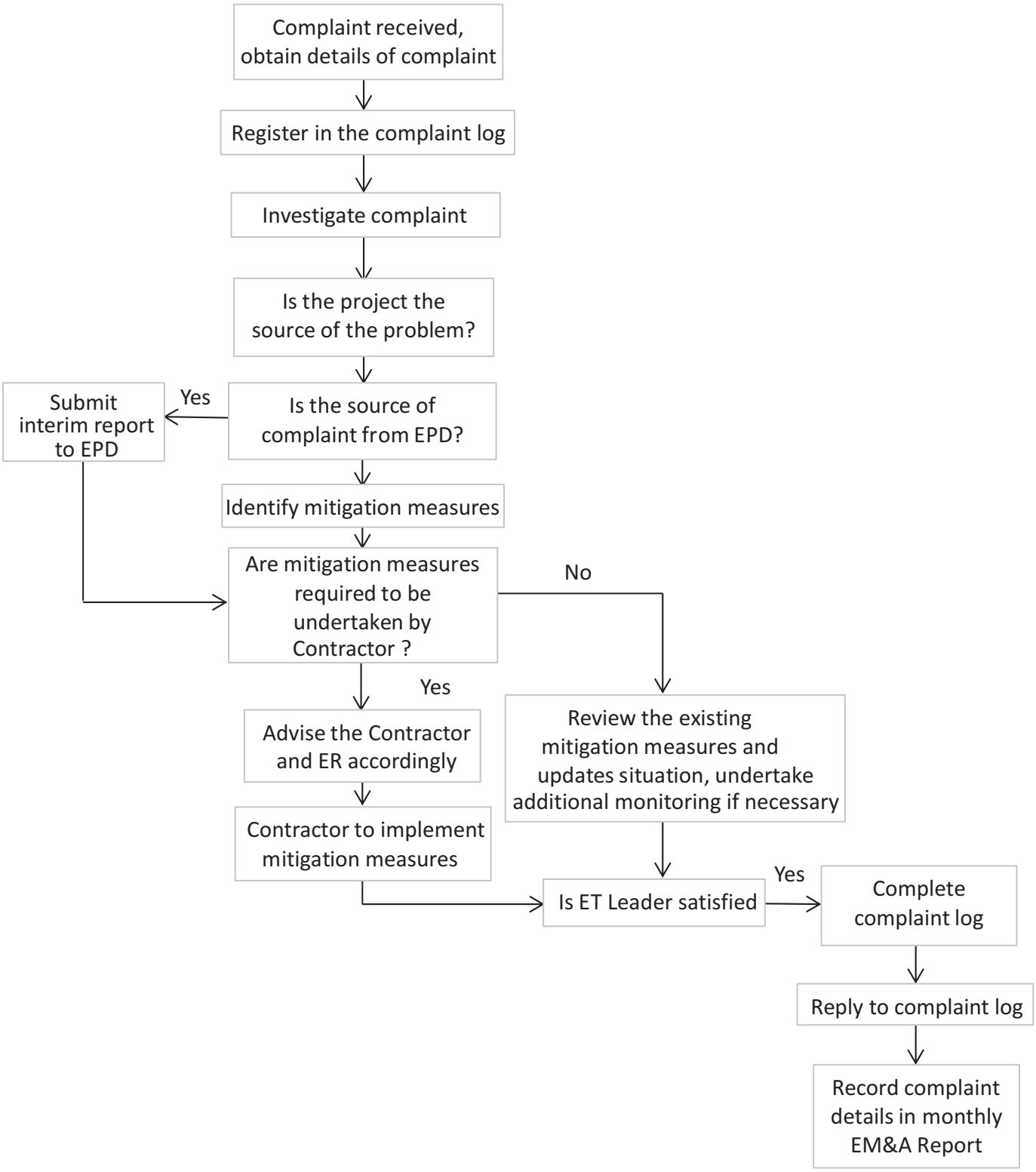


Figure 2.5 Environmental Complaint Handling Procedure

FILE: 0215660n2.cdr
DATE: 06/12/2013

Environmental Resources Management

ERM

3 FUTURE KEY ISSUES

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING QUARTER

As informed by the Contractor, the major works for the Contract in the coming quarter are summarized below:

September 2019

There are no major works to be undertaken in the next monitoring period of September 2019.

October 2019

There are no major works to be undertaken in the next monitoring period of October 2019.

November 2019

There are no major works to be undertaken in the next monitoring period of November 2019.

3.2 KEY ISSUES FOR THE COMING QUARTER

Potential environmental impacts arising from the above upcoming construction activities are mainly associated with waste management issues.

3.3 MONITORING SCHEDULE FOR THE COMING QUARTER

Impact monitoring for dolphin monitoring is scheduled to continue for the next reporting period.

Impact monitoring for air quality and noise were temporarily suspended. EPD have approved the temporary suspension of Air Quality Monitoring and Impact Noise Monitoring on 28 August 2019.

Impact monitoring for marine water quality was temporarily suspended. EPD have approved the temporary suspension of Water Quality Monitoring on 30 August 2019.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress.

4.1 CONCLUSIONS

The Twenty-third Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 June to 31 August 2019, in accordance with the Updated EM&A Manual and the requirements of the *Environmental Permits* (*EP-354/2009/D* and *EP-353/2009/K*).

One (1) Limit Level exceedance of 1-hour TSP was recorded for construction air quality monitoring in the reporting period. No exceedance of Action and Limit Levels of 24-hour TSP was recorded in the reporting period.

No Action or Limit Level exceedance for construction noise monitoring was recorded during the reporting period.

A total of thirty one (31) Action Level exceedances and three (3) Limit Level exceedances of bottom-depth dissolved oxygen (DO) and fifteen (15) Action Level exceedance of surface and middle-depth DO were recorded for water quality impact monitoring in the reporting period.

A total of four (4) groups of eight (8) Chinese White Dolphins were sighted during the six sets of survey from June to August 2019. One (1) Limit Level exceedance was recorded for the quarterly dolphin monitoring data between June to August 2019, no unacceptable impact from the activities of this Contract on Chinese White Dolphins was noticeable from the general observations. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

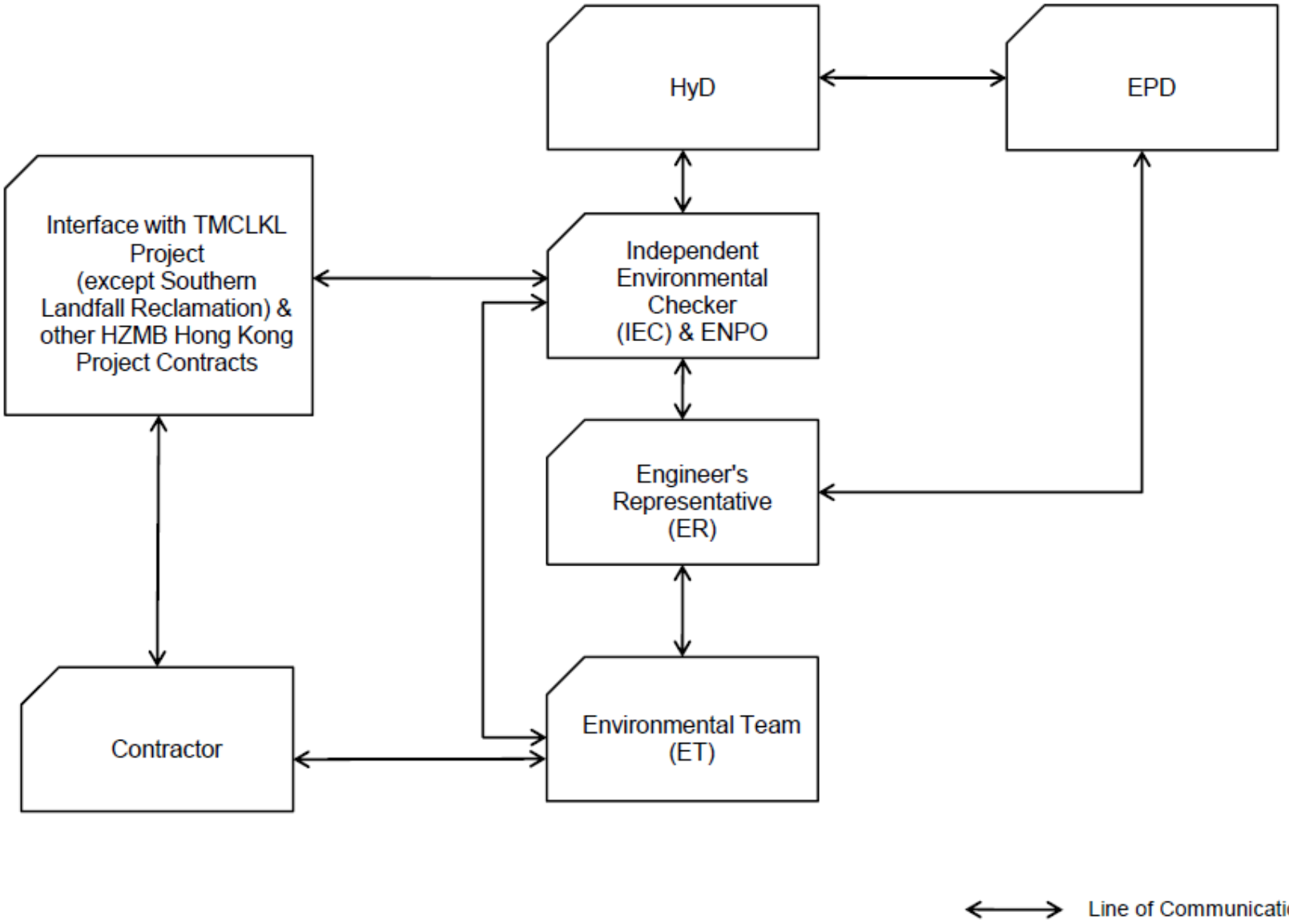
Environmental site inspection was carried out thirteen (13) times in the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audits.

There was no complaint, notification of summons or successful prosecution recorded in the reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not recommended at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A

Project Organization for Environmental Works



Appendix A1

Contract No. HY/2012/07 Southern Connection Viaduct Section
Project Organization

DATE: 06/03/2013

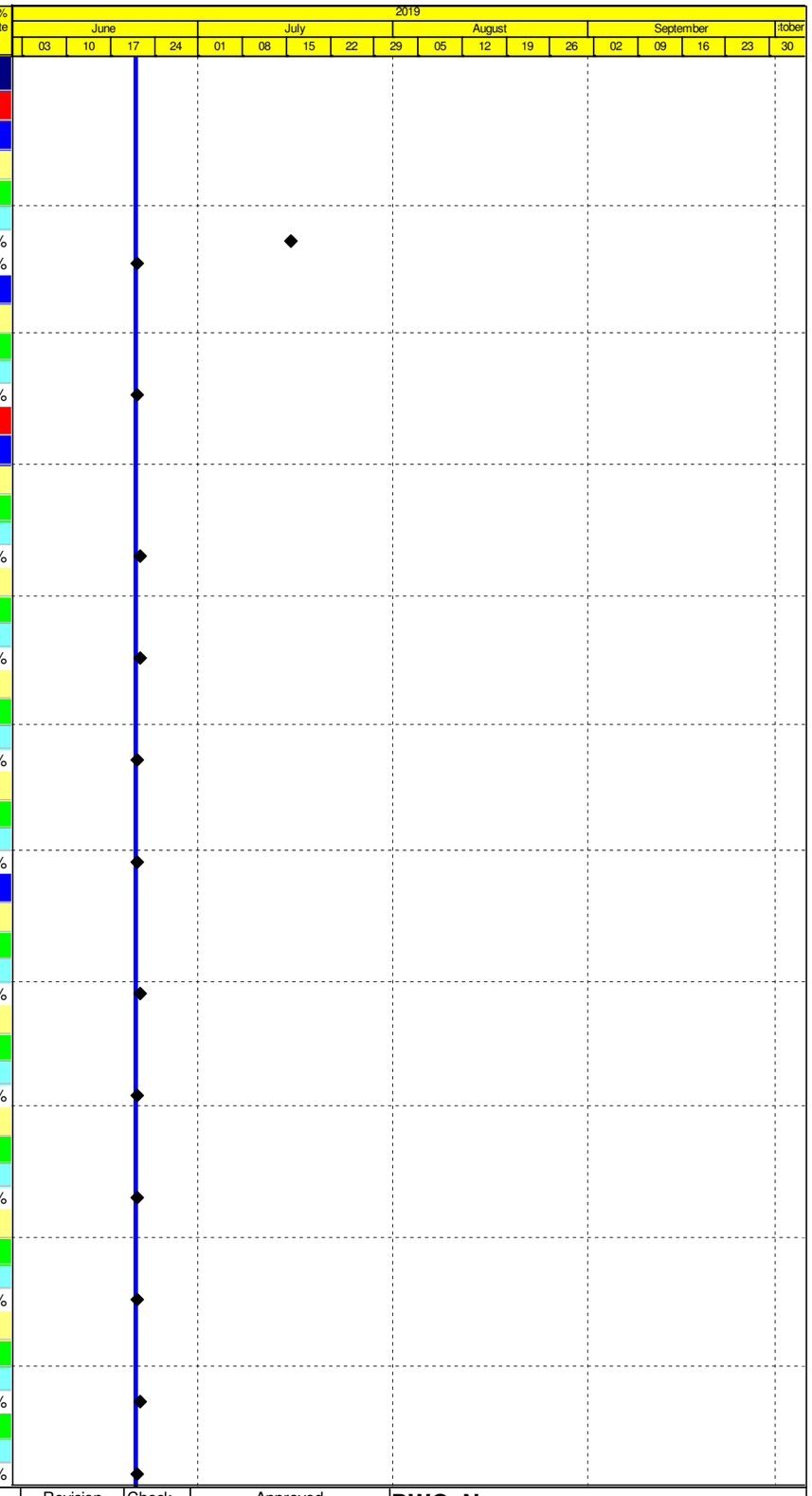
Environmental Resources Management

ERM

Appendix B

Construction Programme for the Reporting Quarter

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Physical % Complete
HY/2012/07 Tuen Mun-Chek Lap Kok Link - Southern Connection									
Contract Milestones									
Key Dates for Completion									
Section of the Works									
Completion Date									
General									
KD18	KD18 - Section 12: All Landscape Softworks (EoT 3-Dec-18)	0		0	15-Jul-19*		03-Dec-18	-224	0%
KD20	KD20 - Section 14: Preserve & Protect Existing Trees (EoT 7-Apr-17)	0		0	21-Jun-19*		07-Apr-17	-804	0%
Portion Handover Dates									
Vacate Works Area									
Vacate Dates									
General									
VAC05	Vacate Works Area WA5 (Zone 5C) (Extension Requested)	0		0	21-Jun-19*		18-Mar-19	-94	0%
Construction									
Foundation & Substructure Works									
Ramp A									
Abutment & Approach Ramp A									
Ramp Finishes, E&M & Roadworks									
ARA-C7850	Ramp A - maintenance period completion	0		0	21-Jun-19*		21-Jun-19	0	0%
Ramp B									
Abutment & Approach Ramp B									
Ramp Finishes, E&M & Roadworks									
ARB-C7850	Ramp B - maintenance period completion	0		0	21-Jun-19*		21-Jun-19	0	0%
Ramp C									
Abutment & Approach Ramp C									
Ramp Finishes, E&M & Roadworks									
ARC-C7850	Ramp C- maintenance period completion	0		0	21-Jun-19*		09-Feb-19	-131	0%
Ramp D									
Abutment & Approach Ramp D									
Ramp Finishes, E&M & Roadworks									
ARD-C7850	Ramp D - maintenance period completion	0		0	21-Jun-19*		26-Apr-19	-55	0%
Superstructure & Associated Works									
Viaduct A									
Bridge A2									
Deck Fnishes, E&M and Roadworks									
VA2-C7850	Viaduct A - maintenance period completion	0		0	21-Jun-19*		21-Jun-19	0	0%
Viaduct B									
Bridge B3									
Deck Fnishes, E&M and Roadworks									
VB3-C7850	Viaduct B - maintenance period completion	0		0	21-Jun-19*		20-Jun-19	0	0%
Viaduct C									
Bridge C4									
Deck Fnishes, E&M and Roadworks									
VC4-C7850	Viaduct C - maintenance period completion	0		0	21-Jun-19*		09-Feb-19	-131	0%
Viaduct D									
Bridge D3									
Deck Fnishes, E&M and Roadworks									
VD3-C7850	Viaduct D - maintenance period completion	0		0	21-Jun-19*		26-Apr-19	-55	0%
Viaduct E									
Bridge E1									
Deck Fnishes, E&M and Roadworks									
VE1CD-C7850	Viaduct E1 - maintenance period completion	0		0	21-Jun-19*		21-Jun-19	0	0%
Bridge E2									
Deck Fnishes, E&M and Roadworks									
VE23-C7850	Viaduct E2 - maintenance period completion	0		0	21-Jun-19*		18-Jun-19	-2	0%



Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPM-M73
Layout: J3518-DWP-3MRP Submission - M73
Filter: TASK filters: 3-Month Lookahead, No CC
Milestones, No Level of Effort.

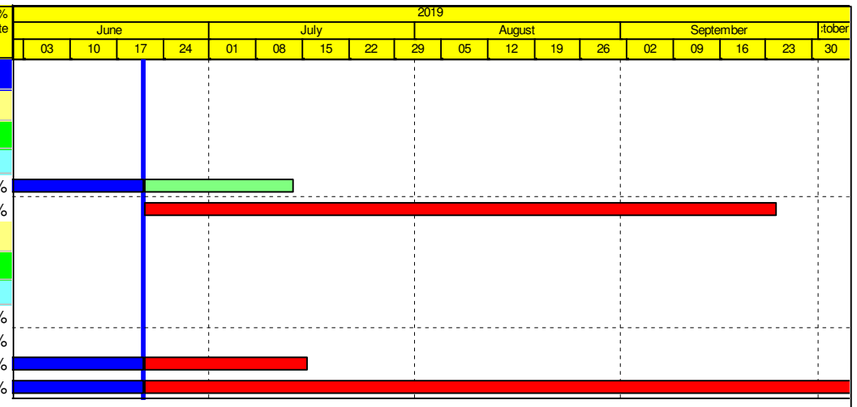
Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 1 of 2 Pages)
(Progress as of 21-Jun-19)

Date	Revision	Check...	Approved
21-Jun-19		Drago...	Brian Ho

DWG. No.:

J3518/GCL/PGM/3MRP-M73

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Physical % Complete
At-Grade Works & Miscellaneous Works									
At-Grade Works at Southern Landfall									
HKBCF Area									
General									
RW30100	South Landfall - New proposed maintenance access	90	21-Mar-19 A	19	13-Jul-19	24-Jun-20	17-Jul-20	300	95%
RW30110	South Landfall - removal of jetty and reinstatement	80	15-Jul-19 A	80	24-Sep-19	09-Oct-18	14-Jan-19	-205	0%
Landscaping Works & Establishment Works									
Lanscape Softworks									
General									
LW00010	Landscaping Works at NLH/CTR (Slope Areas)	120	21-Dec-18 A	0	21-May-19 A				100%
LW00015	Landscaping Works at BCF	60	21-Dec-18 A	0	27-May-19 A				100%
LW00022	Testing & commissioning of Irrigation System	20	21-May-19 A	20	15-Jul-19	10-Nov-18	03-Dec-18	-178	0%
LW00040	Establishment Works for Landscape Softworks	365	28-May-19 A	365	19-Jun-20	02-Dec-18	01-Dec-19	-201	0%



Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPM-M73
Layout: J3518-DWP-3MRP Submission - M73
Filter: TASK filters: 3-Month Lookahead, No CC
Milestones, No Level of Effort.

Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 2 of 2 Pages)
(Progress as of 21-Jun-19)

Date	Revision	Check...	Approved
21-Jun-19		Drago...	Brian Ho

DWG. No.:

J3518/GCL/PGM/3MRP-M73

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

(In reference to CINOTECH (2011) Agreement No. CE35/2011 EP Baseline Environmental Monitoring for Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chep Lap Kok Link – Investigation. Updated EM&A Manual for Tuen Mun-Chek Lap Kok Link)

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
AIR QUALITY									
4.8.1	3.8	An effective watering programme of eight daily watering with complete coverage, is estimated to reduce by 50%. This is recommended for all areas in order to reduce dust levels to a minimum;	All areas / throughout construction period	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8. 1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8. 1	3.8	Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		<>
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		✓
NOISE									
5.11	Section 4	Noise monitoring	All existing representative sensitive receivers / during North Lantau Viaduct construction	Contractor	EM&A Manual		Y		✓
WATER QUALITY									
General Marine Works									
6.10	-	Bored piling to be undertaken within a metal casing.	Marine viaducts of TM-CLKL and HKLR/ bored piling	Contractor	TM-EIAO		Y		n/a
6.10	-	Barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		n/a

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
6.10	-	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		n/a
6.10	-	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.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		n/a
6.10	-	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		n/a
6.10	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		n/a
6.10	-	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.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		n/a
6.10	-	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.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
Temporary Staging work									
	5.2	Regular inspection for the accumulation of floating refuse and collection of floating refuse if required	During temporary staging works	Contractor			Y		n/a
	5.2	Provision of temporary drainage system on the temporary staging for collection of construction site runoff to allow appropriate treatment before discharge into the sea	During temporary staging works	Contractor			Y		n/a
	5.2	Wastewater generated from construction works such as bored / drilling water will be collected, treated, neutralized and de-silted through silt trap or sedimentation tank before disposal	During temporary staging works	Contractor			Y		n/a
	5.2	One additional water quality monitoring station is	During temporary	Contractor			Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		proposed at station SR4a In case elevated SS or turbidity is identified during the water quality monitoring, the source of pollution will be tracked down and be removed as soon as possible. In case depletion of dissolved oxygen is identified, artificial aeration will be arranged at the monitoring station SR4a,	staging works						
Land Works									
6.10	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	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.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	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.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.10	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
6.10	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.10	5.8	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.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	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.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.10	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	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 offsite disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		n/a
6.10	-	The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal Ordinance		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
6.10	-	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.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.10	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	✓
6.10	Section 5	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✓
Water Quality Monitoring									
6.10	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period. One year operation phase water quality monitoring at designated stations	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	✓ (Results adopted from published EM&A data of Contract No. HY/2012/08 between July and August 2019)
ECOLOGY									
8.14	6.3	Specification for and implement pre, during and post construction dolphin abundance monitoring.	All Areas/Detailed Design/ during construction works/post construction	Design Consultant/ Contractor	TMEIA	Y	Y	Y	✓
8.14	6.3	Specification for bored piling monitoring	Detailed Design	Design Consultant	TMEIA	Y			n/a

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
8.14	6.3	Implement any recommendations of the bored piling monitoring	Southern marine viaduct/Throughout construction during bored piling	Contractor	TMEIA		Y		n/a
8.14	6.3,6.5	Avoidance of peak CWD calving season in May and June for driving of metal caissons during bored piling works	Southern marine viaduct/ May and June during bored piling	Contractor	TMEIA		Y		n/a
8.14	6.3,6.5	Specification and implementation of 250m dolphin exclusion zone.	All marine bored piling and temporary staging works areas/Detailed Design/during all marine bored piling and temporary staging works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600 m^2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/ TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	n/a To be enforced by AFCD.
8.14	6.3, 6.5	Specification and implementation of marine vessel control specifications	All areas/Detailed Design/during construction works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.14	6.3, 6.5	Design and implementation of acoustic decoupling methods for marine bored piling and the whole lifespan of temporary staging works.	All areas/ Detailed Design/during marine bored piling and temporary staging works	Design Consultant/ Contractor	TMEIA	Y	Y		n/a
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Tai Ho Wan (donar site) and Yam Tsui Wan (receptor site) /Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		n/a
8.15	6.5	Audit coral translocation success	Yam Tsui Wan (receptor site)/Post translocation	Contractor	TMEIA		Y		Completed in October 2014

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
7.13	6.5	Undertaken gabion wall works in Stream NL1 in the dry season	North Lantau slope works/dry season/construction phase	Contractor	TMEIA		Y		n/a
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		n/a. To be approved by AFCD/LCSD
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Construction activities should be restricted to the proposed works boundary	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
LANDSCAPE AND VISUAL									
10.9	7.6	Round angle, patterned finishes, and oval shaped pier were considered in the viaduct design, and further details will be developed under ACABAS submission (DM3)	All areas/detailed design	Design Consultant	TMEIA	Y			n/a
10.9	7.6	Details of the street furniture will be developed in the detailed design stage (DM4)	All areas/detailed design	Design Consultant	TMEIA	Y			n/a
10.9	7.6	Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5)	All areas/detailed design	Design Consultant	TMEIA	Y			n/a
10.9	7.6	Existing trees on boundary of the Project Area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. (Tree protection measures will be detailed at Tree Removal Application stage) (CM1)							
10.9	7.6	Trees unavoidably affected by the works shall be transplanted where practical. Trees will be transplanted straight to their final receptor site and not held in a temporary nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme (CM2)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓ Tree transplanted as Contract Specification
10.9	7.6	Hillside and roadside screen planting to proposed roads, associated structures and slope works (CM3).	All areas/detailed design/ during construction/post construction	Design Consultant/	TMEIA	Y	Y		✓
10.9	7.6	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone) (CM4)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during	Design Consultant/	TMEIA	Y	Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
			construction	Contractor					
10.9	7.6	Recycle/Reuse all felled trees and vegetation, e.g. mulching (CM9)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		n/a No felled trees or vegetation suitable for recycle
10.9	7.6	Compensatory tree planting shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006 (CM10).	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Re-vegetation of affected woodland/shrubland with native species (OM1)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by AFCD/HyD/ L CSD
10.9	7.6	Tall buffer screen tree / shrub / climber planting should be incorporated to soften hard engineering structures and facilities (OM2)	All areas/detailed design/ during construction/ during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a To be implemented by HyD/LCSD
10.9	7.6	Streetscape elements (e.g. paving, signage, street furniture, lighting etc.) shall be sensitively designed in a manner that responds to the local context, and minimises potential negative landscape and visual impacts. Lighting units should be directional and minimise unnecessary light spill (OM3)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD/LCSD
10.9	7.6	Structure, ornamental tree / shrub / climber planting should be provided along roadside amenity strips, central dividers and newly formed slopes to enhance the townscape quality and further greenery enhancement	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		(OM4)							by HyD/LCSD
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	n/a. To be implemented by HyD
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised	All areas / throughout	Contractor	TMEIA		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	construction period						
12.6	8.1	Rock armour from the existing seawall should be reused on the new sloping seawall as far as possible	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	No waste shall be burnt on site.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Provisions to be made in contract documents to allow and promote the use of recycled aggregates where appropriate.	Detailed Design	Design Consultant	TMEIA	Y			n/a
12.6	8.1	The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction	All areas / throughout construction period	Contractor	TMEIA		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		materials should avoid over-ordering and wastage.							
12.6	8.1	The Contractor should recycle as many C&D materials (this is a waste section) as possible on-site. The public fill and C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal. Where practicable, the concrete and masonry should be crushed and used as fill materials. Steel reinforcement bar should be collected for use by scrap steel mills. Different areas of the sites should be considered for segregation and storage activities.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All falsework will be steel instead of wood.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Chemical waste producers should register with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows: - suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; - Having a capacity of <450L unless the specifications have been approved by the EPD; and - Displaying a label in English and Chinese according to the instructions prescribed in Schedule 2 of the Regulations. Clearly labelled and used solely for the storage of chemical wastes; - Enclosed with at least 3 sides; - Impermeable floor and bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest;	All areas / throughout construction period	Contractor	TMEIA		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		- Adequate ventilation; - Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and - Incompatible materials are adequately separated.							
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on-site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	All waste containers shall be in a secure area on hard standing;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of	Site Offices/	Contractor	TMEIA		Y		✓

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	throughout construction period						
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
CULTURAL HERITAGE									
11.8	Section 9	EM&A in the form of audit of the mitigation measures	All areas / throughout construction period	Highways Department	EIAO-TM		Y		n/a

Notes:

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Status:

✓	Compliance of Mitigation Measures
<>	Compliance of Mitigation but need improvement
x	Non-compliance of Mitigation Measures
▲	Non-compliance of Mitigation Measures but rectified by Contractor
Δ	Deficiency of Mitigation Measures but rectified by Contractor
n/a	Not Applicable in Reporting Period

Appendix D

Summary of Action and Limit Levels

Table D1 Action and Limit Levels for 1-hour and 24-hour TSP

Parameters	Action	Limit
24 Hour TSP Level in μg/m³	ASR9A/ASR8A = 178 ASR9C/ASR8/ASR9 = 178	260
1 Hour TSP Level in μg /m³	ASR9A/ASR8A = 394 ASR9C/ASR8/ASR9 = 393	500

Table D2 Action and Limit Levels for Construction Noise (0700-1900 hrs of normal weekdays)

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

Table D3 Action and Limit Levels for Water Quality

Parameter	Action Level#	Limit Level#
DO in mg/L [(a)]	Surface and Middle **5.0 mg/L** Bottom **4.7 mg/L**	Surface and Middle **4.2 mg/L** Bottom **3.6 mg/L**
Turbidity in NTU (Depth-averaged [(b), (c)])	120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., **27.5 NTU**	130% of upstream control station at the same tide of the same day and 99%-ile of baseline data, i.e., **47.0 NTU**
SS in mg/L (Depth-averaged [(b), (c)])	120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., **23.5 mg/L**	130% of upstream control station at the same tide of the same day and 10mg/L for WSD Seawater Intakes at Tuen Mun and 99%-ile of baseline data, i.e., **34.4 mg/L**

Notes:

Baseline data: data from HKZMB Baseline Water Quality Monitoring between 6 and 31 October 2011.

(a) For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

(b) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths

(c) For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

(d) All figures given in the table are used for reference only, and EPD may amend the figures whenever it is considered as necessary

Parameter	Action Level#	Limit Level#
(e) The 1%-ile of baseline data for surface and middle DO is 4.2 mg/L, whilst for bottom DO is 3.6 mg/L.		

Table D4 Action and Limit Levels for Impact Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	STG < 70% of baseline & ANI < 70% of baseline	STG < 70% of baseline & ANI < 70% of baseline
Limit Level	[STG < 40% of baseline & ANI < 40% of baseline] and STG < 40% of baseline & ANI < 40% of baseline	

Notes:

1. STG means quarterly encounter rate of number of dolphin sightings, which is **6.00 in NEL** and **9.85 in NWL** during the baseline monitoring period
2. ANI means quarterly encounter rate of total number of dolphins, which is **22.19 in NEL** and **44.66 in NWL** during the baseline monitoring period
3. For North Lantau Social Cluster, AL will be trigger if NEL or NWL fall below the criteria; LL will be triggered if both NEL and NWL fall below the criteria.

Table D5 Derived Value of Action Level (AL) and Limit Level (LL)

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	STG < 4.2 & ANI< 15.5	STG < 6.9 & ANI < 31.3
Limit Level	[STG < 2.4 & ANI <8.9] and [STG < 3.9 & ANI <17.9]	

Appendix E

EM&A Monitoring Schedules

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Noise Monitoring Schedule (1 to 30 June 2019)

Alternative Noise Monitoring at Pak Mong Village Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jun
2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun
		Noise Impact Monitoring				
9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	Noise Impact Monitoring			Noise Impact Monitoring		
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
			Noise Impact Monitoring			
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
		Noise Impact Monitoring			Noise Impact Monitoring	
30-Jun						

The schedule is subject to agreement from the EPD on the monitoring times. The schedule will be revised after reviewing the progress of the construction works or due to adverse (safety, weather etc) conditions. Additional weekly noise impact monitoring for construction works undertaken between 19:00-07:00 will be supplemented after confirmation of construction schedule.

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Air Quality Monitoring Schedule (1 to 30 June 2019)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jun
2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun
		1-hr TSP Monitoring 24-hr TSP Monitoring				
9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring		
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
			1-hr TSP Monitoring 24-hr TSP Monitoring			
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
		1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring	
30-Jun						

The schedule is subject to agreement from the EPD on the monitoring times. The schedule will be revised after reviewing the progress of the construction works or due to adverse (safety, weather etc) conditions.

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Noise Monitoring Schedule (1 to 31 July 2019)

Alternative Noise Monitoring at Pak Mong Village Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
				Noise Impact Monitoring		
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
			Noise Impact Monitoring			
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
		Noise Impact Monitoring				
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
	Noise Impact Monitoring			Noise Impact Monitoring		
28-Jul	29-Jul	30-Jul	31-Jul			
			Noise Impact Monitoring			

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Air Quality Monitoring Schedule (1 to 31 July 2019)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
				1-hr TSP Monitoring 24-hr TSP Monitoring		
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
			1-hr TSP Monitoring 24-hr TSP Monitoring			
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
		1-hr TSP Monitoring 24-hr TSP Monitoring				
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
	1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A			1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A		
28-Jul	29-Jul	30-Jul	31-Jul			
			1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring was cancelled due to adverse weather			

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Noise Monitoring Schedule (1 to 31 August 2019)

Alternative Noise Monitoring at Pak Mong Village Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
		Noise Impact Monitoring				
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
	Noise Impact Monitoring			Noise Impact Monitoring		
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
			Noise Impact Monitoring			
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
		Noise Impact Monitoring				

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Air Quality Monitoring Schedule (1 to 31 August 2019)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
		1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A				
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
	1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A			1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A		
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
			1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A			
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
		1-hr TSP Monitoring at ASR8A 24-hr TSP Monitoring at ASR8A				

HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section

Impact Marine Water Quality Monitoring (WQM) Schedule (June 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1/Jun
2/Jun	3/Jun	4/Jun	5/Jun	6/Jun	7/Jun	8/Jun
	ebb tide 11:15 - 14:45 flood tide 4:27 - 7:57		ebb tide 12:34 - 16:04 flood tide 5:36 - 9:06		WQM will be canceled due to suspension of marine works during holiday	
9/Jun	10/Jun	11/Jun	12/Jun	13/Jun	14/Jun	15/Jun
	ebb tide 5:10 - 8:40 flood tide 10:15 - 13:45		ebb tide 7:38 - 11:08 flood tide 13:23 - 16:53		ebb tide 9:16 - 12:46 flood tide 15:46 - 19:16	
16/Jun	17/Jun	18/Jun	19/Jun	20/Jun	21/Jun	22/Jun
	ebb tide 11:18 - 14:48 flood tide 4:24 - 7:54		ebb tide 12:35 - 16:05 flood tide 5:33 - 9:03		ebb tide 13:51 - 17:21 flood tide 6:45 - 10:15	
23/Jun	24/Jun	25/Jun	26/Jun	27/Jun	28/Jun	29/Jun
	ebb tide 15:49 - 19:00 flood tide 9:02 - 12:32		ebb tide 7:00 - 10:11 flood tide 11:40 - 15:10		ebb tide 8:23 - 11:53 flood tide 14:22 - 17:52	
30/Jun						

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Dolphin Monitoring Survey Schedule (1 to 30 June 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jun
2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun	8-Jun
	Impact Dolphin Monitoring			Impact Dolphin Monitoring		
9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	Impact Dolphin Monitoring			Impact Dolphin Monitoring		
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
30-Jun						

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Dolphin Monitoring Survey Schedule (1 to 31 July 2019)

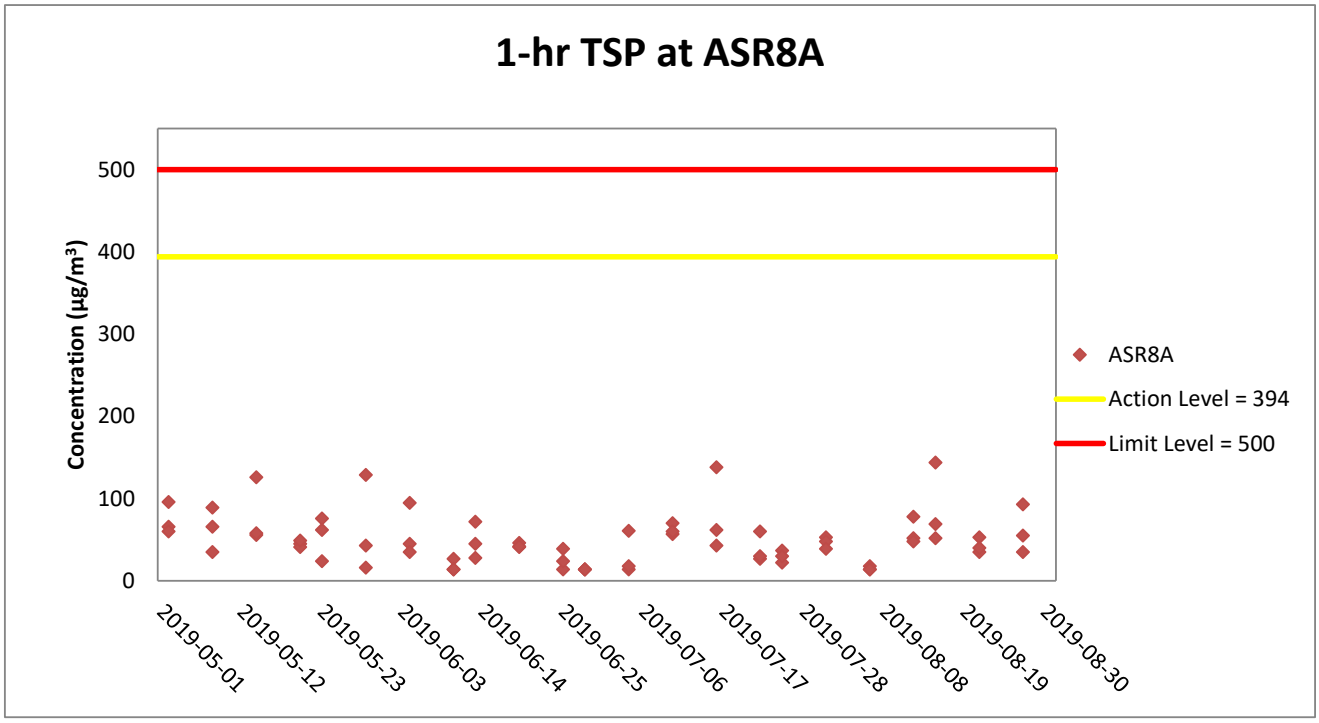
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
		Impact Dolphin Monitoring		Impact Dolphin Monitoring		
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
	Impact Dolphin Monitoring		Impact Dolphin Monitoring			
28-Jul	29-Jul	30-Jul	31-Jul			

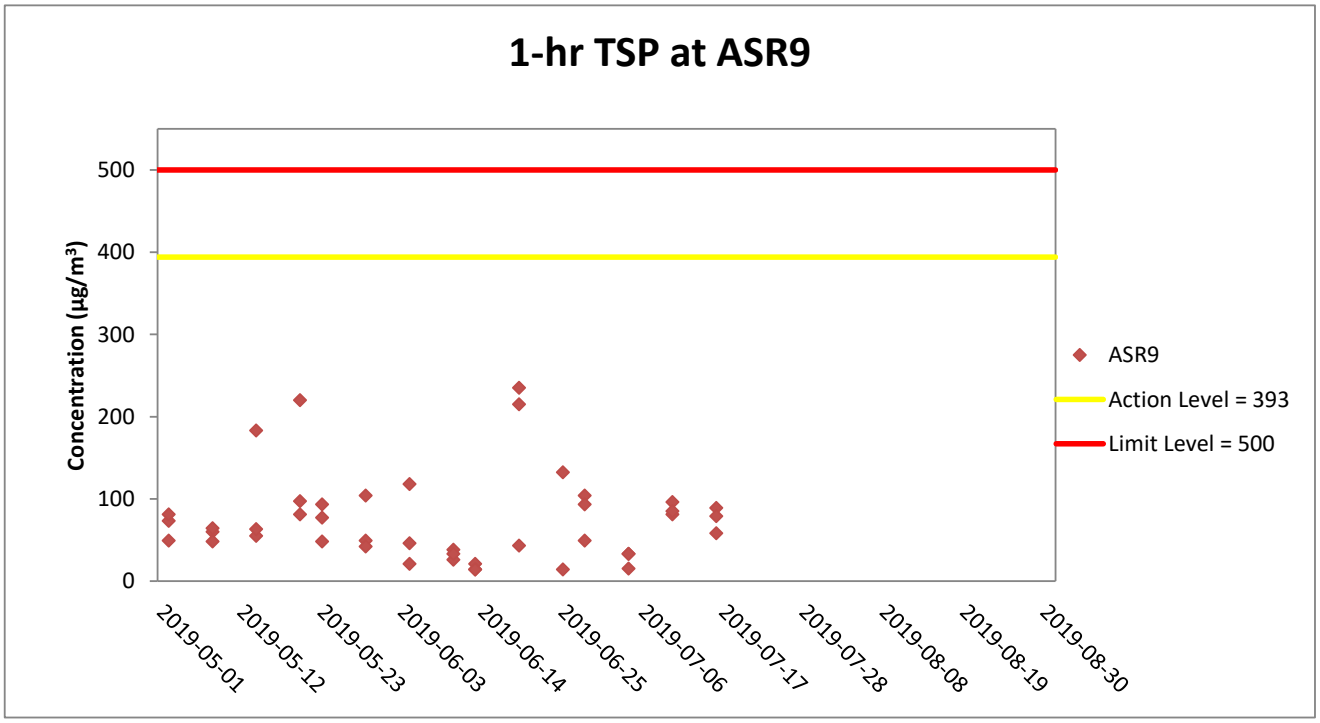
HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Dolphin Monitoring Survey Schedule (1 to 31 August 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
		Impact Dolphin Monitoring	Impact Dolphin Monitoring			
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
		Impact Dolphin Monitoring				
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
	Impact Dolphin Monitoring			Impact Dolphin Monitoring		

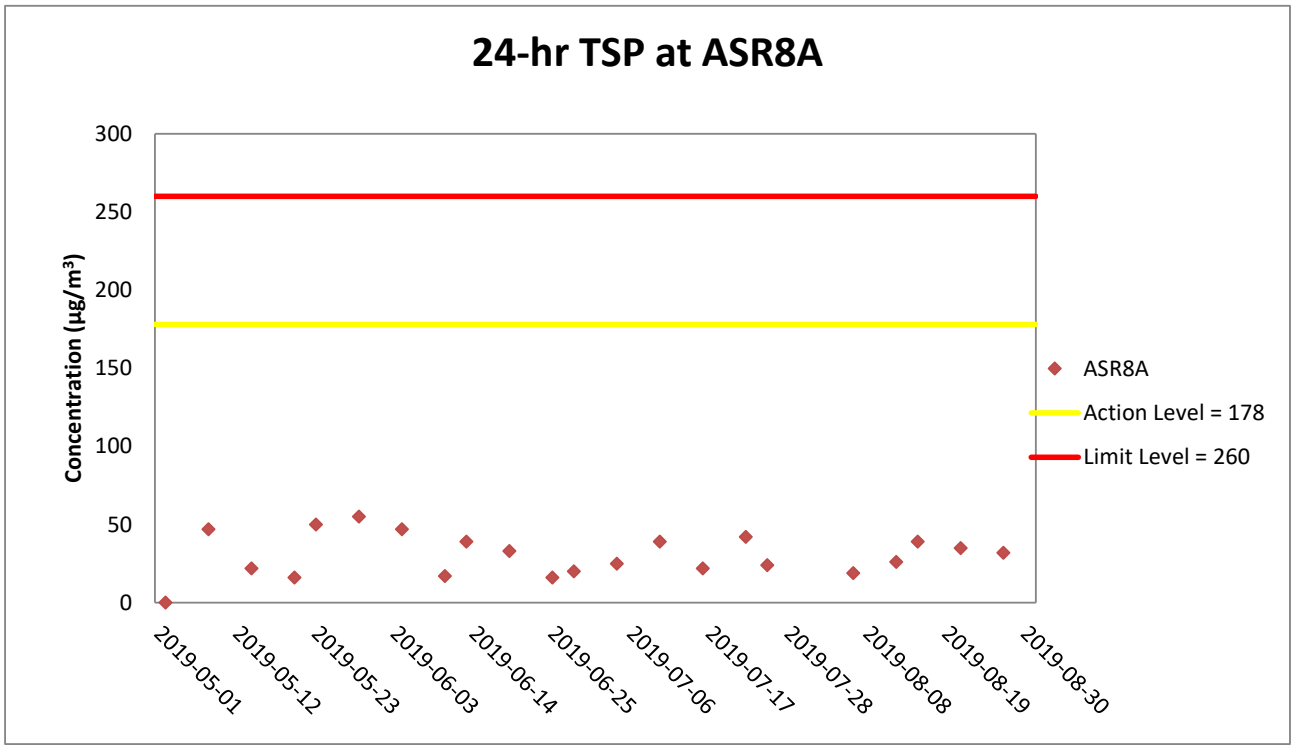
Appendix F

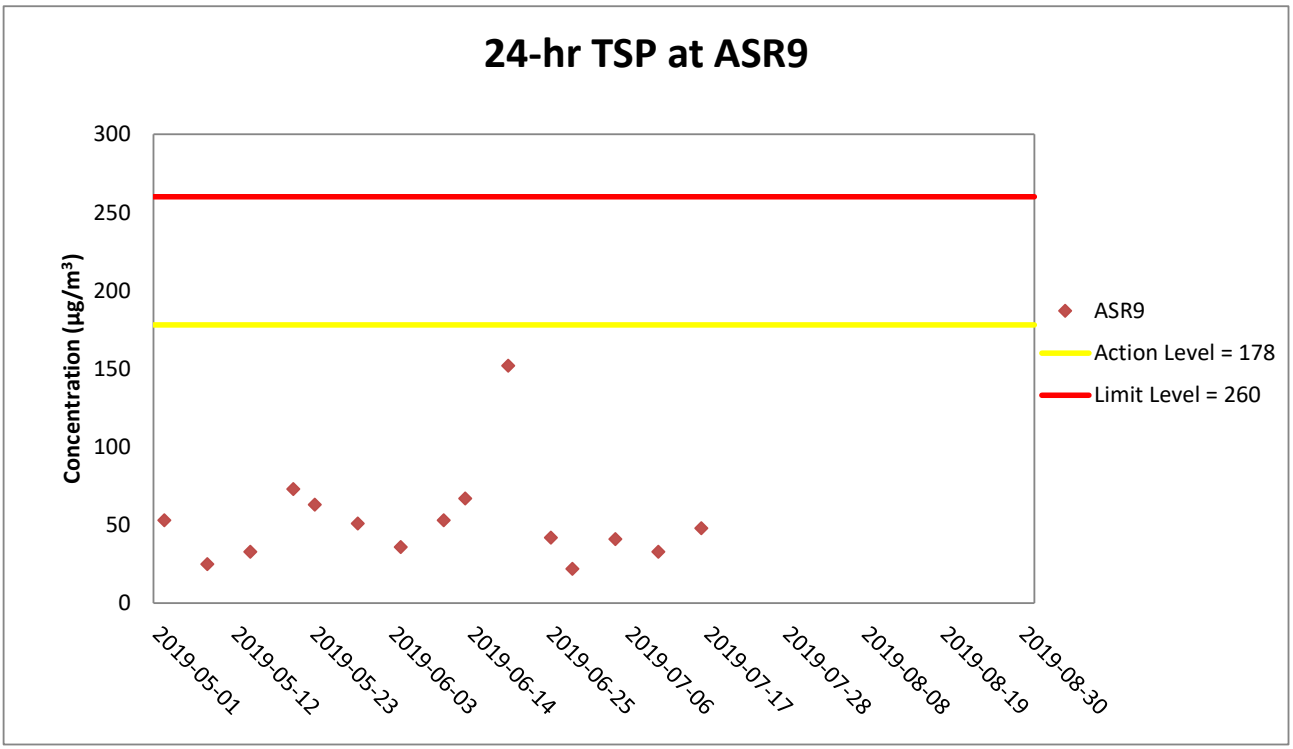
Impact Air Quality Monitoring Graphical Presentation





Weather condition within the reporting period varied between sunny to rainy.
1-hr TSP monitoring on 22, 25, 31 July and in August 2019 at ASR9 were cancelled due to power shortage.
Major construction works undertaken during June and July 2019 included at-grade works and landscaping softworks at HKBCF and reinstatement of seawall at seafront. No major construction works were undertaken during August 2019.

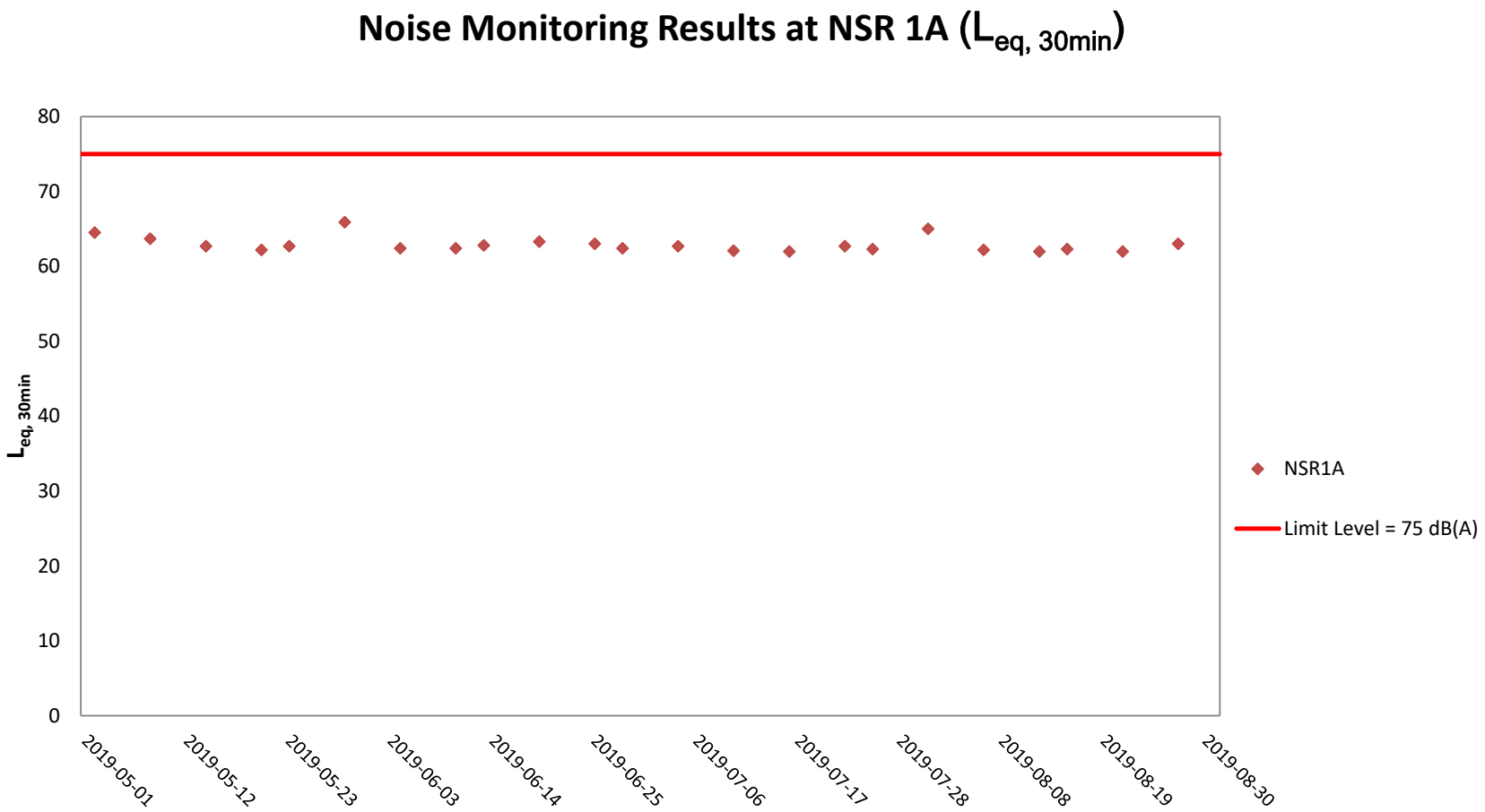




Weather condition within the reporting period varied between sunny to rainy.
24-hr TSP monitoring on 31 July 2019 at ASR8A was cancelled due to adverse weather. 24-hr TSP monitoring on 22, 25, 31 July and in August 2019 at ASR9 were cancelled due to power shortage.
Major construction works undertaken during June and July 2019 included at-grade works and landscaping softworks at HKBCF and reinstatement of seawall at seafront. No major construction works were undertaken during August 2019.

Appendix G

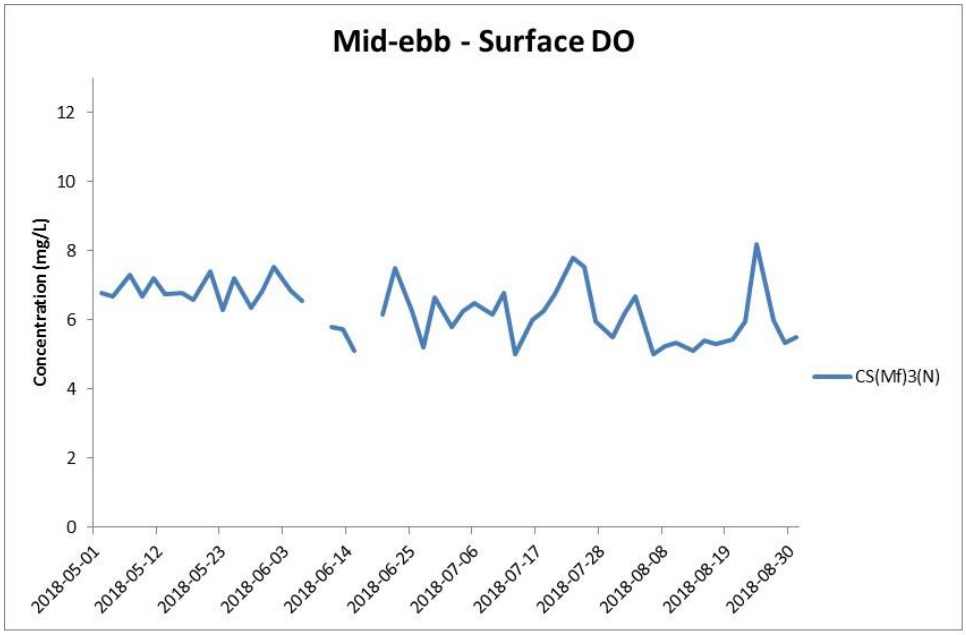
Impact Noise Monitoring Graphical Presentation



Weather condition within the reporting period varied between sunny to rainy.
Major construction works undertaken during June and July 2019 included at-grade works and landscaping softworks at HKBCF and reinstatement of seawall at seafront. No major construction works were undertaken during August 2019.

Appendix H

Impact Water Quality Monitoring Graphical Presentation



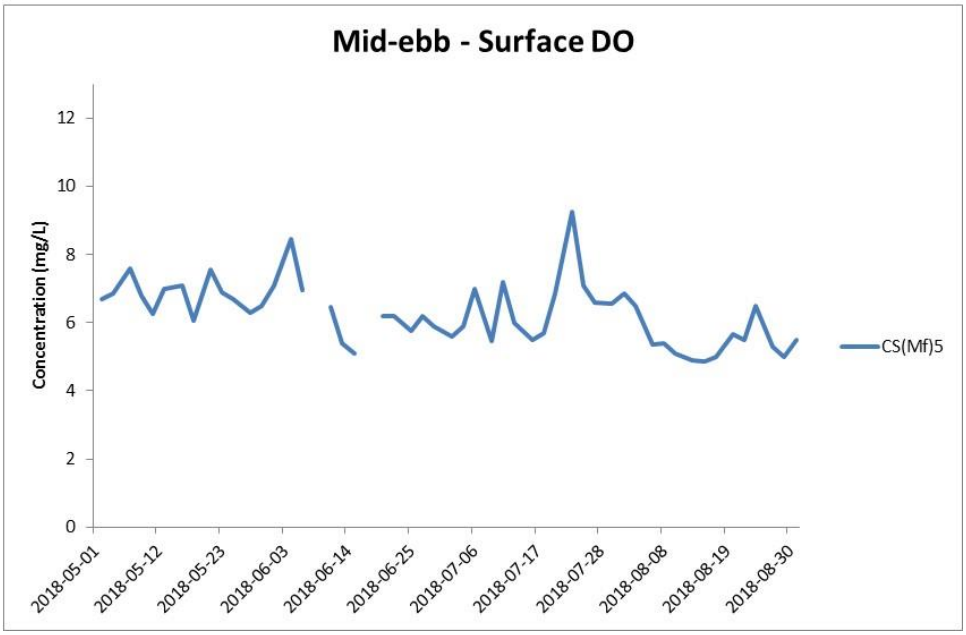
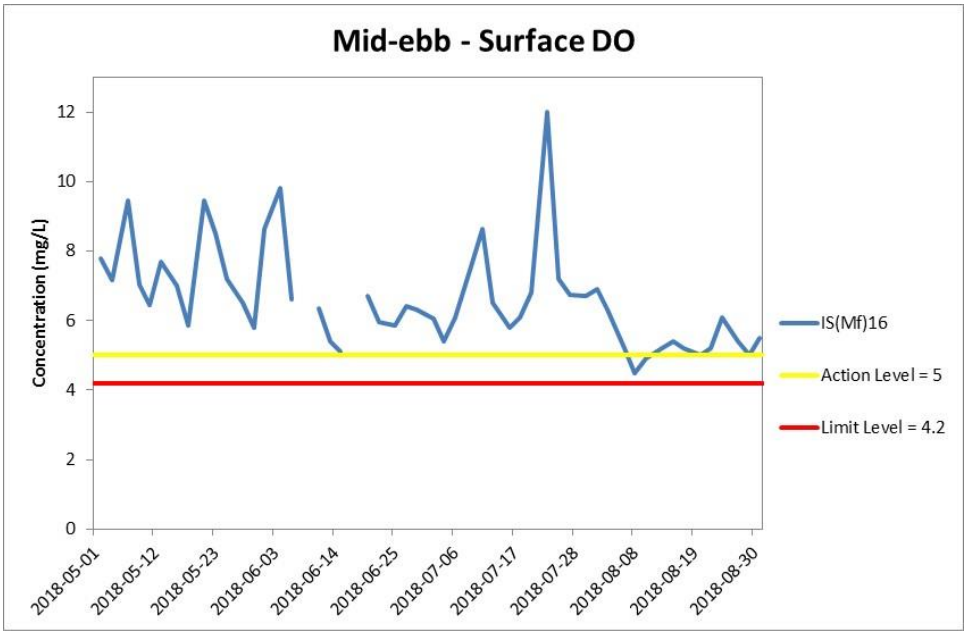


Figure H1 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



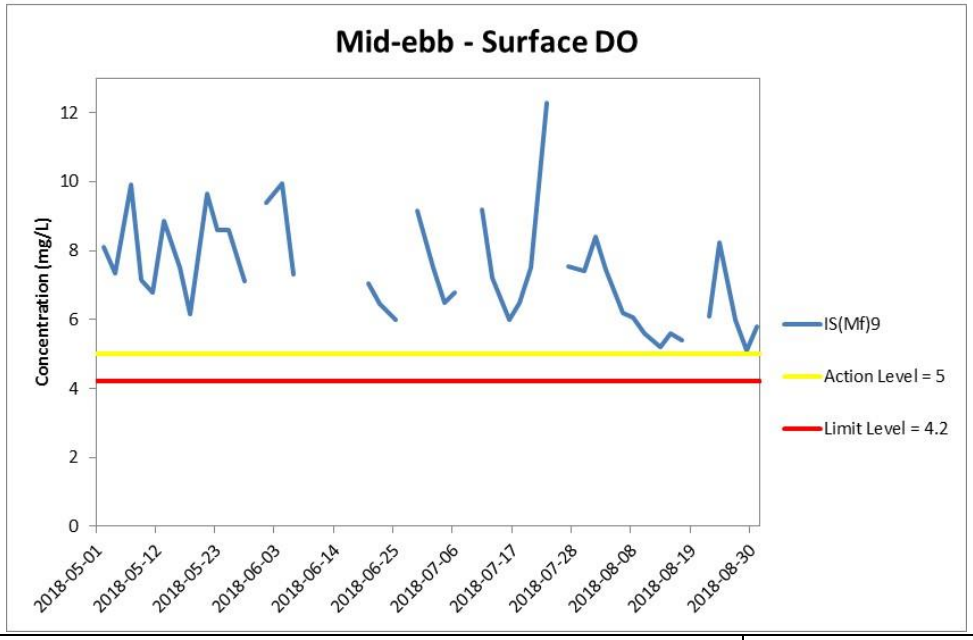
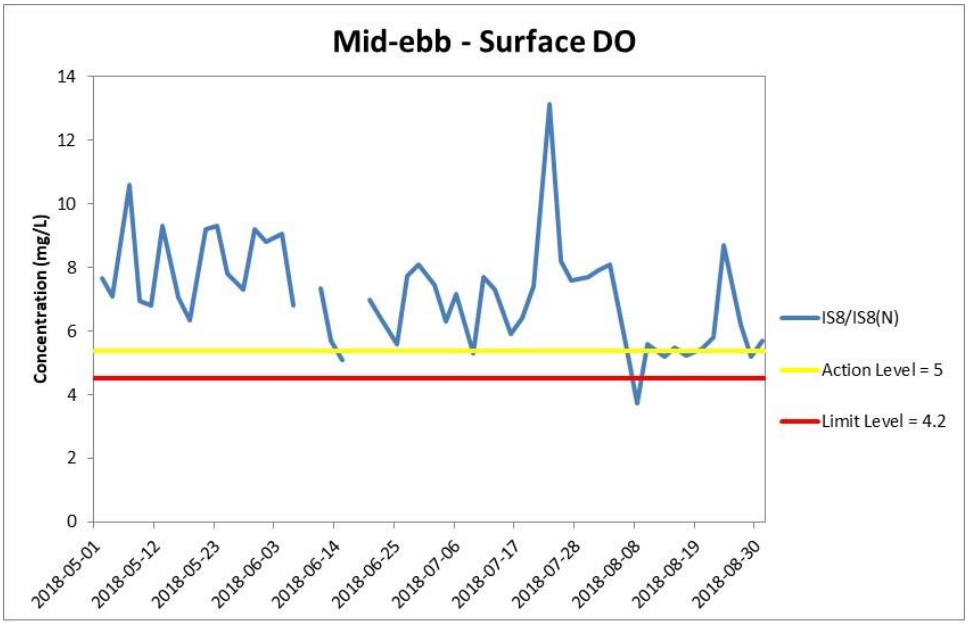


Figure H2 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



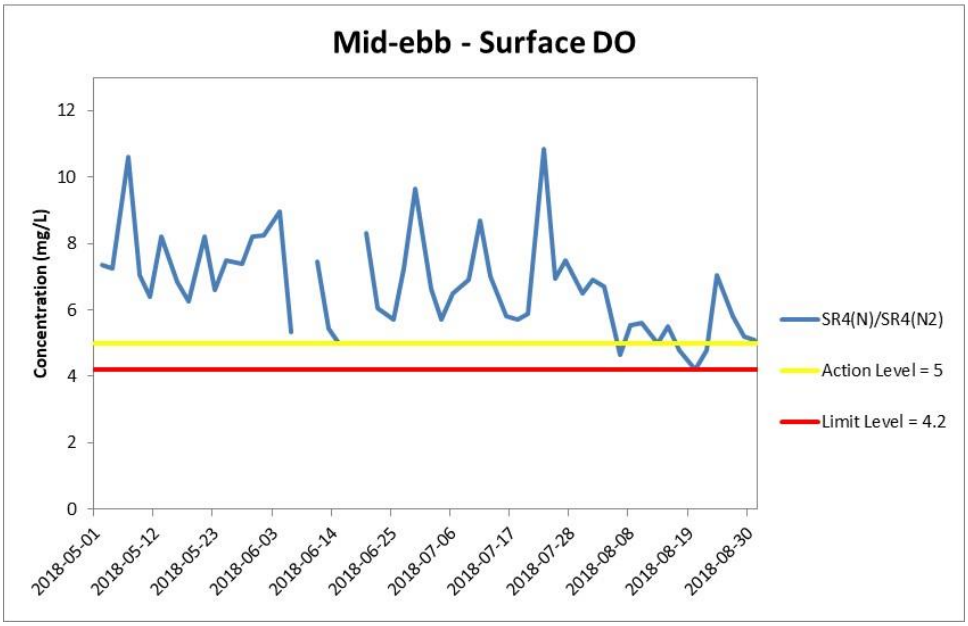


Figure H3 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

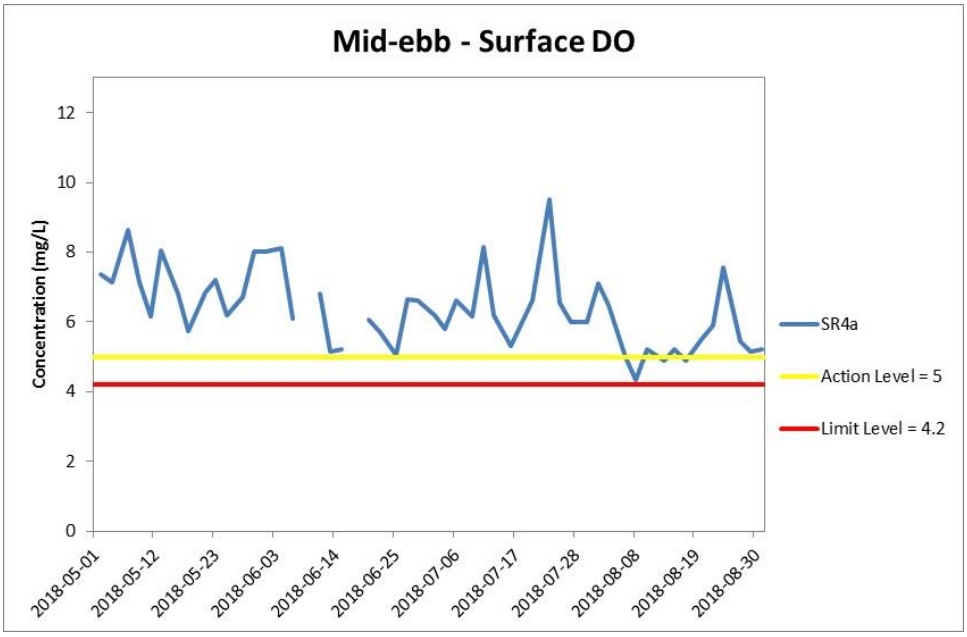
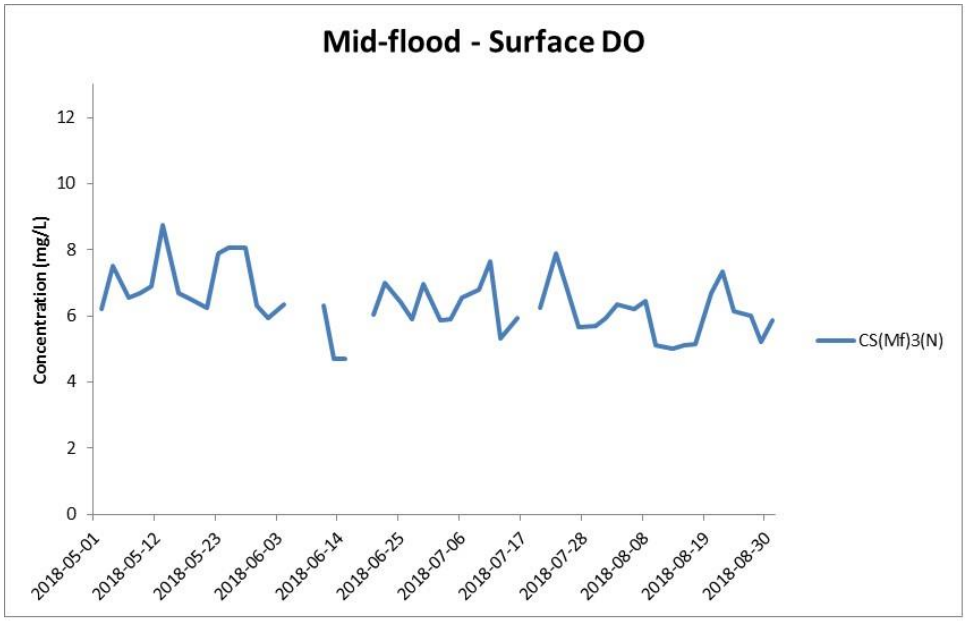


Figure H4 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



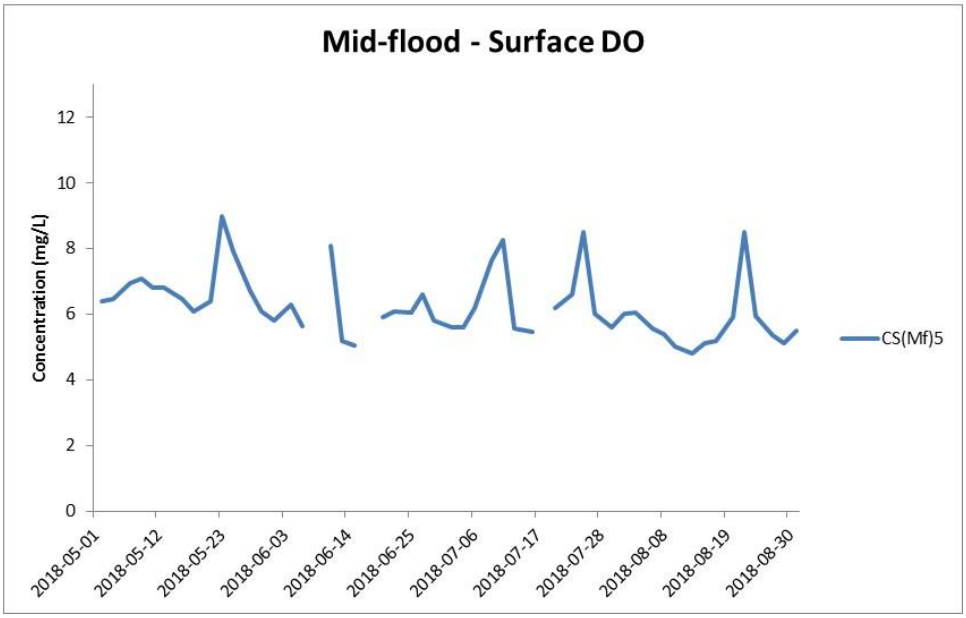
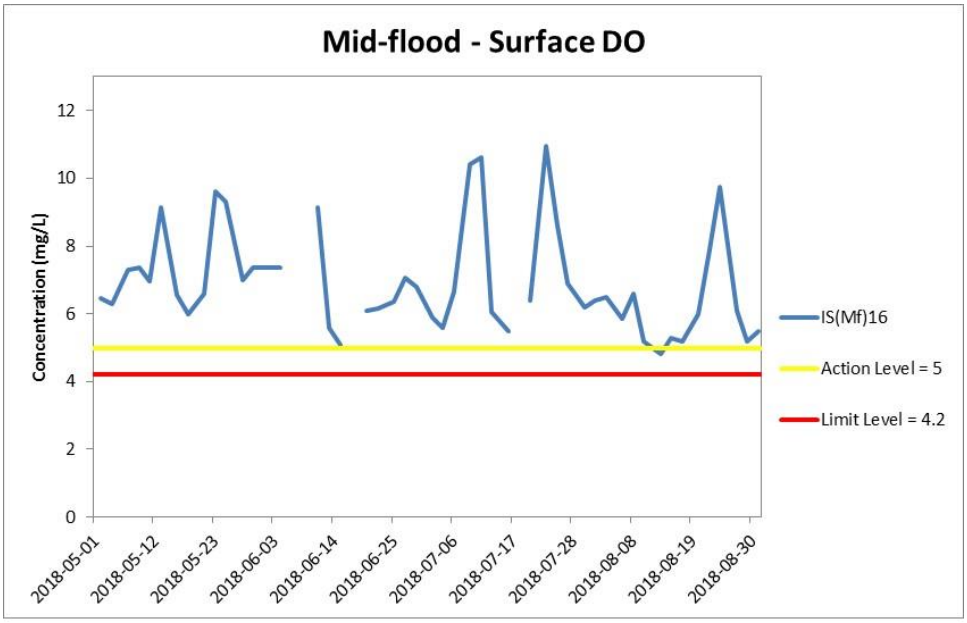


Figure H5 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



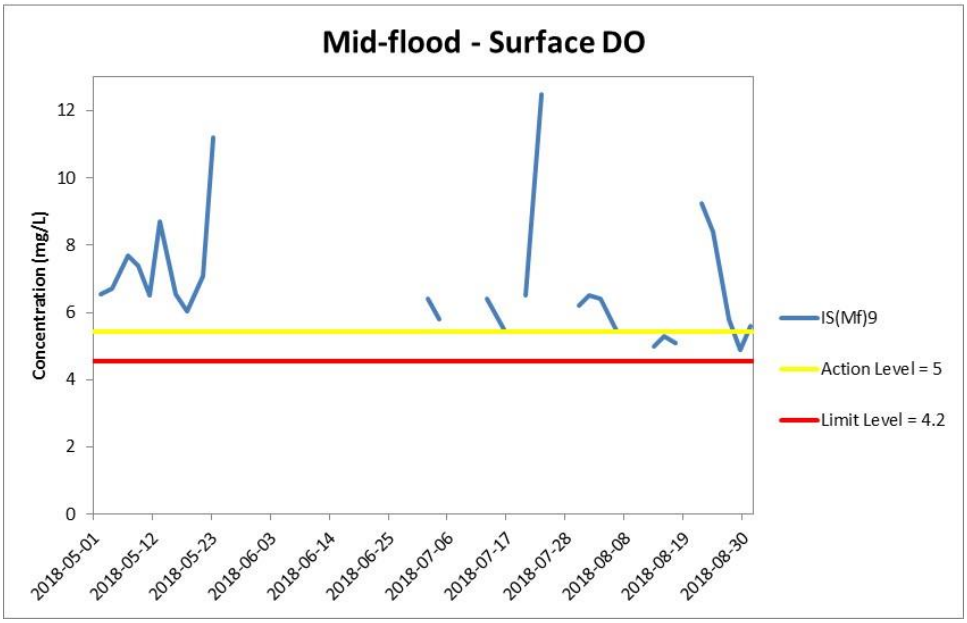
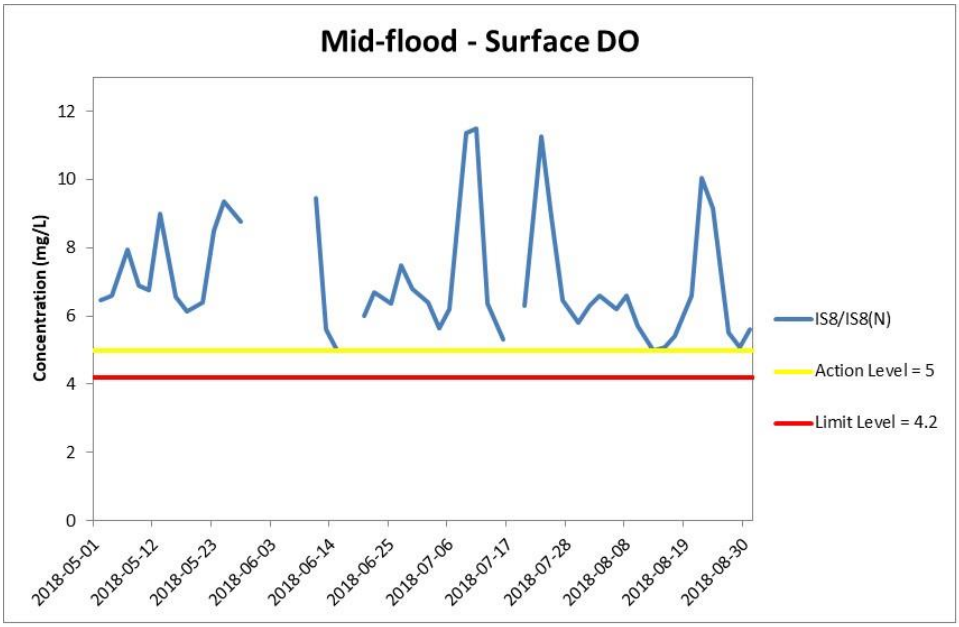


Figure H6 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.)
In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



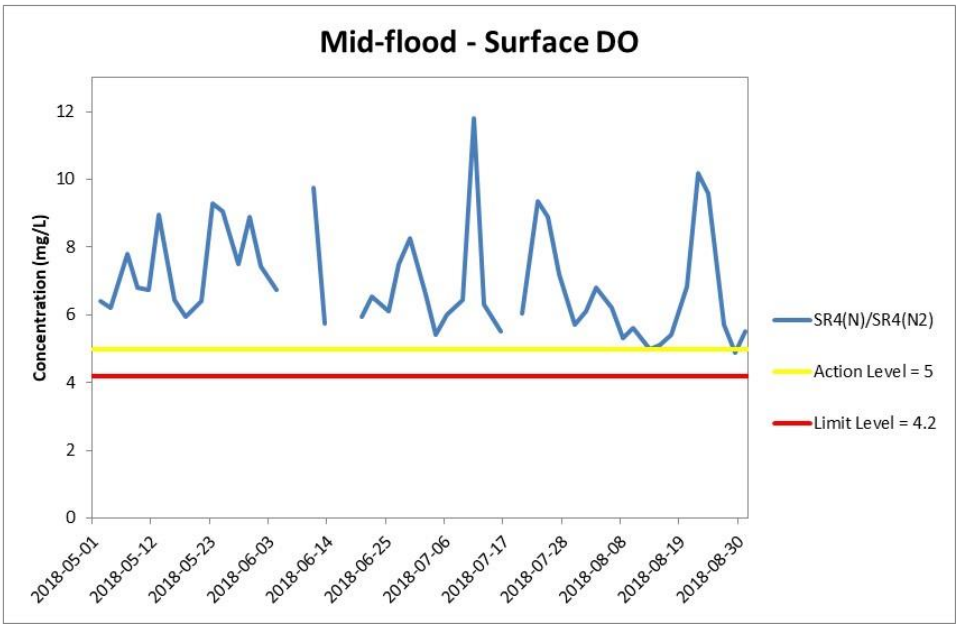


Figure H7 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM

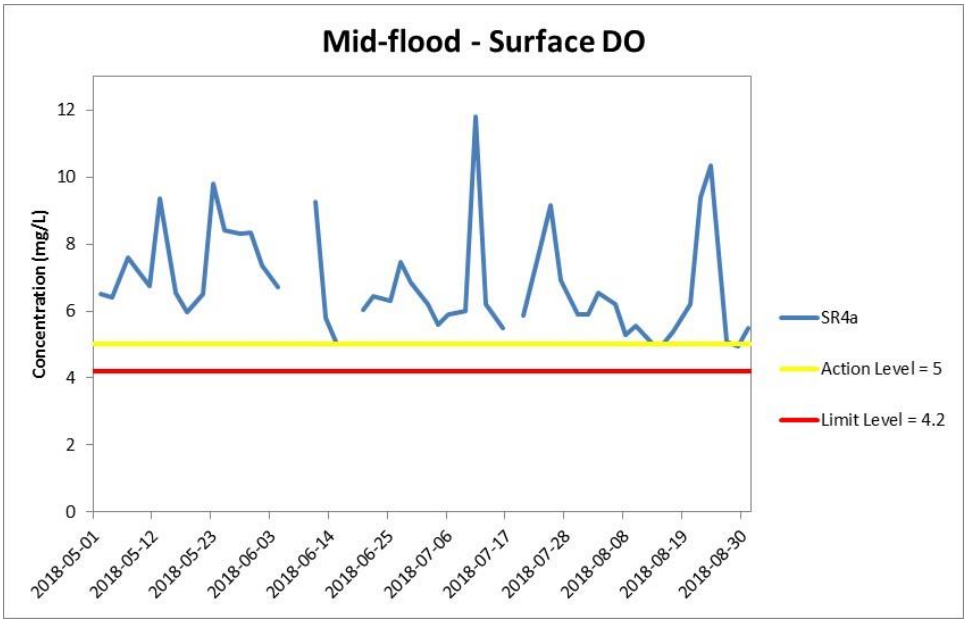
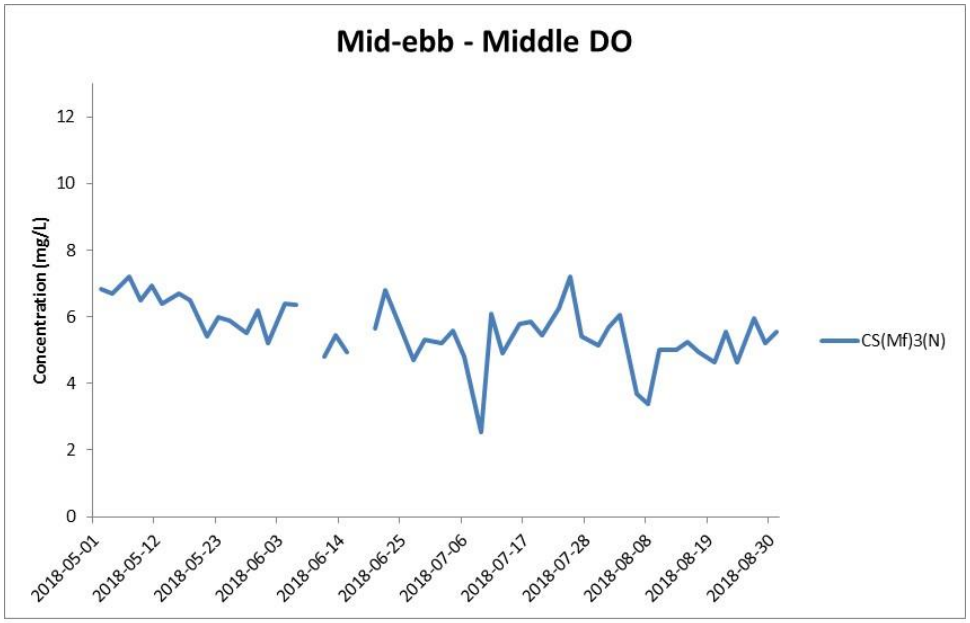


Figure H8 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



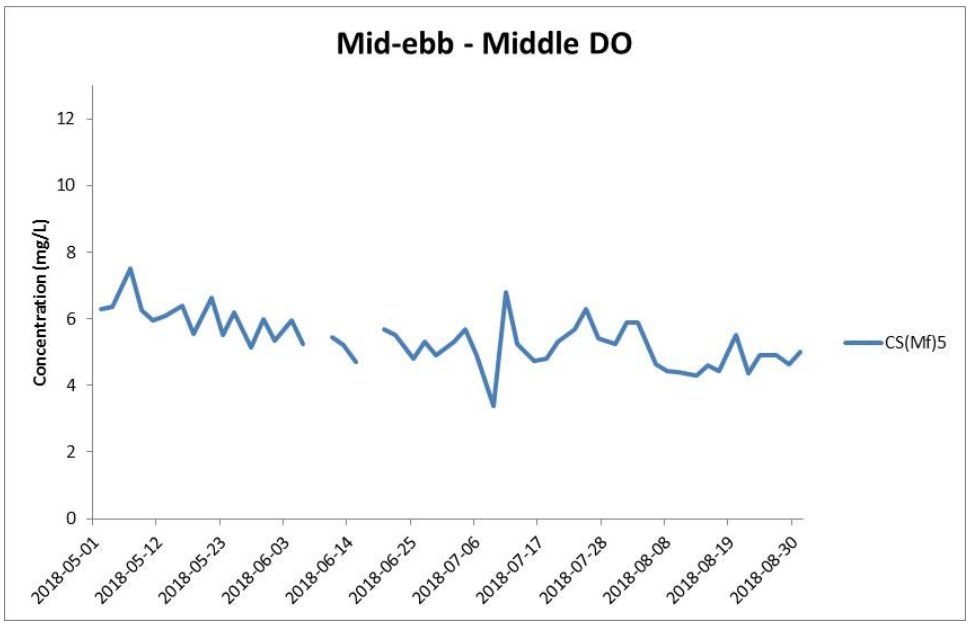
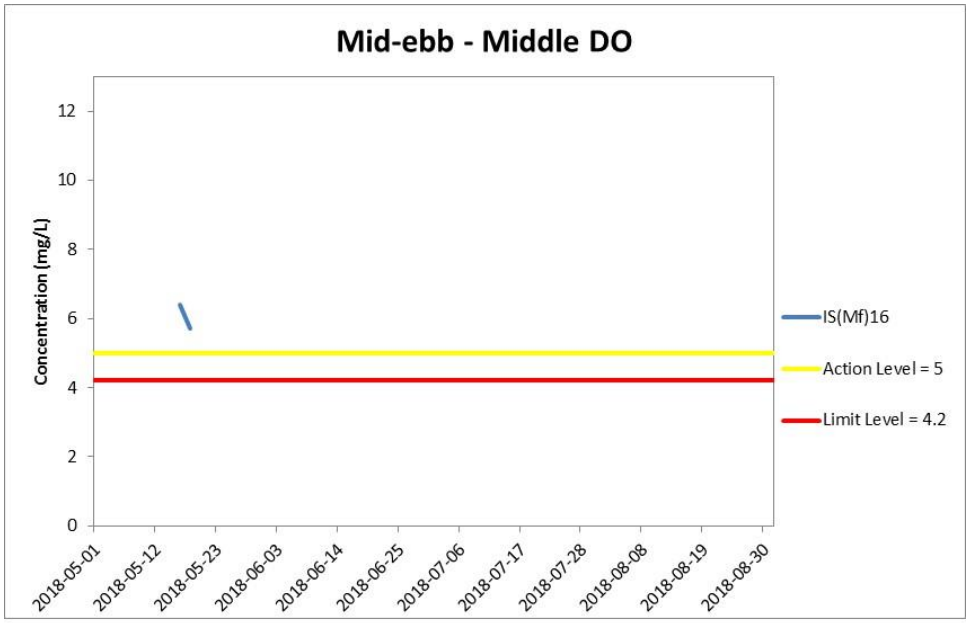


Figure H9 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



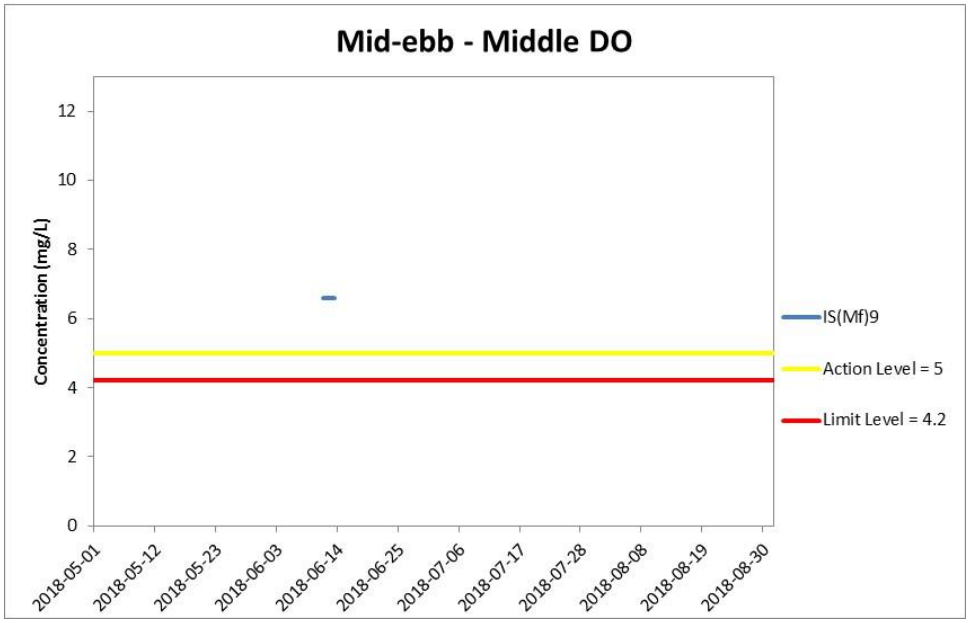
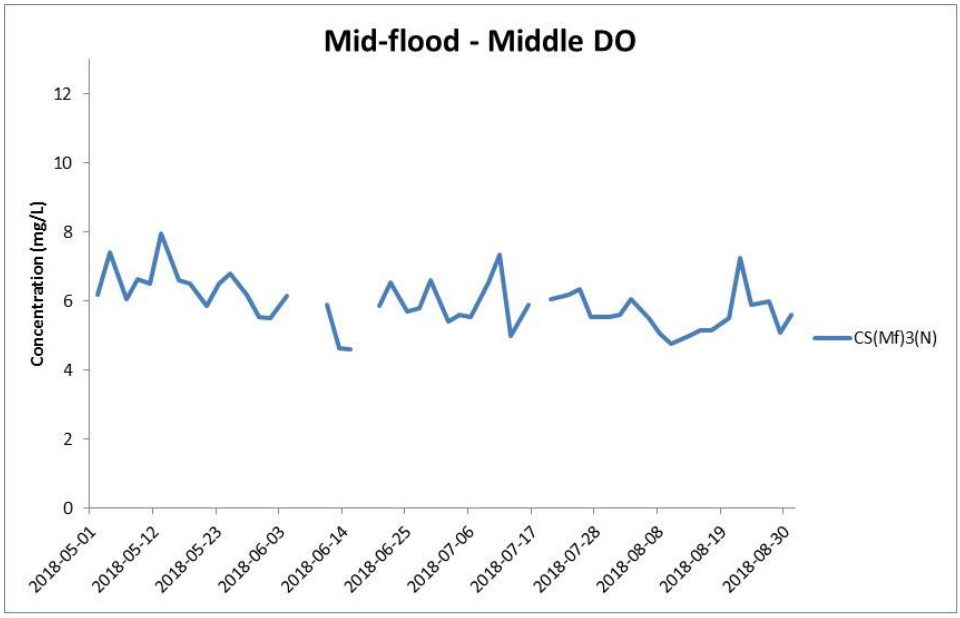


Figure H10 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



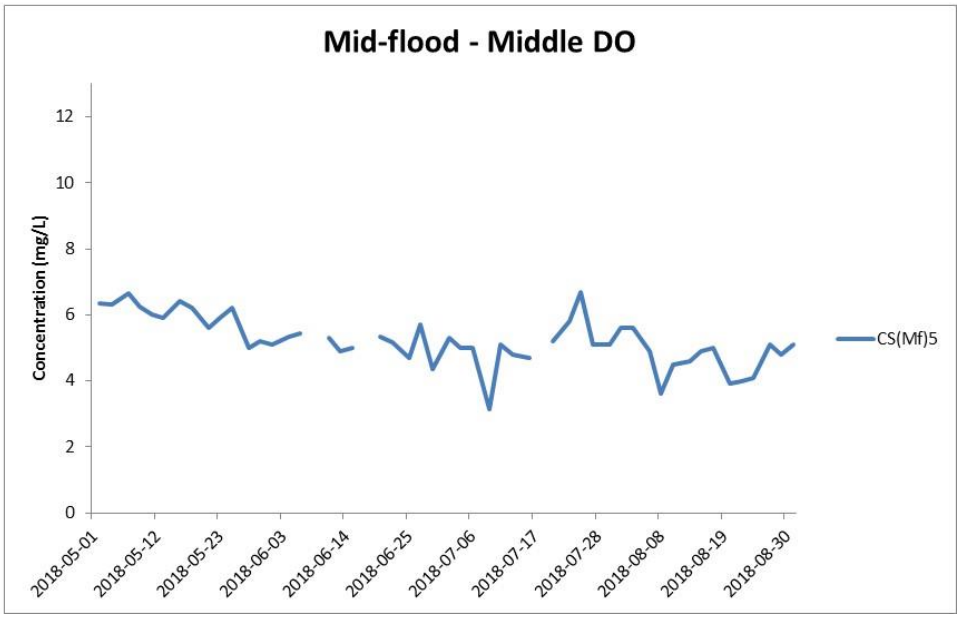


Figure H11 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM

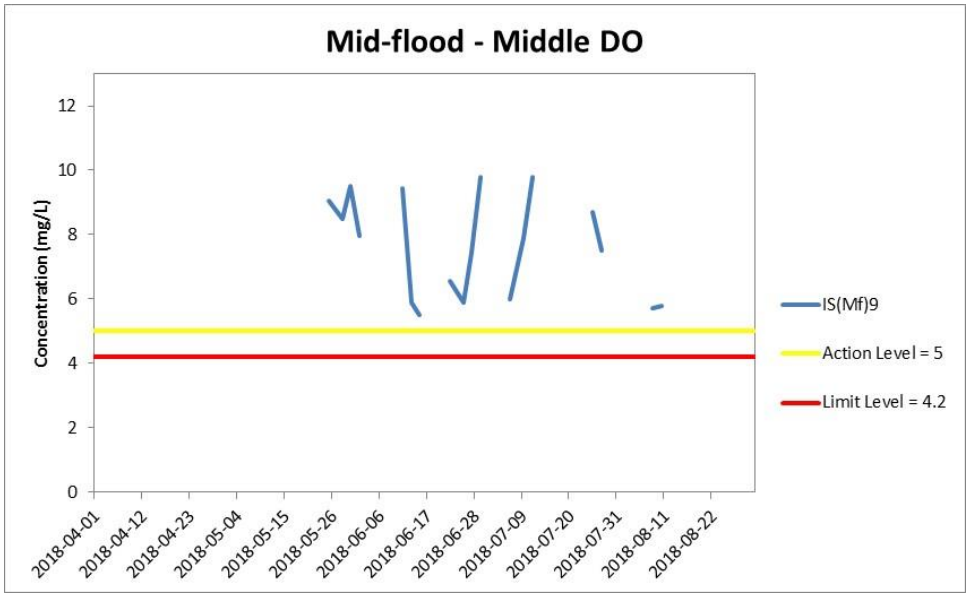
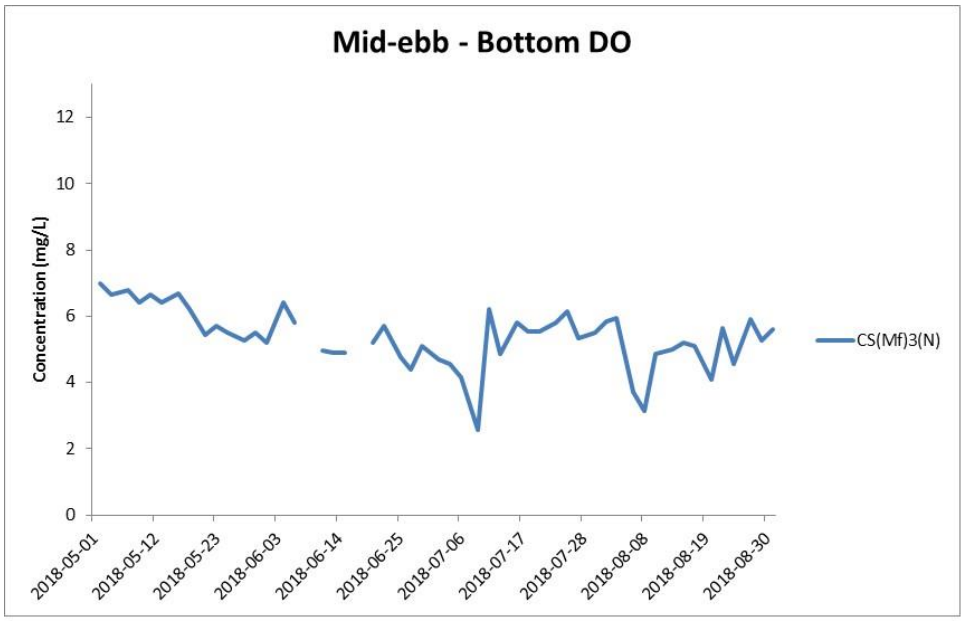


Figure H12 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 May and 31 August 2018 at IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



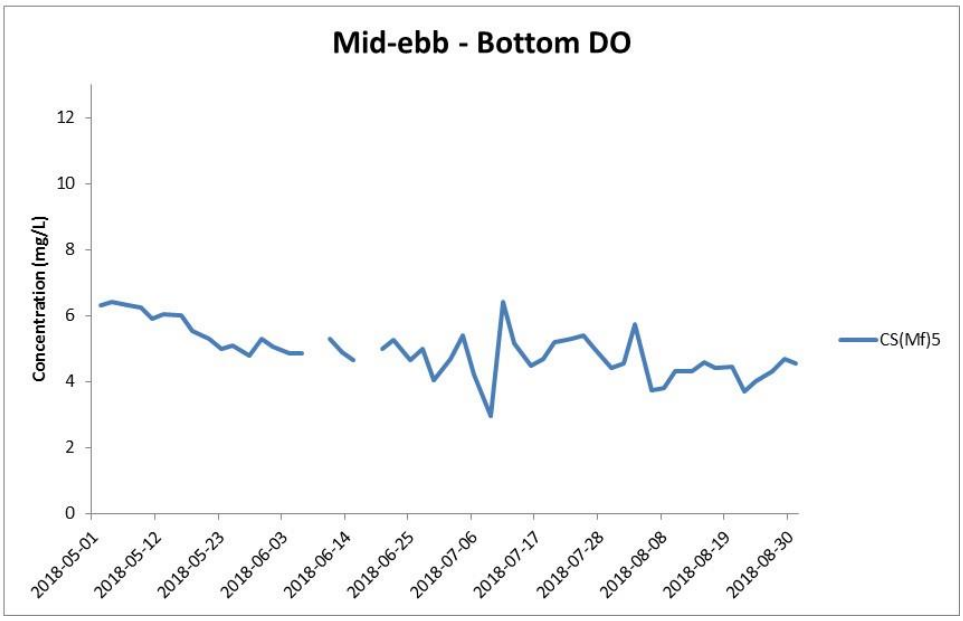
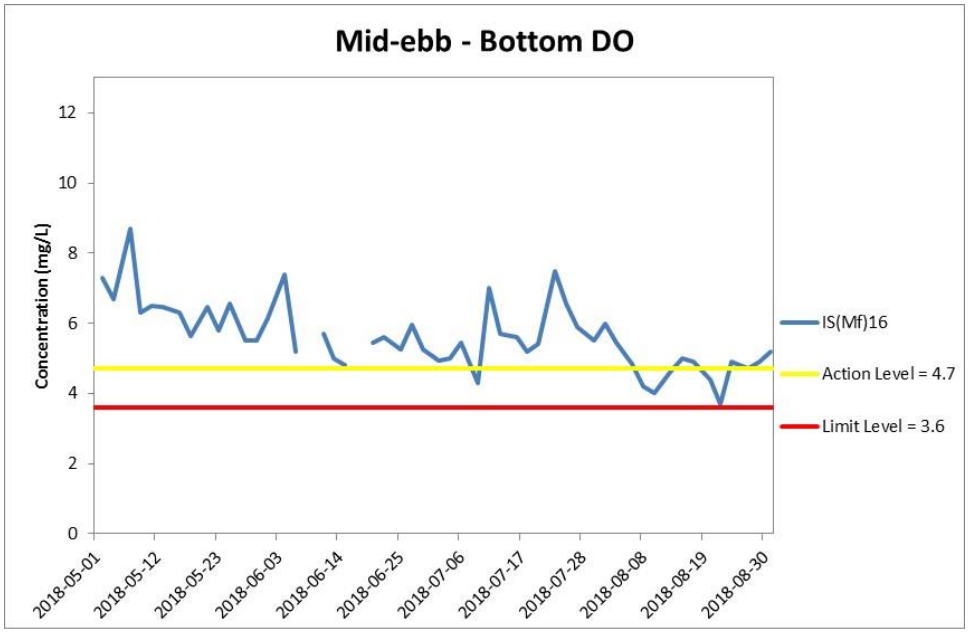


Figure H13 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



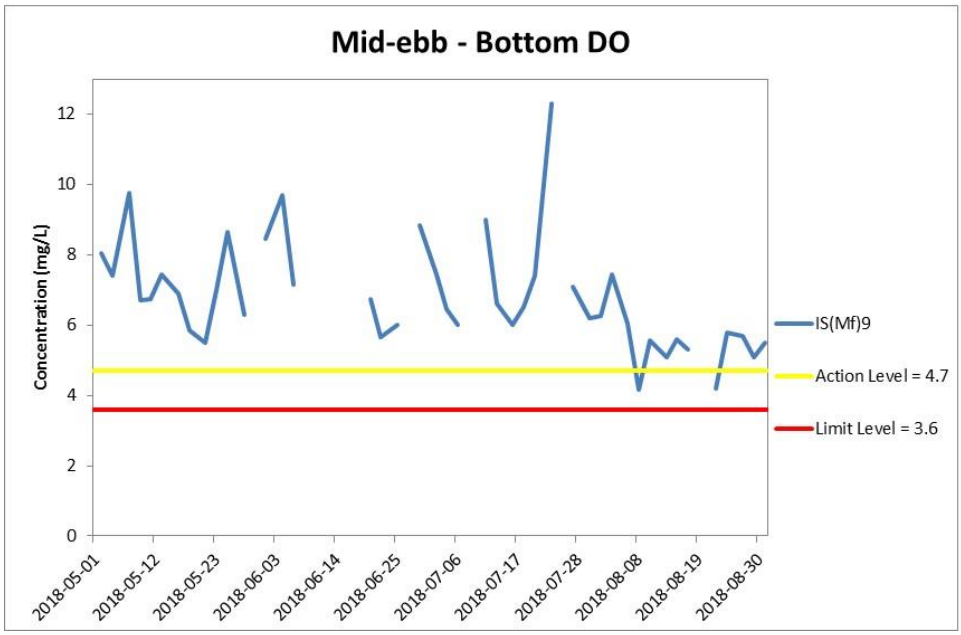
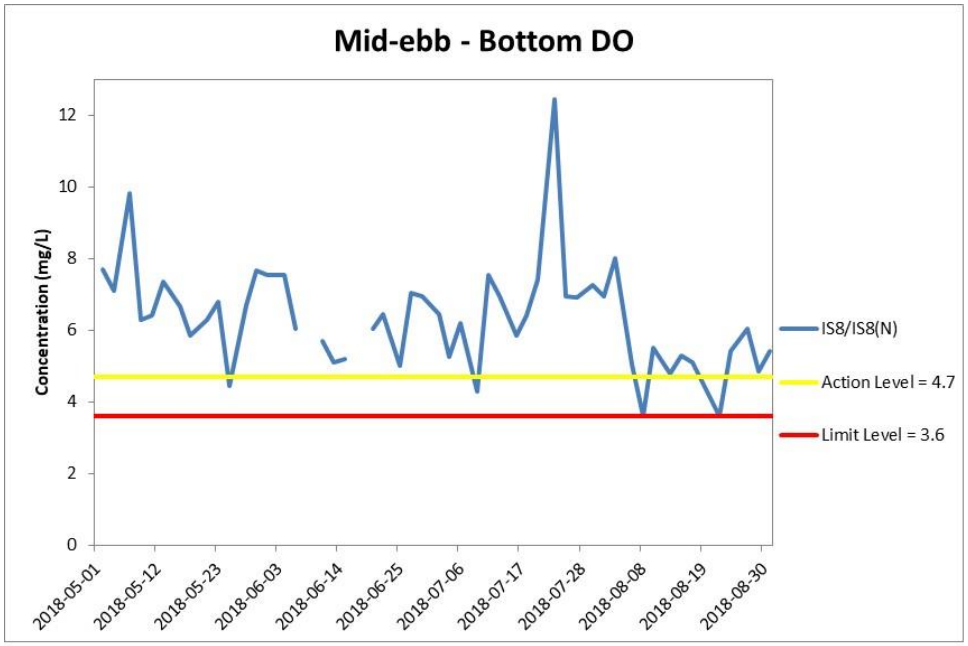


Figure H14 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



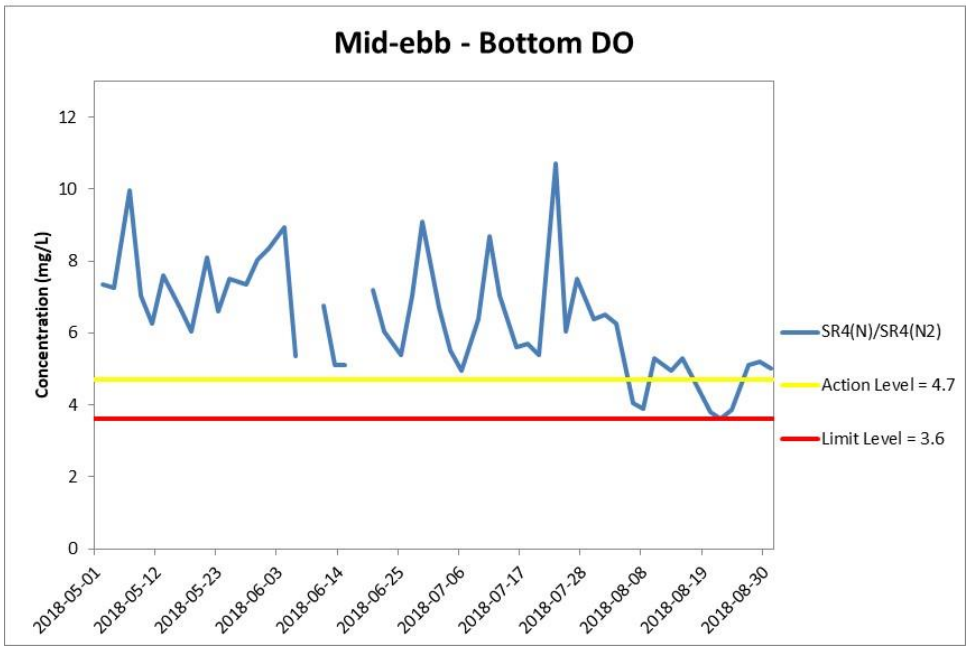


Figure H15 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM

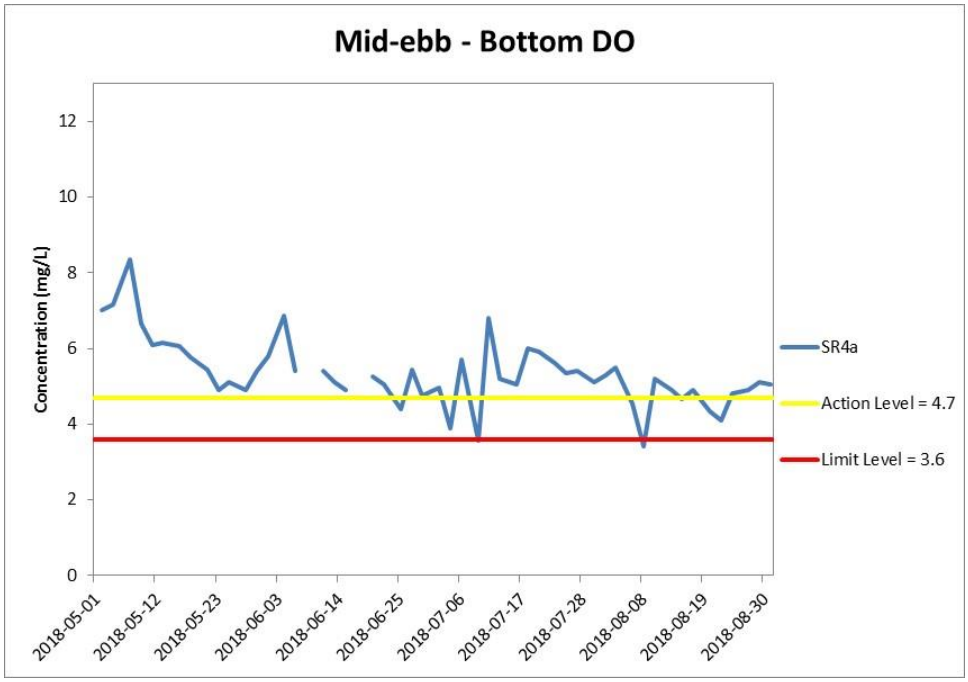
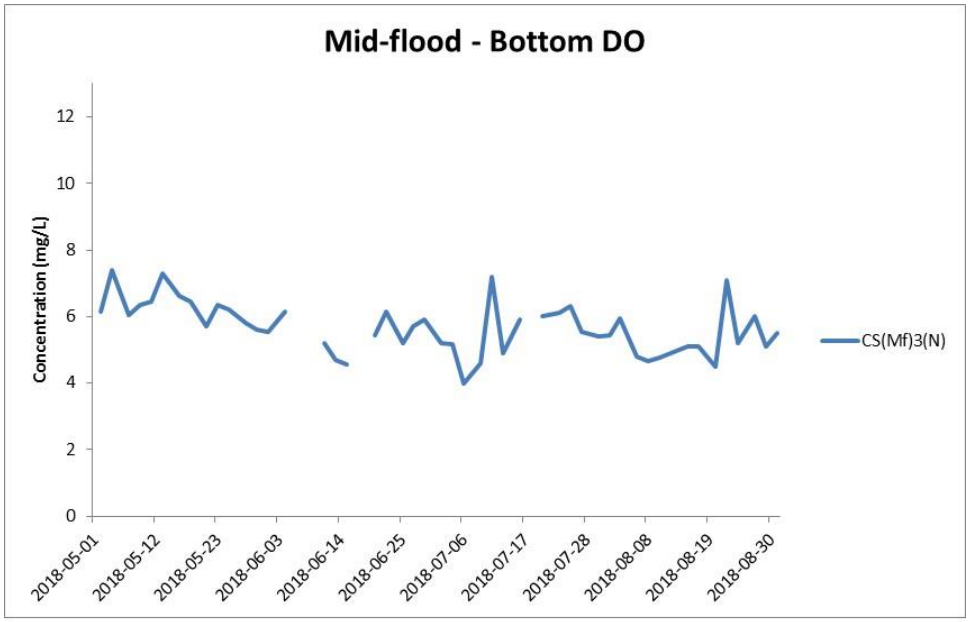


Figure H16 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



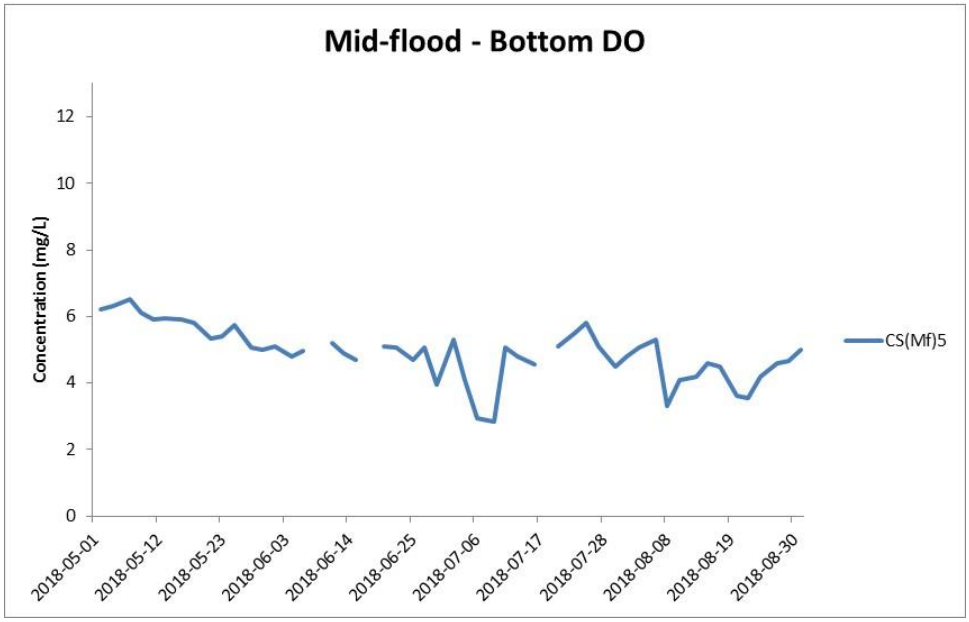
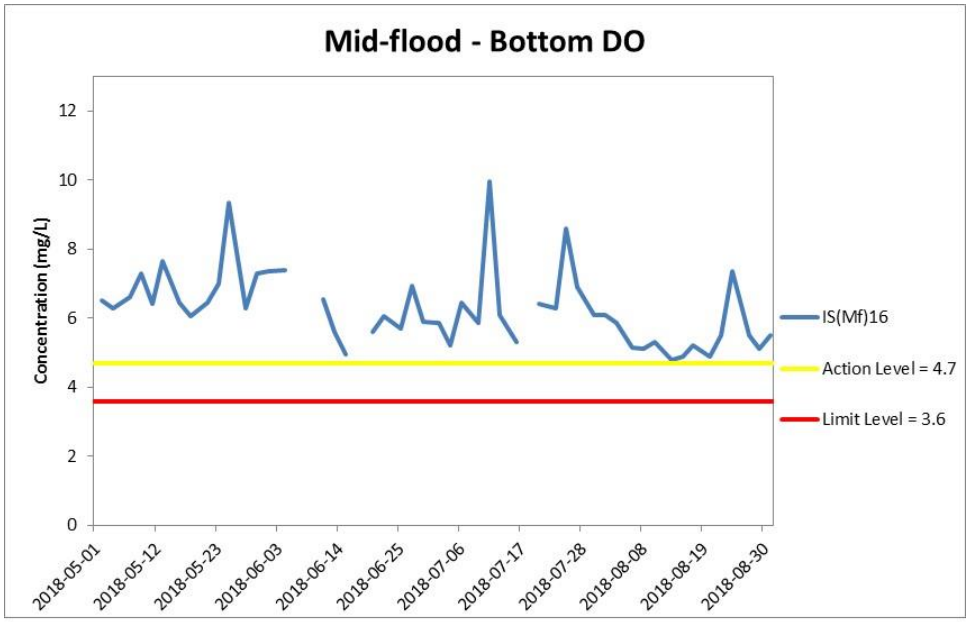


Figure H17 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



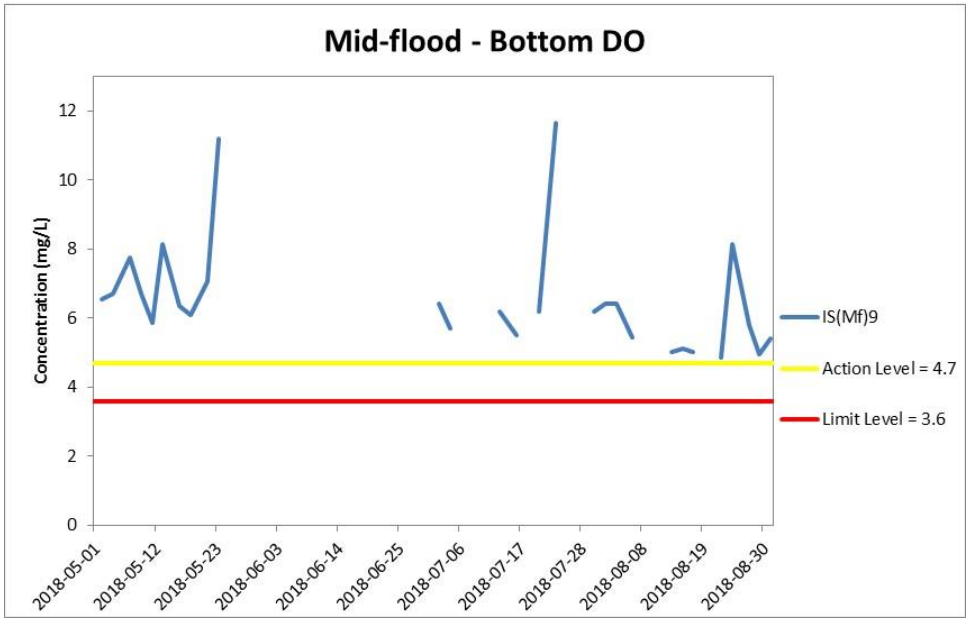
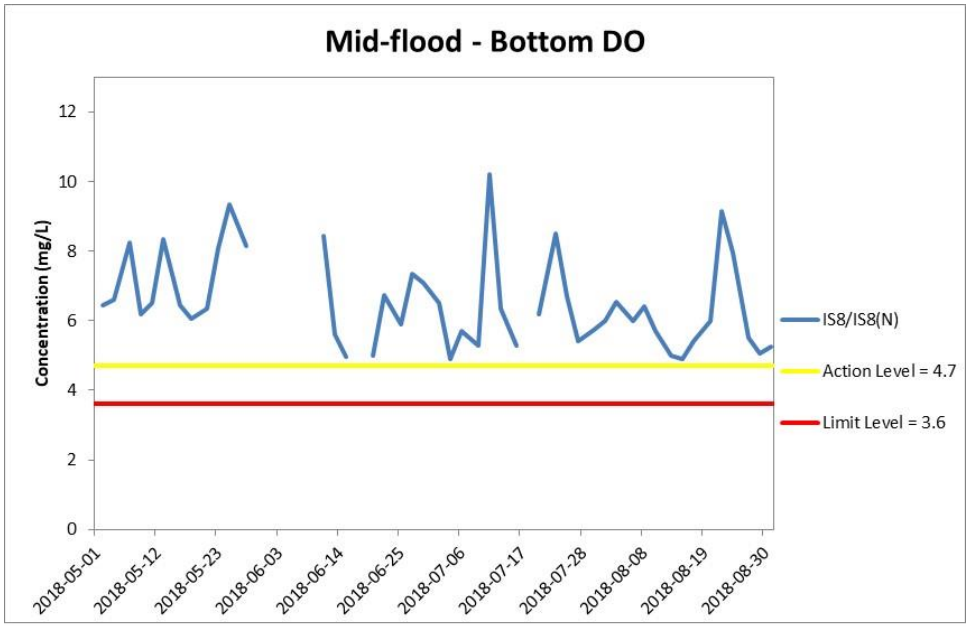


Figure H18 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

ERM



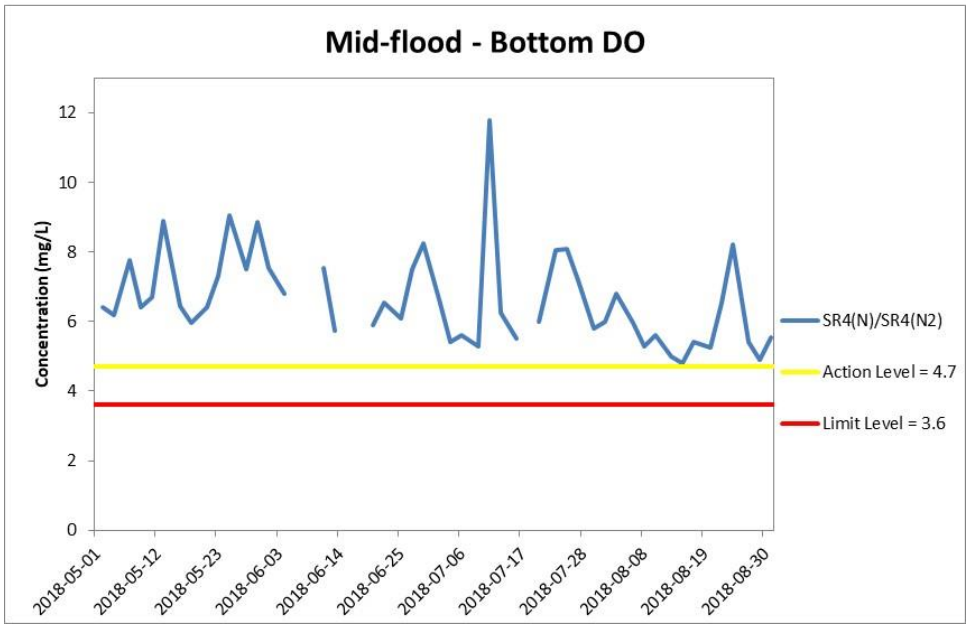


Figure H19 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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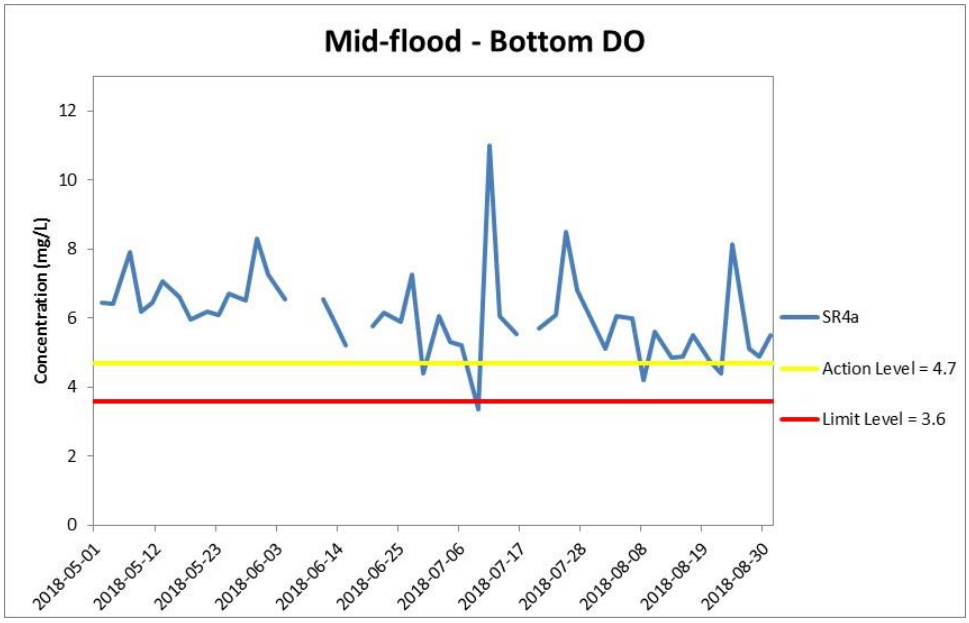

Figure H20 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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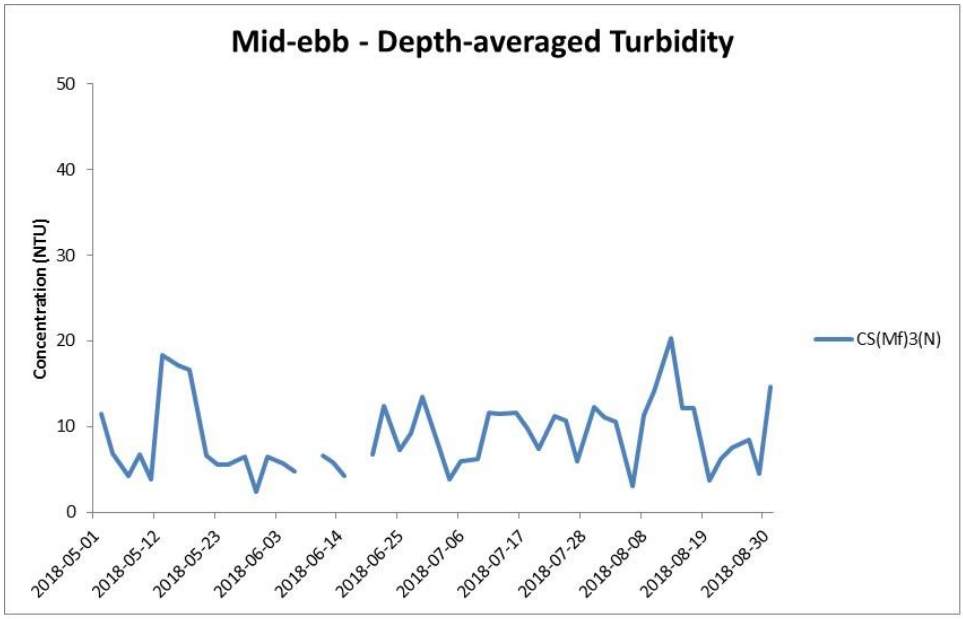

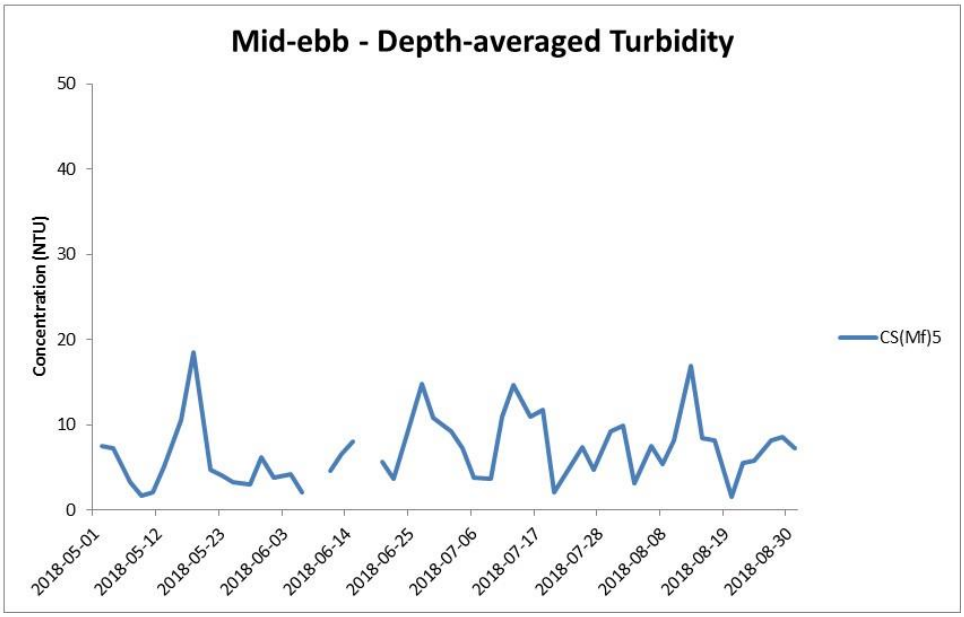

Figure H21 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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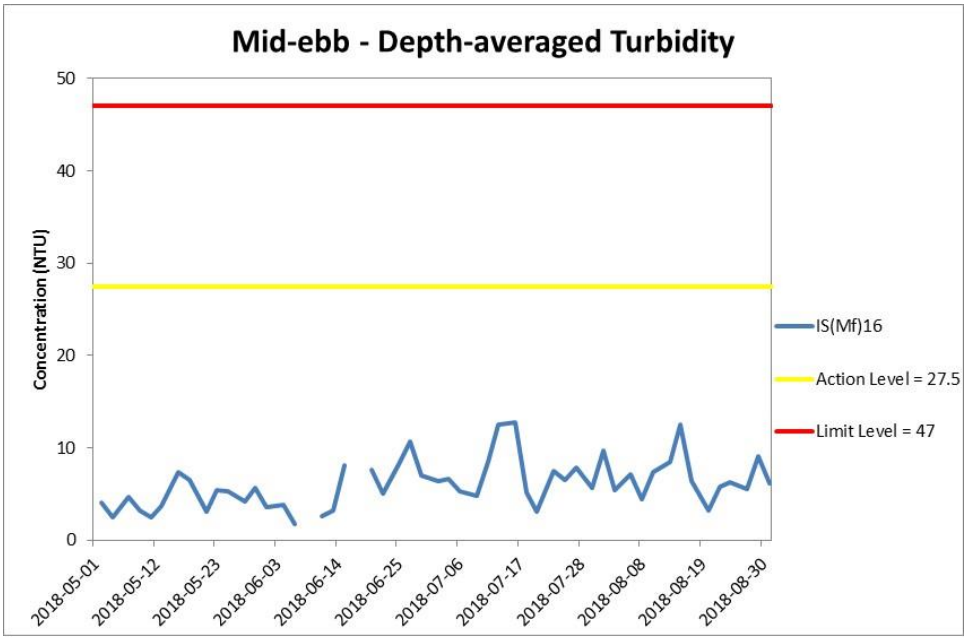

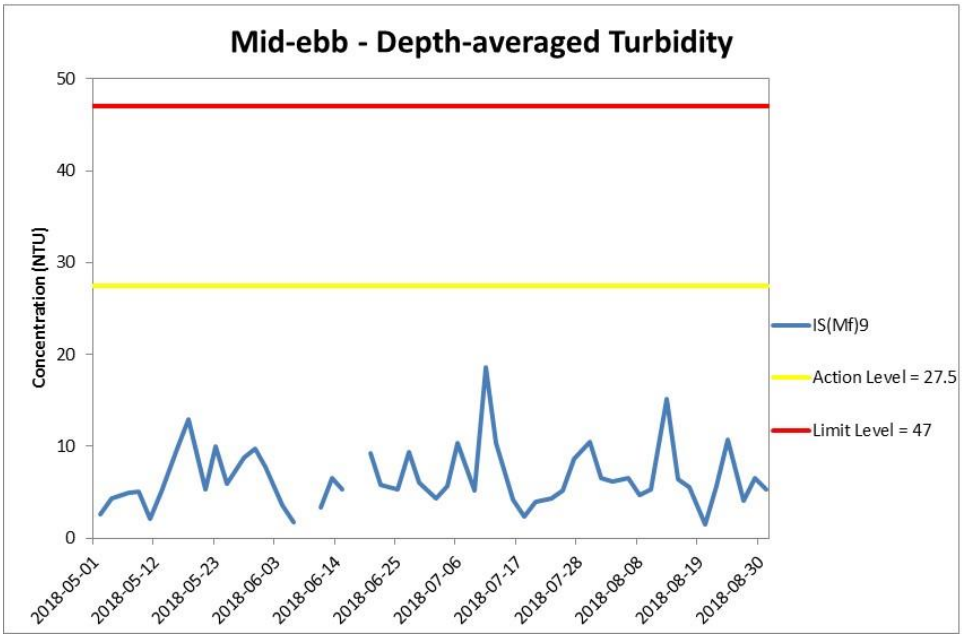

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Figure H22 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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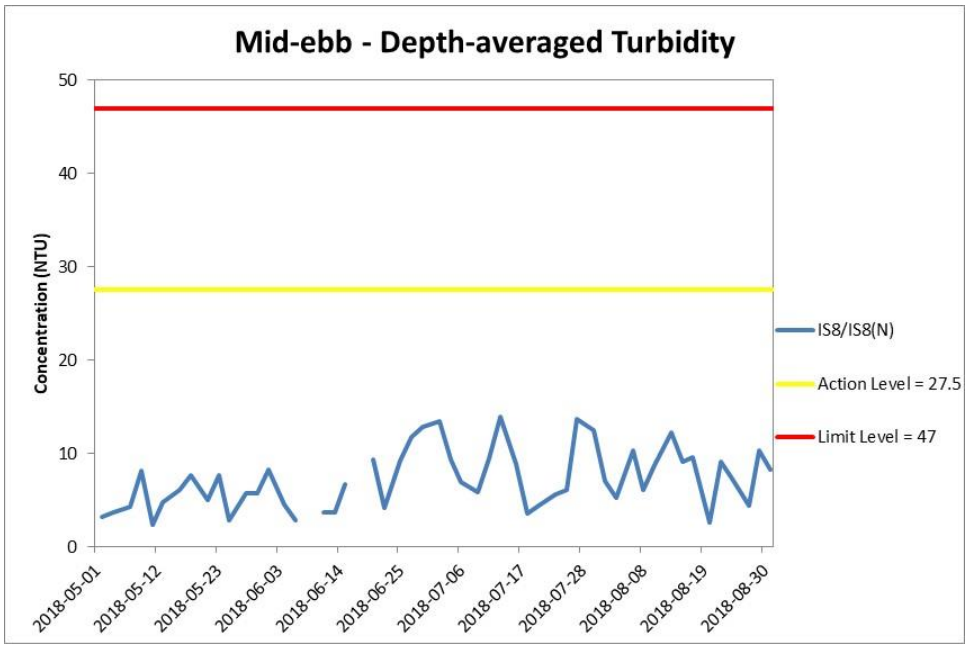

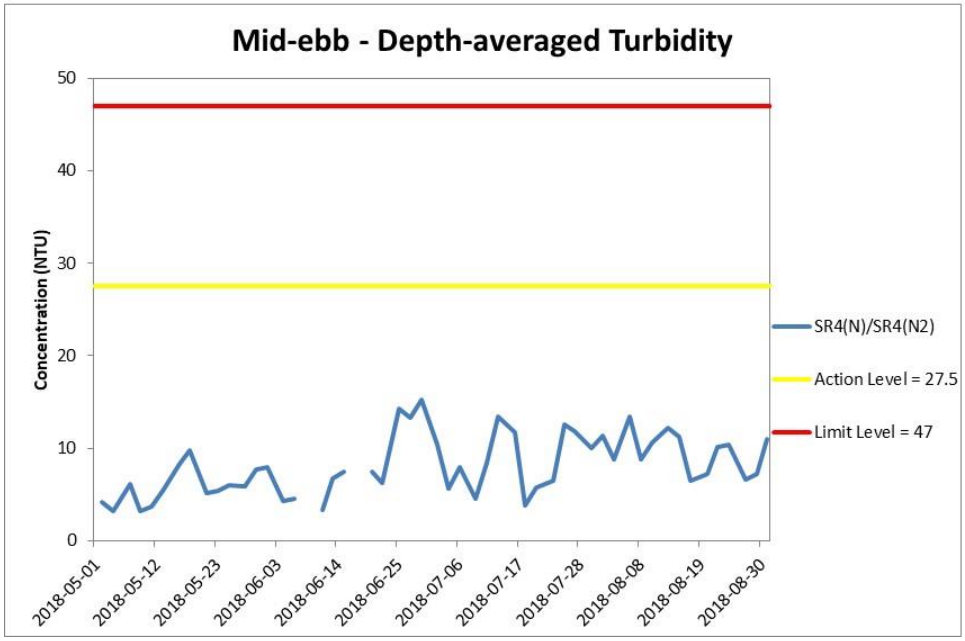

Figure H23 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

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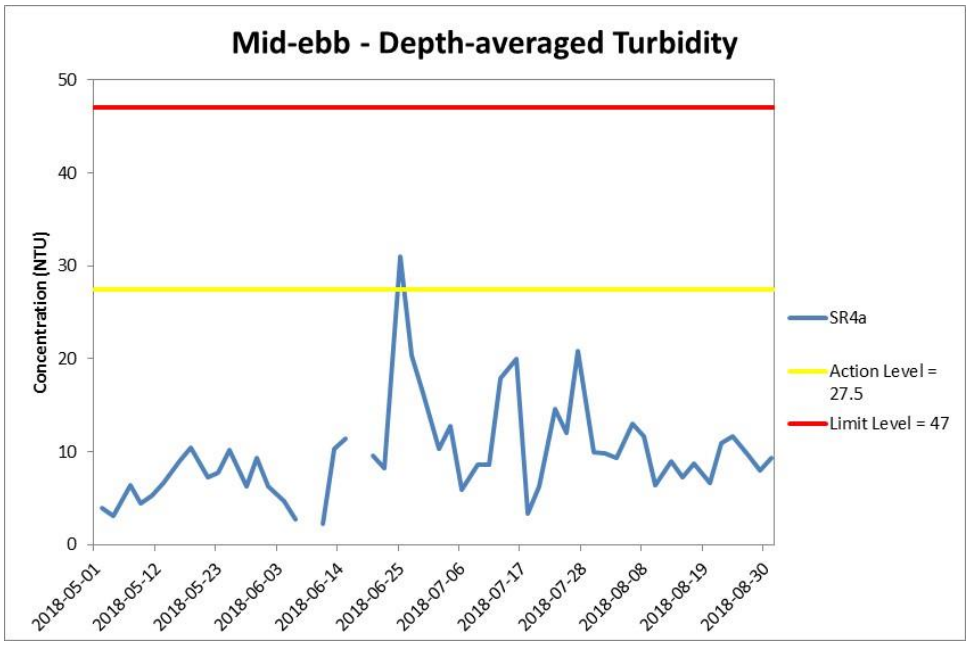

Figure H24 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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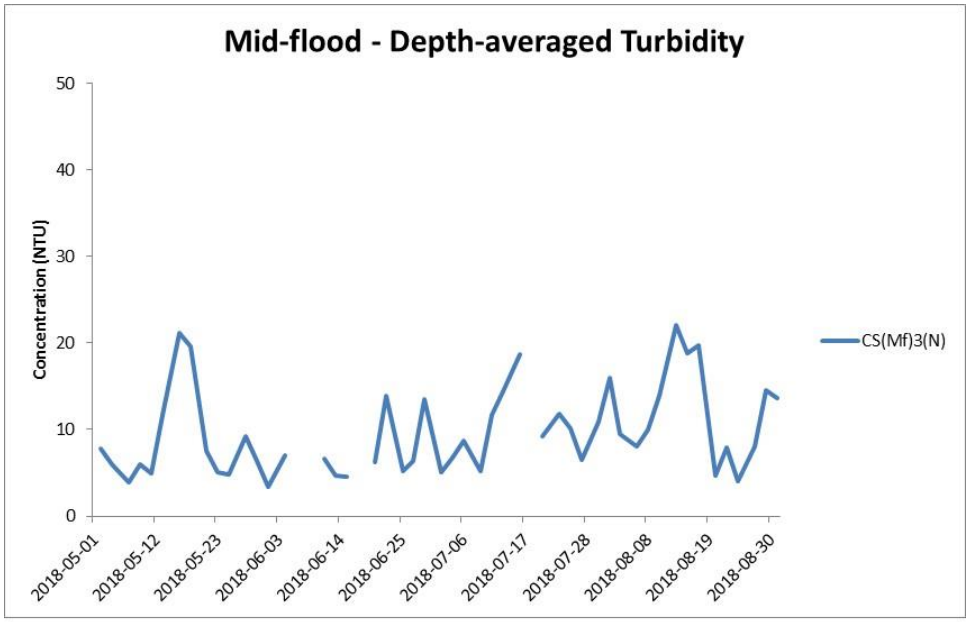

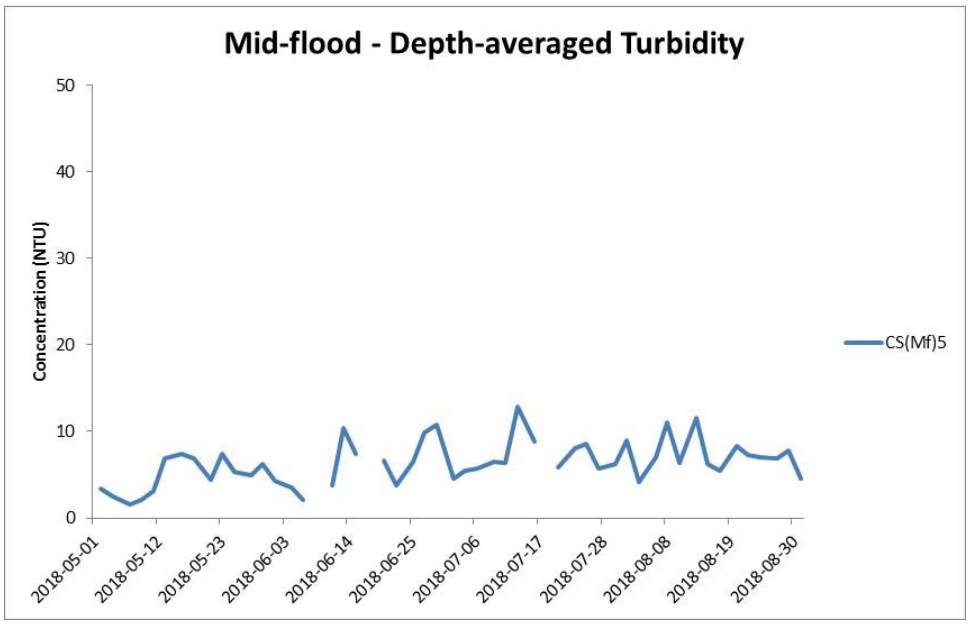

Figure H25 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(MF)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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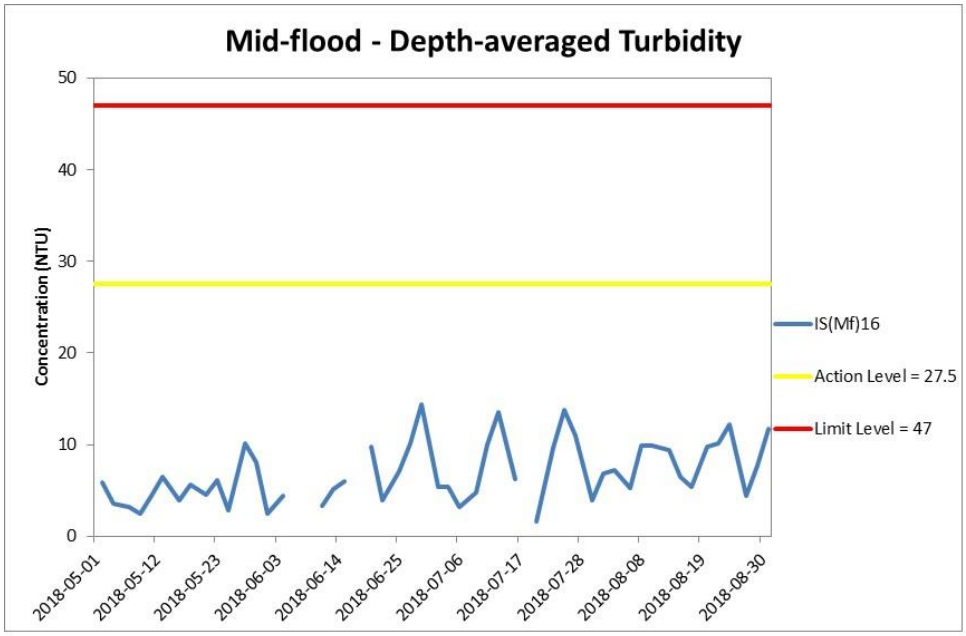

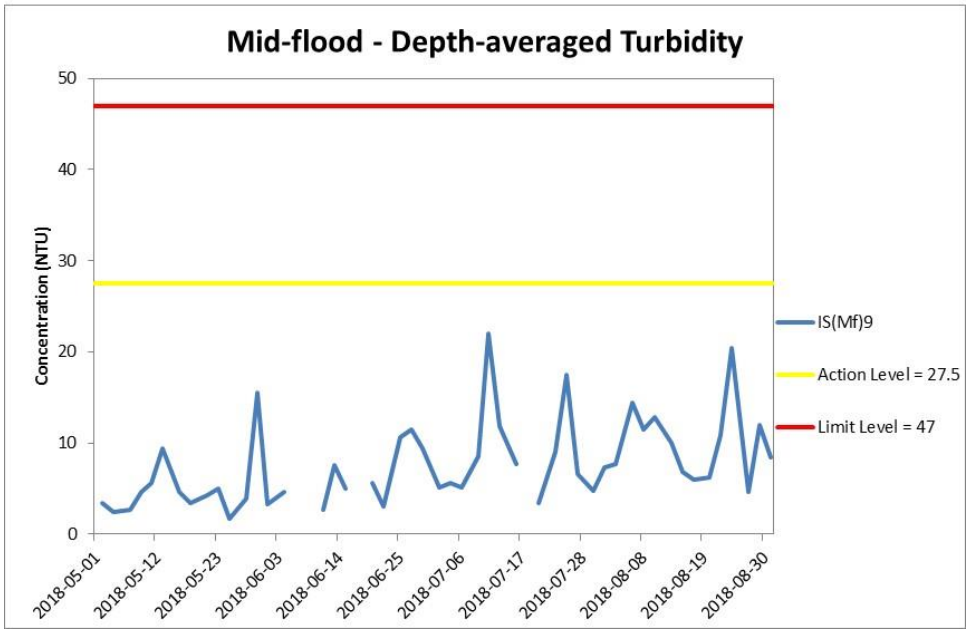

Figure H26 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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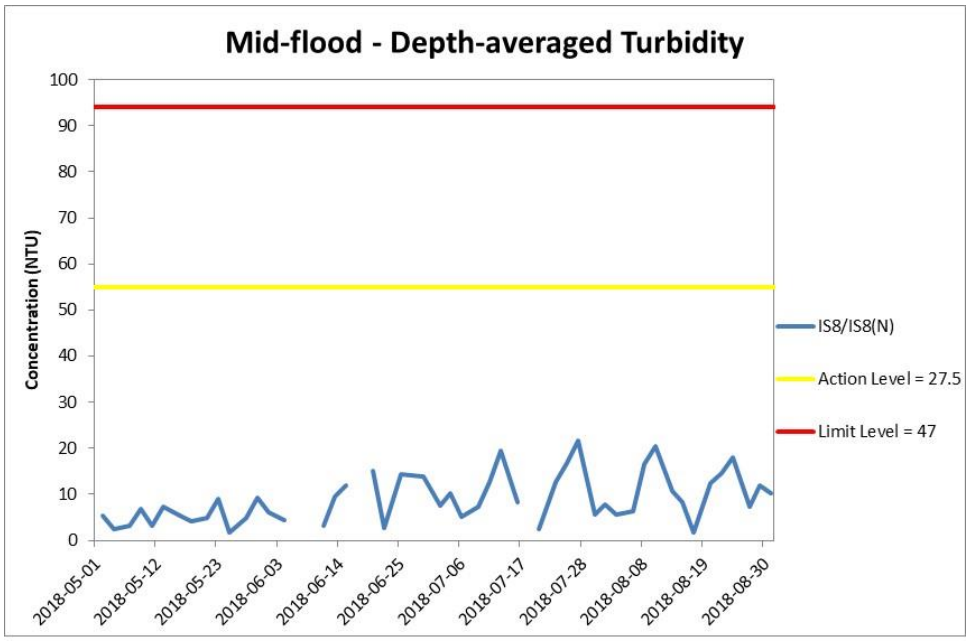

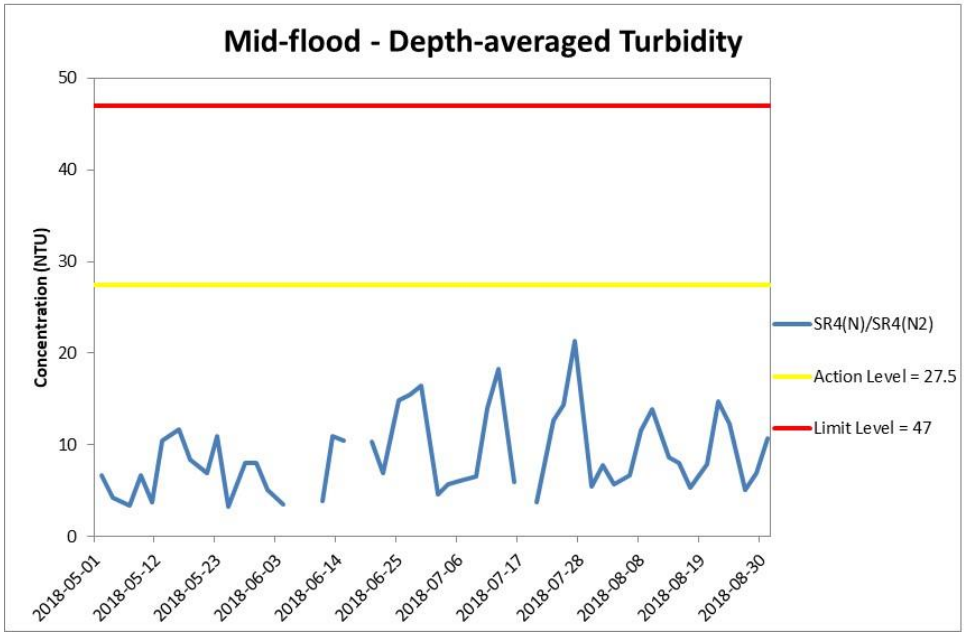

`Figure H27 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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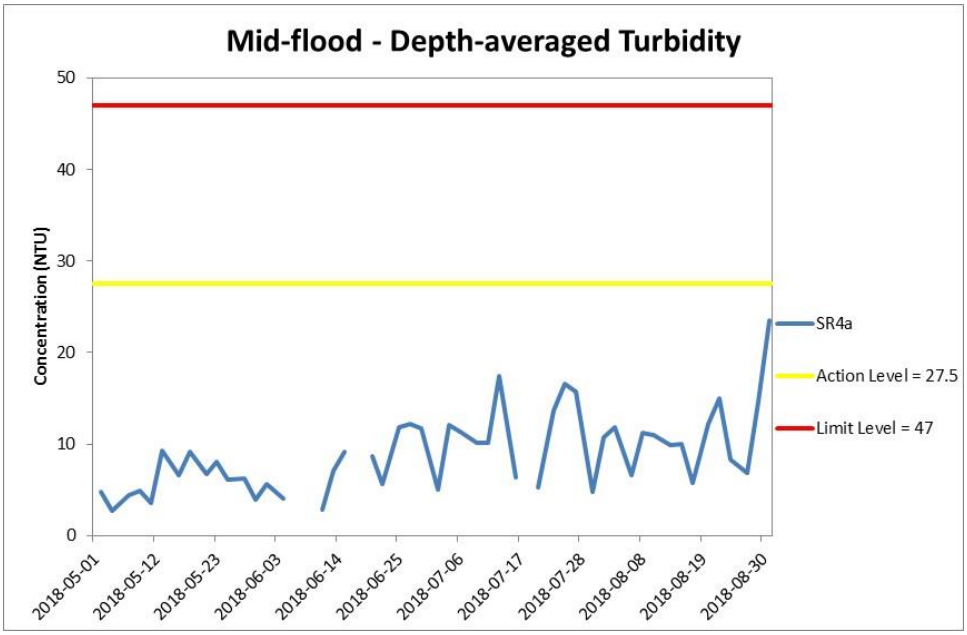

Figure H28 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

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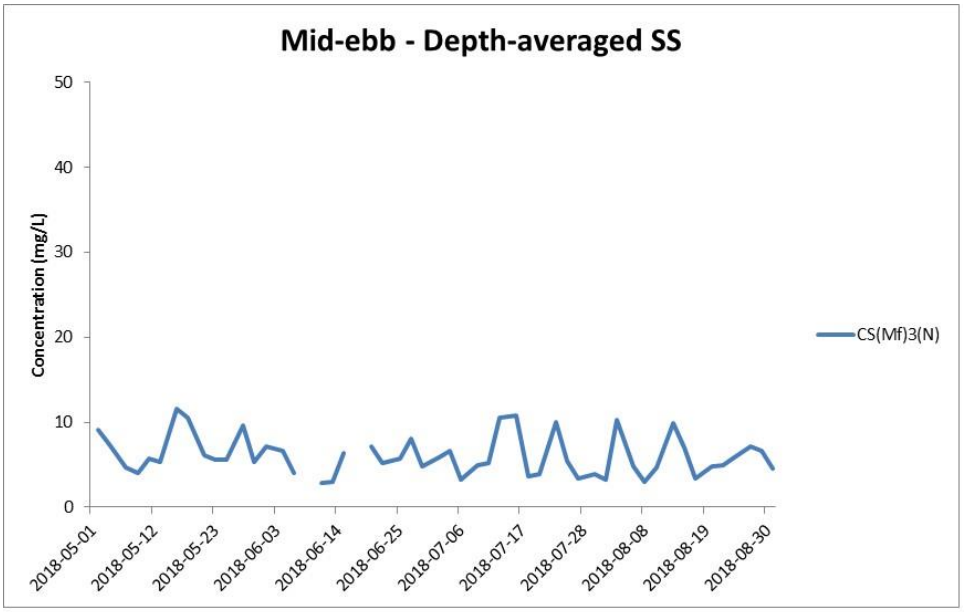

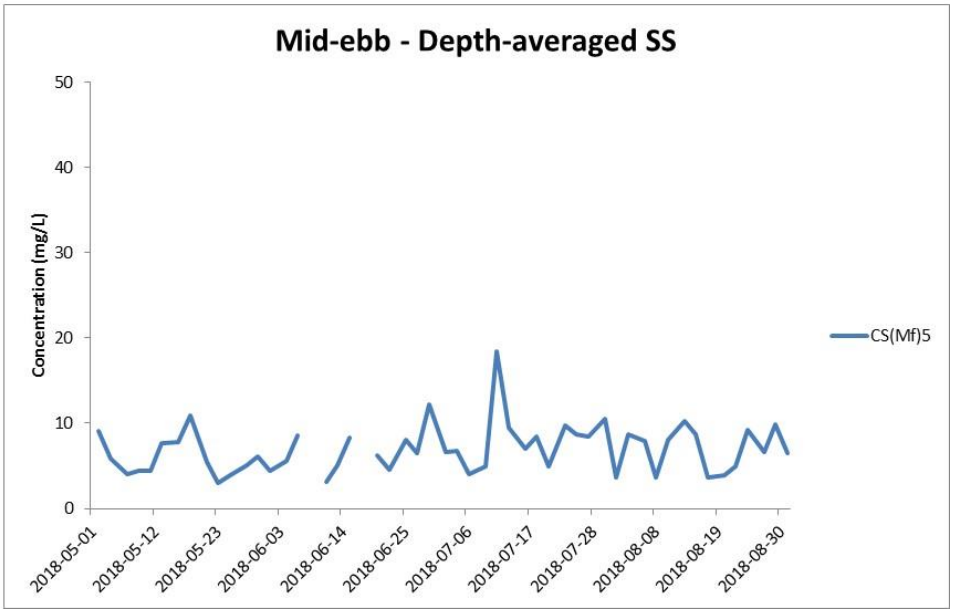

Figure H29 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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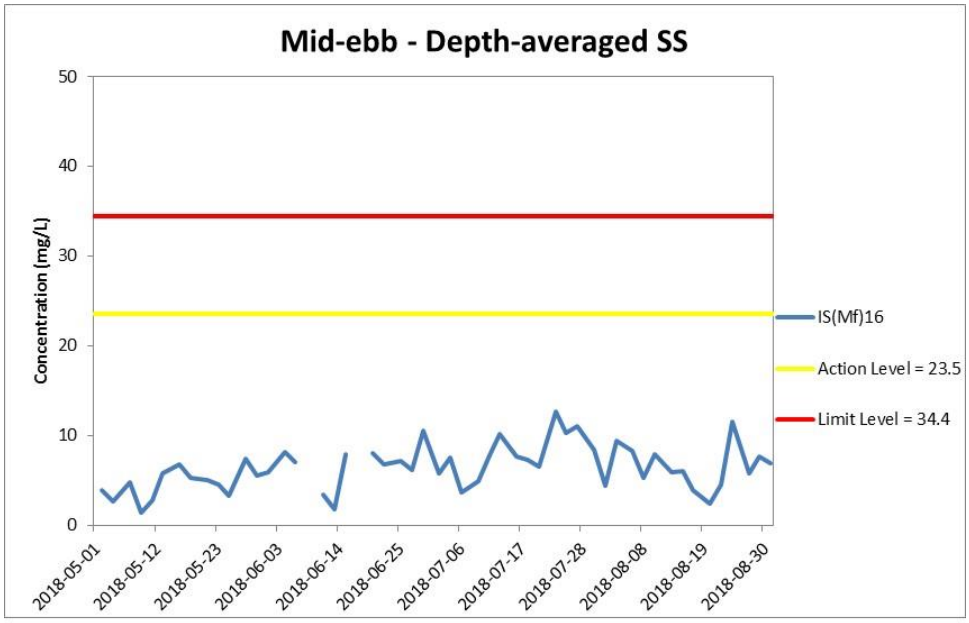

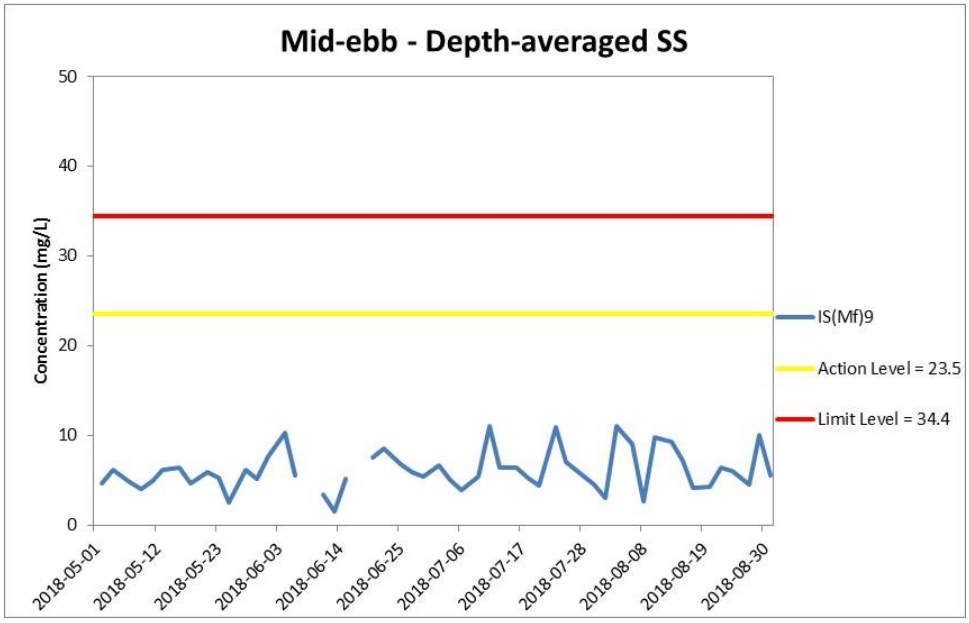

Figure H30 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

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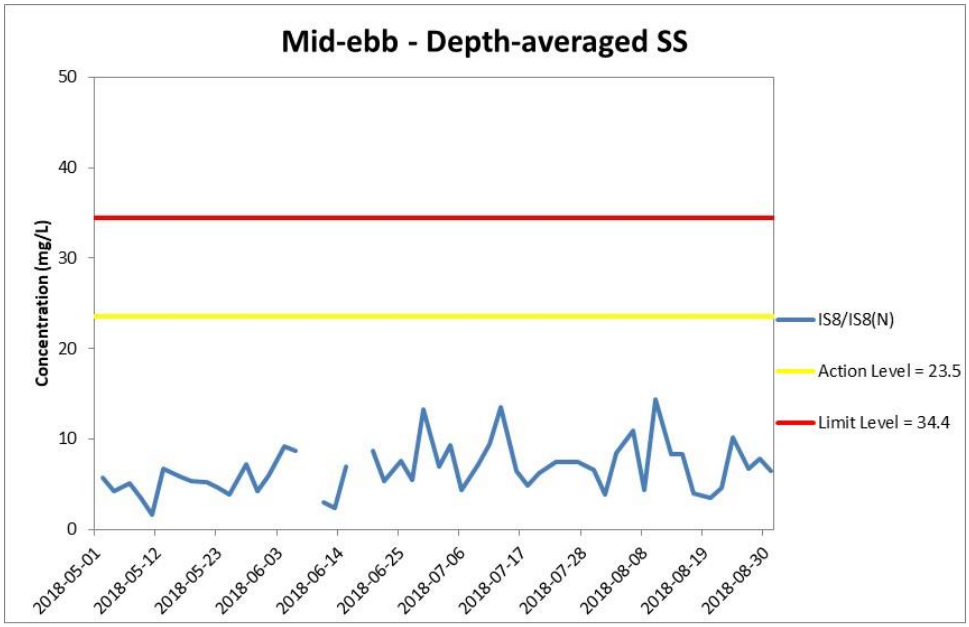

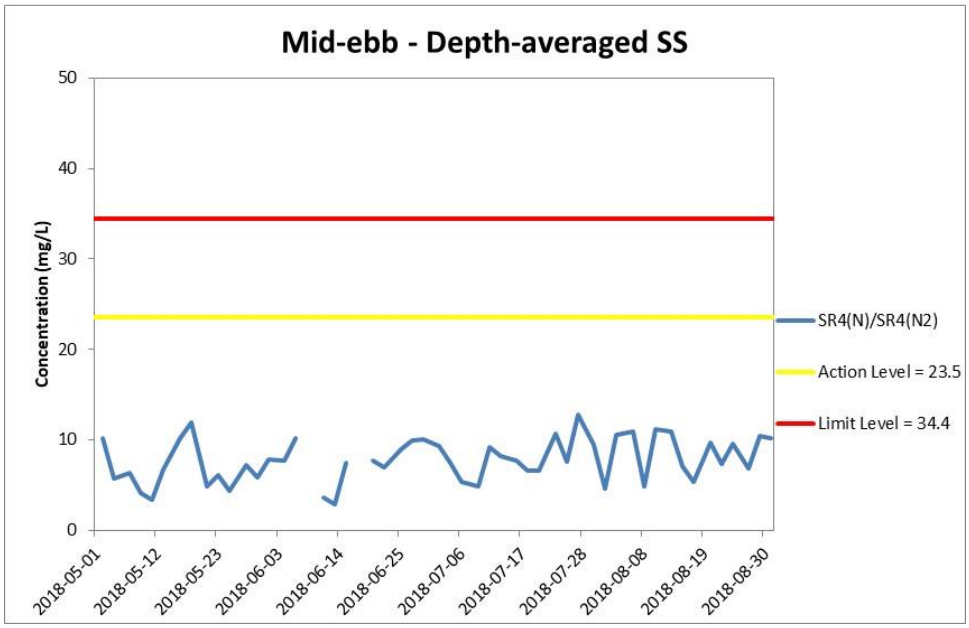

Figure H31 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

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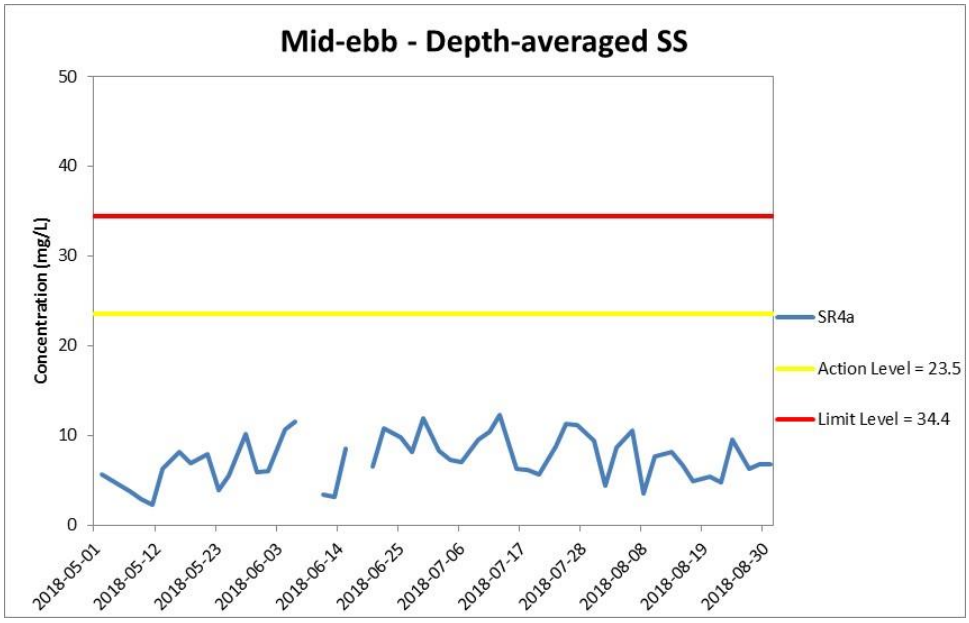

Figure H32 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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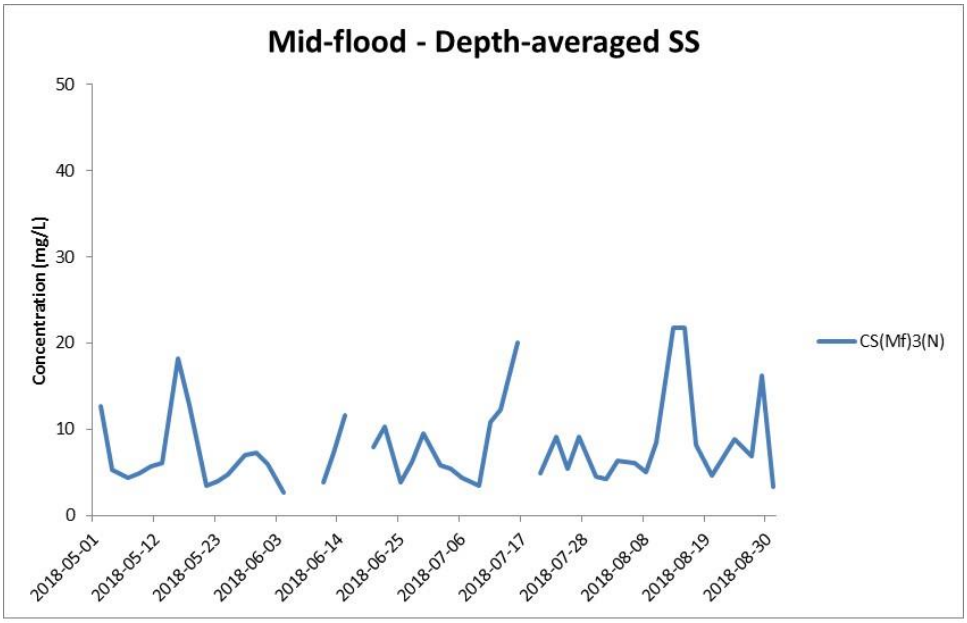

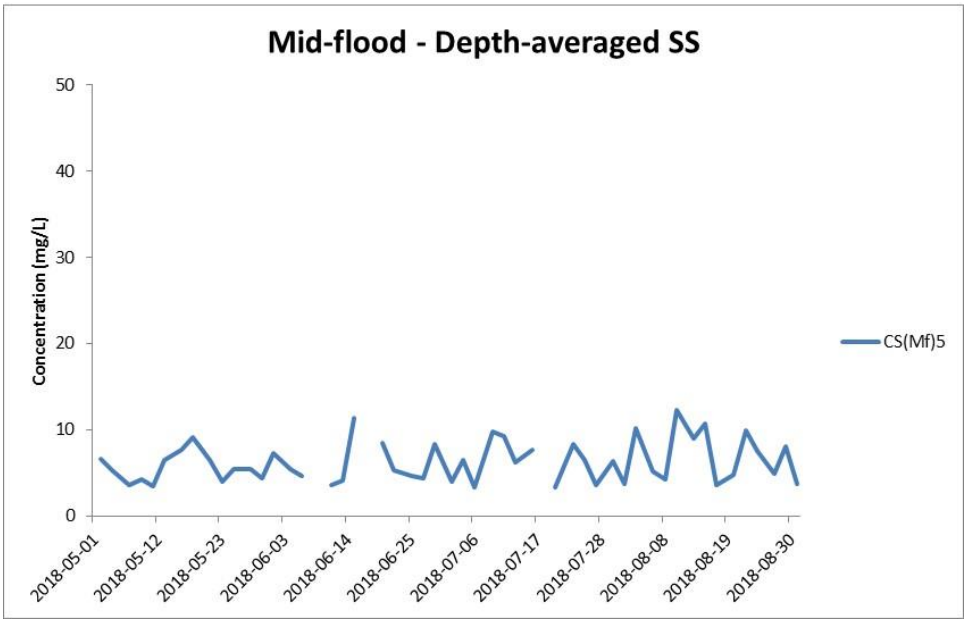

Figure H33 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2018 at CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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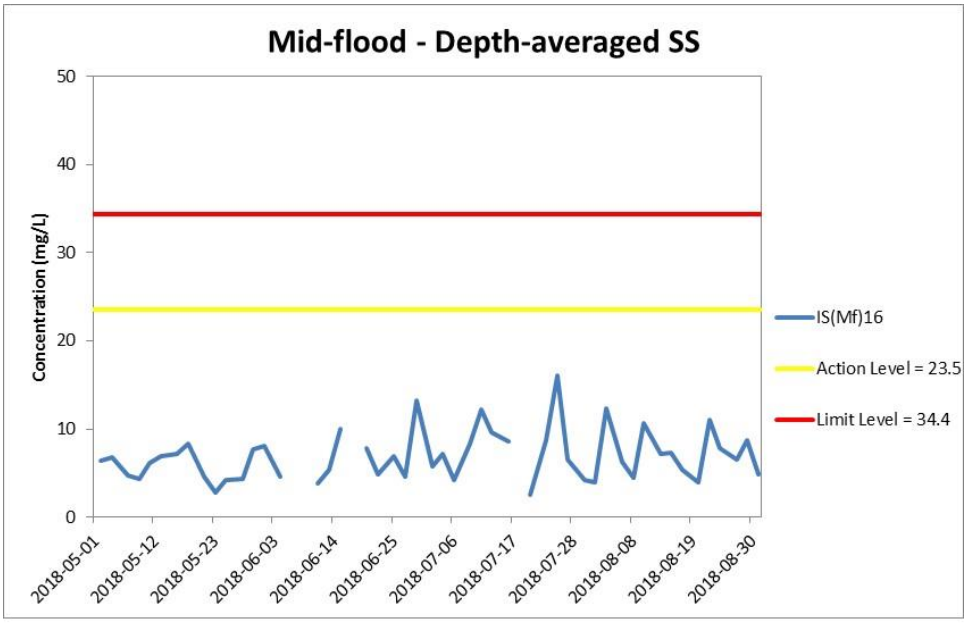


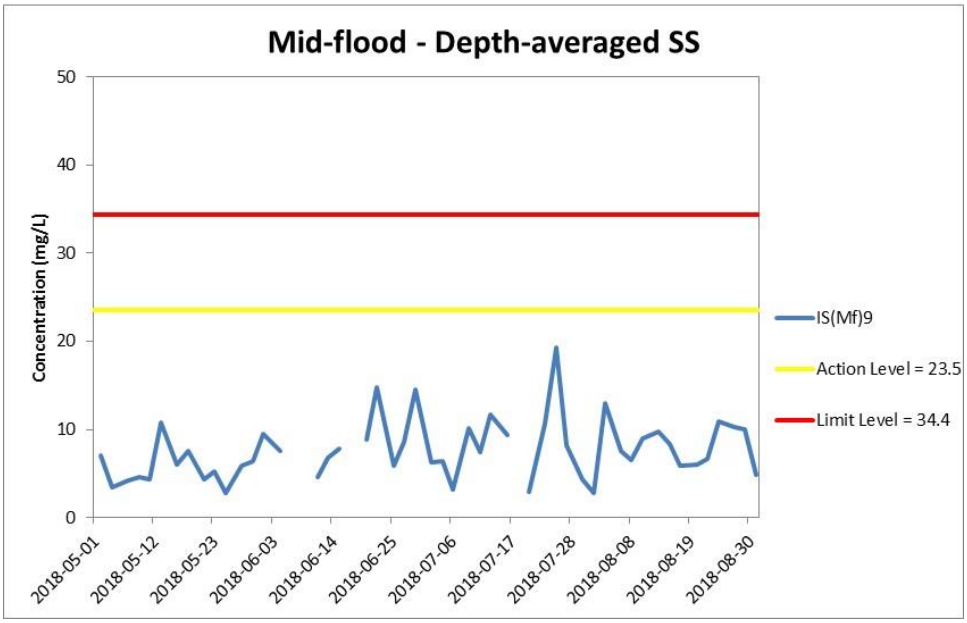
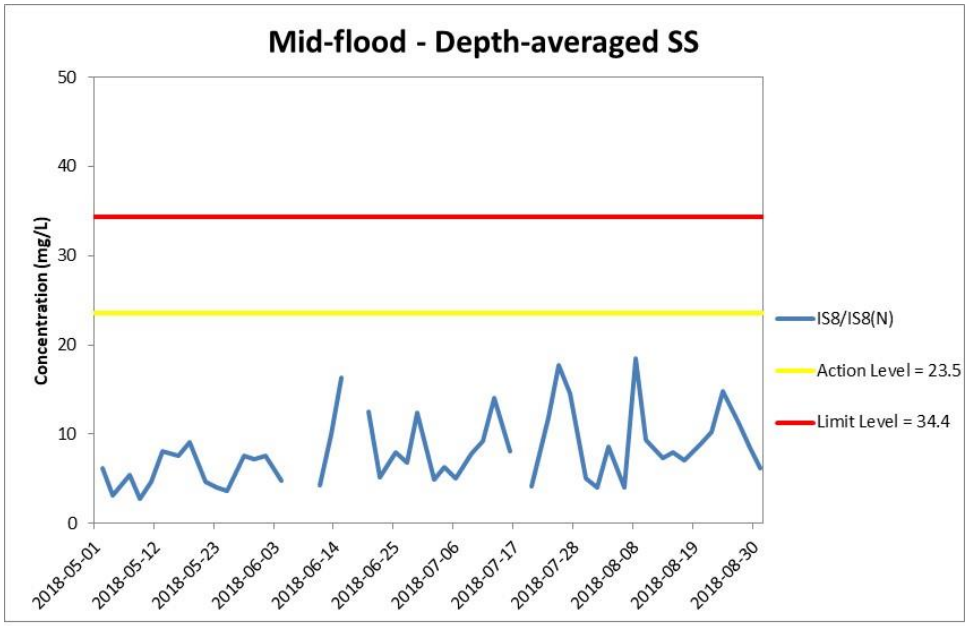


Figure H34 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2018 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.



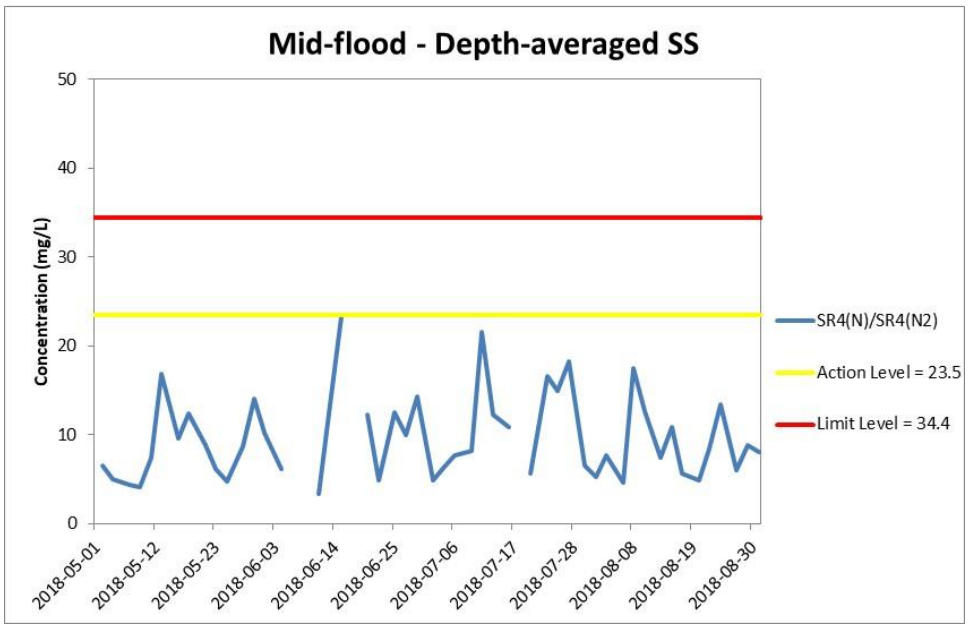


Figure H35 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2018 at IS8/IS8(N) and SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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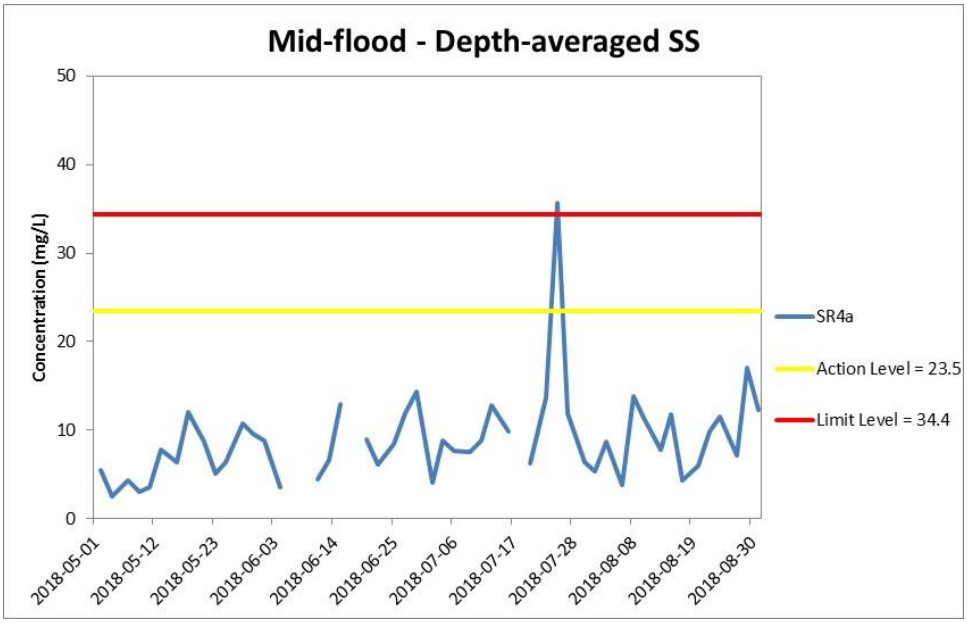

Figure H36 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2018 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 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.

Environmental Resources Management

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Appendix I

Impact Dolphin Monitoring Survey Results

CONTRACT NO. HY/2012/07
Hong Kong-Zhuhai-Macao Bridge Tuen Mun – Chek Lap Kok Link (Southern Connection Viaduct Section)
Dolphin Quarterly Monitoring

20th Quarterly Progress Report (September-November 2018)
submitted to Gammon Construction Limited

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

December 31, 2018

1. Introduction

1.1. The Tuen Mun-Chek Lap Kok Link (TM-CLKL) comprises a 1.6 km long dual 2-lane viaduct section between the Hong Kong Boundary Crossing Facilities (HKBCF) and the North Lantau Highway and associated roads at Tai Ho. Gammon Construction Limited (hereinafter called the "Contractor") was awarded as the main contractor of "Contract No. HY/2012/07 – Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chek Lap Kok Link – Southern Connection Viaduct Section".

1.2. According to the updated Environmental Monitoring and Audit (EM&A) Manual (for TM-CLKL), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the Northwest (NWL) and Northeast Lantau (NEL) survey areas as in AFCD annual marine mammal monitoring programme. However, as such surveys have been undertaken by the HKLR03 and HKBCF projects in the same areas (i.e. NWL and NEL), a combined monitoring approach is recommended by the Highways Department, that the TM-CLKL EM&A project can utilize the monitoring data collected by HKLR03 or HKBCF project to avoid any redundancy in monitoring effort. Such exemption for the dolphin monitoring will end upon the completion of the dolphin monitoring carried out by HKLR03 contract as well as the TM-CLKL Northern Connection Sub-Sea Tunnel Section (HY/2012/08).

1.3. In November 2013, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by Gammon Construction Limited as the dolphin specialist for the TM-CLKL Southern Viaduct Section EM&A project. He is responsible for the dolphin monitoring study, including the data collection on Chinese White Dolphins during the construction phase (i.e. impact period) of the TM-CLKL project in Northwest Lantau (NWL) and Northeast Lantau (NEL) survey areas.

1.4. During the construction period of HKLR, the dolphin specialist would be in charge of

reviewing and collating information collected by the HKLR03 dolphin monitoring programme to examine any potential impacts of TM-CLKL construction works on the dolphins.

1.5. 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.

1.6. This report is the 20th quarterly progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Gammon Construction Limited, summarizing the results of the surveys findings during the period of September to November 2018, utilizing the survey data collected by HKLR03 impact phase monitoring project.

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 NEL and NWL survey areas (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 conducted by HKLR03 project

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	804671	815456		13	Start Point	816506	819480
1	End Point	804671	831404		13	End Point	816506	824859
2	Start Point	805476	820800		14	Start Point	817537	820220
2	End Point	805476	826654		14	End Point	817537	824613
3	Start Point	806464	821150		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	821500		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209
5	Start Point	808504	821850		17	Start Point	820451	822125
5	End Point	808504	828602		17	End Point	820451	823671
6	Start Point	809490	822150		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	822000		19	Start Point	822513	823268
7	End Point	810499	824613		19	End Point	822513	824321
8	Start Point	811508	821123		20	Start Point	823477	823402

8	End Point	811508	824254		20	End Point	823477	824613
9	Start Point	812516	821303		21	Start Point	805476	827081
9	End Point	812516	824254		21	End Point	805476	830562
10	Start Point	813525	821176		22	Start Point	806464	824033
10	End Point	813525	824657		22	End Point	806464	829598
11	Start Point	814556	818853		23	Start Point	814559	821739
11	End Point	814556	820992		23	End Point	814559	824768
12	Start Point	815542	818807		24	Start Point	805476	815900
12	End Point	815542	824882		24	End Point	805476	819100

2.1.2. The HKLR03 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 20 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2018). 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, positions (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 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 NEL and NWL survey areas. Therefore, both primary and secondary survey effort were 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 HKLR03 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. A professional digital camera (*Canon* EOS 7D model), 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 NEL and NWL survey areas in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collect under Beaufort 3 or below condition would be used for the encounter rate analyses. 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. 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 North 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 North 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 present quarterly period.

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 among NWL and NEL survey areas 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, socializing, traveling, and milling/resting) 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 3-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 September to November 2018, six sets of systematic line-transect vessel surveys were conducted under the HKLR03 monitoring works to cover all transect lines in NWL and NEL survey areas twice per month.

3.1.2. From these HKLR03 surveys, a total of 797.27 km of survey effort was collected, with 93.8% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 291.60 km and 505.67 km of survey effort were conducted in NEL and NWL survey areas respectively.

3.1.3. The total survey effort conducted on primary lines was 576.22 km, while the effort on secondary lines was 221.05 km. Survey effort conducted on both primary and secondary lines were considered as on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.4. During the six sets of HKLR03 monitoring surveys from September to November 2018, six groups of 13 Chinese White Dolphins were sighted. All six dolphin sightings were made during on-effort search in this quarter, and five of the six on-effort dolphin sightings were made on primary lines. A summary table of dolphin sightings is shown in Appendix II.

3.1.5. In this quarterly period, all dolphin groups were sighted in NWL, while no dolphin was sighted at all in NEL. In fact, since August 2014, only two sightings of two lone dolphins were made respectively in NEL during HKLR03 monitoring surveys.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during the HKLR03 monitoring surveys from September to November 2018 is shown in Figure 1. All sightings were made at the northwestern portion of the North Lantau region, with the main concentration surrounding Lung Kwu Chau (Figure 1). As consistently recorded in previous monitoring quarters, the dolphins were completely absent from the central and eastern portions of North Lantau waters (Figure 1).

3.2.2. All dolphin sightings were located far away from the TM-CLKL alignment as well as the HKLR09 alignment and HKBCF/HKLR03 reclamation sites (Figure 1).

3.2.3. Sighting distribution of dolphins during the present impact phase monitoring period (September-November 2018) was drastically different from the one during the baseline monitoring period (Figure 1). In the present quarter, dolphins have disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands, near Shum Shui Kok and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1). The nearly complete abandonment of NEL region by the dolphins has been consistently recorded in the past 22 quarters of HKLR03 monitoring, which has resulted in zero to extremely low dolphin encounter rates in this area.

3.2.4. In NWL survey area, dolphin occurrence was also drastically different between the baseline and impact phase periods. During the present impact monitoring period, dolphins were seldom sighted here, and mainly at the northwestern portion of the North Lantau region, which was in stark contrast to their frequent occurrences throughout the area during the baseline period (Figure 1).

3.2.5. Another comparison in dolphin distribution was made between the six quarterly periods of autumn months in 2013-18 (Figure 2). Among the six autumn periods, dolphins were regularly sighted in NWL waters in 2013, but such usage there was dramatically reduced in the five subsequent autumn periods, with their only occurrences mostly concentrated in the waters surrounding Lung Kwu Chau in the past four autumn periods (Figure 2).

3.3. Encounter rate

3.3.1. During the present quarterly period, 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) for each set of the HKLR03 surveys in NEL and NWL are shown in Table 2. The average encounter rates deduced from the six sets of HKLR03 surveys 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 September-November 2018

SURVEY AREA	DOLPHIN MONITORING DATES	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
Northeast Lantau	Set 1 (4 & 17 Sep 2018)	0.00	0.00
	Set 2 (20 & 26 Sep 2018)	0.00	0.00
	Set 3 (4 & 11 Oct 2018)	0.00	0.00
	Set 4 (16 & 18 Oct 2018)	0.00	0.00
	Set 5 (1 & 6 Nov 2018)	0.00	0.00
	Set 6 (8 & 13 Nov 2018)	0.00	0.00
Northwest Lantau	Set 1 (4 & 17 Sep 2018)	0.00	0.00
	Set 2 (20 & 26 Sep 2018)	1.62	3.24
	Set 3 (4 & 11 Oct 2018)	0.00	0.00
	Set 4 (16 & 18 Oct 2018)	1.63	3.27
	Set 5 (1 & 6 Nov 2018)	5.81	9.69
	Set 6 (8 & 13 Nov 2018)	0.00	0.00

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (September – November 2018) and baseline monitoring period (September – November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	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)	
	September – November 2018	September – November 2011	September – November 2018	September – November 2011
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	1.51 ± 2.25	9.85 ± 5.85	2.70 ± 3.78	44.66 ± 29.85

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 NWL were 1.29 sightings and 2.79 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were both nil for this quarter.

3.3.3. In NEL, the average dolphin encounter rates in the present three-month impact monitoring period were both zero with no on-effort sighting being made, and such extremely low occurrence of dolphins in NEL have been consistently recorded in the past 21 quarters of HKLR03 monitoring (Table 4). This is a serious concern as the dolphin occurrence in NEL in the past few years have remained exceptionally low when

compared to the baseline period (Table 4). Dolphins have been virtually absent from NEL waters since January 2014, with only three groups of six dolphins sighted there since then despite consistent and intensive survey effort being conducted in this survey area.

Table 4. Comparison of average dolphin encounter rates in Northeast Lantau survey area from all quarters of HKLR03 impact monitoring period and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and sighting data made along primary transect lines under favourable conditions; the encounter rates in **autumn** months were highlighted in **blue**; ± denotes standard deviation of average encounter rates)

	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)
September-November 2011 (Baseline)	6.00 ± 5.05	22.19 ± 26.81
December 2012-February 2013 (Impact)	3.14 ± 3.21	6.33 ± 8.64
March-May 2013 (Impact)	0.42 ± 1.03	0.42 ± 1.03
June-August 2013 (Impact)	0.88 ± 1.36	3.91 ± 8.36
September-November 2013 (Impact)	1.01 ± 1.59	3.77 ± 6.49
December 2013-February 2014 (Impact)	0.45 ± 1.10	1.34 ± 3.29
March-May 2014 (Impact)	0.00	0.00
June-August 2014 (Impact)	0.42 ± 1.04	1.69 ± 4.15
September-November 2014 (Impact)	0.00	0.00
December 2014-February 2015 (Impact)	0.00	0.00
March-May 2015 (Impact)	0.00	0.00
June-August 2015 (Impact)	0.44 ± 1.08	0.44 ± 1.08
September-November 2015 (Impact)	0.00	0.00
December 2015-February 2016 (Impact)	0.00	0.00
March-May 2016 (Impact)	0.00	0.00
June-August 2016 (Impact)	0.00	0.00
September-November 2016 (Impact)	0.00	0.00
December 2016-February 2017 (Impact)	0.00	0.00
March-May 2017 (Impact)	0.00	0.00
June-August 2017 (Impact)	0.00	0.00
September-November 2017 (Impact)	0.00	0.00
December 2017-February 2018 (Impact)	0.00	0.00
March-May 2018 (Impact)	0.00	0.00
June-August 2018 (Impact)	0.00	0.00
September-November 2018 (Impact)	0.00	0.00

Table 5. Comparison of average dolphin encounter rates in Northwest Lantau survey area from all quarters of HKLR03 impact monitoring period and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; the encounter rates in **autumn** months were highlighted in **blue**; ± denotes the standard deviation of the average encounter rates)

	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)
September-November 2011 (Baseline)	9.85 ± 5.85	44.66 ± 29.85
December 2012-February 2013 (Impact)	8.36 ± 5.03	35.90 ± 23.10
March-May 2013 (Impact)	7.75 ± 3.96	24.23 ± 18.05
June-August 2013 (Impact)	6.56 ± 3.68	27.00 ± 18.71
September-November 2013 (Impact)	8.04 ± 1.10	32.48 ± 26.51
December 2013-February 2014 (Impact)	8.21 ± 2.21	32.58 ± 11.21
March-May 2014 (Impact)	6.51 ± 3.34	19.14 ± 7.19
June-August 2014 (Impact)	4.74 ± 3.84	17.52 ± 15.12
September-November 2014 (Impact)	5.10 ± 4.40	20.52 ± 15.10
December 2014-February 2015 (Impact)	2.91 ± 2.69	11.27 ± 15.19
March-May 2015 (Impact)	0.47 ± 0.73	2.36 ± 4.07
June-August 2015 (Impact)	2.53 ± 3.20	9.21 ± 11.57
September-November 2015 (Impact)	3.94 ± 1.57	21.05 ± 17.19
December 2015-February 2016 (Impact)	2.64 ± 1.52	10.98 ± 3.81
March-May 2016 (Impact)	0.98 ± 1.10	4.78 ± 6.85
June-August 2016 (Impact)	1.72 ± 2.17	7.48 ± 10.98
September-November 2016 (Impact)	2.86 ± 1.98	10.89 ± 10.98
December 2016-February 2017 (Impact)	3.80 ± 3.79	14.52 ± 17.21
March-May 2017 (Impact)	0.93 ± 1.03	5.25 ± 9.53
June-August 2017 (Impact)	2.20 ± 2.88	6.58 ± 8.12
September-November 2017 (Impact)	3.12 ± 1.91	10.35 ± 9.66
December 2017-February 2018 (Impact)	4.75 ± 2.26	15.73 ± 15.94
March-May 2018 (Impact)	2.88 ± 4.81	11.12 ± 22.46
June-August 2018 (Impact)	1.16 ± 1.39	2.87 ± 3.32
September-November 2018 (Impact)	1.51 ± 2.25	2.70 ± 3.78

3.3.4. On the other hand, the average dolphin encounter rates (STG and ANI) in NWL during the present impact phase monitoring period (reductions of 84.7% and 94.0% respectively) were only tiny fractions of the ones recorded during the three-month baseline period,

indicating a dramatic decline in dolphin usage of this survey area as well during the present impact phase period (Table 5).

3.3.5. Notably, when comparing the quarterly periods in autumn months, the quarterly encounter rates in the autumn of 2018 dropped to the lowest among all autumn periods during the HKLR03 construction phase. The dramatic drop in dolphin occurrence during this quarter should raise serious concerns, and such temporal trend should be closely monitored in the upcoming monitoring quarters as the construction activities of HZMB works continue to diminish in coming months.

3.3.6 A two-way ANOVA with repeated measures and unequal sample size was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. The two variables that were examined included the two periods (baseline and impact phases) and two locations (NEL and NWL).

3.3.7. For the comparison between the baseline period and the present quarter (24th quarter of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0029 and 0.0143 respectively. If the alpha value is set at 0.05, significant differences were detected between the baseline and present quarters in both the average dolphin encounter rates of STG and ANI.

3.3.8. For the comparison between the baseline period and the cumulative quarters in impact phase (i.e. the first 24 quarters of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.000000 and 0.000000 respectively. Even if the alpha value is set at 0.00001, significant differences were still detected in both the average dolphin encounter rates of STG and ANI (i.e. between the two periods and the locations).

3.3.9. As indicated in both dolphin distribution patterns and encounter rates, dolphin usage has been significantly reduced in both NEL and NWL survey areas during the present quarterly period, and such low occurrence of dolphins has also been consistently documented in previous quarters of the past few years.

3.3.10. The dramatic decline in dolphin usage of North Lantau region raises serious concern, as the timing of the decline in dolphin usage in North Lantau waters coincided well with the construction schedule of the HZMB-related projects (Hung 2018). Apparently there was very little sign of recovery of dolphin usage, even though almost all marine works associated with the HZMB construction have been completed.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from one to four individuals per group in North Lantau region during September to November 2018. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in Table 6.

Table 6. Comparison of average dolphin group sizes from impact monitoring period (September – November 2018) and baseline monitoring period (September – November 2011) (Note: ± denotes the standard deviation of the average group size)

	Average Dolphin Group Size	
	September – November 2018	**September – November 2011**
Overall	2.17 ± 0.98 (n = 6)	3.72 ± 3.13 (n = 66)
Northeast Lantau	---	3.18 ± 2.16 (n = 17)
Northwest Lantau	2.17 ± 0.98 (n = 6)	3.92 ± 3.40 (n = 49)

3.4.2. The average dolphin group size in NWL waters during September to November 2018 was much lower than the one recorded during the three-month baseline period, but it should be noted that the sample size of six dolphin groups in the present quarter was only a small fraction of the sample size of 66 dolphin groups sighted during the baseline period (Table 6).

3.4.3. Notably, with the exception of one medium-sized group with four animals, the other five dolphin groups were very small with 1-2 individuals per group only (Appendix II).

3.5. Habitat use

3.5.1. From September to November 2018, only six grids recorded dolphin occurrence. The only grid with moderately high dolphin density was located adjacent to Lung Kwu Chau, while the other grids recorded low to very low DPSE values (Figures 3a and 3b)

3.5.2. Notably, all grids near TM-CLKL alignment as well as HKLR09 alignment and HKLR03/HKBCF reclamation sites did not record any presence of dolphins at all during on-effort search in the present quarterly period (Figures 3a and 3b).

3.5.3. It should be emphasized that the amount of survey effort collected in each grid during the three-month period was fairly low (6-12 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 should be examined when more survey effort for each grid is collected throughout the impact phase monitoring programme.

3.5.4. When compared with the habitat use patterns during the baseline period, dolphin usage in NEL and NWL has drastically diminished in both areas during the present impact monitoring period (Figure 4). During the baseline period, many grids between Siu Mo To and Shum Shui Kok in NEL recorded moderately high to high dolphin densities, which was in stark contrast to the complete absence of dolphins there during the present impact phase period (Figure 4).

3.5.5. The density patterns were also drastically different in NWL between the baseline and impact phase monitoring periods, with high dolphin usage recorded throughout the area during the baseline period, especially around Sha Chau, near Black Point, to the west of the airport, as well as between Pillar Point and airport platform. In contrast, only several

grids with low to moderate dolphin densities were located at the northwestern portion of North Lantau waters during the present impact phase period (Figure 4).

3.6. Mother-calf pairs

3.6.1. During the present quarterly period, no young calf was sighted at all among the seven groups of dolphins.

3.7. Activities and associations with fishing boats

3.7.1. Only one of the six dolphin groups was engaged in feeding and socializing activities (with both activities occurred during the same sighting), while no group was engaged in traveling or milling/resting activity during the three-month study period.

3.7.2. Distribution of dolphins engaged in various activities during the present three-month period and baseline period is shown in Figure 5. The only dolphin group engaged in both feeding and socializing activities was sighted to the north of Lung Kwu Chau (Figure 5). In comparison, the distribution of various dolphin activities during the present impact phase monitoring period was very different from the baseline period with a much more restricted area of occurrence (Figure 5).

3.7.3. Notably, none of the six dolphin groups was found to be associated with any operating fishing vessel during the present impact phase period.

3.8. Summary of photo-identification works

3.8.1. From September to November 2018, about 300 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, six individuals sighted 10 times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). All of these re-sightings were made in NWL. Four of the six individuals (NL136, NL182, NL261 and NL328) were re-sighted twice, while the other two individuals (NL272 and NL286) were re-sighted once during the three-month period (Appendix III).

3.8.3. Notably, one of these six individuals (NL136) was also sighted in NWL waters during the HKBCF monitoring surveys under the same three-month period. However, none of them was sighted in WL waters during the HKLR09 monitoring surveys from the September to November 2018, which implied their limited movements across different survey areas during this quarterly monitoring period.

3.9. Individual range use

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

3.9.2. All identified dolphins sighted in the present quarter were utilizing NWL waters only, but have completely avoided NEL waters where many of them have utilized as their core areas in the past (Appendix V). This is in contrary to the extensive movements between NEL and NWL survey areas observed in the earlier impact monitoring quarters as well as

the baseline period.

3.9.3. On the other hand, in contrary to previous monitoring quarters, none of the six individuals have extended their range use to WL waters during the same autumn quarter of 2018, while none of the individuals that consistently utilized WL waters in the past have extended their range use to NWL waters either during the present quarter.

3.9.4. In the upcoming quarters, individual range use and movements should be continuously monitored to examine whether there has been any consistent shifts of individual home ranges from North Lantau to West or Southwest Lantau (and vice versa), as such shift could possibly be related to the HZMB-related construction works.

4. Conclusion

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

4.2. Although the dolphins infrequently occurred along the alignment of TMCLKL southern connection viaduct in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL, and many individuals have shifted away from the important habitat around the Brothers Islands.

4.3. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

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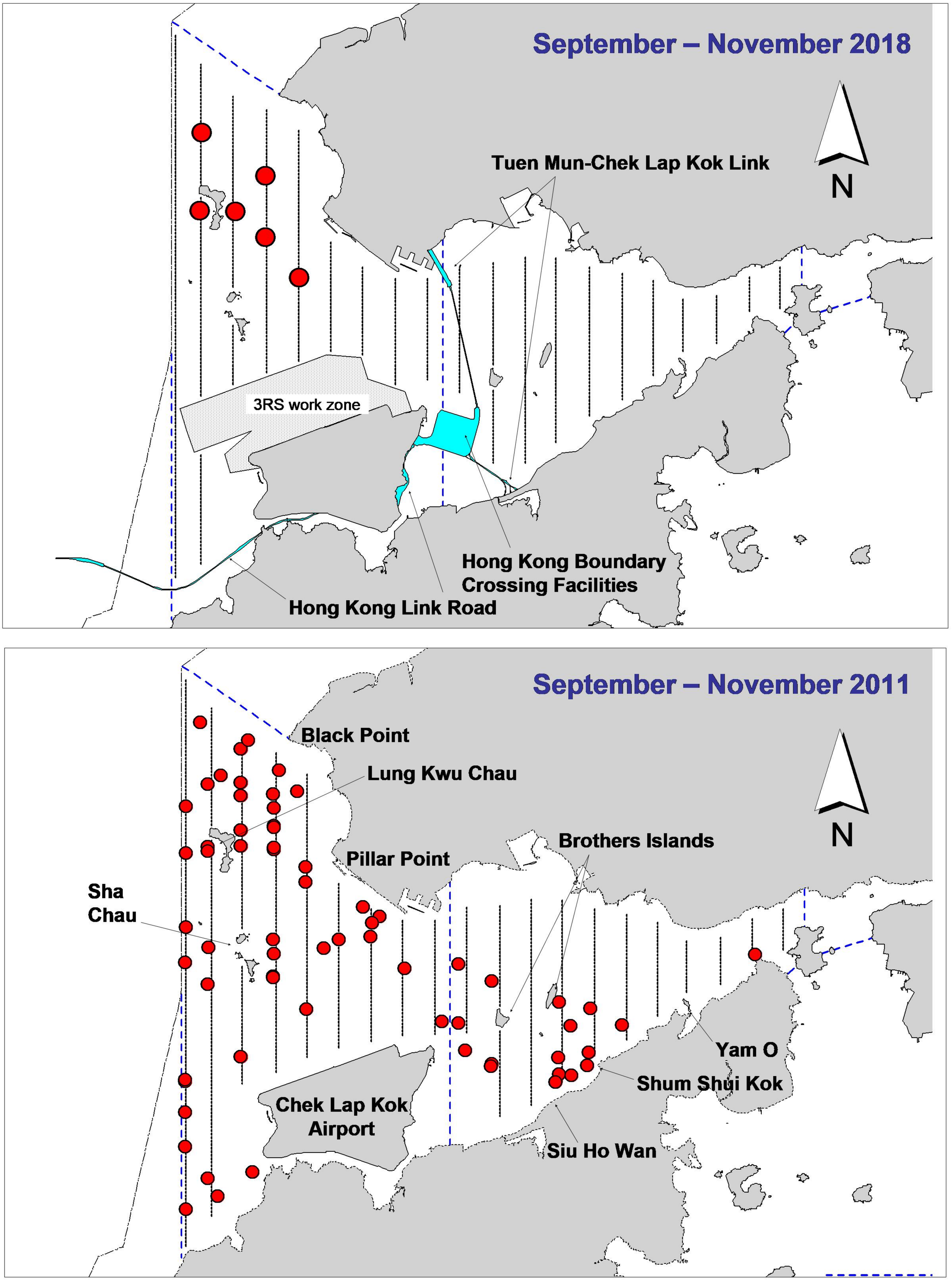


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

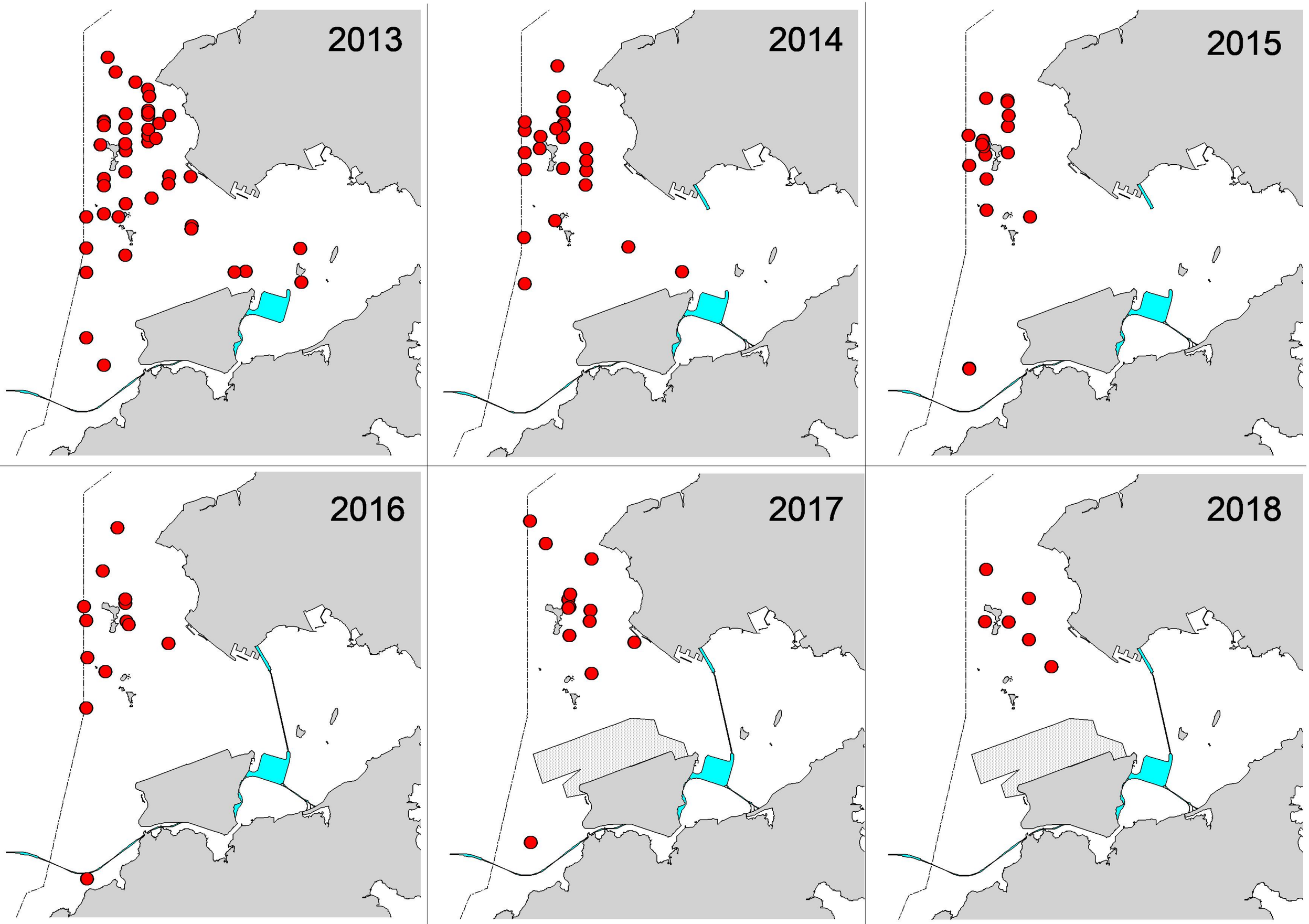


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the past six autumn quarters (September-November) of HKLR03 impact phase in 2013-18

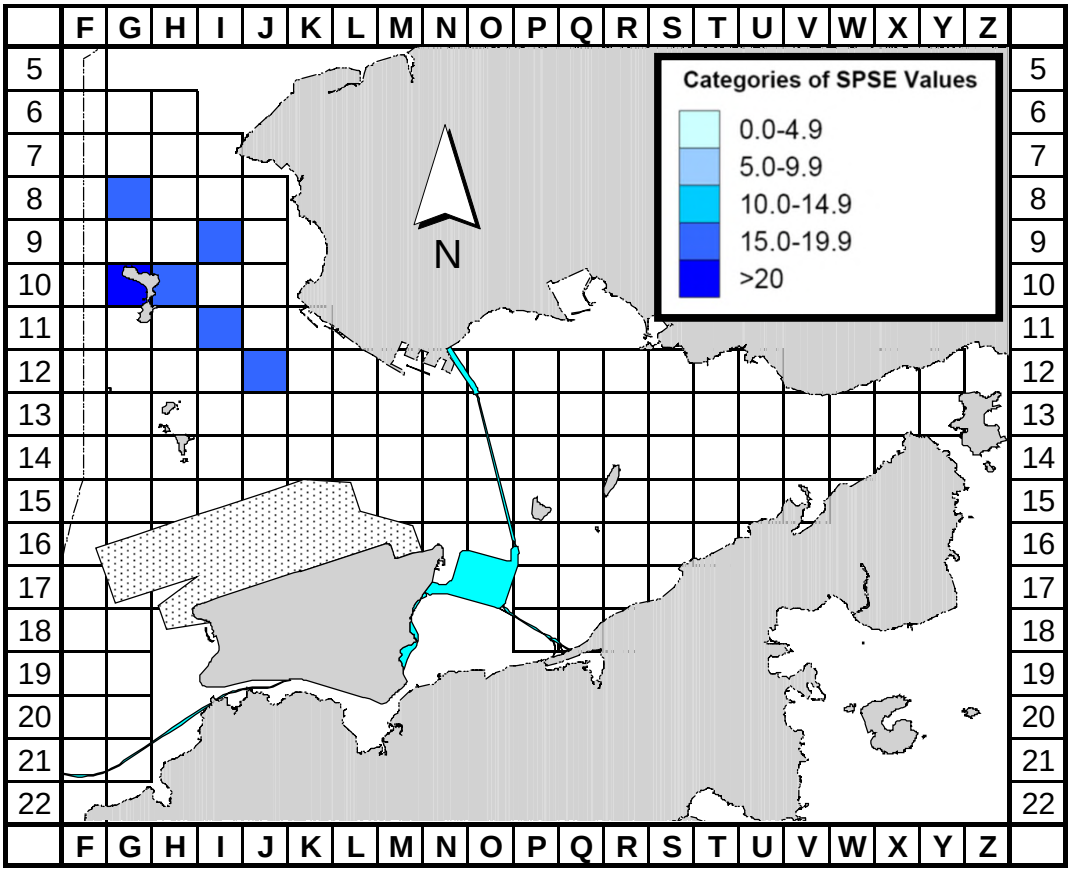


Figure 3a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (Sep-Nov 18) (SPSE = no. of on-effort sightings per 100 units of survey effort)

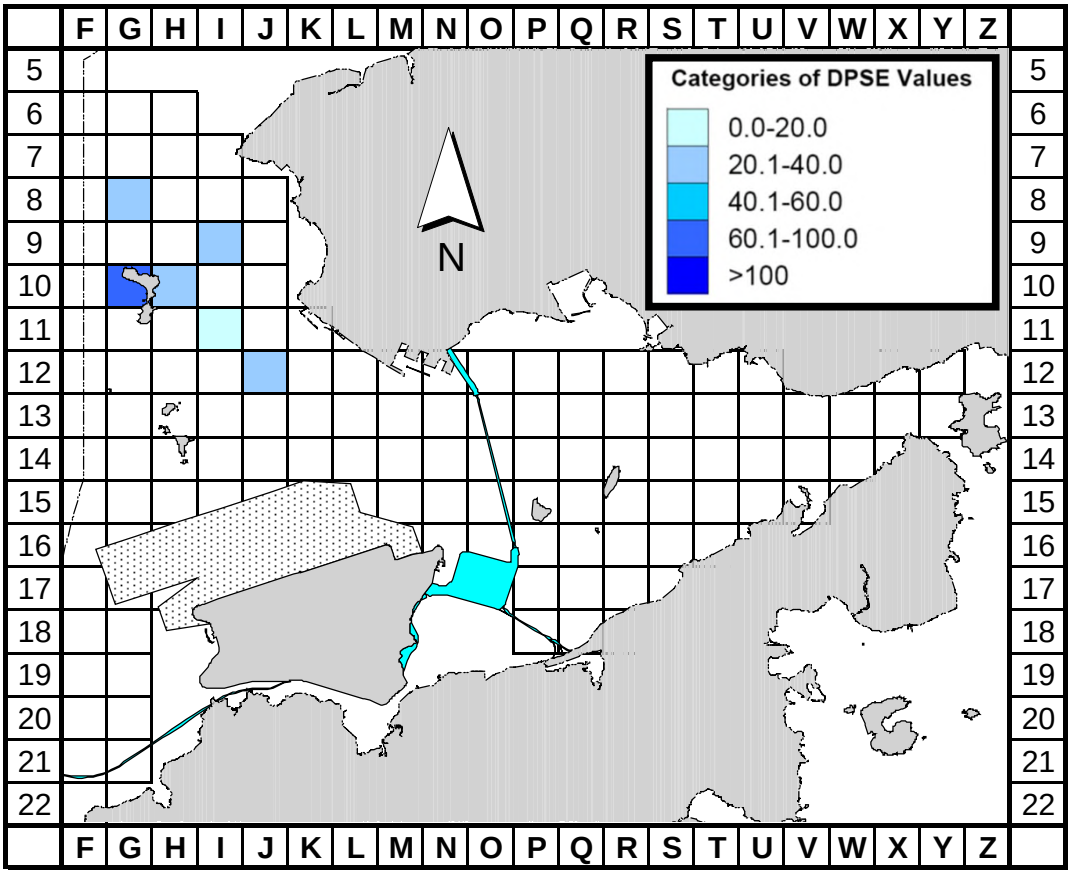


Figure 3b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (Sep-Nov 18) (DPSE = no. of dolphins per 100 units of survey effort)

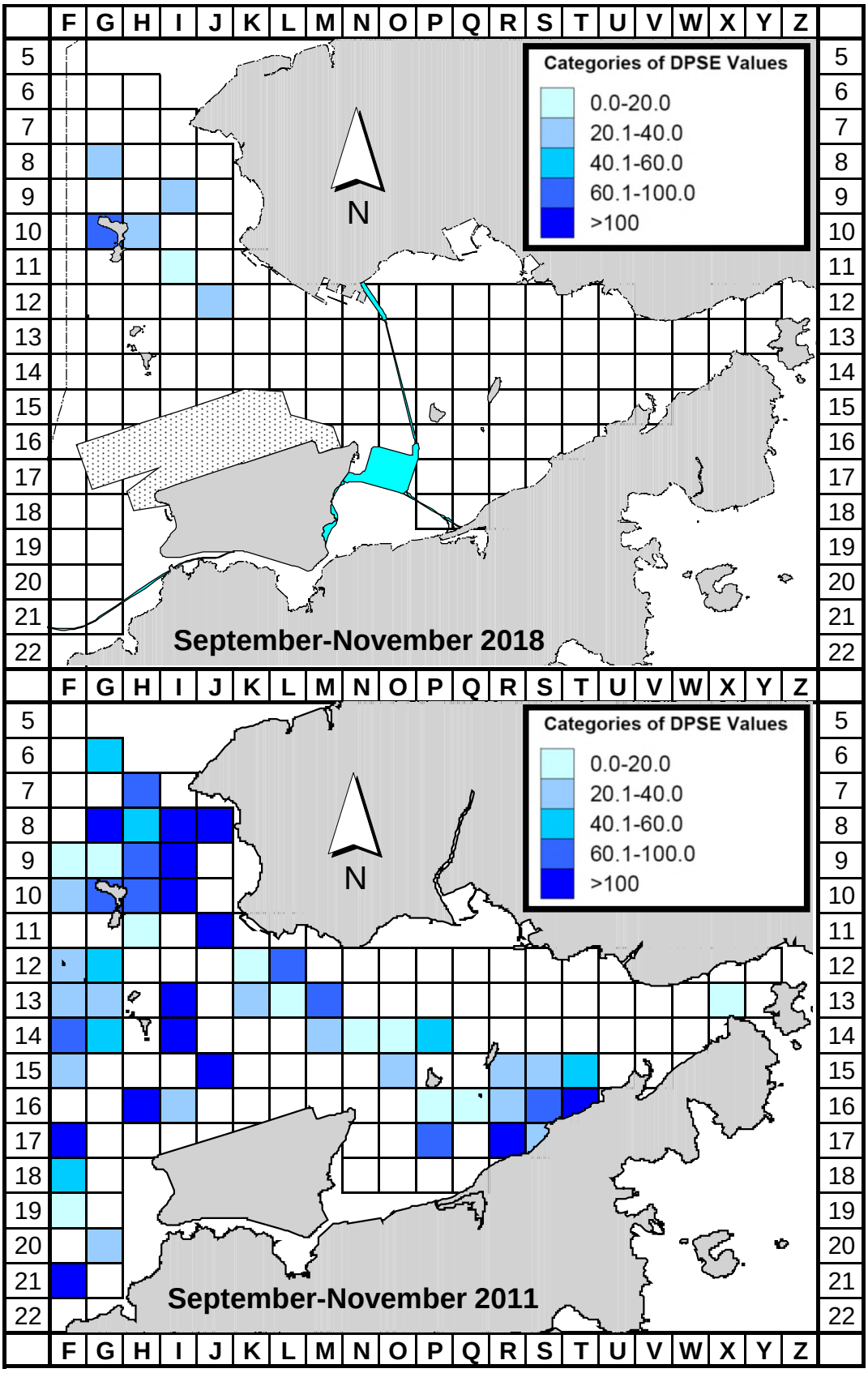


Figure 4. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between the impact monitoring period (September - November 2018) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)

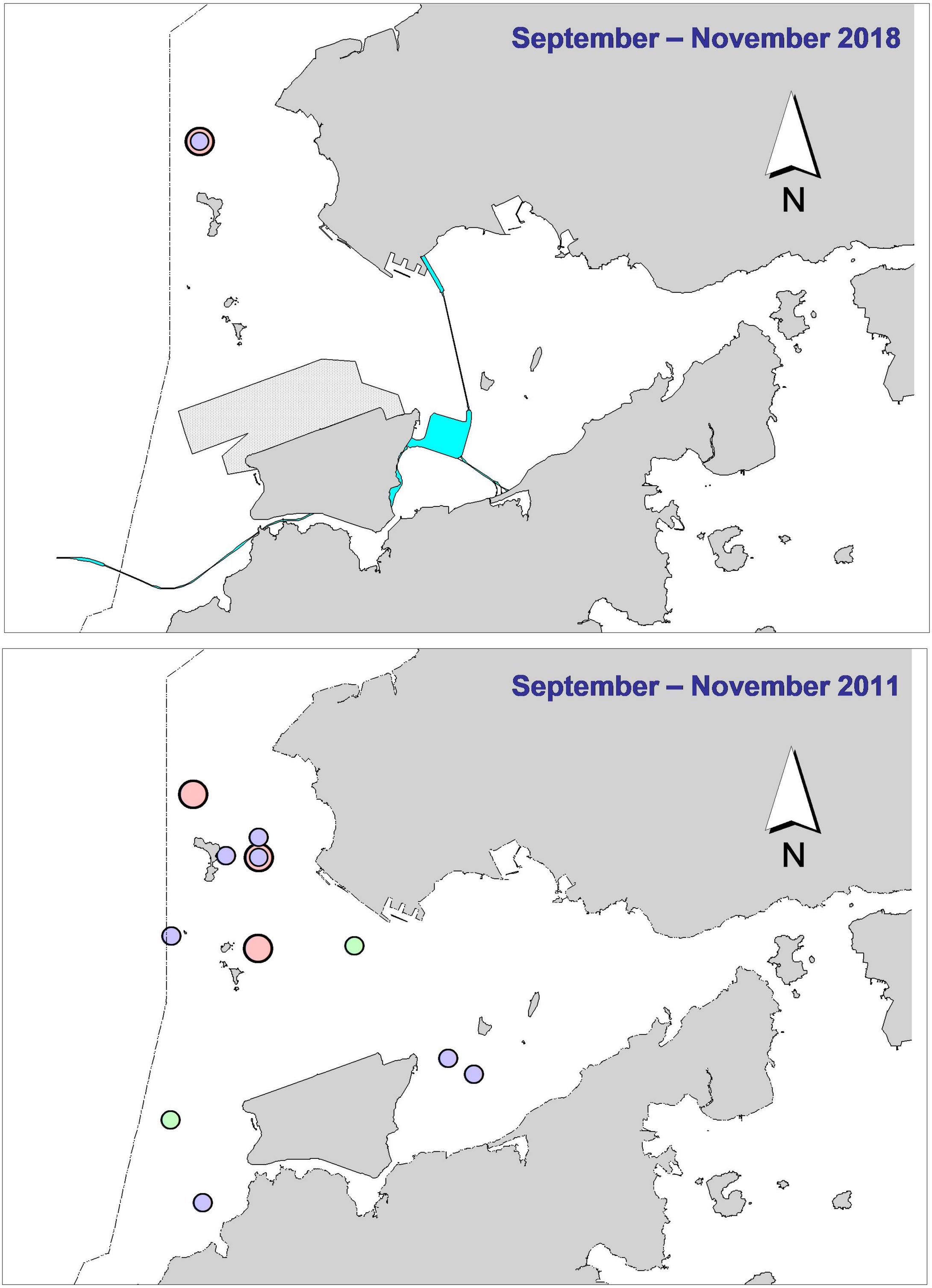


Figure 5. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

Appendix I. HKLR03 Survey Effort Database (September-November 2018)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
4-Sep-18	NW LANTAU	1	7.70	AUTUMN	STANDARD36826	HKLR	P
4-Sep-18	NW LANTAU	2	24.60	AUTUMN	STANDARD36826	HKLR	P
4-Sep-18	NW LANTAU	3	3.00	AUTUMN	STANDARD36826	HKLR	P
4-Sep-18	NW LANTAU	1	4.20	AUTUMN	STANDARD36826	HKLR	S
4-Sep-18	NW LANTAU	2	7.80	AUTUMN	STANDARD36826	HKLR	S
4-Sep-18	NW LANTAU	3	1.30	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NE LANTAU	3	34.10	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NE LANTAU	4	1.10	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NE LANTAU	2	2.50	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NE LANTAU	3	13.40	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NW LANTAU	2	3.50	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NW LANTAU	3	17.73	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NW LANTAU	4	3.97	AUTUMN	STANDARD36826	HKLR	P
18-Sep-18	NW LANTAU	2	4.10	AUTUMN	STANDARD36826	HKLR	S
18-Sep-18	NW LANTAU	3	5.90	AUTUMN	STANDARD36826	HKLR	S
20-Sep-18	NW LANTAU	2	21.14	AUTUMN	STANDARD36826	HKLR	P
20-Sep-18	NW LANTAU	3	6.75	AUTUMN	STANDARD36826	HKLR	P
20-Sep-18	NW LANTAU	2	7.28	AUTUMN	STANDARD36826	HKLR	S
20-Sep-18	NW LANTAU	3	2.01	AUTUMN	STANDARD36826	HKLR	S
26-Sep-18	NE LANTAU	2	33.45	AUTUMN	STANDARD138716	HKLR	P
26-Sep-18	NE LANTAU	3	11.25	AUTUMN	STANDARD138716	HKLR	S
26-Sep-18	NW LANTAU	2	13.12	AUTUMN	STANDARD138716	HKLR	P
26-Sep-18	NW LANTAU	3	20.65	AUTUMN	STANDARD138716	HKLR	P
26-Sep-18	NW LANTAU	2	10.51	AUTUMN	STANDARD138716	HKLR	S
26-Sep-18	NW LANTAU	3	2.62	AUTUMN	STANDARD138716	HKLR	S
4-Oct-18	NW LANTAU	2	19.20	AUTUMN	STANDARD36826	HKLR	P
4-Oct-18	NW LANTAU	3	12.68	AUTUMN	STANDARD36826	HKLR	P
4-Oct-18	NW LANTAU	4	0.62	AUTUMN	STANDARD36826	HKLR	P
4-Oct-18	NW LANTAU	2	6.10	AUTUMN	STANDARD36826	HKLR	S
4-Oct-18	NW LANTAU	3	5.60	AUTUMN	STANDARD36826	HKLR	S
4-Oct-18	NE LANTAU	2	19.33	AUTUMN	STANDARD36826	HKLR	P
4-Oct-18	NE LANTAU	3	15.44	AUTUMN	STANDARD36826	HKLR	P
4-Oct-18	NE LANTAU	2	8.06	AUTUMN	STANDARD36826	HKLR	S
4-Oct-18	NE LANTAU	3	5.07	AUTUMN	STANDARD36826	HKLR	S
11-Oct-18	NW LANTAU	2	15.31	AUTUMN	STANDARD36826	HKLR	P
11-Oct-18	NW LANTAU	3	12.41	AUTUMN	STANDARD36826	HKLR	P
11-Oct-18	NW LANTAU	2	4.07	AUTUMN	STANDARD36826	HKLR	S
11-Oct-18	NW LANTAU	3	9.41	AUTUMN	STANDARD36826	HKLR	S
16-Oct-18	NW LANTAU	2	23.58	AUTUMN	STANDARD36826	HKLR	P
16-Oct-18	NW LANTAU	3	5.15	AUTUMN	STANDARD36826	HKLR	P
16-Oct-18	NW LANTAU	2	10.36	AUTUMN	STANDARD36826	HKLR	S
16-Oct-18	NW LANTAU	3	2.11	AUTUMN	STANDARD36826	HKLR	S
18-Oct-18	NW LANTAU	2	32.45	AUTUMN	STANDARD36826	HKLR	P
18-Oct-18	NW LANTAU	2	11.05	AUTUMN	STANDARD36826	HKLR	S
18-Oct-18	NE LANTAU	2	34.26	AUTUMN	STANDARD36826	HKLR	P
18-Oct-18	NE LANTAU	3	2.27	AUTUMN	STANDARD36826	HKLR	P
18-Oct-18	NE LANTAU	2	11.07	AUTUMN	STANDARD36826	HKLR	S
1-Nov-18	NE LANTAU	2	10.78	AUTUMN	STANDARD36826	HKLR	P
1-Nov-18	NE LANTAU	3	19.78	AUTUMN	STANDARD36826	HKLR	P
1-Nov-18	NE LANTAU	4	6.85	AUTUMN	STANDARD36826	HKLR	P

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
1-Nov-18	NE LANTAU	2	4.88	AUTUMN	STANDARD36826	HKLR	S
1-Nov-18	NE LANTAU	3	7.41	AUTUMN	STANDARD36826	HKLR	S
6-Nov-18	NW LANTAU	2	32.12	AUTUMN	STANDARD36826	HKLR	P
6-Nov-18	NW LANTAU	3	19.50	AUTUMN	STANDARD36826	HKLR	P
6-Nov-18	NW LANTAU	4	6.80	AUTUMN	STANDARD36826	HKLR	P
6-Nov-18	NW LANTAU	2	17.37	AUTUMN	STANDARD36826	HKLR	S
6-Nov-18	NW LANTAU	3	7.91	AUTUMN	STANDARD36826	HKLR	S
6-Nov-18	NW LANTAU	4	2.70	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NW LANTAU	3	9.12	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NW LANTAU	4	16.42	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NW LANTAU	5	1.50	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NW LANTAU	3	5.80	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NW LANTAU	4	5.75	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NW LANTAU	5	1.40	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NE LANTAU	2	21.83	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NE LANTAU	3	13.92	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NE LANTAU	4	1.30	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NE LANTAU	2	7.10	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NE LANTAU	3	5.64	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NE LANTAU	4	0.81	AUTUMN	STANDARD36826	HKLR	S
13-Nov-18	NW LANTAU	2	18.07	AUTUMN	STANDARD36826	HKLR	P
13-Nov-18	NW LANTAU	3	14.72	AUTUMN	STANDARD36826	HKLR	P
13-Nov-18	NW LANTAU	2	6.80	AUTUMN	STANDARD36826	HKLR	S
13-Nov-18	NW LANTAU	3	1.71	AUTUMN	STANDARD36826	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (September-November 2018)

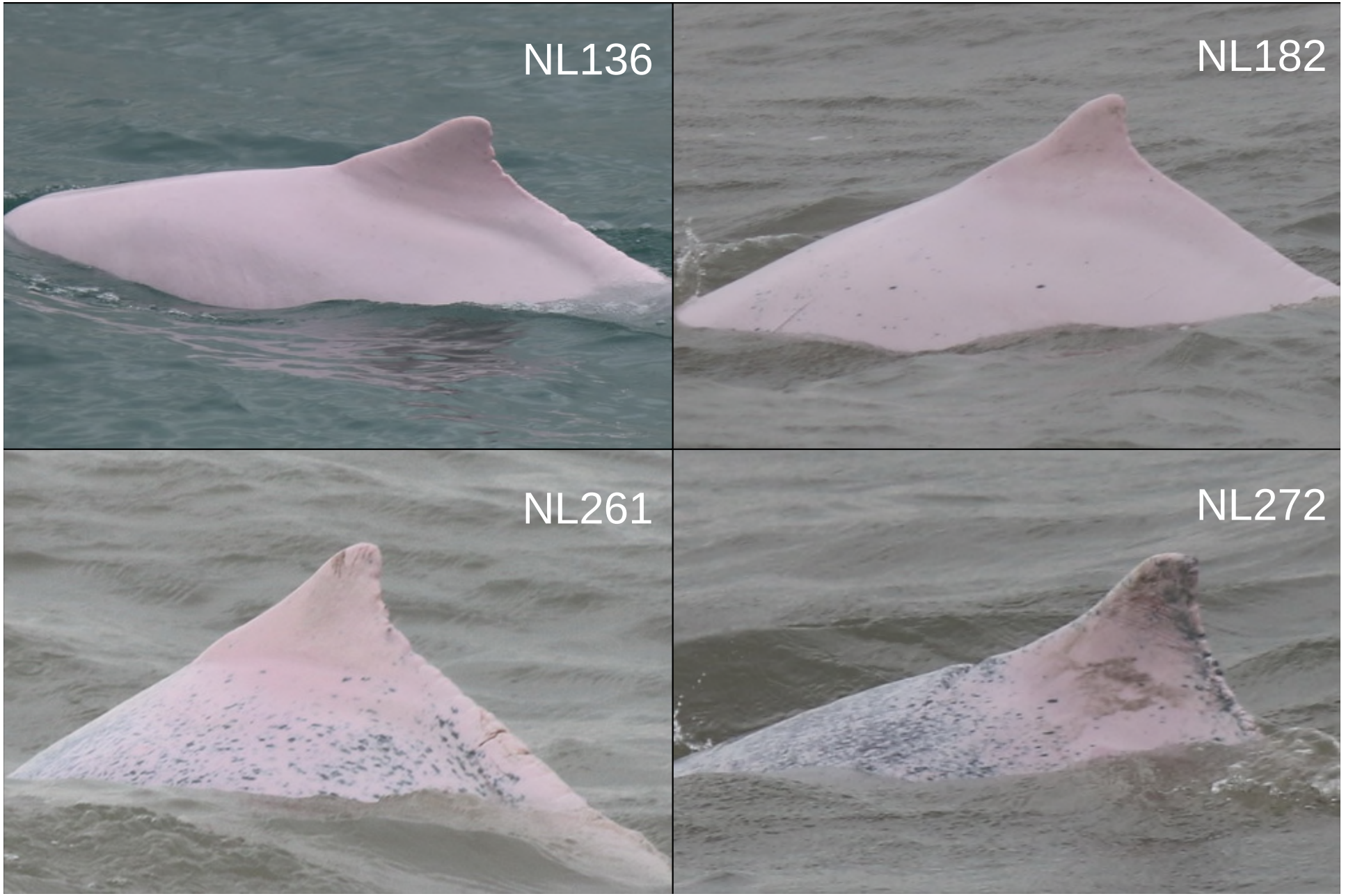
(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
26-Sep-18	1	1433	2	NW LANTAU	2	258	ON	HKLR	826241	806517	AUTUMN	NONE	P
11-Oct-18	1	1222	4	NW LANTAU	3	362	ON	HKLR	826265	805415	AUTUMN	NONE	S
18-Oct-18	1	1232	2	NW LANTAU	2	145	ON	HKLR	824310	808501	AUTUMN	NONE	P
6-Nov-18	1	1107	1	NW LANTAU	2	364	ON	HKLR	825486	807443	AUTUMN	NONE	P
6-Nov-18	2	1119	2	NW LANTAU	2	221	ON	HKLR	827280	807456	AUTUMN	NONE	P
6-Nov-18	3	1202	2	NW LANTAU	2	84	ON	HKLR	828546	805451	AUTUMN	NONE	P

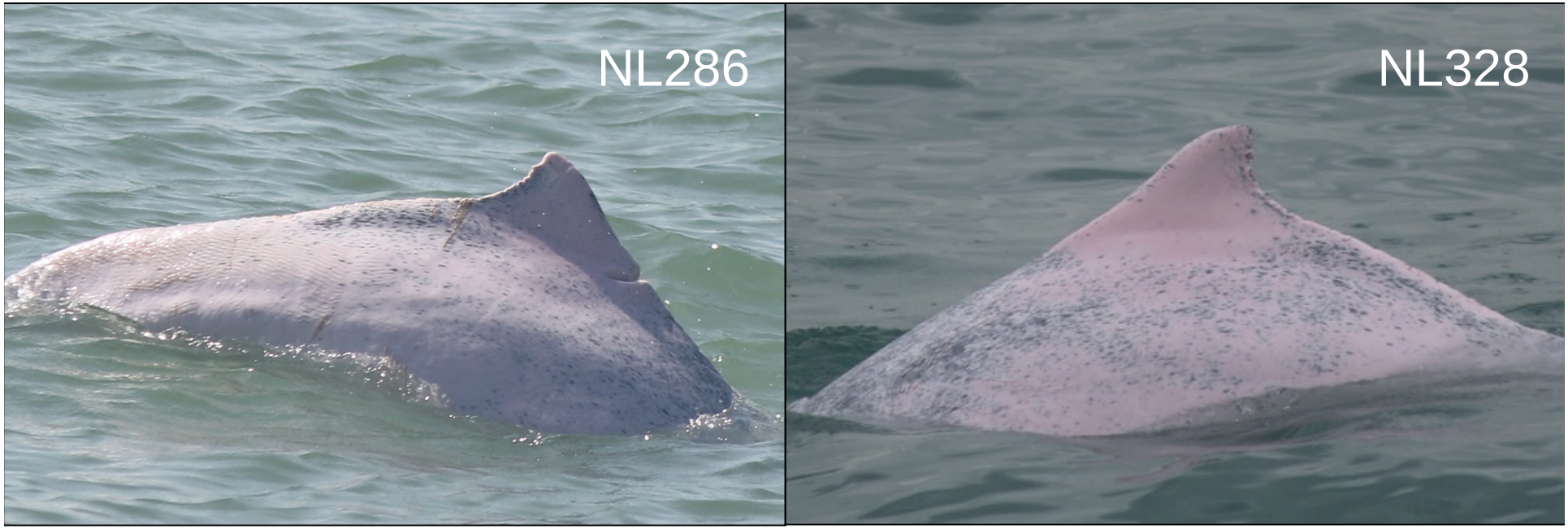
Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in September-November 2018

ID#	DATE	STG#	AREA
NL136	11/10/18	1	NW LANTAU
	18/10/18	1	NW LANTAU
NL182	26/09/18	1	NW LANTAU
	11/10/18	1	NW LANTAU
NL261	11/10/18	1	NW LANTAU
	06/11/18	3	NW LANTAU
NL272	11/10/18	1	NW LANTAU
NL286	06/11/18	2	NW LANTAU
NL328	18/10/18	1	NW LANTAU
	06/11/18	3	NW LANTAU

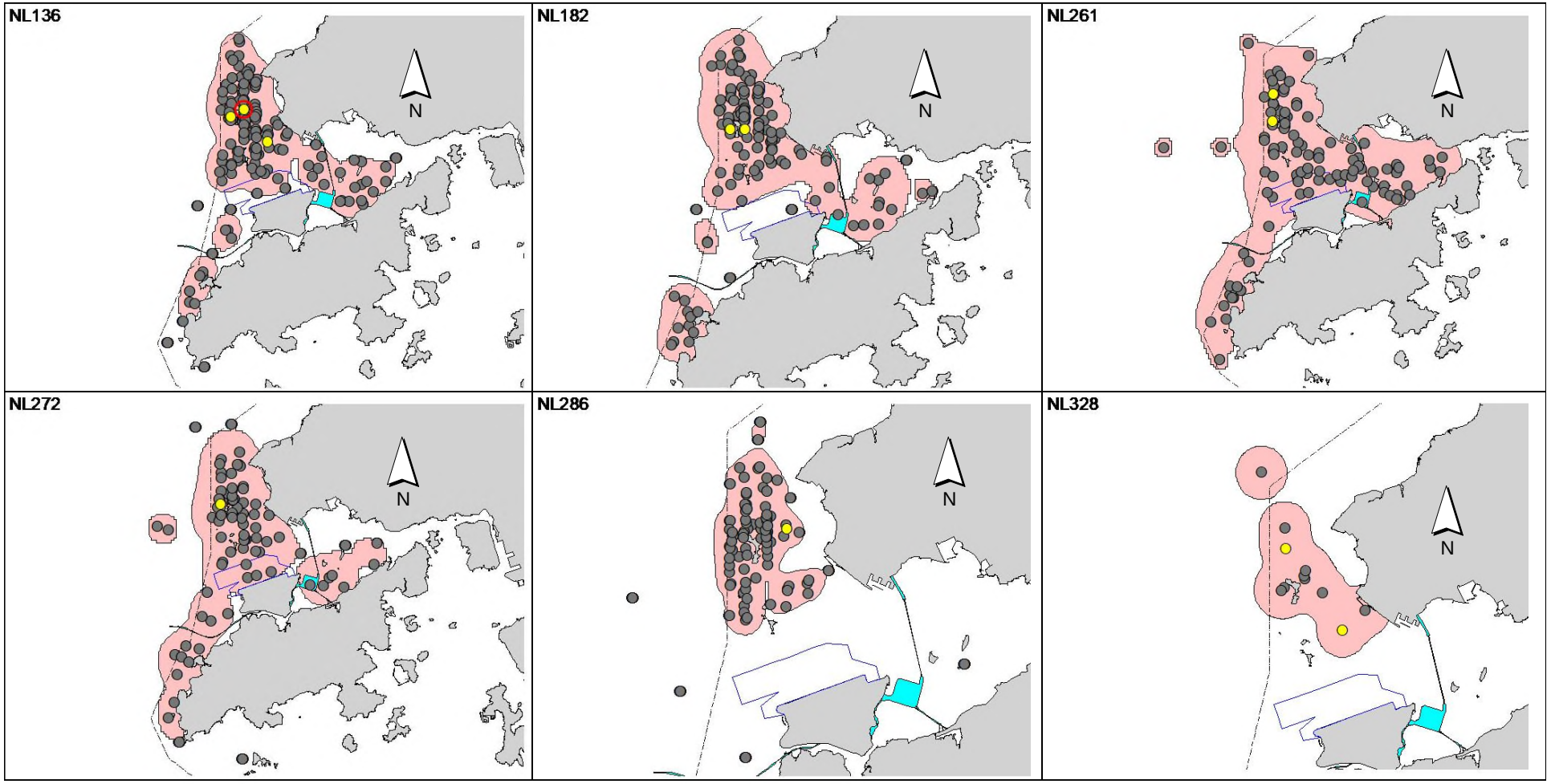
Appendix IV. Six individual dolphins that were identified during September to November 2018 under HKLR03 impact phase monitoring surveys



Appendix IV. (cont'd)



Appendix V. Ranging patterns (95% kernel ranges) of six individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicate sightings made in September-October 2018 during HKLR03 monitoring surveys; the yellow dots with the red circles indicate the ones made during HKBCF monitoring surveys)



Appendix J

Event Action Plan

Appendix J1 Event/ Action Plan for Air Quality

	ACTION			
EVENT	**ET** [(1)]	**IEC** [(1)]	**SOR** [(1)]	**Contractor**
Action Level				
1. Exceedance for one sample	1. Identify the source. 2. Inform the IEC and the SOR. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by the 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 the source. 2. Inform the IEC and the SOR. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with the IEC and the Contractor on remedial actions required. 6. If exceedance continues, arrange meeting with the IEC and the SOR. 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET. 2. Check the Contractor's working method. 3. Discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR on the effectiveness of the proposed remedial measures. 5. Supervisor implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate

	ACTION			
EVENT	**ET** [(1)]	**IEC** [(1)]	**SOR** [(1)]	**Contractor**
Limit Level				
1. Exceedance for one sample	1. Identify the source. 2. Inform the SOR and the DEP. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results.	1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 3. Discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR on the effectiveness of the proposed remedial measures. 5. Supervisor implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Ensure remedial measures are 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 the IEC, the SOR, the DEP and the Contractor. 2. Identify the source. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 6. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken. 7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and	1. Discuss amongst the SOR, ET and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SOR accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	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 activity of works as determined by the SOR until the exceedance is abated.

	the SOR informed of the results.
	8. If exceedance stops cease additional monitoring.

Appendix J2 Event/ Action Plan for Construction Noise

	ACTION			
EVENT	**ET**	**IEC**	**SOR**	**Contractor**
Action Level	1. Notify the IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to the IEC and the 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 SOR accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the 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. Notify the IEC, the SOR, the DEP and the Contractor. 2. Identify the source. 3. Repeat measurement to confirm findings. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform the IEC, the SOR and the DEP the causes & actions taken for the exceedances. 7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results. 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst the SOR, the ET and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SOR accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	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 activity of works as determined by the SOR until the exceedance is abated.

Appendix J3 Event/ Action Plan for Water Quality

Event	ET Leader	IEC	SOR	Contractor
Action level being exceeded by one sampling day	1. Repeat in situ measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and SOR; 4. Check monitoring data, all plant, equipment and Contractor's working methods.	1. Check monitoring data submitted by ET and Contractor's working methods.	1. Confirm receipt of notification of non-compliance in writing; 2. Notify Contractor.	1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level;	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures are properly implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Supervising Officer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of additional mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR; 5. Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact;	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed	1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice;

Event	ET Leader	IEC	SOR	Contractor
	3. Inform IEC, contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor;	on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly.	mitigation measures; 3. Request Contractor to review the working methods.	3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days;	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SOR accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. 5. Ensure mitigation measures are properly implemented; 6. 7. 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. 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.

Appendix J4 Implementation of Event-Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	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, SOR and Contractor; 5. Check monitoring data. 6. Review to ensure all the dolphin protective measures 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 with the IEC and any other measures proposed by the ET; 2. If SOR is satisfied with the proposal of any other measures, SOR to signify the agreement in writing on the measures to be implemented.	1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SOR; 3. Implement the agreed measures.

Event	ET Leader	IEC	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 review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary; 7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.	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 any 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 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 the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by 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.

Appendix J5 Event and Action Plan on Dolphin Acoustic Behaviour

EVENT	ACTION			
	ET Leader	**IEC**	**SO**	**Contractor**
Action Level With the numerical values presented in *Table 5.7* of *Baseline Monitoring Report*, when any of the response variable for dolphin acoustic behaviour recorded in the construction phase monitoring is 20% lower or higher than that recorded in the baseline monitoring (see *Table 5.8* of *Baseline Monitoring Report*), or when there is a difference of 20% in dolphin acoustic signal detection at nighttime period at Site C1 only, the action level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor;	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non- compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.

EVENT	ACTION			
	ET Leader	**IEC**	**SO**	**Contractor**
Limit Level With the numerical values presented in *Table 5.7* of *Baseline Monitoring Report*, when any of the response variable for dolphin acoustic behaviour recorded in the construction phase monitoring is 40% lower or higher than that recorded in the baseline monitoring (see *Table 5.8* of *Baseline Monitoring Report*), or when there is a difference of 40% in dolphin acoustic signal detection at nighttime at Site C1 only, the limit level should be triggered	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SO and Contractor; 5. Check monitoring data; 6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary 7. Discuss additional dolphin monitoring and any other potential mitigation measures (eg consider to temporarily stop relevant portion of construction activity) with the IEC and Contractor.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring with the ET and the Contractor; 3. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise ER accordingly.	1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET; 2. Make agreement on measures to be implemented.	1. Inform the SO and confirm notification of the non- compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SO; 3. Implement the agreed measures.

Abbreviations: ET – Environmental Team, IEC – Independent Environmental Checker, SO – Supervising Office, DEP – Director of Environmental Protection

Appendix K

Quarterly Summary of Waste Flow Table

Contract No. : HY/2012/07

Tuen Mun Chek Lap Kok Link – Southern Connection Viaduct Section

Monthly Summary Waste Flow Table for 2019 (Year)

Month\Material	Actual Quantities of Inert C&D Materials Generation						Actual Quantities of C&D wastes Generation						Actual Quantities of Recyclables Generation			
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fills	Imported Fill	Marine Sediment, Cat. L	Marine Sediment, Cat. Mp	Marine Sediment, Cat. Mf	Marine Sediment, Cat. H	Chemical Waste	General Refuse	Metals	Felled trees	Paper/ cardboard packaging	Plastics
Unit	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000m^3)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)	('000Kg)
Jan	3.687	0.861	-	-	3.687	-	-	-	-	-	0.800	251.110	-	-	-	-
Feb	1.254	0.046	-	0.637	0.617	-	-	-	-	-	-	84.990	-	-	-	-
Mar	4.491	0.000	-	3.627	0.864	-	-	-	-	-	-	71.750	-	-	-	-
Apr	9.363	0.153	-	8.979	0.384	-	-	-	-	-	-	56.470	-	9.520	0.084	-
May	5.334	0.000	-	5.258	0.077	-	-	-	-	-	-	76.380	-	-	-	-
Jun	0.356	0.000	-	0.315	0.041	-	-	-	-	-		39.960	-	-	-	-
SUB-TOTAL	**24.484**	**1.060**	**0.000**	**18.815**	**5.669**	**0.000**	**-**	**-**	**-**	**-**	**0.800**	**580.660**	**-**	**9.520**	**0.084**	**-**
Jul	-	0.000	-	-	-	-	-	-	-	-	-	17.100	-	-	-	-
Aug	-	0.000	-	-	-	-	-	-	-	-	-	31.050	-	-	-	-
Sep	-	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oct	-	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	-	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec	-	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**24.484**	**1.060**	**-**	**18.815**	**5.669**	**-**	**-**	**-**	**-**	**-**	**0.800**	**628.810**	**-**	**9.520**	**0.084**	**-**

Notes :

1 - The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

2 - Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

3 - Broken concrete for recycling into aggregates.

4 - Assumed 5 kg per damaged water-filled barrier.

5 - Disposed as Public Fills includes Hard Rock and Large Broken Concrete.

Appendix L

Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Appendix L1 Cumulative Statistics on Exceedances

		Total No. recorded in this quarter	**Total No. recorded since contract commencement**
1-Hr TSP	Action	0	0
	Limit	1	2
24-Hr TSP	Action	0	2
	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Water Quality	Action	46	272
	Limit	3	27
Impact Dolphin Monitoring	Action	0	11
	Limit	1	17

Appendix L2 Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

Reporting Period	**Cumulative Statistics**		
	Complaints	Notifications of Summons	Successful Prosecutions
This quarter	0	0	0
Total No. received since contract commencement	14	0	0

Email message

Environmental Resources Management

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25 Westlands Road
Quarry Bay, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jovy.tam@erm.com

To	Ramboll Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Air Quality Impact Monitoring
Date	12 July 2019

ERM

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Limit Level Exceedance
0215660_25 June 2019_1hrTSP_Station ASR9

A total of one (1) exceedance was recorded on 25 June 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Air Quality Impact Monitoring

Notification of Exceedance

Log No.	**<u>Limit Level Exceedance</u> 0215660_25 June 2019_1hrTSP_Station ASR9 [Total No. of Exceedances = 1]**	
Date	25 June 2019 (Measured) 11 July 2019 (*R*esults received by ERM)	
Monitoring Station	ASR8A, ASR9	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	1-hr TSP (µg/m³)	ASR8A = 394 ASR9 = 393
Limit Levels	1-hr TSP (µg/m³)	ASR8A and ASR9 = 500
Measured Levels	<u>Limit Level Exceedance</u> 1. 1-hr TSP at ASR9 (752 µg/m³) during 8:30a.m.-9:30 a.m.	
Works Undertaken (at the time of monitoring event)	Works undertaken under this Contract on 25 June 2019 included: • Reinstatement of seawall at Seafront, and • At-Grade Works at Southern Landfall.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance is unlikely to be due to the Contract, in view of the following: • According to the record provided by the Contractor, works under this Contract conducted on 25 June 2019 included reinstatement of seawall at seafront and at-grade works at southern landfall (see *Figure 1*). According to the recorded wind direction (ranged between 227° and 238°, blowing from a southwesterly direction), the works area at seafront is located upstream of Station ASR9. However, the reinstatement works at the seafront were at the marine and intertidal zones where exposed surfaces are kept wet. In addition, with reference to the low wind speed (ranged from 0.13 to 0.45 m/s) during the period of the observed 1-hr TSP exceedance and the distance between the works area and ASR9 of approximately 400 m, it is considered that the observed exceedance should not be due to the dust, if any, generated by the construction activities under this Contract. • Apart from one 1hr-TSP (08:30a.m.-9:30a.m.) at ASR9, other 1-hr TSP levels and all 24-hr TSP at ASR8A and ASR9 were in compliance with the Action and Limit Levels on the same day. • According to ET inspection of the seafront, no particular observation was observed at the works area (see *Annex A*). Based on the above, the exceedance is unlikely to be due to the Contract.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The Contractor has been reminded to ensure all dust suppression measures are implemented at the site area including water spraying at unpaved road/stockpiles and use of tarpaulin for stockpiles covering (if any). The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results and meteorological information on 25 June 2019 and locations of air quality monitoring stations are attached.	

Results of Air Quality Monitoring

Project	Works	Date (yyyy-mm-dd)	Station	Time (hh:mm, 24hour)	Parameter	Results	Unit
TMCLKL	HY/2012/07	2019/06/25	ASR8A	8:42	1-hr TSP	39	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR8A	9:44	1-hr TSP	14	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR8A	10:48	1-hr TSP	24	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR8A	11:50	24-hr TSP	20	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR9	8:30	1-hr TSP	752	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR9	9:32	1-hr TSP	132	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR9	10:37	1-hr TSP	14	ug/m3
TMCLKL	HY/2012/07	2019/06/25	ASR9	11:39	24-hr TSP	42	ug/m3

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

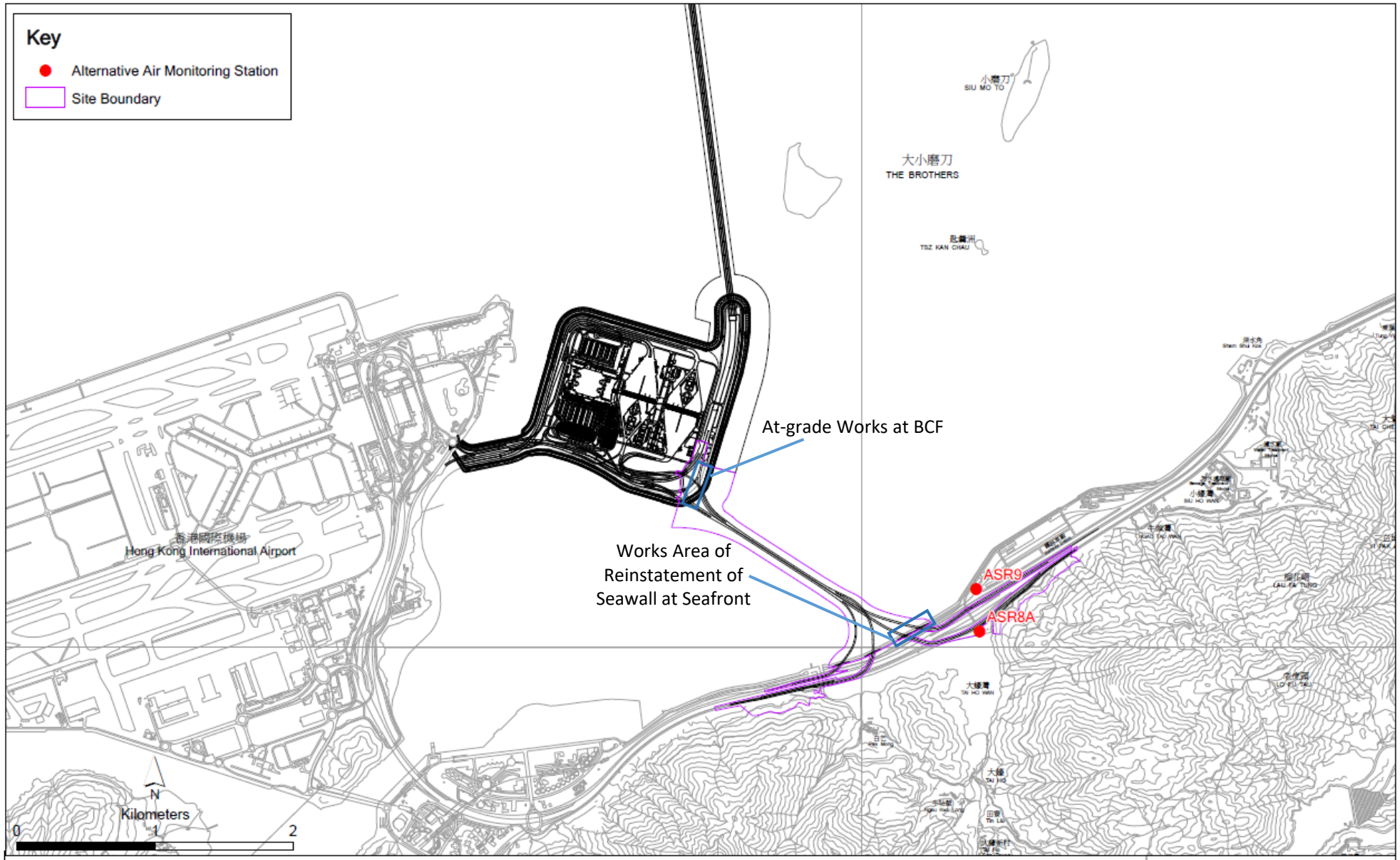

Figure 1

Locations of Air Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_AQMS.mxd
Date: 7/1/2015

Environmental Resources Management

ERM

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	Time (24hrs)	Average of Wind Speed (m/s)	Average of Wind Direction (degree)
19/06/25	0:00	0.26	225
19/06/25	1:00	1.50	237
19/06/25	2:00	0.61	225
19/06/25	3:00	0.08	222
19/06/25	4:00	0.07	210
19/06/25	5:00	0.03	226
19/06/25	6:00	0.02	179
19/06/25	7:00	0.05	193
19/06/25	8:00	0.45	238
19/06/25	9:00	0.13	227
19/06/25	10:00	0.84	224
19/06/25	11:00	0.59	245
19/06/25	12:00	0.26	231
19/06/25	13:00	0.24	208
19/06/25	14:00	0.64	186
19/06/25	15:00	0.02	184
19/06/25	16:00	0.02	129
19/06/25	17:00	0.11	206
19/06/25	18:00	0.21	198
19/06/25	19:00	0.25	236
19/06/25	20:00	1.07	224
19/06/25	21:00	2.36	219
19/06/25	22:00	1.70	222
19/06/25	23:00	1.60	214

Annex A

Photo at Seafront on 25 June 2019

ANNEX A – PHOTO AT SEAFRONT REINSTATEMENT WORKS AREA ON 25 JUNE 2019

Photo 1 - Seafront on 25 June 2019

Email message

Environmental Resources Management

2507,
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18 Tak Fung Street,
Hung Hom, Hong Kong
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To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	24 July 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_3 July 2019_Bottom DO_E_Station SR4a

A total of one exceedance was recorded on 3 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

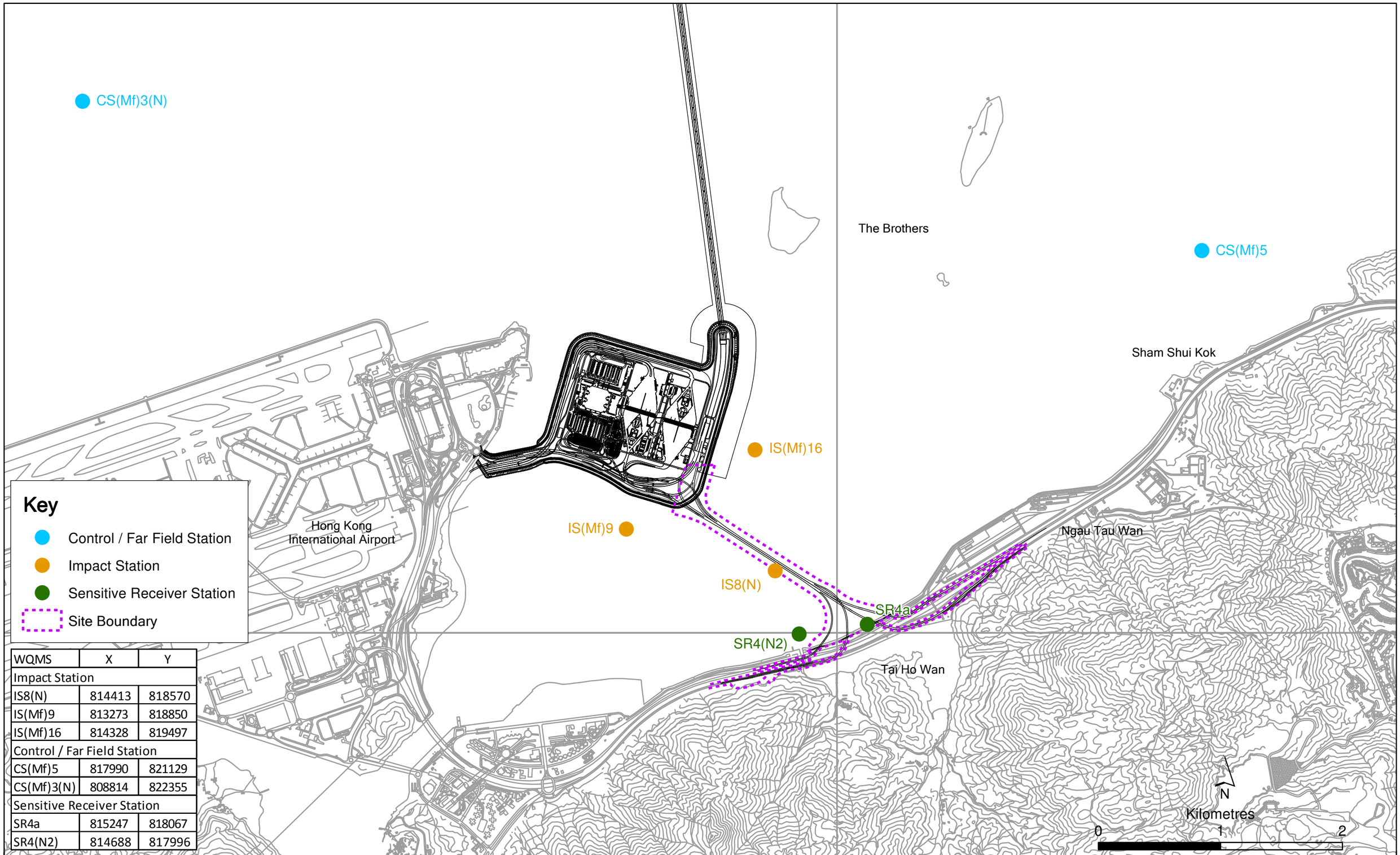
Log No.	**<u>Action Level Exceedance</u> 0215660_3 July 2019_Bottom DO_E_Station SR4a [Total No. of Exceedance = 1]**	
Date	3 July 2019 (Measured) 24 July 2019 (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at SR4a (Bottom-depth DO = 4.6 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 3 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 3 July 2019. • Apart from bottom-depth DO exceedance at SR4a, levels of DO at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. The slight exceedance of bottom-depth DO at SR4a may be due to natural fluctuation of water quality.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 3 July 2019 and locations of water quality monitoring stations are attached.	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Surface	1	1	27.6	7.8	21.2	5.8	5.4	6.3	6.9	8.1	8.4
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Surface	1	2	28.1	8.0	20.8	5.7		5.6		8.0	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Middle	2	1	27.4	7.8	22.5	5.1		7.5		11.3	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Middle	2	2	27.9	8.0	22.1	5.0		7.0		11.5	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Bottom	3	1	27.4	7.8	22.6	5.2	5.2	8.0		11.4	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Bottom	3	2	27.9	8.0	22.2	5.1		7.2		11.1	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Surface	1	1	27.6	7.9	20.7	6.2	6.1	5.0	7.7	8.7	8.8
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Surface	1	2	28.2	8.0	20.3	6.2		4.2		8.9	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Middle	2	1	27.5	7.8	21.3	6.0		9.8		8.5	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Middle	2	2	28.0	8.0	20.9	5.9		9.9		8.7	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Bottom	3	1	27.5	7.8	22.4	5.6	5.6	8.9		9.0	
HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Bottom	3	2	28.1	8.0	21.9	5.5		8.3		8.8	
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Surface	1	1	27.4	7.9	22.9	5.6	5.6	6.5	5.9	9.5	9.8
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Surface	1	2	27.9	8.1	22.4	5.6		6.2		9.8	
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Bottom	3	1	27.1	7.8	24.2	5.5	5.4	5.9		9.7	
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Bottom	3	2	27.6	8.0	23.8	5.3		5.0		10.0	
HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Surface	1	1	27.6	8.0	21.2	6.4	6.4	5.2	7.3	7.9	8.6
HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Surface	1	2	28.1	8.1	20.8	6.3		4.7		7.6	
HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Bottom	3	1	27.3	7.8	23.9	4.7	4.6	9.6		8.9	
HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Bottom	3	2	27.8	8.0	23.4	4.5		9.6		9.2	
HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Surface	1	1	27.6	7.8	21.7	5.7	5.7	7.3	8.0	9.7	10.9
HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Surface	1	2	28.1	8.0	21.2	5.7		7.7		10.1	
HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Bottom	3	1	27.5	7.8	22.2	5.4	5.4	7.7		11.9	
HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Bottom	3	2	28.1	8.0	21.8	5.3		9.3		11.7	
HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Surface	1	1	27.7	8.0	21.4	6.5	6.5	7.4	7.2	10.8	11.1
HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Surface	1	2	28.3	8.2	20.9	6.5		7.1		11.0	
HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Bottom	3	1	27.5	7.8	22.8	5.6	5.6	7.2		11.2	
HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Bottom	3	2	28.0	8.0	22.3	5.5		7.0		11.3	
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Surface	1	1					6.8		9.2		7.3
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Surface	1	2									
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Middle	2	1	27.6	7.8	20.4	6.8		9.1		10.6	
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Middle	2	2	28.2	8.0	19.9	6.7		9.2		10.9	
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Bottom	3	1					N/A				
HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Bottom	3	2									

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)5	5:32	Surface	1	1	27.6	7.8	20.7	5.7	5.3	2.6	5.6	3.1	3.5
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)5	5:32	Surface	1	2	28.1	8.0	20.3	5.6		2.7		3.4	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)5	5:32	Middle	2	1	27.2	7.7	23.9	5.0		4.1		3.7	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)5	5:32	Middle	2	2	27.7	8.0	23.5	4.9		4.5		3.7	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)5	5:32	Bottom	3	1	26.5	7.7	27.1	4.3	4.3	9.8		3.5	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)5	5:32	Bottom	3	2	27.0	7.9	26.7	4.2		9.8		3.8	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)3(N)	6:23	Surface	1	1	27.7	7.8	19.1	6.0	5.8	3.0	9.6	4.0	4.2
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)3(N)	6:23	Surface	1	2	28.3	8.0	18.8	5.9		2.4		4.3	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)3(N)	6:23	Middle	2	1	27.8	7.8	20.5	5.7		12.7		3.9	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)3(N)	6:23	Middle	2	2	28.4	8.0	20.1	5.6		13.0		4.2	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)3(N)	6:23	Bottom	3	1	27.8	7.8	20.6	5.7	5.7	13.3		4.2	
HY/2012/08	2019/07/03	Mid-Flood	CS(Mf)3(N)	6:23	Bottom	3	2	28.4	8.0	20.2	5.6		13.4		4.5	
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)16	7:10	Surface	1	1	27.6	7.9	21.5	6.1	6.1	4.6	4.6	5.0	5.0
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)16	7:10	Surface	1	2	28.1	8.1	21.2	6.0		4.1		5.0	
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)16	7:10	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)16	7:10	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)16	7:10	Bottom	3	1	27.5	7.9	21.7	6.1	6.1	4.8		5.1	
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)16	7:10	Bottom	3	2	28.1	8.1	21.3	6.0		4.9		4.9	
HY/2012/08	2019/07/03	Mid-Flood	SR4a	7:18	Surface	1	1	27.7	7.9	21.3	6.4	6.4	4.4	4.6	4.1	4.6
HY/2012/08	2019/07/03	Mid-Flood	SR4a	7:18	Surface	1	2	28.2	8.1	20.9	6.3		4.5		4.4	
HY/2012/08	2019/07/03	Mid-Flood	SR4a	7:18	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Flood	SR4a	7:18	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Flood	SR4a	7:18	Bottom	3	1	27.7	7.9	21.8	6.5	6.5	4.6		4.7	
HY/2012/08	2019/07/03	Mid-Flood	SR4a	7:18	Bottom	3	2	28.2	8.1	21.4	6.4		4.8		4.8	
HY/2012/08	2019/07/03	Mid-Flood	SR4(N2)	7:25	Surface	1	1	27.5	7.9	20.6	6.5	6.5	3.7	3.9	4.4	4.6
HY/2012/08	2019/07/03	Mid-Flood	SR4(N2)	7:25	Surface	1	2	28.1	8.1	20.2	6.5		3.8		4.1	
HY/2012/08	2019/07/03	Mid-Flood	SR4(N2)	7:25	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Flood	SR4(N2)	7:25	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Flood	SR4(N2)	7:25	Bottom	3	1	27.5	7.9	20.7	6.6	6.6	4.0		4.8	
HY/2012/08	2019/07/03	Mid-Flood	SR4(N2)	7:25	Bottom	3	2	28.1	8.1	20.3	6.6		3.9		5.0	
HY/2012/08	2019/07/03	Mid-Flood	IS8(N)	7:30	Surface	1	1	27.7	7.9	21.1	6.2	6.2	5.2	4.9	4.0	4.6
HY/2012/08	2019/07/03	Mid-Flood	IS8(N)	7:30	Surface	1	2	28.3	8.1	20.7	6.1		5.4		4.3	
HY/2012/08	2019/07/03	Mid-Flood	IS8(N)	7:30	Middle	2	1									
HY/2012/08	2019/07/03	Mid-Flood	IS8(N)	7:30	Middle	2	2									
HY/2012/08	2019/07/03	Mid-Flood	IS8(N)	7:30	Bottom	3	1	27.7	7.9	21.1	6.2	6.2	4.6		4.9	
HY/2012/08	2019/07/03	Mid-Flood	IS8(N)	7:30	Bottom	3	2	28.3	8.1	20.7	6.1		4.5		5.3	
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)9	7:38	Surface	1	1					6.4		5.8		3.4
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)9	7:38	Surface	1	2									
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)9	7:38	Middle	2	1	27.6	7.9	21.4	6.4		5.6		5.0	
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)9	7:38	Middle	2	2	28.1	8.1	21.0	6.3		5.9		4.8	
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)9	7:38	Bottom	3	1					N/A				
HY/2012/08	2019/07/03	Mid-Flood	IS(Mf)9	7:38	Bottom	3	2									

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	1 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_12 July 2019_ Bottom DO_E_Station IS(Mf)16
0215660_12 July 2019_Bottom DO_E_Station SR4a

A total of two (2) exceedance was recorded on 12 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

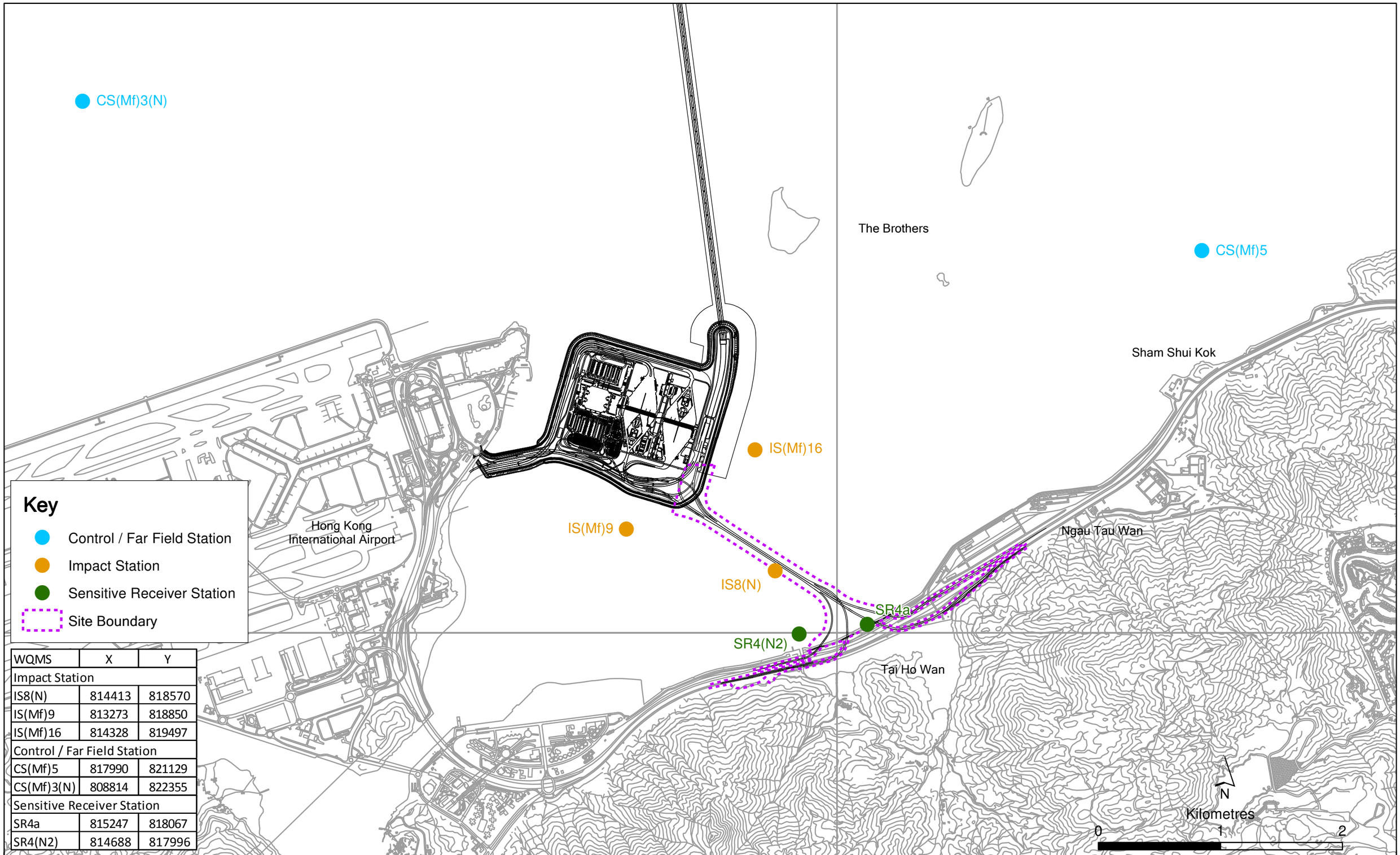
Notification of Exceedance

Log No.	**<u>Action Level Exceedance</u> 0212330_12 July 2019_ Bottom DO_E_Station IS(Mf)16 0212330_12 July 2019_ Bottom DO_E_Station SR4a [Total No. of Exceedance = 2]**	
Date	12 July 2019 (Measured) 6 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at IS(Mf)16 (Bottom-depth DO = 4.4 mg/L) 2. Mid-ebb at SR4a (Bottom-depth DO = 4.4 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 12 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 12 July 2019. • Apart from bottom-depth DO exceedance at IS(Mf)16 and SR4a during mid-ebb, levels of DO at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • The DO pattern at IS(Mf)16 and SR4a was similar to the control station where the bottom-depth DO levels were generally lower.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 12 July 2019 and locations of water quality monitoring stations are attached.	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Surface	1	1	28.7	7.8	12.3	5.1	4.6	4.3	3.9	2.8	2.8
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Surface	1	2	28.2	7.9	12.8	5.1		4.3		3.2	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Middle	2	1	27.8	7.8	18.9	4.1		2.8		2.9	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Middle	2	2	27.3	7.8	19.4	4.2		2.7		2.6	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Bottom	3	1	26.0	7.8	27.9	2.9	3.0	4.7		4.0	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Bottom	3	2	25.5	7.8	28.4	3.1		4.7		4.2	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Surface	1	1	29.4	7.9	9.1	5.7	5.3	4.3	4.3	2.8	3.0
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Surface	1	2	28.8	8.0	9.4	5.8		4.3		3.0	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Middle	2	1	28.8	7.8	13.4	4.7		3.4		3.2	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Middle	2	2	28.2	8.0	13.7	4.8		3.6		2.9	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Bottom	3	1	27.9	7.7	21.6	3.5	3.4	5.2		3.0	
HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Bottom	3	2	27.2	7.9	22.3	3.3		4.8		2.8	
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Surface	1	1	29.1	7.9	13.7	5.6	5.6	3.8	5.9	3.9	4.8
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Surface	1	2	28.6	8.1	14.1	5.6		3.8		3.7	
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Bottom	3	1	28.2	7.8	20.1	4.4	4.4	7.8		5.8	
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Bottom	3	2	27.4	8.0	21.0	4.4		8.0		5.6	
HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Surface	1	1	28.9	7.9	13.4	5.2	5.2	5.1	6.1	6.3	6.9
HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Surface	1	2	28.3	8.0	13.8	5.2		5.1		6.3	
HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Bottom	3	1	28.5	7.8	15.7	4.3	4.4	6.9		7.3	
HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Bottom	3	2	28.1	8.0	16.1	4.4		7.1		7.1	
HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Surface	1	1	28.9	7.8	13.9	5.0	5.1	7.0	8.1	9.1	11.5
HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Surface	1	2	28.3	8.0	14.2	5.1		7.1		8.7	
HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Bottom	3	1	28.8	7.8	14.4	4.9	4.9	9.1		14.0	
HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Bottom	3	2	28.2	8.0	14.8	4.9		9.1		14.3	
HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Surface	1	1	29.3	7.9	12.9	5.8	5.9	3.1	3.7	3.6	4.0
HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Surface	1	2	28.7	8.1	13.2	5.9		3.1		3.9	
HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Bottom	3	1	29.1	7.9	13.5	5.8	5.8	4.2		4.2	
HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Bottom	3	2	28.6	8.1	13.8	5.8		4.2		4.1	
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Surface	1	1					5.2		6.4		2.5
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Surface	1	2									
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Middle	2	1	29.0	7.9	14.2	5.2		6.3		3.6	
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Middle	2	2	28.4	8.0	14.5	5.2		6.4		3.7	
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Bottom	3	1					N/A				
HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Bottom	3	2									

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)5	16:59	Surface	1	1	29.9	8.0	10.5	6.1	4.6	3.1	2.9	3.8	4.0
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)5	16:59	Surface	1	2	29.3	8.1	10.8	6.2		3.2		3.6	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)5	16:59	Middle	2	1	27.2	7.8	22.6	3.0		2.7		4.0	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)5	16:59	Middle	2	2	26.7	8.0	23.4	3.1		2.7		3.6	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)5	16:59	Bottom	3	1	25.6	7.8	30.1	2.1	2.2	3.0		4.3	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)5	16:59	Bottom	3	2	25.0	8.0	31.2	2.2		2.9		4.4	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)3(N)	16:06	Surface	1	1	30.3	7.9	3.5	6.4	5.6	9.2	6.9	7.3	7.0
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)3(N)	16:06	Surface	1	2	29.7	8.1	3.6	6.4		9.1		6.7	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)3(N)	16:06	Middle	2	1	29.2	7.7	10.0	4.8		5.5		6.7	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)3(N)	16:06	Middle	2	2	28.6	7.9	10.3	4.8		5.7		7.0	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)3(N)	16:06	Bottom	3	1	28.8	7.7	13.7	4.3	4.4	5.7		7.2	
HY/2012/08	2019/07/12	Mid-Flood	CS(Mf)3(N)	16:06	Bottom	3	2	28.1	7.9	14.0	4.4		5.9		7.1	
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)16	15:28	Surface	1	1	29.6	8.0	12.6	6.3	6.3	5.6	8.2	5.6	8.4
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)16	15:28	Surface	1	2	29.1	8.1	13.0	6.3		5.5		5.9	
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)16	15:28	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)16	15:28	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)16	15:28	Bottom	3	1	29.3	7.9	13.8	5.9	5.9	10.8		11.1	
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)16	15:28	Bottom	3	2	28.7	8.1	14.2	5.9		10.9		11.0	
HY/2012/08	2019/07/12	Mid-Flood	SR4a	15:16	Surface	1	1	29.9	8.0	12.3	6.6	6.7	3.1	3.9	4.4	6.0
HY/2012/08	2019/07/12	Mid-Flood	SR4a	15:16	Surface	1	2	29.3	8.1	12.6	6.7		3.2		4.4	
HY/2012/08	2019/07/12	Mid-Flood	SR4a	15:16	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Flood	SR4a	15:16	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Flood	SR4a	15:16	Bottom	3	1	28.9	7.8	15.0	5.2	5.2	4.6		6.6	
HY/2012/08	2019/07/12	Mid-Flood	SR4a	15:16	Bottom	3	2	28.3	8.0	15.5	5.2		4.7		7.0	
HY/2012/08	2019/07/12	Mid-Flood	SR4(N2)	15:07	Surface	1	1	29.3	8.0	13.6	6.4	6.5	2.5	3.6	7.4	13.5
HY/2012/08	2019/07/12	Mid-Flood	SR4(N2)	15:07	Surface	1	2	28.7	8.1	14.0	6.5		2.5		7.1	
HY/2012/08	2019/07/12	Mid-Flood	SR4(N2)	15:07	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Flood	SR4(N2)	15:07	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Flood	SR4(N2)	15:07	Bottom	3	1	29.3	8.0	13.7	6.4	6.4	4.9		19.7	
HY/2012/08	2019/07/12	Mid-Flood	SR4(N2)	15:07	Bottom	3	2	28.7	8.0	14.1	6.4		4.6		19.9	
HY/2012/08	2019/07/12	Mid-Flood	IS8(N)	14:56	Surface	1	1	29.7	7.9	12.1	6.1	6.1	3.1	3.9	4.2	5.1
HY/2012/08	2019/07/12	Mid-Flood	IS8(N)	14:56	Surface	1	2	29.2	8.1	12.5	6.1		3.2		4.3	
HY/2012/08	2019/07/12	Mid-Flood	IS8(N)	14:56	Middle	2	1									
HY/2012/08	2019/07/12	Mid-Flood	IS8(N)	14:56	Middle	2	2									
HY/2012/08	2019/07/12	Mid-Flood	IS8(N)	14:56	Bottom	3	1	29.7	7.9	12.5	6.2	6.2	4.7		5.8	
HY/2012/08	2019/07/12	Mid-Flood	IS8(N)	14:56	Bottom	3	2	29.2	8.1	12.8	6.2		4.5		6.2	
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)9	14:47	Surface	1	1					5.5		7.4		2.9
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)9	14:47	Surface	1	2									
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)9	14:47	Middle	2	1	29.1	7.9	14.8	5.4		7.4		4.3	
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)9	14:47	Middle	2	2	28.5	8.1	15.2	5.5		7.3		4.1	
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)9	14:47	Bottom	3	1					N/A				
HY/2012/08	2019/07/12	Mid-Flood	IS(Mf)9	14:47	Bottom	3	2									

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
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- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	7 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_17 July 2019_Bottom DO_E_Station SR4(N2)

A total of one exceedance was recorded on 17 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

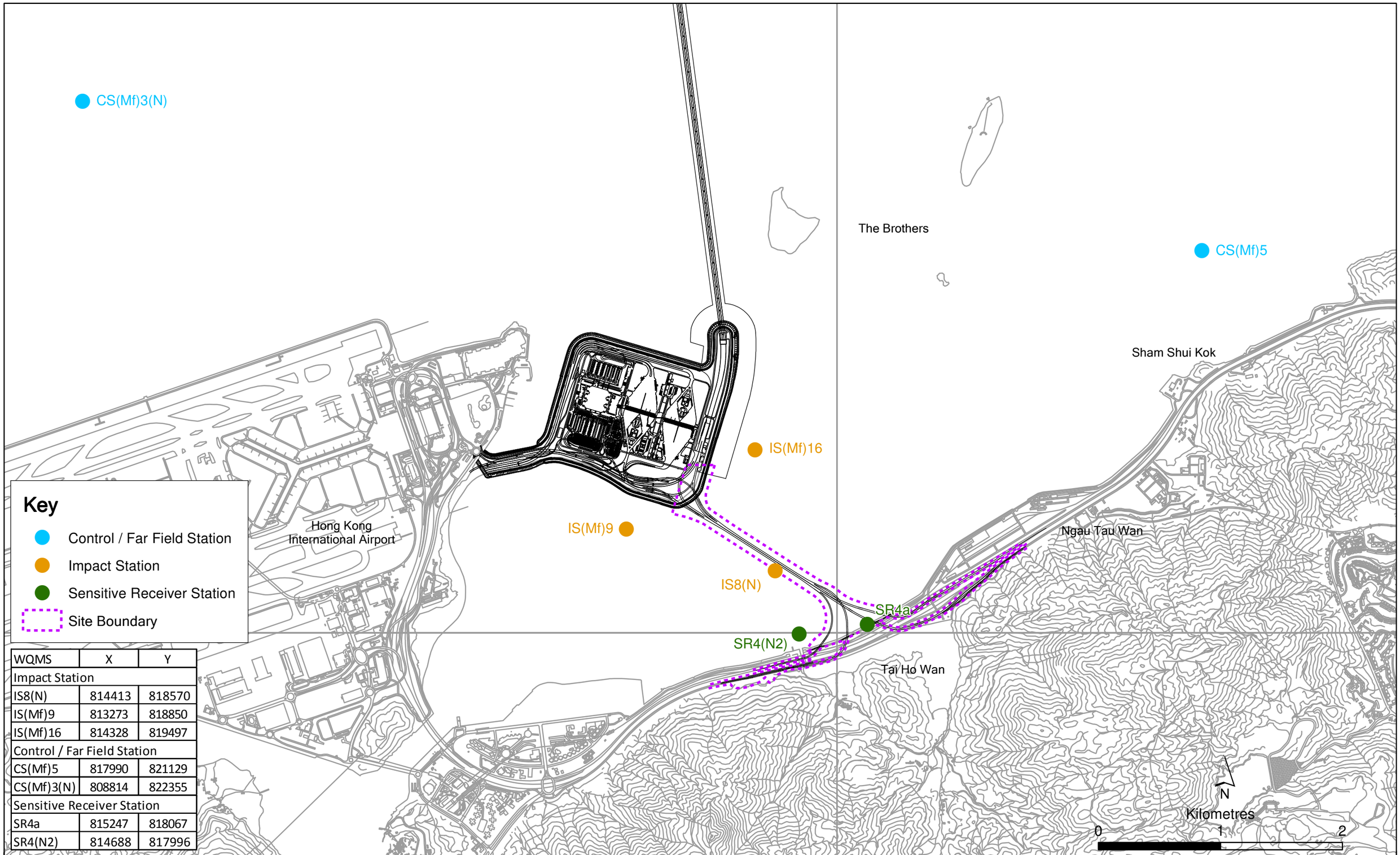
Log No.	**<u>Action Level Exceedance</u> 0212330_17 July 2019_ Bottom DO_E_Station SR4(N2) [Total No. of Exceedance = 1]**	
Date	17 July 2019 (Measured) 6 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at SR4(N2) (Bottom-depth DO = 4.5 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 17 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 17 July 2019. • Apart from bottom-depth DO exceedance at SR4(N2) during mid-ebb, levels of DO at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • The DO pattern at SR4(N2) was similar to the control station where the bottom-depth DO levels were generally lower.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 17 July 2019 and locations of water quality monitoring stations are attached.	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Surface	1	1	28.5	7.9	18.7	6.5	5.9	3.0	5.5	7.2	4.9
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Surface	1	2	27.9	7.9	18.7	6.4		4.1		7.0	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Middle	2	1	28.1	7.9	19.3	5.4		4.9		5.4	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Middle	2	2	27.5	7.9	19.7	5.3		5.7		5.7	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Bottom	3	1	25.6	7.7	28.4	3.5	3.6	7.4		4.7	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Bottom	3	2	25.0	7.7	29.2	3.6		8.0		4.3	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Surface	1	1	29.9	8.0	11.6	6.3	6.2	2.2	4.1	5.1	4.5
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Surface	1	2	29.3	8.0	11.9	6.3		2.4		4.6	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Middle	2	1	29.7	8.0	12.2	6.1		3.4		4.2	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Middle	2	2	29.1	8.0	12.6	6.0		3.4		4.5	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Bottom	3	1	27.0	7.9	22.9	3.7	3.8	6.6		4.7	
HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Bottom	3	2	26.4	7.9	23.6	3.8		6.6		4.0	
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Surface	1	1	29.5	8.0	14.4	7.6	7.6	4.7	5.9	4.7	5.7
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Surface	1	2	28.9	8.0	14.8	7.5		5.6		5.0	
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Bottom	3	1	27.9	7.8	19.6	5.4	5.4	6.2		6.2	
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Bottom	3	2	27.3	7.8	20.1	5.4		7.1		7.0	
HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Surface	1	1	28.9	7.8	14.7	6.2	6.2	3.0	6.2	6.1	5.3
HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Surface	1	2	28.3	7.8	15.1	6.1		4.0		5.5	
HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Bottom	3	1	27.6	7.7	20.7	4.7	4.8	8.5		5.5	
HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Bottom	3	2	27.0	7.7	21.2	4.8		9.3		4.9	
HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Surface	1	1	28.5	7.7	16.6	5.3	5.3	11.5	13.4	5.7	4.9
HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Surface	1	2	27.9	7.7	17.1	5.2		12.3		5.4	
HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Bottom	3	1	27.6	7.7	20.8	4.5	4.5	15.8		4.3	
HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Bottom	3	2	27.0	7.7	21.4	4.5		14.1		4.0	
HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Surface	1	1	29.6	8.1	14.2	8.3	8.3	7.1	10.3	6.4	5.1
HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Surface	1	2	29.0	8.1	14.6	8.2		7.9		6.1	
HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Bottom	3	1	28.1	7.8	18.6	5.4	5.5	12.9		3.6	
HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Bottom	3	2	27.6	7.8	18.9	5.5		13.3		4.1	
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Surface	1	1	29.6	8.0	13.1	8.1	8.1	4.5	6.5	5.8	4.1
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Surface	1	2	29.0	8.0	13.5	8.1		5.5		6.0	
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Bottom	3	1	29.1	7.9	14.7	7.1	N/A	7.8		4.3	
HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Bottom	3	2	28.5	7.9	15.1	7.2		8.2		4.7	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)5	5:38	Surface	1	1	29.1	8.0	11.6	5.9	5.5	4.0	11.6	4.6	4.3
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)5	5:38	Surface	1	2	28.5	8.0	11.9	5.8		4.7		4.4	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)5	5:38	Middle	2	1	27.5	8.0	21.7	5.2		3.2		4.1	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)5	5:38	Middle	2	2	26.9	8.0	22.3	5.2		3.2		4.2	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)5	5:38	Bottom	3	1	25.2	7.8	30.0	3.2	3.3	29.7		4.1	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)5	5:38	Bottom	3	2	24.6	7.8	30.9	3.3		24.8		4.3	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)3(N)	6:27	Surface	1	1	28.8	7.8	9.5	5.2	5.2	3.8	5.6	5.5	7.0
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)3(N)	6:27	Surface	1	2	28.2	7.8	9.9	5.2		4.7		5.8	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)3(N)	6:27	Middle	2	1	28.9	7.8	10.4	5.3		4.3		7.0	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)3(N)	6:27	Middle	2	2	28.3	7.8	10.7	5.2		5.1		6.8	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)3(N)	6:27	Bottom	3	1	28.1	7.8	17.0	4.3	4.4	7.6		8.6	
HY/2012/08	2019/07/17	Mid-Flood	CS(Mf)3(N)	6:27	Bottom	3	2	27.5	7.8	17.5	4.4		8.1		8.2	
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)16	7:10	Surface	1	1	29.1	8.1	13.6	6.5	6.5	3.6	5.5	4.2	3.9
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)16	7:10	Surface	1	2	28.5	8.1	14.2	6.5		4.5		4.9	
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)16	7:10	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)16	7:10	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)16	7:10	Bottom	3	1	28.2	7.9	17.5	5.0	5.0	6.7		3.6	
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)16	7:10	Bottom	3	2	27.6	7.9	17.9	5.0		7.3		3.0	
HY/2012/08	2019/07/17	Mid-Flood	SR4a	7:20	Surface	1	1	29.0	8.0	12.5	6.1	6.1	3.5	4.5	4.1	3.7
HY/2012/08	2019/07/17	Mid-Flood	SR4a	7:20	Surface	1	2	28.4	8.0	12.9	6.0		4.5		3.7	
HY/2012/08	2019/07/17	Mid-Flood	SR4a	7:20	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Flood	SR4a	7:20	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Flood	SR4a	7:20	Bottom	3	1	28.5	7.9	15.5	5.1	5.1	5.0		3.5	
HY/2012/08	2019/07/17	Mid-Flood	SR4a	7:20	Bottom	3	2	28.0	7.9	16.0	5.1		5.0		3.9	
HY/2012/08	2019/07/17	Mid-Flood	SR4(N2)	7:25	Surface	1	1	29.1	8.0	13.1	6.0	6.0	4.0	4.8	4.1	3.8
HY/2012/08	2019/07/17	Mid-Flood	SR4(N2)	7:25	Surface	1	2	28.5	8.0	13.4	5.9		4.6		4.0	
HY/2012/08	2019/07/17	Mid-Flood	SR4(N2)	7:25	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Flood	SR4(N2)	7:25	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Flood	SR4(N2)	7:25	Bottom	3	1	28.6	7.9	15.9	4.8	4.9	5.0		3.2	
HY/2012/08	2019/07/17	Mid-Flood	SR4(N2)	7:25	Bottom	3	2	28.0	7.9	16.3	4.9		5.7		3.8	
HY/2012/08	2019/07/17	Mid-Flood	IS8(N)	7:31	Surface	1	1	29.1	8.0	12.0	6.5	6.5	3.4	6.1	3.8	4.2
HY/2012/08	2019/07/17	Mid-Flood	IS8(N)	7:31	Surface	1	2	28.5	8.0	12.4	6.4		4.5		4.4	
HY/2012/08	2019/07/17	Mid-Flood	IS8(N)	7:31	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Flood	IS8(N)	7:31	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Flood	IS8(N)	7:31	Bottom	3	1	28.7	7.9	14.9	5.5	5.5	7.9		4.3	
HY/2012/08	2019/07/17	Mid-Flood	IS8(N)	7:31	Bottom	3	2	28.1	7.9	15.3	5.5		8.6		4.1	
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)9	7:39	Surface	1	1	29.0	8.0	12.9	6.4	6.4	5.9	6.1	4.6	3.7
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)9	7:39	Surface	1	2	28.4	8.0	13.2	6.4		5.7		4.5	
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)9	7:39	Middle	2	1									
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)9	7:39	Middle	2	2									
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)9	7:39	Bottom	3	1	28.9	8.0	14.0	6.0	6.0	6.3		5.4	
HY/2012/08	2019/07/17	Mid-Flood	IS(Mf)9	7:39	Bottom	3	2	28.2	8.0	14.4	6.0		6.4		5.1	

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

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To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	7 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_19 July 2019_Bottom DO_E_Station SR4(N2)

A total of one exceedance was recorded on 19 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

Log No.	**<u>Action Level Exceedance</u> 0212330_19 July 2019_ Bottom DO_E_Station SR4(N2) [Total No. of Exceedance = 1]**	
Date	19 July 2019 (Measured) 7 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at SR4(N2) (Bottom-depth DO = 4.4 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 19 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 19 July 2019. • Apart from bottom-depth DO exceedance at SR4(N2) during mid-ebb, levels of DO at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • The DO pattern at SR4(N2) was similar to the control station where the bottom-depth DO levels were generally lower.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 19 July 2019 and locations of water quality monitoring stations are attached.	

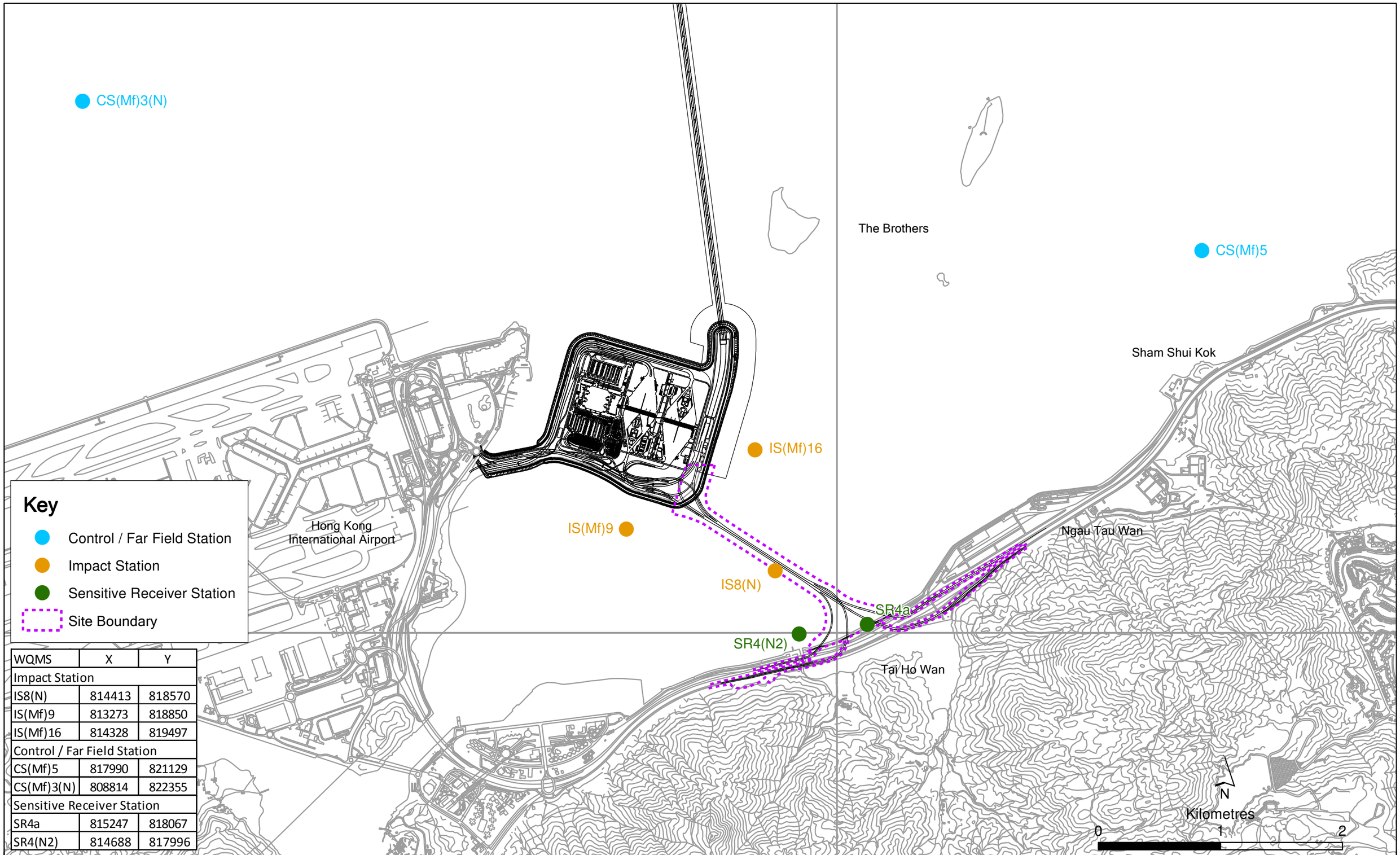
Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Surface	1	1	28.6	8.0	16.5	5.8	4.9	3.1	6.2	5.3	5.8
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Surface	1	2	28.0	8.0	16.9	5.8		3.2		5.0	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Middle	2	1	26.7	7.9	24.3	3.9		6.7		6.1	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Middle	2	2	26.1	7.9	25.0	3.9		6.6		5.9	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Bottom	3	1	25.3	7.9	29.6	3.8	3.9	8.9		9.2	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Bottom	3	2	24.8	7.9	30.3	4.0		8.8		9.4	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Surface	1	1	29.2	8.0	12.9	6.2	5.3	2.2	3.3	4.0	5.0
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Surface	1	2	28.6	8.0	13.3	6.1		2.5		4.4	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Middle	2	1	27.6	7.9	20.1	4.4		3.3		5.1	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Middle	2	2	27.0	7.9	20.8	4.4		3.2		4.7	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Bottom	3	1	27.5	7.9	23.3	4.0	4.1	4.4		5.8	
HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Bottom	3	2	27.0	7.9	23.9	4.1		4.1		6.1	
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Surface	1	1	28.8	8.1	18.0	5.9	6.0	6.5	6.2	9.0	9.8
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Surface	1	2	28.3	8.1	18.2	6.1		6.5		8.7	
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Bottom	3	1	27.2	8.0	23.1	4.9	5.0	5.9		10.8	
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Bottom	3	2	26.6	8.0	23.7	5.0		5.9		10.7	
HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Surface	1	1	28.6	8.0	17.9	5.7	5.7	4.4	5.5	5.4	9.2
HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Surface	1	2	28.1	8.0	18.3	5.7		4.5		5.2	
HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Bottom	3	1	28.1	8.0	22.1	4.5	4.5	6.6		11.0	
HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Bottom	3	2	27.5	8.0	22.9	4.5		6.6		11.3	
HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Surface	1	1	29.2	8.0	16.1	6.3	6.3	4.3	7.4	6.5	9.3
HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Surface	1	2	28.7	8.1	16.5	6.3		4.4		6.8	
HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Bottom	3	1	27.8	7.9	20.2	4.4	4.4	10.4		11.6	
HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Bottom	3	2	27.2	7.9	20.8	4.4		10.4		12.1	
HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Surface	1	1	28.9	8.2	17.6	6.6	6.6	8.6	10.6	14.4	16.7
HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Surface	1	2	28.3	8.2	18.1	6.5		8.9		13.9	
HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Bottom	3	1	28.1	8.0	21.0	5.3	5.3	12.5		19.4	
HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Bottom	3	2	27.6	8.0	21.3	5.3		12.5		19.1	
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Surface	1	1	28.9	8.1	16.5	6.6	6.6	4.2	7.6	5.0	5.2
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Surface	1	2	28.3	8.1	17.0	6.5		4.6		5.3	
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Bottom	3	1	28.6	8.0	17.8	5.6	5.7	10.8		10.4	
HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Bottom	3	2	28.0	8.0	18.5	5.7		10.8		10.1	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)5	7:17	Surface	1	1	28.4	8.0	16.3	5.2	4.4	4.1	5.6	4.6	4.3
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)5	7:17	Surface	1	2	27.8	7.9	16.8	5.1		4.1		4.4	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)5	7:17	Middle	2	1	26.4	7.9	25.6	3.7		3.5		4.1	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)5	7:17	Middle	2	2	25.8	7.9	26.4	3.7		3.5		4.2	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)5	7:17	Bottom	3	1	25.1	7.9	30.3	3.5	3.6	9.2		4.1	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)5	7:17	Bottom	3	2	24.5	7.9	31.2	3.6		9.2		4.3	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)3(N)	8:06	Surface	1	1	28.8	7.9	11.2	5.1	5.1	3.8	6.6	5.5	7.0
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)3(N)	8:06	Surface	1	2	28.2	7.9	11.5	5.1		4.0		5.8	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)3(N)	8:06	Middle	2	1	28.5	7.9	14.6	5.0		3.9		7.0	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)3(N)	8:06	Middle	2	2	27.9	7.9	15.0	5.0		4.2		6.8	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)3(N)	8:06	Bottom	3	1	27.6	7.9	20.8	4.3	4.3	11.8		8.6	
HY/2012/08	2019/07/19	Mid-Flood	CS(Mf)3(N)	8:06	Bottom	3	2	27.0	7.9	21.3	4.2		11.6		8.2	
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)16	8:51	Surface	1	1	28.4	8.0	17.2	5.7	5.7	10.0	11.2	4.2	3.9
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)16	8:51	Surface	1	2	27.8	8.0	17.7	5.6		10.3		4.9	
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)16	8:51	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)16	8:51	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)16	8:51	Bottom	3	1	28.4	8.0	20.2	5.0	5.1	12.3		3.6	
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)16	8:51	Bottom	3	2	27.7	8.0	20.8	5.1		12.0		3.0	
HY/2012/08	2019/07/19	Mid-Flood	SR4a	8:58	Surface	1	1	28.8	8.0	15.1	5.8	5.8	4.3	5.9	4.1	3.7
HY/2012/08	2019/07/19	Mid-Flood	SR4a	8:58	Surface	1	2	28.2	8.0	15.6	5.7		4.5		3.7	
HY/2012/08	2019/07/19	Mid-Flood	SR4a	8:58	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Flood	SR4a	8:58	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Flood	SR4a	8:58	Bottom	3	1	28.0	7.9	18.9	4.7	4.8	7.2		3.5	
HY/2012/08	2019/07/19	Mid-Flood	SR4a	8:58	Bottom	3	2	27.4	7.9	19.5	4.8		7.7		3.9	
HY/2012/08	2019/07/19	Mid-Flood	SR4(N2)	9:06	Surface	1	1	28.5	8.0	16.7	5.4	5.4	6.3	8.9	4.1	3.8
HY/2012/08	2019/07/19	Mid-Flood	SR4(N2)	9:06	Surface	1	2	27.9	8.0	17.2	5.4		6.5		4.0	
HY/2012/08	2019/07/19	Mid-Flood	SR4(N2)	9:06	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Flood	SR4(N2)	9:06	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Flood	SR4(N2)	9:06	Bottom	3	1	28.5	8.0	18.0	5.1	5.2	11.5		3.2	
HY/2012/08	2019/07/19	Mid-Flood	SR4(N2)	9:06	Bottom	3	2	27.9	8.0	18.5	5.2		11.1		3.8	
HY/2012/08	2019/07/19	Mid-Flood	IS8(N)	9:11	Surface	1	1	28.8	8.1	15.7	6.2	6.2	3.2	5.0	3.8	4.2
HY/2012/08	2019/07/19	Mid-Flood	IS8(N)	9:11	Surface	1	2	28.2	8.1	16.1	6.2		3.4		4.4	
HY/2012/08	2019/07/19	Mid-Flood	IS8(N)	9:11	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Flood	IS8(N)	9:11	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Flood	IS8(N)	9:11	Bottom	3	1	28.2	8.0	17.9	5.0	5.0	6.9		4.3	
HY/2012/08	2019/07/19	Mid-Flood	IS8(N)	9:11	Bottom	3	2	27.6	7.9	18.4	5.0		6.4		4.1	
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)9	9:19	Surface	1	1	28.6	8.0	15.7	5.6	5.6	4.3	4.5	4.6	3.7
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)9	9:19	Surface	1	2	28.0	8.0	16.1	5.5		4.5		4.5	
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)9	9:19	Middle	2	1									
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)9	9:19	Middle	2	2									
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)9	9:19	Bottom	3	1	28.4	8.0	17.1	5.5	5.5	4.7		5.4	
HY/2012/08	2019/07/19	Mid-Flood	IS(Mf)9	9:19	Bottom	3	2	27.8	8.0	17.7	5.5		4.5		5.1	

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	9 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_22 July 2019_ Bottom DO_E_Station IS(Mf)16
0215660_22 July 2019_ Surface & Middle DO_E_Station SR4a
0215660_22 July 2019_ Bottom DO_E_Station SR4a
0215660_22 July 2019_ Bottom DO_E_Station SR4(N2)
0215660_22 July 2019_ Bottom DO_E_Station IS8(N)
0215660_22 July 2019_ Surface & Middle DO_F_Station IS(Mf)16
0215660_22 July 2019_ Bottom DO_F_Station IS(Mf)16
0215660_22 July 2019_ Bottom DO_F_Station SR4a
0215660_22 July 2019_ Surface & Middle DO_F_Station SR4(N2)
0215660_22 July 2019_ Bottom DO_F_Station SR4(N2)

A total of ten (10) exceedances were recorded on 22 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

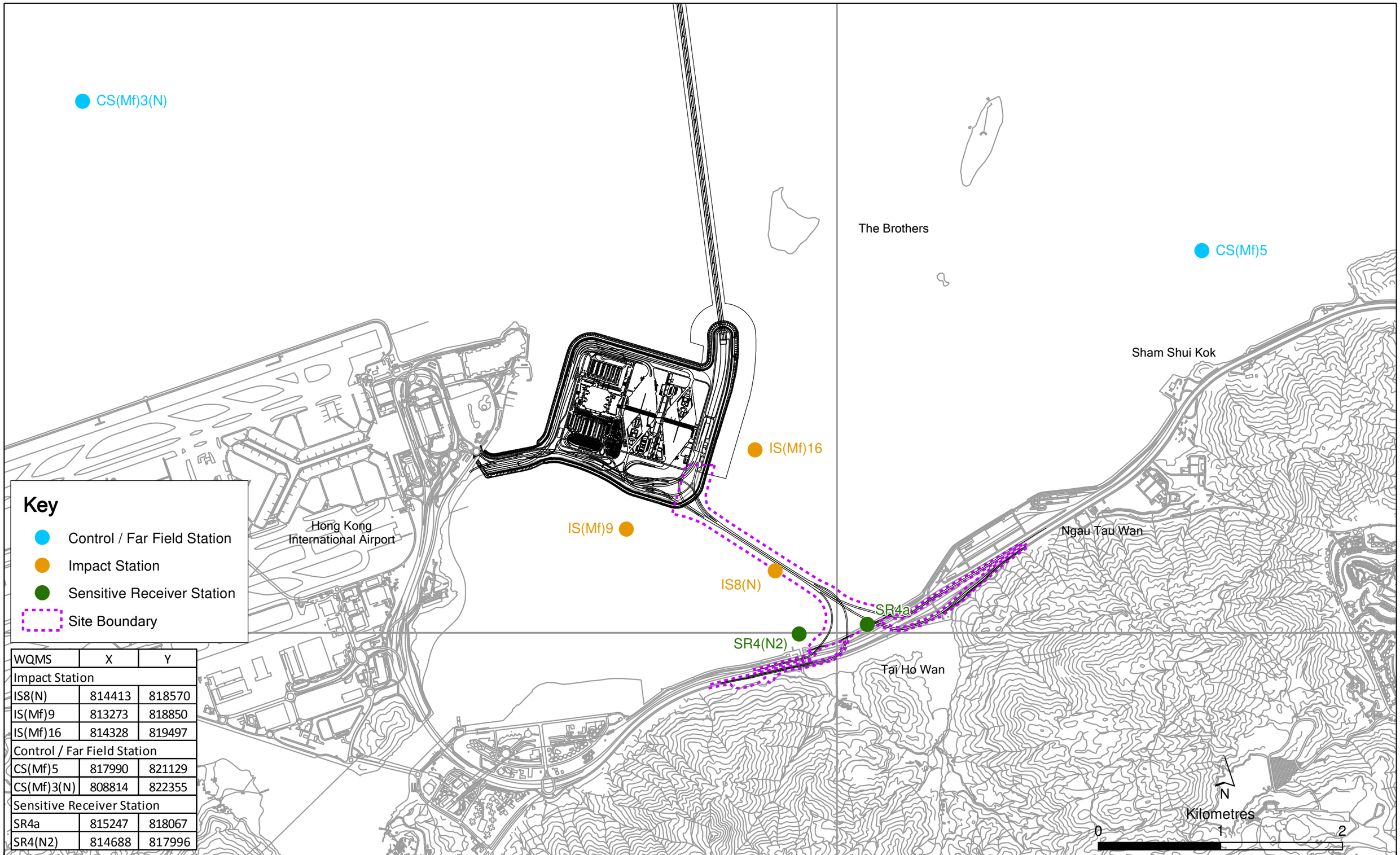
Notification of Exceedance

Log No.	**Action Level Exceedance** **0215660_22 July 2019_ Bottom DO_E_Station IS(Mf)16** **0215660_22 July 2019_ Surface & Middle DO_E_Station SR4a** **0215660_22 July 2019_ Bottom DO_E_Station SR4a** **0215660_22 July 2019_ Bottom DO_E_Station SR4(N2)** **0215660_22 July 2019_ Bottom DO_E_Station IS8(N)** **0215660_22 July 2019_ Surface & Middle DO_F_Station IS(Mf)16** **0215660_22 July 2019_ Bottom DO_F_Station IS(Mf)16** **0215660_22 July 2019_ Bottom DO_F_Station SR4a** **0215660_22 July 2019_ Surface & Middle DO_F_Station SR4(N2)** **0215660_22 July 2019_ Bottom DO_F_Station SR4(N2)** **[Total No. of Exceedance = 10]**	
Date	22 July 2019 (Measured) 7 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Surface and Middle-depth DO	5.0 mg/L
	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Surface and Middle-depth DO	4.2 mg/L
	Bottom-depth DO	3.6 mg/L
Measured Levels	Action Level Exceedance 1. Mid-ebb at IS(Mf)16 (Bottom-depth DO = 4.1 mg/L) 2. Mid-ebb at SR4a (Surface and Middle-depth DO = 4.7 mg/L) 3. Mid-ebb at SR4a (Bottom-depth DO = 4.1 mg/L) 4. Mid-ebb at SR4(N2) (Bottom-depth DO = 4.4 mg/L) 5. Mid-ebb at IS8(N) (Bottom-depth DO = 3.9 mg/L) 6. Mid-flood at IS(Mf)16 (Surface and Middle-depth DO = 4.8 mg/L) 7. Mid-flood at IS(Mf)16 (Bottom-depth DO = 4.3 mg/L) 8. Mid-flood at SR4a (Bottom-Depth DO = 4.2 mg/L) 9. Mid-flood at SR4(N2) (Surface and Middle-depth DO = 4.8 mg/L) 10. Mid-flood at SR4(N2) (Bottom-Depth DO = 4.1 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 22 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of Surface and Middle-depth and bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 22 July 2019. • The DO patterns at Impact stations and sensitive receiver stations with exceedances were similar to the control station where the DO levels were generally lower.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 22 July 2019 and locations of water quality monitoring stations are attached.	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	17:48	Surface	1	1	27.0	7.7	19.3	4.8	4.2	2.4	4.2	3.1	2.5
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	17:48	Surface	1	2	26.7	7.7	20.9	4.8		2.3		2.8	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	17:48	Middle	2	1	25.5	7.7	26.2	3.4		4.5		3.2	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	17:48	Middle	2	2	25.8	7.7	27.3	3.7		4.5		3.3	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	17:48	Bottom	3	1	24.7	7.6	29.9	3.3	3.3	6.1		2.8	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	17:48	Bottom	3	2	24.6	7.7	30.0	3.2		5.3		2.9	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	17:03	Surface	1	1	27.5	7.6	14.9	4.8	4.1	2.9	8.4	4.2	5.0
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	17:03	Surface	1	2	27.5	7.6	14.6	4.7		2.9		4.4	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	17:03	Middle	2	1	26.0	7.6	24.0	3.5		7.8		5.0	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	17:03	Middle	2	2	25.8	7.6	22.9	3.5		7.1		5.1	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	17:03	Bottom	3	1	25.7	7.6	25.3	3.5	3.6	14.4		5.6	
HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	17:03	Bottom	3	2	25.7	7.6	25.3	3.6		15.2		5.9	
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	16:20	Surface	1	1	27.4	7.7	18.1	5.7	5.8	3.7	4.4	4.8	4.9
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	16:20	Surface	1	2	27.5	7.8	17.9	5.8		3.4		4.5	
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	16:20	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	16:20	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	16:20	Bottom	3	1	26.1	7.6	24.6	4.1	4.1	5.2		4.8	
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	16:20	Bottom	3	2	26.4	7.6	23.1	4.0		5.1		5.3	
HY/2012/08	2019/07/22	Mid-Ebb	SR4a	16:09	Surface	1	1	27.1	7.6	18.8	4.6	4.7	4.6	5.1	2.9	3.6
HY/2012/08	2019/07/22	Mid-Ebb	SR4a	16:09	Surface	1	2	27.0	7.6	18.1	4.7		4.6		3.2	
HY/2012/08	2019/07/22	Mid-Ebb	SR4a	16:09	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Ebb	SR4a	16:09	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Ebb	SR4a	16:09	Bottom	3	1	26.7	7.6	20.9	4.1	4.1	5.6		3.8	
HY/2012/08	2019/07/22	Mid-Ebb	SR4a	16:09	Bottom	3	2	27.0	7.6	20.9	4.1		5.4		3.7	
HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	16:05	Surface	1	1	27.7	7.7	17.4	5.3	5.4	4.5	6.2	2.8	3.4
HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	16:05	Surface	1	2	27.5	7.7	16.8	5.4		5.1		3.1	
HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	16:05	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	16:05	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	16:05	Bottom	3	1	27.0	7.6	20.3	4.4	4.4	8.3		3.8	
HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	16:05	Bottom	3	2	27.0	7.7	19.7	4.4		7.0		3.7	
HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	15:57	Surface	1	1	27.6	7.7	17.9	5.2	5.2	9.4	10.0	3.4	3.4
HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	15:57	Surface	1	2	27.7	7.7	17.5	5.2		8.4		3.5	
HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	15:57	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	15:57	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	15:57	Bottom	3	1	26.4	7.6	22.8	3.8	3.9	11.6		3.3	
HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	15:57	Bottom	3	2	26.3	7.6	22.9	3.9		10.7		3.2	
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	15:50	Surface	1	1	27.6	7.7	17.8	5.8	5.8	3.6	5.6	3.6	2.8
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	15:50	Surface	1	2	27.6	7.7	17.7	5.8		3.6		3.8	
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	15:50	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	15:50	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	15:50	Bottom	3	1	27.2	7.6	19.1	4.7	4.8	7.5		3.7	
HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	15:50	Bottom	3	2	27.2	7.6	19.1	4.8		7.6		4.0	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)5	9:00	Surface	1	1	26.9	7.6	19.1	4.3	4.0	2.8	2.9	3.1	3.6
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)5	9:00	Surface	1	2	27.0	7.6	18.0	4.4		3.0		3.3	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)5	9:00	Middle	2	1	25.7	7.6	25.2	3.6		2.4		3.5	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)5	9:00	Middle	2	2	25.7	7.6	25.3	3.6		2.4		3.9	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)5	9:00	Bottom	3	1	24.5	7.6	30.5	3.2	3.3	3.4		3.8	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)5	9:00	Bottom	3	2	24.6	7.6	30.5	3.3		3.4		3.7	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)3(N)	9:57	Surface	1	1	27.7	7.5	9.3	5.1	4.9	4.8	5.1	3.5	4.5
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)3(N)	9:57	Surface	1	2	27.7	7.6	9.0	5.1		4.9		3.9	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)3(N)	9:57	Middle	2	1	27.4	7.6	14.1	4.7		3.6		4.5	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)3(N)	9:57	Middle	2	2	27.5	7.6	13.7	4.7		4.2		4.9	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)3(N)	9:57	Bottom	3	1	26.5	7.6	21.2	4.1	4.1	6.7		5.1	
HY/2012/08	2019/07/22	Mid-Flood	CS(Mf)3(N)	9:57	Bottom	3	2	26.6	7.5	20.9	4.1		6.4		4.9	
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)16	10:41	Surface	1	1	27.1	7.6	18.4	4.7	4.8	3.4	4.0	4.1	5.2
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)16	10:41	Surface	1	2	27.3	7.7	17.5	4.9		3.5		4.3	
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)16	10:41	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)16	10:41	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)16	10:41	Bottom	3	1	26.3	7.6	22.5	4.4	4.3	4.5		6.2	
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)16	10:41	Bottom	3	2	26.9	7.6	21.4	4.2		4.7		6.0	
HY/2012/08	2019/07/22	Mid-Flood	SR4a	10:52	Surface	1	1	27.4	7.7	16.6	5.0	5.0	3.3	5.3	4.6	5.4
HY/2012/08	2019/07/22	Mid-Flood	SR4a	10:52	Surface	1	2	27.4	7.7	16.3	5.0		3.2		4.9	
HY/2012/08	2019/07/22	Mid-Flood	SR4a	10:52	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Flood	SR4a	10:52	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Flood	SR4a	10:52	Bottom	3	1	26.6	7.6	20.9	4.2	4.2	7.4		5.7	
HY/2012/08	2019/07/22	Mid-Flood	SR4a	10:52	Bottom	3	2	26.6	7.6	21.0	4.2		7.4		5.5	
HY/2012/08	2019/07/22	Mid-Flood	SR4(N2)	10:57	Surface	1	1	27.3	7.6	18.6	4.9	4.8	4.3	6.9	5.5	6.0
HY/2012/08	2019/07/22	Mid-Flood	SR4(N2)	10:57	Surface	1	2	27.2	7.6	17.8	4.7		4.5		5.8	
HY/2012/08	2019/07/22	Mid-Flood	SR4(N2)	10:57	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Flood	SR4(N2)	10:57	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Flood	SR4(N2)	10:57	Bottom	3	1	26.7	7.6	20.7	4.1	4.1	8.7		6.4	
HY/2012/08	2019/07/22	Mid-Flood	SR4(N2)	10:57	Bottom	3	2	26.8	7.6	20.6	4.1		10.1		6.2	
HY/2012/08	2019/07/22	Mid-Flood	IS8(N)	11:04	Surface	1	1	27.6	7.7	16.2	5.3	5.3	3.5	5.0	4.2	4.5
HY/2012/08	2019/07/22	Mid-Flood	IS8(N)	11:04	Surface	1	2	27.5	7.7	16.3	5.2		3.4		4.1	
HY/2012/08	2019/07/22	Mid-Flood	IS8(N)	11:04	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Flood	IS8(N)	11:04	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Flood	IS8(N)	11:04	Bottom	3	1	27.1	7.6	19.0	4.8	4.8	7.0		4.8	
HY/2012/08	2019/07/22	Mid-Flood	IS8(N)	11:04	Bottom	3	2	27.3	7.7	18.5	4.8		6.2		4.9	
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)9	11:11	Surface	1	1	27.4	7.7	17.0	5.1	5.1	3.9	4.1	4.3	3.4
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)9	11:11	Surface	1	2	27.4	7.7	17.0	5.0		3.9		4.2	
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)9	11:11	Middle	2	1									
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)9	11:11	Middle	2	2									
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)9	11:11	Bottom	3	1	27.2	7.7	17.8	4.9	4.9	4.2		4.8	
HY/2012/08	2019/07/22	Mid-Flood	IS(Mf)9	11:11	Bottom	3	2	27.2	7.7	17.6	4.9		4.4		4.5	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	9 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_24 July 2019_ Bottom DO_E_Station SR4a
0215660_24 July 2019_ Bottom DO_E_Station IS8(N)
0215660_24 July 2019_ Bottom DO_F_Station IS(Mf)16
0215660_24 July 2019_ Bottom DO_F_Station SR4(N2)

A total of four (4) exceedances were recorded on 24 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

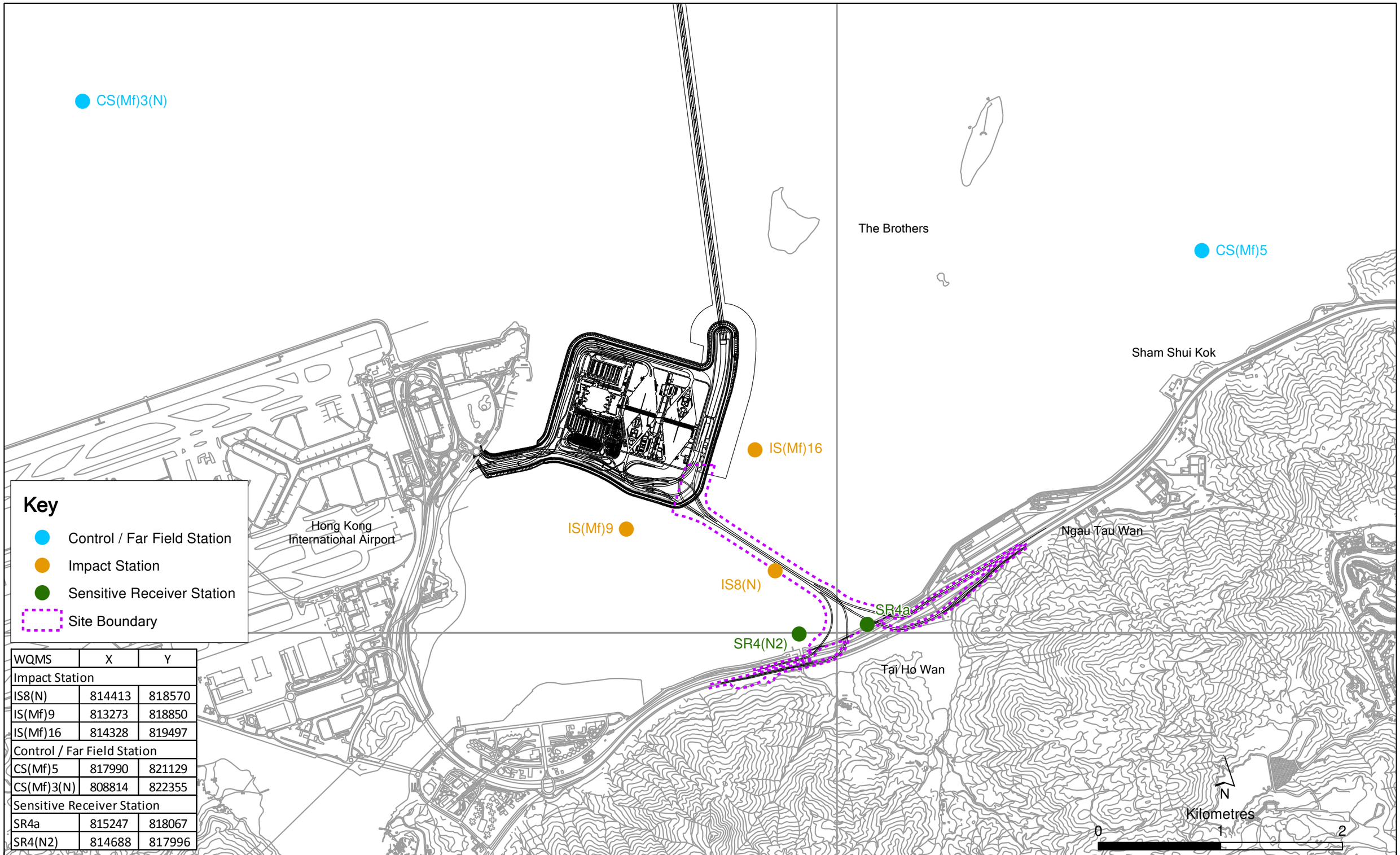
Notification of Exceedance

Log No.	**<u>Action Level Exceedance</u> 0215660_24 July 2019_ Bottom DO_E_Station SR4a 0215660_24 July 2019_ Bottom DO_E_Station IS8(N) 0215660_24 July 2019_ Bottom DO_F_Station IS(Mf)16 0215660_24 July 2019_ Bottom DO_F_Station SR4(N2) [Total No. of Exceedance = 4]**	
Date	24 July 2019 (Measured) 9 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8 (N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at SR4a (Bottom-depth DO = 4.5 mg/L) 2. Mid-ebb at IS8(N) (Bottom-depth DO = 4.6 mg/L) 3. Mid-flood at IS(Mf)16 (Bottom-depth DO =4.4 mg/L) 4. Mid-flodd at SR4(N2) (Bottom-depth DO = 4.5 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 24 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 24 July 2019. • The DO pattern at stations with exceedances were similar to the control stations where the bottom-depth DO levels were generally lower.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 24 July 2019 and locations of water quality monitoring stations are attached.	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Surface	1	1	28.5	8.0	19.5	7.3	5.6	4.7	3.8	3.6	3.3
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Surface	1	2	28.5	8.0	19.5	7.5		4.4		3.9	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Middle	2	1	26.4	7.8	25.2	3.9		2.0		3.8	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Middle	2	2	25.6	7.8	26.5	3.7		2.2		3.7	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Bottom	3	1	25.0	7.7	30.5	3.4	3.4	4.8		4.1	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Bottom	3	2	25.2	7.8	29.5	3.4		4.4		4.3	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Surface	1	1	28.1	7.8	16.9	5.6	4.7	1.1	3.1	3.8	3.4
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Surface	1	2	28.1	7.8	17.0	5.5		1.2		3.6	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Middle	2	1	26.7	7.7	21.7	4.0		2.8		3.1	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Middle	2	2	26.4	7.7	23.5	3.7		2.6		3.2	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Bottom	3	1	26.0	7.7	26.3	3.4	3.5	5.5		3.4	
HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Bottom	3	2	26.0	7.7	26.6	3.5		5.1		3.2	
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Surface	1	1	28.0	8.0	20.7	7.3	7.4	6.3	7.0	7.2	7.5
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Surface	1	2	28.3	8.0	20.2	7.4		6.7		7.4	
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Bottom	3	1	26.6	7.8	23.9	5.0	5.0	7.6		7.8	
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Bottom	3	2	26.6	7.8	23.7	5.0		7.2		7.6	
HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Surface	1	1	28.7	8.2	19.5	8.4	8.5	2.1	3.4	6.4	6.6
HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Surface	1	2	28.0	8.1	20.2	8.5		2.8		6.1	
HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Bottom	3	1	27.1	7.8	22.6	4.5	4.5	4.3		6.9	
HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Bottom	3	2	27.0	7.8	22.8	4.4		4.3		6.7	
HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Surface	1	1	28.0	8.0	20.5	7.8	7.9	3.5	4.9	5.3	5.6
HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Surface	1	2	28.3	8.0	20.1	7.9		3.2		5.4	
HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Bottom	3	1	27.5	7.9	21.5	5.4	5.4	6.5		6.0	
HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Bottom	3	2	27.3	7.8	21.9	5.3		6.2		5.6	
HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Surface	1	1	28.0	8.0	20.4	6.6	6.7	6.9	7.6	8.2	8.7
HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Surface	1	2	28.0	8.0	20.4	6.7		6.7		8.1	
HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Bottom	3	1	26.9	7.7	23.1	4.6	4.6	8.4		9.1	
HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Bottom	3	2	27.2	7.7	23.1	4.5		8.2		9.2	
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Surface	1	1	29.2	8.2	19.2	9.7	9.8	2.5	3.2	6.4	5.0
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Surface	1	2	28.5	8.2	19.5	9.9		3.3		6.2	
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Bottom	3	1	28.4	8.0	19.5	7.7	7.7	3.2		7.2	
HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Bottom	3	2	28.1	8.0	19.7	7.6		3.6		7.1	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)5	11:00	Surface	1	1	27.7	7.8	19.7	5.1	4.3	2.2	4.5	4.6	5.3
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)5	11:00	Surface	1	2	27.4	7.8	20.4	4.9		2.0		4.8	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)5	11:00	Middle	2	1	26.2	7.7	25.6	3.7		3.4		4.9	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)5	11:00	Middle	2	2	25.8	7.8	26.7	3.5		3.3		5.1	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)5	11:00	Bottom	3	1	25.2	7.7	29.6	3.4	3.4	8.0		6.2	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)5	11:00	Bottom	3	2	25.3	7.7	29.5	3.4		7.9		6.4	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)3(N)	11:44	Surface	1	1	28.2	7.7	14.7	5.2	4.7	1.4	1.7	2.9	4.4
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)3(N)	11:44	Surface	1	2	28.2	7.7	14.6	5.1		1.8		3.2	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)3(N)	11:44	Middle	2	1	27.5	7.7	19.5	4.3					
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)3(N)	11:44	Middle	2	2	27.4	7.7	19.5	4.2					
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)3(N)	11:44	Bottom	3	1	26.7	7.7	22.7	3.6	3.7	1.8		5.7	
HY/2012/08	2019/07/24	Mid-Flood	CS(Mf)3(N)	11:44	Bottom	3	2	26.8	7.7	21.8	3.7		1.9		5.8	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)16	12:32	Surface	1	1	27.3	7.9	20.3	5.8	5.7	1.8	2.7	4.7	5.3
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)16	12:32	Surface	1	2	27.4	7.8	20.2	5.6		1.9		4.9	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)16	12:32	Middle	2	1						1.7		5.1	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)16	12:32	Middle	2	2						1.9		5.4	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)16	12:32	Bottom	3	1	26.6	7.8	24.0	4.4	4.4	4.5		6.0	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)16	12:32	Bottom	3	2	27.2	7.8	23.6	4.4		4.3		5.8	
HY/2012/08	2019/07/24	Mid-Flood	SR4a	12:42	Surface	1	1	27.8	8.0	19.3	5.6	5.6	1.7	3.5	2.3	3.0
HY/2012/08	2019/07/24	Mid-Flood	SR4a	12:42	Surface	1	2	27.5	7.9	19.6	5.6		1.7		2.1	
HY/2012/08	2019/07/24	Mid-Flood	SR4a	12:42	Middle	2	1						1.3		2.9	
HY/2012/08	2019/07/24	Mid-Flood	SR4a	12:42	Middle	2	2						2.8		3.1	
HY/2012/08	2019/07/24	Mid-Flood	SR4a	12:42	Bottom	3	1	27.8	7.8	22.3	5.3	5.3	6.7		3.3	
HY/2012/08	2019/07/24	Mid-Flood	SR4a	12:42	Bottom	3	2	27.8	7.8	22.3	5.3		6.9		3.4	
HY/2012/08	2019/07/24	Mid-Flood	SR4(N2)	12:46	Surface	1	1	28.2	8.0	19.0	7.1	7.1	1.6	2.2	3.3	3.5
HY/2012/08	2019/07/24	Mid-Flood	SR4(N2)	12:46	Surface	1	2	28.9	8.0	18.5	7.1		1.7		2.9	
HY/2012/08	2019/07/24	Mid-Flood	SR4(N2)	12:46	Middle	2	1						1.2		3.6	
HY/2012/08	2019/07/24	Mid-Flood	SR4(N2)	12:46	Middle	2	2						1.4		3.8	
HY/2012/08	2019/07/24	Mid-Flood	SR4(N2)	12:46	Bottom	3	1	27.1	7.7	22.6	4.5	4.5	3.6		3.9	
HY/2012/08	2019/07/24	Mid-Flood	SR4(N2)	12:46	Bottom	3	2	27.3	7.7	22.2	4.5		3.4		3.6	
HY/2012/08	2019/07/24	Mid-Flood	IS8(N)	12:51	Surface	1	1	27.2	7.8	21.8	5.9	6.0	3.8	3.7	8.0	9.5
HY/2012/08	2019/07/24	Mid-Flood	IS8(N)	12:51	Surface	1	2	27.9	7.9	20.3	6.0		3.7		7.7	
HY/2012/08	2019/07/24	Mid-Flood	IS8(N)	12:51	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Flood	IS8(N)	12:51	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Flood	IS8(N)	12:51	Bottom	3	1	27.1	7.8	22.3	5.8	5.8	3.6		10.9	
HY/2012/08	2019/07/24	Mid-Flood	IS8(N)	12:51	Bottom	3	2	27.7	7.9	20.6	5.8		3.7		11.2	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)9	12:59	Surface	1	1	28.1	7.9	19.3	7.0	6.9	5.4	4.4	4.8	3.7
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)9	12:59	Surface	1	2	27.9	7.9	19.7	6.7		5.4		4.7	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)9	12:59	Middle	2	1									
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)9	12:59	Middle	2	2									
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)9	12:59	Bottom	3	1	27.8	7.9	19.9	6.1	6.2	3.3		5.1	
HY/2012/08	2019/07/24	Mid-Flood	IS(Mf)9	12:59	Bottom	3	2	27.9	7.9	19.7	6.2		3.6		5.4	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	9 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_29 July 2019_ Bottom DO_E_Station SR4(N2)
0215660_29 July 2019_ Bottom DO_E_Station IS(Mf)9
0215660_29 July 2019_ Bottom DO_F_Station SR4a
0215660_29 July 2019_ Bottom DO_F_Station SR4(N2)

Limit Level Exceedance
0215660_29 July 2019_ Bottom DO_E_Station IS(Mf)16
0215660_29 July 2019_ Bottom DO_E_Station IS8(N)

A total of six (6) exceedances were recorded on 29 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

Log No.	**<u>Action Level Exceedance</u> 0215660_29 July 2019_ Bottom DO_E_Station SR4(N2) 0215660_29 July 2019_ Bottom DO_E_Station IS(Mf)9 0215660_29 July 2019_ Bottom DO_F_Station SR4a 0215660_29 July 2019_ Bottom DO_F_Station SR4(N2) <u>Limit Level Exceedance</u> 0215660_29 July 2019_Bottom_DO_E_station IS(Mf)16 0215660_29 July 2019_Bottom_DO_E_station IS8(N) [Total No. of Exceedance = 6]**	
Date	29 July 2019 (Measured) 9 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at SR(N2) (Bottom-depth DO = 4.6 mg/L) 2. Mid-ebb at IS(Mf)9 (Bottom-depth DO = 3.9 mg/L) 3. Mid-flood at SR4a (Bottom-depth DO =4.2 mg/L) 4. Mid-flood at SR4(N2) (Bottom-depth DO = 3.9 mg/L) <u>Limit Level Exceedance</u> 5. Mid-ebb at IS(Mf)16 (Bottom-depth DO =3.4 mg/L) 6. Mid-ebb at IS8(N) (Bottom-depth DO = 3.4 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 29 July 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following: • No marine works were undertaken on 29 July 2019. • The bottom-depth DO pattern at stations with exceedances were similar to the control stations where the bottom-depth DO levels were generally lower.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 29 July 2019 and locations of water quality monitoring stations are attached.	

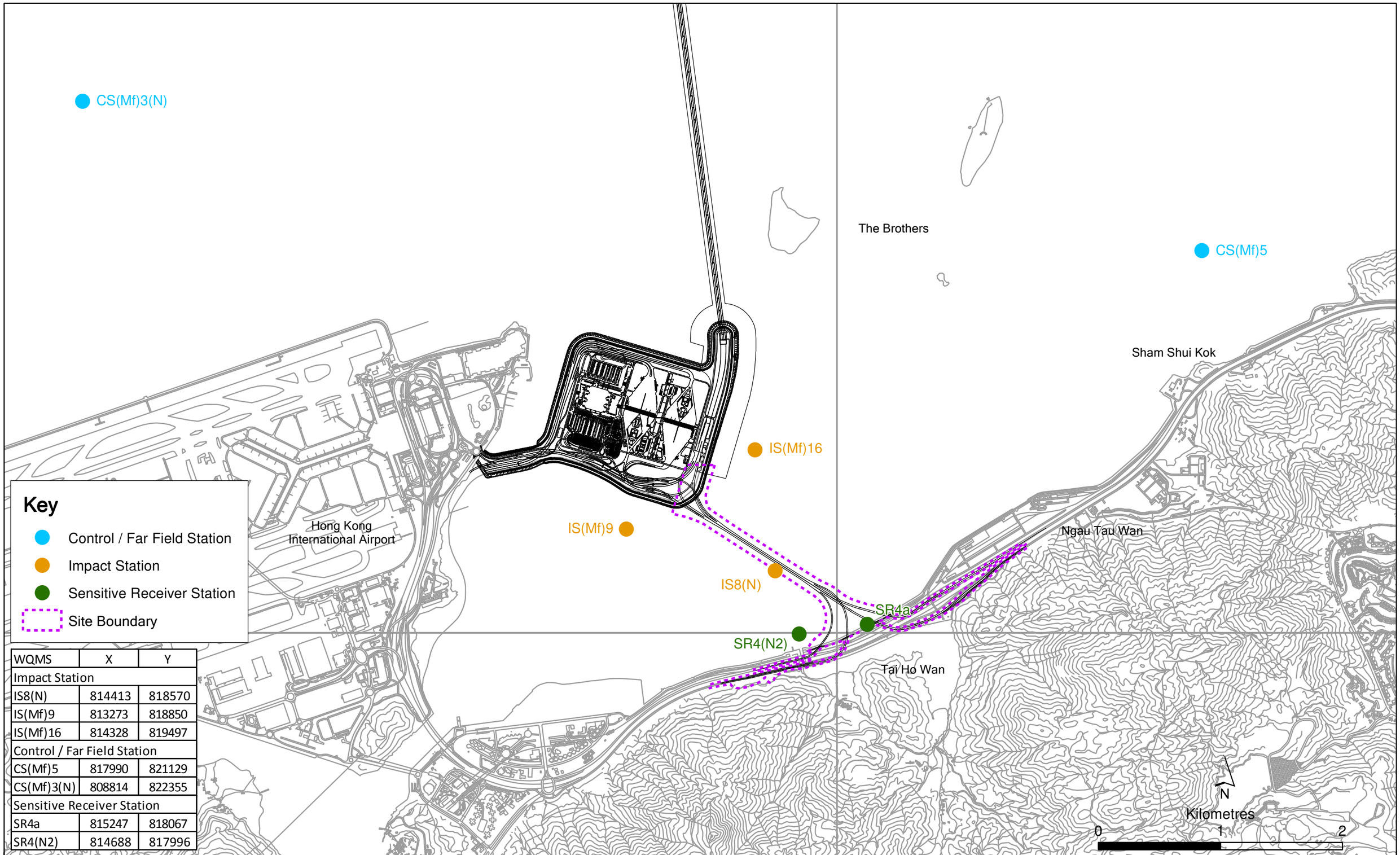
Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Surface	1	1	27.6	8.2	19.0	8.3	6.8	2.9	3.5	5.9	6.0
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Surface	1	2	27.7	8.2	19.0	8.4		2.9		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Middle	2	1	26.5	7.9	23.1	5.2		4.4		5.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Middle	2	2	26.5	7.9	23.2	5.2		4.3		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Bottom	3	1	25.6	7.9	27.5	4.8	4.8	3.3		6.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Bottom	3	2	25.6	7.8	27.5	4.7		3.4		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Surface	1	1	27.9	8.3	17.4	8.7	5.8	2.6	5.6	5.6	6.4
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Surface	1	2	27.9	8.3	17.3	8.8		2.6		4.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Middle	2	1	25.2	7.7	28.0	2.9		5.5		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Middle	2	2	25.2	7.7	28.0	2.9		5.5		7.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Bottom	3	1	25.0	7.7	29.0	3.1	3.1	8.7		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Bottom	3	2	25.0	7.7	29.0	3.1		8.7		7.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Surface	1	1	28.5	8.3	16.6	8.3	8.4	3.4	5.3	5.1	4.2
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Surface	1	2	28.5	8.3	16.7	8.4		3.4		5.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Bottom	3	1	25.3	7.8	28.3	3.4	3.4	7.2		2.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Bottom	3	2	25.3	7.8	28.3	3.4		7.2		3.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Surface	1	1	27.3	8.0	19.6	5.9	6.1	5.5	8.5	6.2	6.3
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Surface	1	2	27.4	8.0	19.5	6.2		5.5		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Bottom	3	1	26.5	7.8	23.7	4.8	4.8	11.4		6.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Bottom	3	2	26.5	7.8	23.7	4.7		11.4		7.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Surface	1	1	28.2	8.1	16.8	6.6	6.6	4.4	6.7	5.5	7.1
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Surface	1	2	28.2	8.1	16.8	6.6		4.3		6.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Bottom	3	1	27.0	7.8	21.5	4.6	4.6	9.0		7.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Bottom	3	2	27.1	7.8	21.5	4.6		8.9		8.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Surface	1	1	27.8	8.1	18.9	7.1	7.1	3.1	5.1	4.3	5.1
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Surface	1	2	27.8	8.1	18.8	7.1		3.1		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Bottom	3	1	26.0	7.8	25.8	3.4	3.4	7.1		4.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Bottom	3	2	26.0	7.8	25.9	3.4		7.0		5.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Surface	1	1	28.6	8.4	15.5	9.3	9.3	2.5	5.0	3.2	3.2
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Surface	1	2	28.6	8.4	15.4	9.3		2.5		2.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Bottom	3	1	26.5	7.7	23.8	3.9	3.9	7.4		3.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Bottom	3	2	26.4	7.7	23.8	3.9		7.4		3.6	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Surface	1	1	27.5	8.2	17.8	8.5	8.0	3.1	3.0	5.9	5.5
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Surface	1	2	27.6	8.2	17.8	8.6		3.1		6.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Middle	2	1	26.9	8.0	22.6	7.4		3.3		5.0	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Middle	2	2	26.9	8.0	22.6	7.4		3.3		5.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Bottom	3	1	25.5	7.9	28.1	5.7	5.7	2.5		4.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Bottom	3	2	25.5	7.9	28.2	5.7		2.4		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Surface	1	1	27.8	8.2	15.3	7.4	6.5	3.9	5.1	4.6	5.7
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Surface	1	2	27.8	8.2	15.3	7.4		3.9		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Middle	2	1	27.3	8.0	18.9	5.6		4.3		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Middle	2	2	27.3	8.0	18.9	5.6		4.3		6.0	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Bottom	3	1	25.9	7.7	25.6	3.5	3.5	7.1		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Bottom	3	2	25.9	7.7	25.6	3.5		7.1		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Surface	1	1	28.0	8.2	16.9	8.3	8.4	3.3	3.3	6.9	6.3
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Surface	1	2	28.0	8.2	16.9	8.4		3.4		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Bottom	3	1	26.9	8.0	22.1	6.4	6.4	3.2		6.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Bottom	3	2	26.9	8.0	22.1	6.3		3.2		5.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Surface	1	1	28.4	8.3	16.8	8.4	8.4	3.8	6.6	6.4	6.9
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Surface	1	2	28.4	8.3	16.8	8.4		3.9		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Bottom	3	1	26.9	7.8	22.3	4.2	4.2	9.3		8.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Bottom	3	2	26.9	7.8	22.3	4.1		9.3		7.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Surface	1	1	27.9	8.1	18.2	6.9	6.9	4.3	6.2	6.2	7.3
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Surface	1	2	27.9	8.1	18.2	6.9		4.4		7.2	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Bottom	3	1	27.1	7.7	21.7	3.9	3.9	8.1		8.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Bottom	3	2	27.1	7.7	21.7	3.9		8.1		7.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Surface	1	1	28.0	8.3	16.7	8.3	8.3	3.0	3.4	5.4	6.2
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Surface	1	2	28.0	8.3	16.7	8.3		3.0		5.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Bottom	3	1	27.3	8.0	20.3	6.6	6.6	3.8		6.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Bottom	3	2	27.3	8.0	20.3	6.6		3.8		7.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Surface	1	1	28.3	8.3	15.8	8.5	8.5	2.7	3.1	4.7	4.7
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Surface	1	2	28.3	8.3	15.8	8.5		2.7		3.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Bottom	3	1	27.3	8.0	20.0	6.6	6.6	3.4		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Bottom	3	2	27.4	8.0	19.9	6.5		3.5		4.7	

Note:

Indicates Exc 2017/11/01

Indicates Exc 2017/11/01



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
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E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	19 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_7 August 2019_ Surface & Middle DO_E_Station IS(Mf)9
0215660_7 August 2019_ Bottom DO_F_Station SR4a

A total of two (2) exceedances were recorded on 7 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

Log No.	**<u>Action Level Exceedance</u> 0215660_7 August 2019_ Surface & Middle DO_E_Station IS(Mf)9 0215660_7 August 2019_ Bottom DO_F_Station SR4a [Total No. of Exceedance = 2]**	
Date	7 August 2019 (Measured) 19 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Surface & Middle-depth Dissolved Oxygen (DO) Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Surface and Middle-depth DO	5.0 mg/L
	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Surface and Middle-depth DO	4.2 mg/L
	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at IS(Mf)9 (Surface & Middle-depth DO = 4.3 mg/L) 2. Mid-flood at SR4a (Bottom-depth DO =4.5 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 7 August 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of DO is unlikely to be due to the Contract, in view of the following: • No marine works were undertaken on 7 August 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • The DO pattern at stations with exceedances were similar to some control stations where the DO levels were generally lower. DO levels were generally lower at water quality monitoring stations due to reduce in natural ability for water to hold dissolved oxygen under higher water temperature in summer months. • There are no discharge of waste water from the landside works area under this Contract.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 7 August 2019 and locations of water quality monitoring stations are attached.	

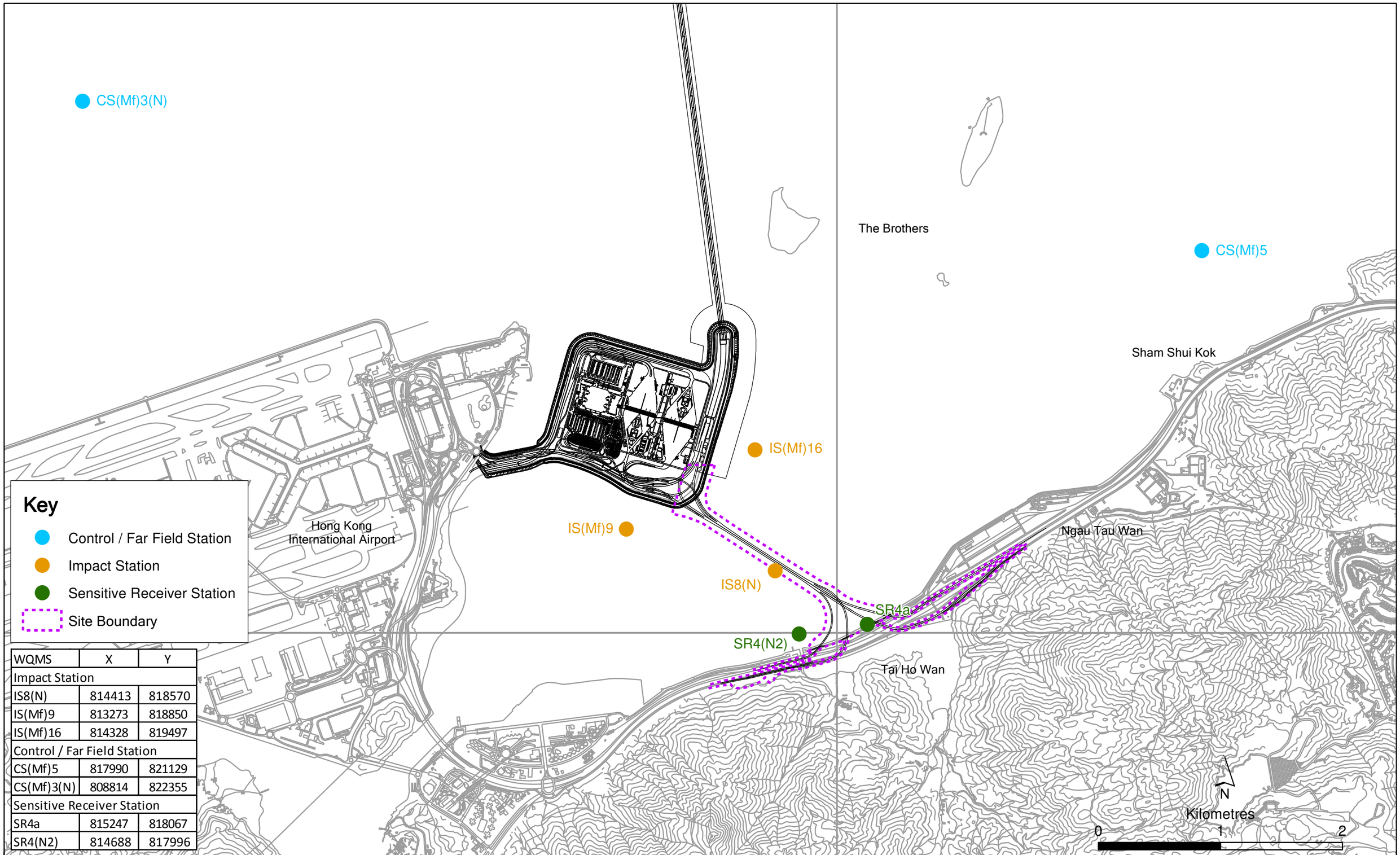
Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Surface	1	1	28.7	7.8	21.8	5.7	5.3	3.8	3.4	6.1	4.9
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Surface	1	2	28.7	7.9	21.4	5.7		3.8		5.5	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Middle	2	1	27.9	7.8	24.2	4.9		3.5		5.2	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Middle	2	2	27.9	7.9	23.7	4.9		3.5		5.9	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Bottom	3	1	27.7	7.8	25.7	4.8	4.9	2.8		5.6	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Bottom	3	2	27.7	7.9	25.1	4.9		2.7		6.0	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Surface	1	1	28.9	7.7	18.3	5.5	5.2	3.9	7.1	7.8	7.7
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Surface	1	2	28.9	7.8	18.0	5.5		3.8		8.1	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Middle	2	1	28.0	7.8	21.7	4.8		6.2		8.7	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Middle	2	2	28.0	7.8	21.4	4.9		6.2		8.9	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Bottom	3	1	28.0	7.8	23.3	5.1	5.2	11.3		6.5	
HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Bottom	3	2	28.0	7.9	22.9	5.2		11.3		6.2	
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Surface	1	1	28.4	7.8	21.6	5.5	5.5	5.5	6.5	9.8	9.7
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Surface	1	2	28.4	7.9	21.6	5.5		5.5		10.6	
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Bottom	3	1	28.1	7.8	22.3	5.1	5.1	7.4		9.7	
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Bottom	3	2	28.1	7.8	21.9	5.1		7.5		8.7	
HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Surface	1	1	28.5	7.8	20.8	5.8	5.9	4.5	4.7	11.3	10.4
HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Surface	1	2	28.5	7.9	20.4	5.9		4.6		10.6	
HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Bottom	3	1	28.1	7.8	21.6	4.9	5.1	4.8		10.2	
HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Bottom	3	2	28.2	7.8	21.2	5.2		4.9		10.5	
HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Surface	1	1	28.5	7.8	20.9	5.6	5.7	6.5	8.1	9.8	9.1
HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Surface	1	2	28.5	7.8	20.6	5.7		6.4		10.7	
HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Bottom	3	1	28.3	7.8	21.5	5.0	5.0	9.8		8.5	
HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Bottom	3	2	28.3	7.8	21.1	5.0		9.7		7.5	
HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Surface	1	1	28.4	7.8	21.4	5.5	5.5	6.5	7.2	7.1	7.2
HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Surface	1	2	28.4	7.9	21.0	5.5		6.5		6.1	
HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Bottom	3	1	28.1	7.8	22.2	5.0	5.0	7.9		7.4	
HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Bottom	3	2	28.1	7.9	21.8	5.0		7.9		8.1	
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Surface	1	1	27.6	7.8	25.1	4.5	4.5	3.3	4.3	7.6	4.9
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Surface	1	2	27.6	7.8	25.1	4.5		3.3		6.7	
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Bottom	3	1	28.0	7.8	21.0	7.0	7.0	5.3		6.7	
HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Bottom	3	2	28.0	7.8	21.0	7.0		5.3		6.6	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)5	10:29	Surface	1	1	28.0	7.8	21.3	4.6	4.6	4.0	6.2	6.5	6.8
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)5	10:29	Surface	1	2	27.6	7.8	21.3	4.6		4.0		5.8	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)5	10:29	Middle	2	1	27.6	7.8	24.6	4.6		4.0		6.7	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)5	10:29	Middle	2	2	27.6	7.8	24.2	4.6		4.0		6.8	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)5	10:29	Bottom	3	1	27.5	7.8	26.5	4.5	4.5	10.6		7.0	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)5	10:29	Bottom	3	2	27.4	7.8	26.0	4.5		10.6		7.9	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)3(N)	11:19	Surface	1	1	28.2	7.7	19.8	5.0	5.1	5.1	5.8	9.1	9.7
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)3(N)	11:19	Surface	1	2	28.4	7.8	19.2	5.3		5.2		8.1	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)3(N)	11:19	Middle	2	1	28.2	7.7	19.9	5.0		6.0		10.5	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)3(N)	11:19	Middle	2	2	28.2	7.8	19.5	5.0		6.1		9.9	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)3(N)	11:19	Bottom	3	1	28.3	7.7	20.1	5.2	5.2	6.2		10.7	
HY/2012/08	2019/08/07	Mid-Flood	CS(Mf)3(N)	11:19	Bottom	3	2	28.2	7.8	19.6	5.1		6.2		9.8	
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)16	12:23	Surface	1	1	28.5	7.8	20.7	5.6	5.6	5.9	8.1	8.7	7.9
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)16	12:23	Surface	1	2	28.5	7.9	20.3	5.6		5.9		7.7	
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)16	12:23	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)16	12:23	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)16	12:23	Bottom	3	1	28.0	7.8	21.6	5.0	5.0	10.4		7.1	
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)16	12:23	Bottom	3	2	28.0	7.8	21.2	5.0		10.3		8.0	
HY/2012/08	2019/08/07	Mid-Flood	SR4a	12:32	Surface	1	1	28.6	7.7	20.4	5.5	5.6	3.6	5.2	9.2	9.2
HY/2012/08	2019/08/07	Mid-Flood	SR4a	12:32	Surface	1	2	28.6	7.8	20.1	5.6		3.6		8.2	
HY/2012/08	2019/08/07	Mid-Flood	SR4a	12:32	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Flood	SR4a	12:32	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Flood	SR4a	12:32	Bottom	3	1	28.0	7.7	21.7	4.5	4.5	6.7		9.6	
HY/2012/08	2019/08/07	Mid-Flood	SR4a	12:32	Bottom	3	2	28.0	7.8	21.3	4.5		6.7		9.9	
HY/2012/08	2019/08/07	Mid-Flood	SR4(N2)	12:36	Surface	1	1	28.5	7.7	20.4	5.5	5.6	3.6	3.9	10.2	9.3
HY/2012/08	2019/08/07	Mid-Flood	SR4(N2)	12:36	Surface	1	2	28.4	7.8	20.0	5.6		3.6		9.2	
HY/2012/08	2019/08/07	Mid-Flood	SR4(N2)	12:36	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Flood	SR4(N2)	12:36	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Flood	SR4(N2)	12:36	Bottom	3	1	28.2	7.7	20.7	5.3	5.4	4.1		8.4	
HY/2012/08	2019/08/07	Mid-Flood	SR4(N2)	12:36	Bottom	3	2	28.3	7.8	20.3	5.4		4.1		9.3	
HY/2012/08	2019/08/07	Mid-Flood	IS8(N)	12:41	Surface	1	1	28.3	7.7	20.8	5.2	5.2	5.6	7.6	9.7	9.1
HY/2012/08	2019/08/07	Mid-Flood	IS8(N)	12:41	Surface	1	2	28.3	7.8	20.4	5.2		5.6		9.3	
HY/2012/08	2019/08/07	Mid-Flood	IS8(N)	12:41	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Flood	IS8(N)	12:41	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Flood	IS8(N)	12:41	Bottom	3	1	28.3	7.7	21.0	5.1	5.2	9.5		8.4	
HY/2012/08	2019/08/07	Mid-Flood	IS8(N)	12:41	Bottom	3	2	28.2	7.8	20.5	5.2		9.5		8.8	
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)9	12:49	Surface	1	1	28.4	7.7	20.7	5.7	5.7	7.0	8.1	8.6	6.4
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)9	12:49	Surface	1	2	28.4	7.8	20.3	5.7		7.0		8.3	
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)9	12:49	Middle	2	1									
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)9	12:49	Middle	2	2									
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)9	12:49	Bottom	3	1	28.3	7.7	20.8	5.3	5.4	9.3		8.6	
HY/2012/08	2019/08/07	Mid-Flood	IS(Mf)9	12:49	Bottom	3	2	28.3	7.8	20.5	5.4		9.2		8.6	

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

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To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	20 August 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_14 August 2019_ Bottom DO_E_Station IS(Mf)16

A total of one (1) exceedance were recorded on 14 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

Log No.	**Action Level Exceedance** **0215660_14 August 2019_ Bottom DO_E_Station IS(Mf)16** **[Total No. of Exceedance = 1]**	
Date	14 August 2019 (Measured) 19 August (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Bottom-depth DO	3.6 mg/L
Measured Levels	Action Level Exceedance 1. Mid-ebb at IS(Mf)16 (Bottom-depth DO = 4.6 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 14 August 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of bottom-depth DO is unlikely to be due to the Contract, in view of the following: • No marine works were undertaken on 14 August 2019. • The bottom-depth DO pattern at the station with exceedance was similar to the control stations where the bottom-depth DO levels were generally lower. In addition, lower bottom-depth DO levels may possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. • There are no discharge of waste water from the landside works area under this Contract.	
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.	
Remarks	The monitoring results on 14 August 2019 and locations of water quality monitoring stations are attached.	

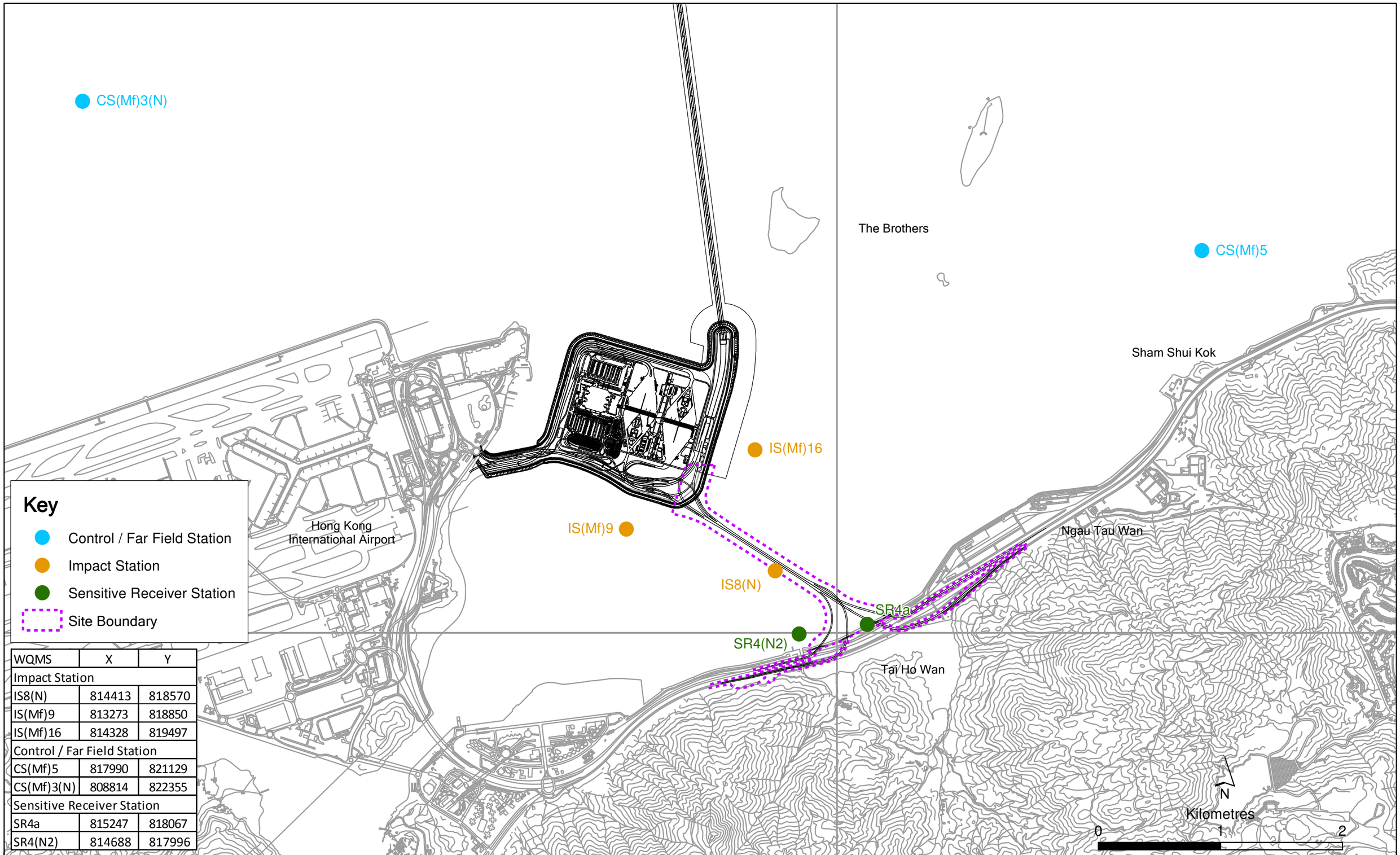
Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Surface	1	1	30.1	8.0	18.4	6.1	5.6	3.0	5.1
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Surface	1	2	30.0	8.0	18.4	6.1		3.0	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Middle	2	1	29.3	7.9	21.1	5.0		4.5	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Middle	2	2	29.3	7.9	21.2	5.0		4.6	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Bottom	3	1	28.0	7.9	26.6	3.8	3.8	7.7	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Bottom	3	2	28.0	7.9	26.6	3.8		7.6	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Surface	1	1	30.6	7.9	16.4	6.1	5.8	2.9	3.8
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Surface	1	2	30.6	7.9	16.5	6.1		2.9	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Middle	2	1	29.7	7.9	18.9	5.4		3.9	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Middle	2	2	29.7	7.9	18.9	5.4		3.8	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Bottom	3	1	29.6	7.9	19.7	5.3	5.3	4.5	
HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Bottom	3	2	29.7	7.9	19.6	5.3		4.5	
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Surface	1	1	30.1	8.0	18.5	6.2	6.2	4.8	7.4
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Surface	1	2	30.2	8.0	18.5	6.2		4.8	
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Bottom	3	1	28.6	7.9	24.5	4.6	4.6	9.9	
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Bottom	3	2	28.6	7.9	24.4	4.6		9.9	
HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Surface	1	1	30.4	8.0	17.4	6.4	6.4	3.2	4.1
HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Surface	1	2	30.4	8.0	17.3	6.4		3.2	
HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Bottom	3	1	30.0	7.9	18.6	5.6	5.6	4.9	
HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Bottom	3	2	30.0	7.9	18.6	5.6		4.9	
HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Surface	1	1	30.5	8.0	17.4	6.3	6.3	3.3	5.8
HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Surface	1	2	30.5	8.0	17.4	6.3		3.3	
HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Bottom	3	1	30.0	7.9	18.8	5.6	5.6	8.2	
HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Bottom	3	2	30.0	7.9	18.8	5.6		8.2	
HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Surface	1	1	30.4	8.0	18.2	6.1	6.1	9.9	11.0
HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Surface	1	2	30.4	8.0	18.2	6.1		9.9	
HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Bottom	3	1	29.9	8.0	19.0	5.6	5.6	12.2	
HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Bottom	3	2	29.9	8.0	19.0	5.6		12.1	
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Surface	1	1	30.6	8.1	17.7	6.6	6.6	3.3	3.5
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Surface	1	2	30.6	8.1	17.7	6.6		3.3	
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Bottom	3	1	30.4	8.1	17.8	6.5	6.5	3.6	
HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Bottom	3	2	30.4	8.1	17.8	6.4		3.6	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)5	4:38	Surface	1	1	30.1	7.9	16.8	6.2	6.1	3.2	2.4
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)5	4:38	Surface	1	2	30.1	7.9	16.8	6.2		3.2	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)5	4:38	Middle	2	1	29.9	7.9	19.2	6.0		2.0	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)5	4:38	Middle	2	2	29.9	7.9	19.2	6.0		2.0	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)5	4:38	Bottom	3	1	28.5	7.9	25.3	4.7	4.7	2.0	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)5	4:38	Bottom	3	2	28.5	7.9	25.3	4.7		2.0	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)3(N)	5:56	Surface	1	1	29.9	7.9	16.6	6.0	6.0	4.2	5.9
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)3(N)	5:56	Surface	1	2	29.9	7.9	16.6	6.0		4.2	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)3(N)	5:56	Middle	2	1	29.9	7.9	17.1	5.9		4.0	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)3(N)	5:56	Middle	2	2	29.9	7.9	17.1	5.9		4.0	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)3(N)	5:56	Bottom	3	1	29.7	7.9	18.9	5.5	5.5	9.4	
HY/2012/08	2019/08/14	Mid-Flood	CS(Mf)3(N)	5:56	Bottom	3	2	29.7	7.9	18.9	5.4		9.3	
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)16	6:18	Surface	1	1	30.0	8.0	18.0	6.2	6.2	3.5	3.5
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)16	6:18	Surface	1	2	30.0	8.0	18.1	6.2		3.5	
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)16	6:18	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)16	6:18	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)16	6:18	Bottom	3	1	30.0	8.0	18.0	6.2	6.2	3.6	
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)16	6:18	Bottom	3	2	30.0	8.0	18.0	6.2		3.5	
HY/2012/08	2019/08/14	Mid-Flood	SR4a	6:27	Surface	1	1	30.2	8.0	17.5	5.9	6.0	4.1	5.6
HY/2012/08	2019/08/14	Mid-Flood	SR4a	6:27	Surface	1	2	30.2	8.0	17.5	6.0		4.1	
HY/2012/08	2019/08/14	Mid-Flood	SR4a	6:27	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Flood	SR4a	6:27	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Flood	SR4a	6:27	Bottom	3	1	29.9	7.9	18.7	5.3	5.3	7.1	
HY/2012/08	2019/08/14	Mid-Flood	SR4a	6:27	Bottom	3	2	29.9	7.9	18.7	5.3		7.1	
HY/2012/08	2019/08/14	Mid-Flood	SR4(N2)	6:32	Surface	1	1	30.1	8.0	17.2	6.1	6.1	3.5	4.4
HY/2012/08	2019/08/14	Mid-Flood	SR4(N2)	6:32	Surface	1	2	30.1	8.0	17.2	6.1		3.4	
HY/2012/08	2019/08/14	Mid-Flood	SR4(N2)	6:32	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Flood	SR4(N2)	6:32	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Flood	SR4(N2)	6:32	Bottom	3	1	30.0	8.0	18.0	5.9	5.9	5.4	
HY/2012/08	2019/08/14	Mid-Flood	SR4(N2)	6:32	Bottom	3	2	30.0	8.0	18.0	5.9		5.3	
HY/2012/08	2019/08/14	Mid-Flood	IS8(N)	6:38	Surface	1	1	30.0	8.0	17.3	6.1	6.1	4.1	4.7
HY/2012/08	2019/08/14	Mid-Flood	IS8(N)	6:38	Surface	1	2	30.0	8.0	17.3	6.1		4.2	
HY/2012/08	2019/08/14	Mid-Flood	IS8(N)	6:38	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Flood	IS8(N)	6:38	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Flood	IS8(N)	6:38	Bottom	3	1	30.0	8.0	17.5	6.0	6.0	5.3	
HY/2012/08	2019/08/14	Mid-Flood	IS8(N)	6:38	Bottom	3	2	30.0	8.0	17.5	6.0		5.3	
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)9	6:45	Surface	1	1	29.9	8.0	17.3	6.1	6.1	4.8	5.9
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)9	6:45	Surface	1	2	29.9	8.0	17.3	6.1		4.9	
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)9	6:45	Middle	2	1							
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)9	6:45	Middle	2	2							
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)9	6:45	Bottom	3	1	29.9	8.0	17.8	6.1	6.1	6.9	
HY/2012/08	2019/08/14	Mid-Flood	IS(Mf)9	6:45	Bottom	3	2	29.9	8.0	17.8	6.1		7.0	

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	3 September 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_19 August 2019_ Surface & Middle DO_E_Station IS(Mf)16
0215660_19 August 2019_ Bottom DO_E_Station IS(Mf)16
0215660_19 August 2019_ Surface & Middle DO_E_Station SR4a
0215660_19 August 2019_ Bottom DO_E_Station SR4a
0215660_19 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0215660_19 August 2019_ Bottom DO_E_Station SR4(N2)
0215660_19 August 2019_ Bottom DO_E_Station IS8(N)

A total of seven (7) exceedances were recorded on 19 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

Log No.	**Action Level Exceedance** **0215660_19 August 2019_ Surface & Middle DO_E_Station IS(Mf)16** **0215660_19 August 2019_ Bottom DO_E_Station IS(Mf)16** **0215660_19 August 2019_ Surface & Middle DO_E_Station SR4a** **0215660_19 August 2019_ Bottom DO_E_Station SR4a** **0215660_19 August 2019_ Surface & Middle DO_E_Station SR4(N2)** **0215660_19 August 2019_ Bottom DO_E_Station SR4(N2)** **0215660_19 August 2019_ Bottom DO_E_Station IS8(N)** **[Total No. of Exceedance = 7]**	
Date	19 August 2019 (Measured) 30 August 2019 (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Surface and Middle-depth Dissolved Oxygen (DO) Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Surface and Middle-depth DO	5.0 mg/L
	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Surface and Middle-depth DO	4.2 mg/L
	Bottom-depth DO	3.6 mg/L
Measured Levels	Action Level Exceedance 1. Mid-ebb at IS(Mf)16 (Surface & Middle-depth DO = 4.8 mg/L) 2. Mid-ebb at IS(Mf)16 (Bottom-depth DO = 4.3 mg/L) 3. Mid-ebb at SR4a (Surface & Middle-depth DO = 4.7 mg/L) 4. Mid-ebb at SR4a (Bottom-depth DO = 4.5 mg/L) 5. Mid-ebb at SR4(N2) (Surface & Middle-depth DO = 4.8 mg/L) 6. Mid-ebb at SR4(N2) (Bottom-depth DO = 4.6 mg/L) 7. Mid-ebb at IS8(N) (Bottom-depth DO = 4.6 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 19 August 2019.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of DO is unlikely to be due to the Contract, in view of the following: • No marine works were undertaken on 19 August 2019. • The DO pattern at the station with exceedance was similar to the control station CS(Mf)5 during ebb tide where the bottom-depth DO levels are generally lower. In addition, lower bottom-depth DO levels may possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. • There are no discharge of waste water from the landside works area under this Contract.	

Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 19 August 2019 and locations of water quality monitoring stations are attached.

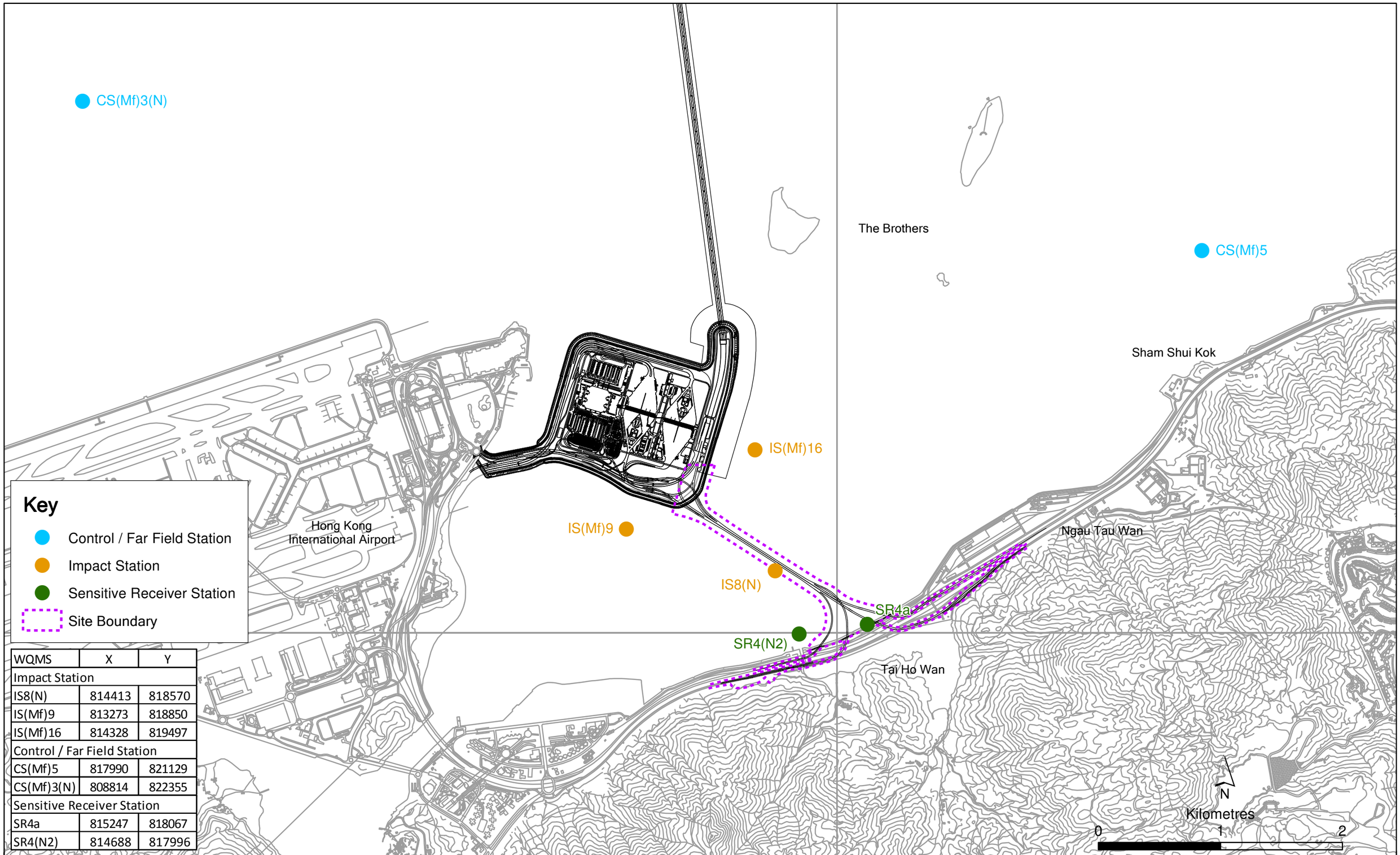
Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Surface	1	1	28.2	8.0	22.2	5.0	4.6	3.8	8.9
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Surface	1	2	28.9	7.9	21.8	5.0		4.1	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Middle	2	1	26.6	8.0	26.8	4.1		8.2	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Middle	2	2	27.3	7.9	26.4	4.1		8.0	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Bottom	3	1	25.8	8.1	30.1	3.8	3.8	14.4	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Bottom	3	2	26.5	7.9	29.7	3.7		14.6	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Surface	1	1	28.9	8.0	19.6	5.6	5.3	3.0	4.9
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Surface	1	2	29.7	7.9	19.2	5.5		3.1	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Middle	2	1	28.0	8.0	22.9	5.1		4.8	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Middle	2	2	28.8	7.9	22.4	5.1		4.9	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Bottom	3	1	27.5	8.0	24.5	4.9	4.8	6.5	
HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Bottom	3	2	28.3	7.9	24.0	4.7		6.9	
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Surface	1	1	27.8	8.1	23.3	4.8	4.8	7.8	6.4
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Surface	1	2	28.6	7.9	22.9	4.8		7.2	
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Middle	2	1							
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Middle	2	2							
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Bottom	3	1	26.2	8.0	28.5	4.4	4.3	5.2	
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Bottom	3	2	27.0	7.9	28.1	4.2		5.4	
HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Surface	1	1	27.8	8.0	22.9	4.6	4.7	8.6	10.1
HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Surface	1	2	28.5	7.9	22.6	4.7		8.2	
HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Middle	2	1							
HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Middle	2	2							
HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Bottom	3	1	27.6	8.0	23.7	4.5	4.5	11.9	
HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Bottom	3	2	28.4	7.9	23.3	4.5		11.8	
HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Surface	1	1	28.0	8.0	22.3	4.7	4.8	10.0	10.8
HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Surface	1	2	28.7	7.9	22.0	4.8		10.0	
HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Middle	2	1							
HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Middle	2	2							
HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Bottom	3	1	27.8	8.0	22.8	4.6	4.6	11.7	
HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Bottom	3	2	28.6	7.9	22.5	4.6		11.6	
HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Surface	1	1	27.9	8.1	22.9	5.1	5.1	10.6	10.7
HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Surface	1	2	28.6	7.9	22.7	5.1		10.4	
HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Middle	2	1							
HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Middle	2	2							
HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Bottom	3	1	27.6	8.1	23.8	4.6	4.6	10.9	
HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Bottom	3	2	28.3	7.9	23.5	4.5		10.9	
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Surface	1	1	28.7	8.0	21.4	5.6	5.6	3.9	4.6
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Surface	1	2	29.5	8.0	21.1	5.6		4.1	
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Middle	2	1							
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Middle	2	2							
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Bottom	3	1	28.4	8.0	21.6	5.5	5.5	5.2	
HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Bottom	3	2	29.1	8.0	21.3	5.5		5.1	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Surface	1	1	28.8	7.8	20.1	5.0	4.6	3.3	6.6
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Surface	1	2	28.0	8.0	20.4	5.0		3.3	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Middle	2	1	27.6	7.8	25.7	4.2		4.9	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Middle	2	2	26.8	8.0	26.2	4.2		4.9	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Bottom	3	1	26.7	7.8	29.5	3.7	3.8	11.5	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Bottom	3	2	25.9	8.0	29.9	3.8		11.5	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Surface	1	1	28.4	8.0	17.0	5.5	5.4	3.7	4.3
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Surface	1	2	29.2	7.9	16.7	5.5		3.7	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Middle	2	1	28.2	8.0	19.2	5.4		4.6	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Middle	2	2	29.0	7.8	18.9	5.3		4.7	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Bottom	3	1	28.2	8.0	19.4	5.4	5.4	4.6	
HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Bottom	3	2	29.0	7.9	19.1	5.3		4.7	
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Surface	1	1	28.0	8.1	21.6	5.2	5.2	4.5	6.0
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Surface	1	2	28.7	7.9	21.3	5.2		4.9	
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Middle	2	1							
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Middle	2	2							
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Bottom	3	1	27.8	8.1	22.2	5.3	5.2	7.4	
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Bottom	3	2	28.6	8.0	21.8	5.1		7.3	
HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Surface	1	1	28.0	8.1	21.2	5.2	5.2	4.7	6.6
HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Surface	1	2	28.7	7.9	20.9	5.2		4.8	
HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Middle	2	1							
HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Middle	2	2							
HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Bottom	3	1	27.9	8.1	21.9	4.9	4.9	8.2	
HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Bottom	3	2	28.6	8.0	21.6	4.9		8.8	
HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Surface	1	1	28.0	8.1	21.1	5.4	5.4	4.4	4.9
HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Surface	1	2	28.8	7.9	20.7	5.3		4.4	
HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Middle	2	1							
HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Middle	2	2							
HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Bottom	3	1	28.0	8.1	21.2	5.5	5.5	5.9	
HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Bottom	3	2	28.7	7.9	20.8	5.5		5.0	
HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Surface	1	1	28.0	8.1	21.1	5.2	5.2	5.3	7.0
HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Surface	1	2	28.8	7.9	20.7	5.1		5.9	
HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Middle	2	1							
HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Middle	2	2							
HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Bottom	3	1	27.8	8.1	22.0	5.1	5.1	8.5	
HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Bottom	3	2	28.6	7.9	21.6	5.0		8.2	
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Surface	1	1	28.1	8.1	21.3	5.4	5.4	4.4	6.3
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Surface	1	2	28.9	7.9	20.9	5.4		4.7	
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Middle	2	1							
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Middle	2	2							
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Bottom	3	1	28.0	8.1	21.6	5.5	5.5	8.0	
HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Bottom	3	2	28.7	7.9	21.3	5.5		8.1	

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	3 September 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_28 August 2019_ Surface & Middle DO_E_Station IS(Mf)16
0215660_28 August 2019_ Surface & Middle DO_E_Station SR4a
0215660_28 August 2019_ Bottom DO_E_Station SR4a
0215660_28 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0215660_28 August 2019_ Surface & Middle DO_E_Station IS8(N)
0215660_28 August 2019_ Bottom DO_E_Station IS8(N)
0215660_28 August 2019_ Bottom DO_F_Station SR4a

Limit Level Exceedance
0215660_28 August 2019_ Bottom DO_E_Station SR4(N2)

A total of eight (8) exceedances were recorded on 28 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

Log No.	**<u>Action Level Exceedance</u>** **0215660_28 August 2019_ Surface & Middle DO_E_Station IS(Mf)16** **0215660_28 August 2019_ Surface & Middle DO_E_Station SR4a** **0215660_28 August 2019_ Bottom DO_E_Station SR4a** **0215660_28 August 2019_ Surface & Middle DO_E_Station SR4(N2)** **0215660_28 August 2019_ Surface & Middle DO_E_Station IS8(N)** **0215660_28 August 2019_ Bottom DO_E_Station IS8(N)** **0215660_28 August 2019_ Bottom DO_F_Station SR4a** **<u>Limit Level Exceedance</u>** **0215660_28 August 2019_ Bottom DO_E_Station SR4(N2)** **[Total No. of Exceedance = 8]**	
Date	28 August 2019 (Measured) 2 September 2019 (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Surface and Middle-depth Dissolved Oxygen (DO) Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Surface and Middle-depth DO	5.0 mg/L
	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Surface and Middle-depth DO	4.2 mg/L
	Bottom-depth DO	3.6 mg/L
Measured Levels	<u>Action Level Exceedance</u> 1. Mid-ebb at IS(Mf)16 (Surface & Middle-depth DO = 4.9 mg/L) 2. Mid-ebb at SR4a (Surface & Middle-depth DO = 4.8 mg/L) 3. Mid-ebb at SR4a (Bottom-depth DO = 4.0 mg/L) 4. Mid-ebb at SR4(N2) (Surface & Middle-depth DO = 4.3 mg/L) 5. Mid-ebb at IS8(N) (Surface & Middle-depth DO = 4.7 mg/L) 6. Mid-ebb at IS8(N) (Bottom-depth DO = 4.4 mg/L) 7. Mid-flood at SR4a (Bottom-depth DO 4.2 = mg/L) <u>Limit Level Exceedance</u> 1. Mid-ebb at SR4(N2) (Bottom-depth DO = 3.5 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 28 August 2019.	

Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of DO is unlikely to be due to the Contract, in view of the following: • No marine works were undertaken on 28 August 2019. • The DO pattern at the station with exceedance was similar to the control stations where the bottom-depth DO levels are generally lower. In addition, lower bottom-depth DO levels may possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. • Surface & Middle-depth DO levels exceedances recorded during mid-ebb tide were similar to the corresponding control station, CS(Mf)3(N), during mid-ebb tide, in which the recorded Surface & Middle-depth DO level at the corresponding control station were below Action Level. In addition, stations with Surface & Middle-depth DO exceedances have recorded exceedances in Bottom-depth DO in which the Bottom-depth DO is lower or the same as the Surface & Middle-depth DO. • There are no discharge of waste water from the landside works area under this Contract.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 28 August 2019 and locations of water quality monitoring stations are attached.

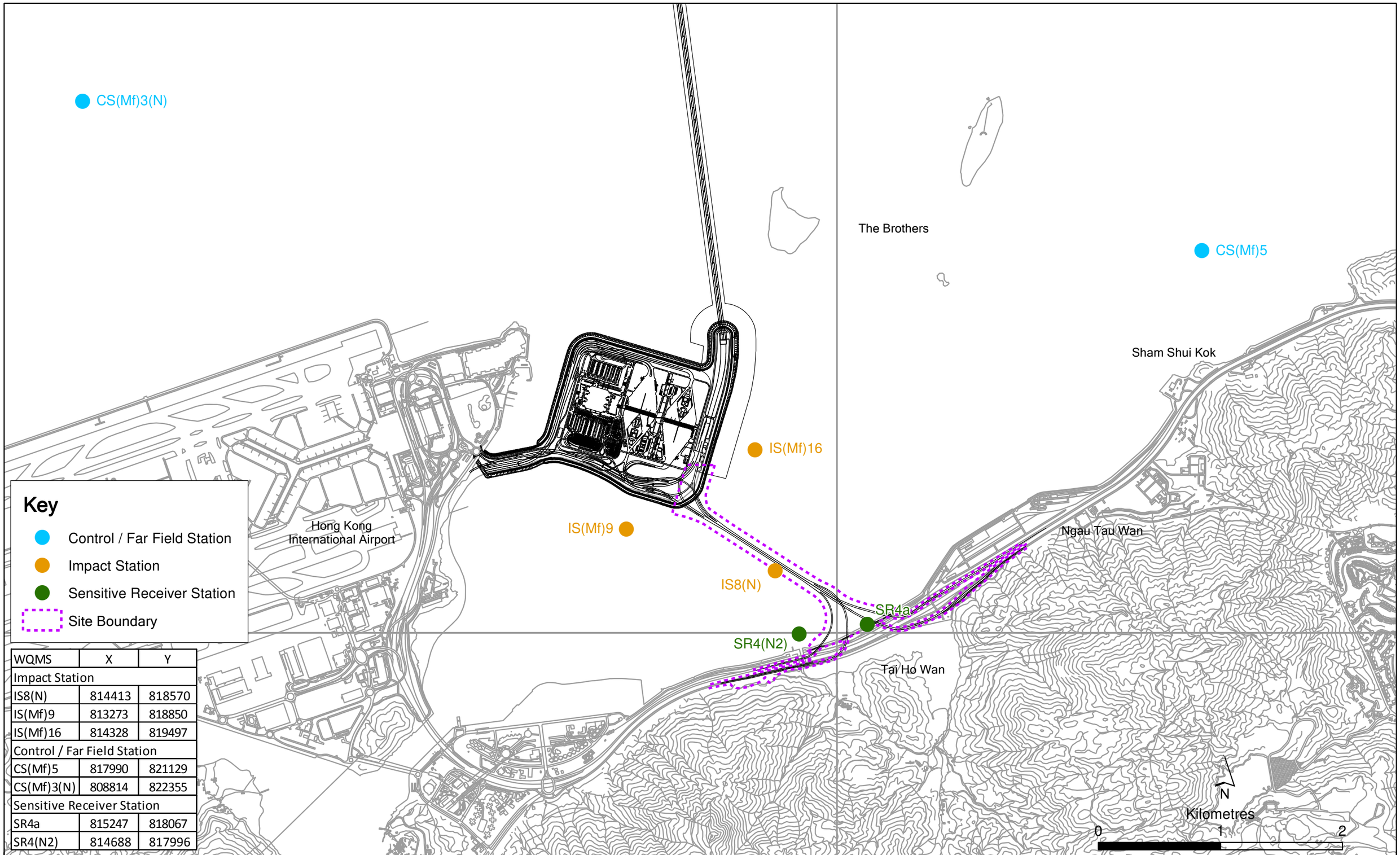
Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Surface	1	1	27.7	7.8	23.3	5.1	4.5	2.1	2.3
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Surface	1	2	27.7	7.9	22.9	5.1		1.9	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Middle	2	1	25.9	7.8	28.8	3.9		1.5	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Middle	2	2	25.9	7.8	28.2	3.9		1.6	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Bottom	3	1	24.8	7.7	31.6	3.2	3.2	3.5	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Bottom	3	2	24.8	7.7	30.9	3.2		3.4	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Surface	1	1	28.7	7.8	20.4	4.9	4.5	1.2	5.2
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Surface	1	2	28.7	7.8	20.0	4.9		1.2	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Middle	2	1	27.9	7.7	23.6	4.0		4.8	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Middle	2	2	27.9	7.7	23.1	4.0		4.9	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Bottom	3	1	27.2	7.7	26.0	3.7	3.7	9.3	
HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Bottom	3	2	27.2	7.6	25.5	3.7		9.8	
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Surface	1	1	28.3	7.8	22.7	4.9	4.9	7.8	8.2
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Surface	1	2	28.3	7.8	22.1	4.9		7.9	
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Middle	2	1							
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Middle	2	2							
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Bottom	3	1	27.5	7.8	24.3	4.9	4.9	8.3	
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Bottom	3	2	27.8	7.8	24.3	4.8		8.9	
HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Surface	1	1	28.1	7.7	21.5	4.8	4.8	6.5	7.4
HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Surface	1	2	28.1	7.8	21.1	4.8		6.1	
HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Middle	2	1							
HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Middle	2	2							
HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Bottom	3	1	27.4	7.7	24.7	4.0	4.0	8.9	
HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Bottom	3	2	27.4	7.7	24.2	4.0		8.2	
HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Surface	1	1	28.2	7.7	21.9	4.3	4.3	9.4	10.0
HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Surface	1	2	28.2	7.8	21.5	4.3		9.6	
HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Middle	2	1							
HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Middle	2	2							
HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Bottom	3	1	27.6	7.7	24.0	3.5	3.5	10.5	
HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Bottom	3	2	27.6	7.7	23.7	3.5		10.6	
HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Surface	1	1	28.0	7.8	22.9	4.6	4.7	7.6	9.1
HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Surface	1	2	28.0	7.7	22.4	4.7		7.3	
HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Middle	2	1							
HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Middle	2	2							
HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Bottom	3	1	27.5	7.7	24.4	4.2	4.4	10.7	
HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Bottom	3	2	27.7	7.7	23.4	4.5		10.8	
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Surface	1	1					5.6		3.6
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Surface	1	2							
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Middle	2	1	29.0	7.8	21.5	5.6		3.8	
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Middle	2	2	29.0	7.8	21.1	5.6		3.3	
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Bottom	3	1					N/A		
HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Bottom	3	2							

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Surface	1	1	27.8	7.8	24.0	4.9	4.2	2.5	8.1
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Surface	1	2	27.8	7.9	23.5	4.9		2.4	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Middle	2	1	25.4	7.8	30.1	3.5		10.9	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Middle	2	2	25.4	7.8	29.5	3.5		10.7	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Bottom	3	1	25.4	7.8	30.1	3.6	3.6	10.6	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Bottom	3	2	25.4	7.8	29.5	3.6		11.3	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Surface	1	1	29.8	7.8	15.1	5.5	5.3	5.9	5.9
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Surface	1	2	29.8	7.8	14.9	5.4		5.1	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Middle	2	1	29.8	7.8	15.2	5.1		6.0	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Middle	2	2	29.8	7.7	14.9	5.2		5.9	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Bottom	3	1	28.2	7.7	19.9	4.5	4.5	6.2	
HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Bottom	3	2	28.4	7.7	20.3	4.4		6.3	
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Surface	1	1	28.7	7.9	22.0	5.8	5.8	9.1	10.4
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Surface	1	2	28.7	7.9	21.6	5.8		9.0	
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Middle	2	1							
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Middle	2	2							
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Bottom	3	1	28.7	7.9	22.1	5.8	5.8	11.6	
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Bottom	3	2	28.6	7.8	21.7	5.8		11.9	
HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Surface	1	1	28.5	7.9	22.2	5.6	5.6	5.9	6.7
HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Surface	1	2	28.5	7.9	21.7	5.6		5.7	
HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Middle	2	1							
HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Middle	2	2							
HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Bottom	3	1	28.1	7.8	23.0	4.2	4.2	7.9	
HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Bottom	3	2	28.1	7.8	22.5	4.2		7.4	
HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Surface	1	1	29.4	7.9	21.2	6.1	6.1	7.9	10.6
HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Surface	1	2	29.4	7.9	20.8	6.1		7.9	
HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Middle	2	1							
HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Middle	2	2							
HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Bottom	3	1	28.8	7.9	22.0	5.2	5.2	13.4	
HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Bottom	3	2	28.8	7.8	21.7	5.2		13.0	
HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Surface	1	1	28.9	7.9	21.5	5.8	5.8	8.5	9.6
HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Surface	1	2	28.9	7.9	21.1	5.8		8.5	
HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Middle	2	1							
HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Middle	2	2							
HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Bottom	3	1	28.9	7.9	21.5	5.8	5.8	11.0	
HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Bottom	3	2	28.9	7.8	21.1	5.8		10.2	
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Surface	1	1					6.2		8.7
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Surface	1	2							
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Middle	2	1	28.8	8.0	21.9	6.1		8.4	
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Middle	2	2	28.8	7.9	21.5	6.2		8.9	
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Bottom	3	1					N/A		
HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Bottom	3	2							

Note:

Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section
Subject	Notification of Exceedance for Marine Water Quality Impact Monitoring
Date	11 September 2019

Dear Sir/ Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0215660_30 August 2019_ Surface & Middle DO_E_Station SR4a
0215660_30 August 2019_ Bottom DO_E_Station SR4a
0215660_30 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0215660_30 August 2019_ Surface & Middle DO_E_Station IS8(N)
0215660_30 August 2019_ Bottom DO_F_Station SR4a
0215660_30 August 2019_ Surface & Middle DO_F_Station SR4(N2)

A total of six (6) exceedances were recorded on 30 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Marine Water Quality Impact Monitoring

Notification of Exceedance

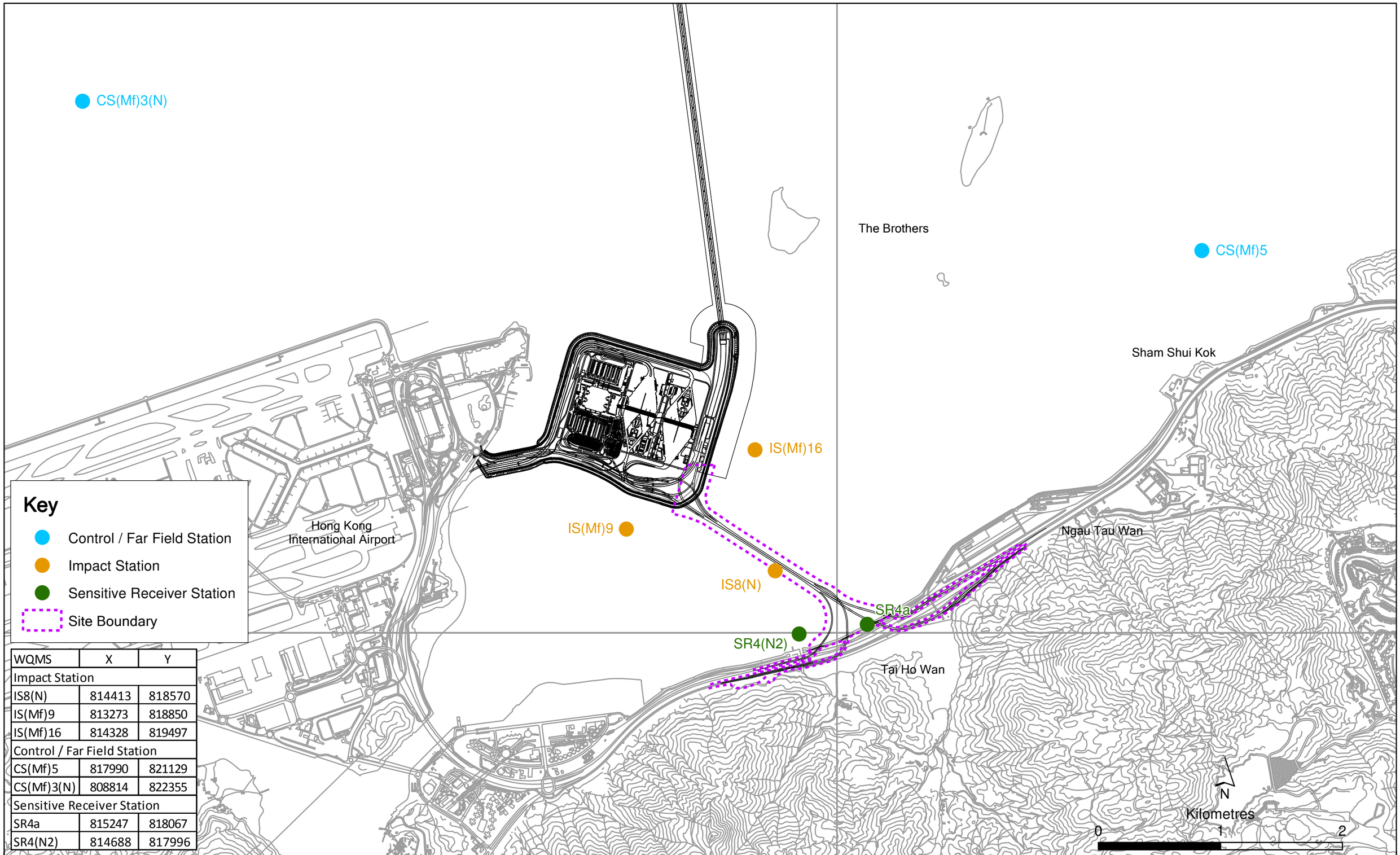
Log No.	**Action Level Exceedance** **0215660_28 August 2019_ Surface & Middle DO_E_Station SR4a** **0215660_28 August 2019_ Bottom DO_E_Station SR4a** **0215660_28 August 2019_ Surface & Middle DO_E_Station SR4(N2)** **0215660_28 August 2019_ Surface & Middle DO_E_Station IS8(N)** **0215660_28 August 2019_ Bottom DO_F_Station SR4a** **0215660_28 August 2019_ Surface & Middle DO_F_Station SR4(N2)** **[Total No. of Exceedance = 6]**	
Date	30 August 2019 (Measured) 11 September 2019 (Results obtained from ENPO Website)	
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N)	
Parameter(s) with Exceedance(s)	Surface and Middle-depth Dissolved Oxygen (DO) Bottom-depth Dissolved Oxygen (DO)	
Action Levels for DO	Surface and Middle-depth DO	5.0 mg/L
	Bottom-depth DO	4.7 mg/L
Limit Levels for DO	Surface and Middle-depth DO	4.2 mg/L
	Bottom-depth DO	3.6 mg/L
Measured Levels	Action Level Exceedance 1. Mid-ebb at SR4a (Surface & Middle-depth DO = 4.5 mg/L) 2. Mid-ebb at SR4a (Bottom-depth DO = 4.5 mg/L) 3. Mid-ebb at SR4(N2) (Surface & Middle-depth DO = 4.8 mg/L) 4. Mid-ebb at IS8(N) (Surface & Middle-depth DO = 4.9 mg/L) 5. Mid-flood at SR4a (Bottom-depth DO 4.1 = mg/L) 6. Mid-flood at SR4(N2) (Surface & Middle-depth DO = 4.9 mg/L)	
Works Undertaken (at the time of monitoring event)	No marine works were undertaken on 30 August 2019.	

Possible Reason for Action or Limit Level Exceedance(s)	The exceedance of DO is unlikely to be due to the Contract, in view of the following: • No marine works were undertaken on 30 August 2019. • The Surface & Middle depth DO with exceedances recorded at the SR4a, SR4(N2) and IS8(N) stations during mi-ebb tide and SR4(N2) during mid-floods tide were similar to the corresponding control stations, CS(Mf)3(N) during mid-ebb and CS(Mf)5 during mid-flood , in which the recorded Surface & Middle-depth DO levels at the corresponding control stations were below Action Level. • In addition, the bottom-depth DO levels at SR4a during mid-flood may possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of SR4a. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level at SR4a. • The bottom-depth DO at SR4a during mid-ebb was similar to the control station where the bottom-depth DO levels were generally lower. DO levels were generally lower at water quality monitoring stations due to reduce in natural ability for water to hold dissolved oxygen under higher water temperature in summer months. In addition, lower bottom-depth DO levels may possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water. • There are no discharge of waste water from the landside works area under this Contract.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 30 August 2019 and locations of water quality monitoring stations are attached.

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Surface	1	1	27.4	7.8	24.4	5.1	5.0	4.7	6.3	7.4	7.1
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Surface	1	2	27.4	7.8	24.3	5.2		4.7		8.3	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Middle	2	1	27.1	7.8	25.4	4.8		6.0		8.8	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Middle	2	2	27.1	7.8	25.4	4.8		6.1		8.3	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Bottom	3	1	26.5	7.8	27.7	4.4	4.4	8.3		8.8	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Bottom	3	2	26.5	7.8	27.7	4.3		8.2		9.8	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Surface	1	1	27.8	7.8	23.5	4.8	4.8	7.1	8.7	8.4	8.1
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Surface	1	2	27.8	7.8	23.5	4.8		7.1		8.6	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Middle	2	1	27.7	7.8	24.2	4.8		9.2		9.2	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Middle	2	2	27.7	7.8	24.2	4.8		9.3		9.5	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Bottom	3	1	27.6	7.8	24.7	5.0	5.0	10.0		6.8	
HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Bottom	3	2	27.6	7.8	24.7	5.0		9.3		5.8	
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Surface	1	1	27.2	7.8	24.9	5.1	5.1	9.7	10.3	11.8	12.2
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Surface	1	2	27.4	7.8	24.7	5.1		9.4		12.1	
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Middle	2	1									
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Middle	2	2									
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Bottom	3	1	26.8	7.8	27.2	4.8	4.8	11.0		12.9	
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Bottom	3	2	26.8	7.8	27.2	4.7		10.9		12.0	
HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Surface	1	1	27.4	7.8	24.7	4.5	4.5	10.2	10.3	12.7	15.1
HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Surface	1	2	27.4	7.8	24.5	4.5		9.9		14.6	
HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Middle	2	1									
HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Middle	2	2									
HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Bottom	3	1	26.8	7.8	26.8	4.5	4.5	10.7		14.3	
HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Bottom	3	2	26.8	7.8	26.8	4.4		10.4		16.4	
HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Surface	1	1	27.6	7.8	23.5	4.8	4.8	12.2	14.1	9.0	11.4
HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Surface	1	2	27.6	7.8	23.5	4.8		11.9		10.2	
HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Middle	2	1									
HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Middle	2	2									
HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Bottom	3	1	27.1	7.8	24.9	4.9	4.9	16.2		13.3	
HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Bottom	3	2	27.2	7.8	24.9	4.9		16.2		13.1	
HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Surface	1	1	27.6	7.8	24.0	4.9	4.9	9.2	11.3	11.8	11.8
HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Surface	1	2	27.6	7.8	24.1	4.9		8.3		11.2	
HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Middle	2	1									
HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Middle	2	2									
HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Bottom	3	1	27.1	7.8	24.4	4.7	4.8	13.8		12.4	
HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Bottom	3	2	27.2	7.8	24.6	4.8		13.8		11.8	
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Surface	1	1	27.8	7.8	24.3	5.1	5.1	9.7	9.5	7.9	5.7
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Surface	1	2	27.8	7.8	24.3	5.1		9.9		8.9	
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Middle	2	1									
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Middle	2	2									
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Bottom	3	1	27.8	7.8	24.2	5.2	5.2	9.2		8.4	
HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Bottom	3	2	27.8	7.8	24.2	5.1		9.1		8.9	

Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Level Code	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Surface	1	1	27.4	7.8	25.0	4.8	4.7	5.4	6.9	7.9	8.8
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Surface	1	2	27.4	7.8	25.1	4.8		5.4		7.1	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Middle	2	1	26.8	7.8	26.7	4.6		7.0		7.8	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Middle	2	2	27.0	7.8	26.1	4.6		7.0		7.9	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Bottom	3	1	26.6	7.8	27.3	4.6	4.6	8.6		11.7	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Bottom	3	2	26.6	7.8	27.3	4.6		8.1		10.4	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Surface	1	1	28.7	7.7	18.4	4.8	4.8	11.1	13.6	8.9	8.6
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Surface	1	2	28.7	7.7	18.4	4.8		11.9		8.0	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Middle	2	1	28.6	7.7	18.7	4.9		13.9		9.2	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Middle	2	2	28.7	7.7	18.7	4.8		13.7		8.5	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Bottom	3	1	28.6	7.7	18.9	4.9	4.9	15.7		8.9	
HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Bottom	3	2	28.6	7.7	18.9	4.9		15.3		7.9	
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Surface	1	1	27.7	7.9	24.2	5.3	5.3	17.1	18.6	8.9	9.6
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Surface	1	2	27.7	7.9	24.2	5.3		17.8		8.4	
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Middle	2	1									
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Middle	2	2									
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Bottom	3	1	27.7	7.9	24.5	5.3	5.3	19.9		10.4	
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Bottom	3	2	27.7	7.9	24.5	5.3		19.4		10.6	
HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Surface	1	1	27.6	7.9	24.0	5.0	5.0	10.4	12.4	14.5	13.4
HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Surface	1	2	27.7	7.9	23.9	5.0		10.2		12.9	
HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Middle	2	1									
HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Middle	2	2									
HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Bottom	3	1	27.3	7.9	26.5	4.1	4.1	14.1		14.0	
HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Bottom	3	2	27.3	7.9	26.5	4.0		14.8		13.2	
HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Surface	1	1	27.5	7.9	24.6	4.9	4.9	9.6	9.9	10.9	13.2
HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Surface	1	2	27.5	7.9	24.4	4.9		9.9		12.3	
HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Middle	2	1									
HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Middle	2	2									
HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Bottom	3	1	27.4	7.9	24.8	5.0	5.0	9.9		13.9	
HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Bottom	3	2	27.4	7.9	24.8	4.9		10.0		15.7	
HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Surface	1	1	27.7	7.9	24.3	5.3	5.3	10.3	10.6	10.4	11.2
HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Surface	1	2	27.7	7.9	24.2	5.3		10.3		9.5	
HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Middle	2	1									
HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Middle	2	2									
HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Bottom	3	1	27.7	7.9	24.4	5.4	5.4	10.9		13.0	
HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Bottom	3	2	27.7	7.9	24.4	5.4		10.9		11.7	
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Surface	1	1	27.7	8.0	24.5	5.8	5.8	16.8	18.0	8.9	6.3
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Surface	1	2	27.7	8.0	24.5	5.8		16.6		7.9	
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Middle	2	1									
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Middle	2	2									
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Bottom	3	1	27.7	8.0	24.5	5.9	5.9	19.3		8.1	
HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Bottom	3	2	27.7	8.0	24.5	5.8		19.3		7.7	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station
- Site Boundary

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4a	815247	818067
SR4(N2)	814688	817996

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 20/7/2019

Environmental Resources Management

ERM

Email message

Environmental Resources Management

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25/F
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E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/07 Tuen Mun–Chek Lap Kok Link–Southern Connection Viaduct Section
Subject	Notification of Exceedance for Impact Dolphin Monitoring
Date	27 December 2019

Dear Sir or Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

0215660_June/August2019_dolphin_STG&ANI_NEL&NWL

A total of one limit level exceedance was recorded in the quarterly impact dolphin monitoring data between June and August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/07
TUEN MUN – CHEK LAP KOK LINK – SOUTHERN CONNECTION VIADUCT SECTION

Impact Dolphin Monitoring
Notification of Exceedance

Log No.	**0215660_Jun/Aug2019_dolphin_STG&ANI_NEL&NWL** **[Total No. of Exceedance = 1]**	
Date	June to August 2019 (monitored) 9 December 2019 (results received by ERM)	
Monitoring Area	Northeast Lantau (NEL) and Northwest Lantau (NWL)	
Parameter(s) with Exceedance(s)	Quarterly encounter rate of dolphin sightings (STG) Quarterly encounter rate of total number of dolphins (ANI)	
Action Levels	North Lantau Social cluster	NEL: STG < 4.2 & ANI < 15.5 or NWL: STG < 6.9 & ANI < 31.3
Limit Levels		NEL: STG < 2.4 & ANI < 8.9 and NWL: STG < 3.9 & ANI < 17.9
Recorded Levels	NEL	STG = 0 & ANI = 0
	NWL	STG = 0.62 & ANI = 1.55
	One Limit Level Exceedance was recorded in the quarterly impact dolphin monitoring at NEL and NWL between June and August 2019. The exceedance was reported in the approved *Seventieth Monthly EM&A Report* dated 12 September 2019.	
Statistical Analyses	Further to the review of the available and relevant dolphin monitoring data in the EM&A under this Contract, statistical analyses were conducted as follows: • A two-way ANOVA with repeated measures and unequal sample size was conducted using Period (2 levels: baseline vs impact – present impact quarter, June to August 2019) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and present impact monitoring quarter. By setting $\alpha = 0.05$ as the significance level in the statistical tests, significant differences in STG ($p = 0.0011$) and ANI ($p = 0.0062$) were detected between Periods. • A two-way ANOVA with repeated measures and unequal sample size was conducted using Cumulative Period (2 levels: baseline vs impact – cumulative quarters, December 2012 to August 2019) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and cumulative impact monitoring quarter. By setting $\alpha = 0.00001$ as the significance level in the statistical tests, significant difference in STG ($p = 0.000000$) and in ANI ($p = 0.000000$) between Cumulative Period (baseline and impact phases) and Location (NEL and NWL) were detected. * Note: The commencement date under *Contract No. HY/2012/07* is 31 October 2013.	
Works Undertaken (in the monitoring quarter)	In the quarter between June and August 2019, the only marine works undertaken under *Contract No. HY/2012/07* was reinstatement of seawall at seafront in July 2019. No marine works were undertaken under *Contract No. HY/2012/07* in August and September 2019.	

Possible Reason for Action or Limit Level Exceedance(s)	The potential factors that may have contributed to the observed exceedance are reviewed below: Blocking of CWD travelling corridor: • The Monitoring of Marine Mammals in Hong Kong Waters (2018 – 19) [(1)] reported that dolphin usage and traveling activities to the northern side of the airport (dolphin traveling corridor) are affected by frequent high-speed ferry traffic from Sky Pier (not related to this Contract), which is likely one of the factors resulting in the decrease in dolphin abundances in North Lantau. Marine works of the Contract: • As per the findings from the EIA report (Section 8.11.9), the major influences on the Chinese White Dolphin (CWD) Sousa chinensis under this Contract are marine traffics and bored piling works. The Monitoring of Marine Mammals in Hong Kong Waters (2018-2019) reported that CWD decline were likely influenced by reclamation works from construction activities. • Based on these possible reasons, implementation of mitigation measures are reviewed. This Contract does not have any reclamation works, thus no habitat loss was caused by reclamation. In the reporting period, the Contractor implemented the marine traffic control as per the requirements in the EP-354/2009/D and the updated EM&A Manual. Most of the vessels of this Contract also worked within the site boundary, in which the area is seldom used by CWD. Disturbance from vessels of this Contract is considered minor. All of the marine bored piling works of this Contract was completed in September 2015. As informed by the Contractor on 1 July 2019 and confirmed by SOR on 21 August 2019, no marine works would be undertaken under the Contract. Thus, underwater noise emission from this Contract had been substantially reduced. During dolphin monitoring in this quarter, no unacceptable impact on CWD due to the activities under this Contract was observed. Impact on water quality: • According to the findings in the water quality monitoring results at the impact monitoring stations between June to August 2019, there were a total of thirty one (31) Action Level exceedances and three (3) Limit Level exceedances of bottom-depth dissolved oxygen (DO) and fifteen (15) Action Level exceedance of surface and middle-depth DO recorded for water quality impact monitoring in the reporting period. No Turbidity and Suspended Solids (SS) exceedances were recorded for water quality impact monitoring in the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation reports are presented in Appendix L of the 23rd Quarterly EM&A Report (June to August 2019). In view of the above, marine ecological mitigation measures were considered properly implemented, and thus no unacceptable impact on CWD or its habitat was associated with this Contract in this quarter.

(1) Hung SKY (2018). Prepared for AFCD. Available at: https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/files/Final_Report_2018_19.pdf

Actions Taken / To Be Taken	With reference to the site inspection records in this quarter, the respective marine ecological mitigation measures have been implemented properly by the Contractor throughout the marine works period, including: 1. 250m dolphin exclusion zone undertaken in June 2019 (No marine works were undertaken in July and August 2019, therefore, daily 250 m marine mammal exclusion zone monitoring was not undertaken in July and August 2019); 2. Acoustic decoupling plan; 3. Training to workers; 4. Offsite vessel routing control in accordance with Regular Marine Travel Routes Plan, including routing control within existing marine park boundaries; 5. Vessels speed limited at 5 knots and 10 knots within existing marine park boundaries and site boundary respectively; 6. Idling and mooring of working vessels within site boundary The existing mitigation measures are recommended to be continuously implemented. Furthermore, it is also recommended to reduce the vessels for marine works as much as possible. It was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified or separate from the other stress factors. The dolphin specialists of the Projects confirmed that the CWD sighting nearby north of Sha Chau and Lung Kwu Chau Marine Park has significantly declined. The reason for the decline was likely related to the re-routing of high-speed ferry from Skypier. The ET will keep reviewing the implementation status of the dolphin related mitigation measures and remind the contractors to ensure the relevant measures are fully implemented. Furthermore, it was recommended that the marine works of HZMB projects should be completed as soon as possible to reduce the overall duration of impacts and allow the dolphins population to recover as early as possible. In addition, the protection measures (e.g. speed limit control) for the BMP are implemented so as to provide a better habitat for dolphin recovery. It is noted that even though marine vessels may moor within the mooring site of BMP, commercial activities including loading / unloading / transhipment are not allowed except a permit is obtained. The HZMB works vessels were recommended to avoid the BMP. It was also recommended that the marine works footprint and vessels for the marine works should be reduced as much as possible, and vessels idling / mooring in other part of the North Lantau shall be avoided whenever possible.
Remarks	The results of impact water quality and impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved *Sixty-eighth* to *Seventieth Monthly EM&A Reports*. Comparison on water quality between impact and baseline periods is elaborated in the *23rd Quarterly EM&A Report*.