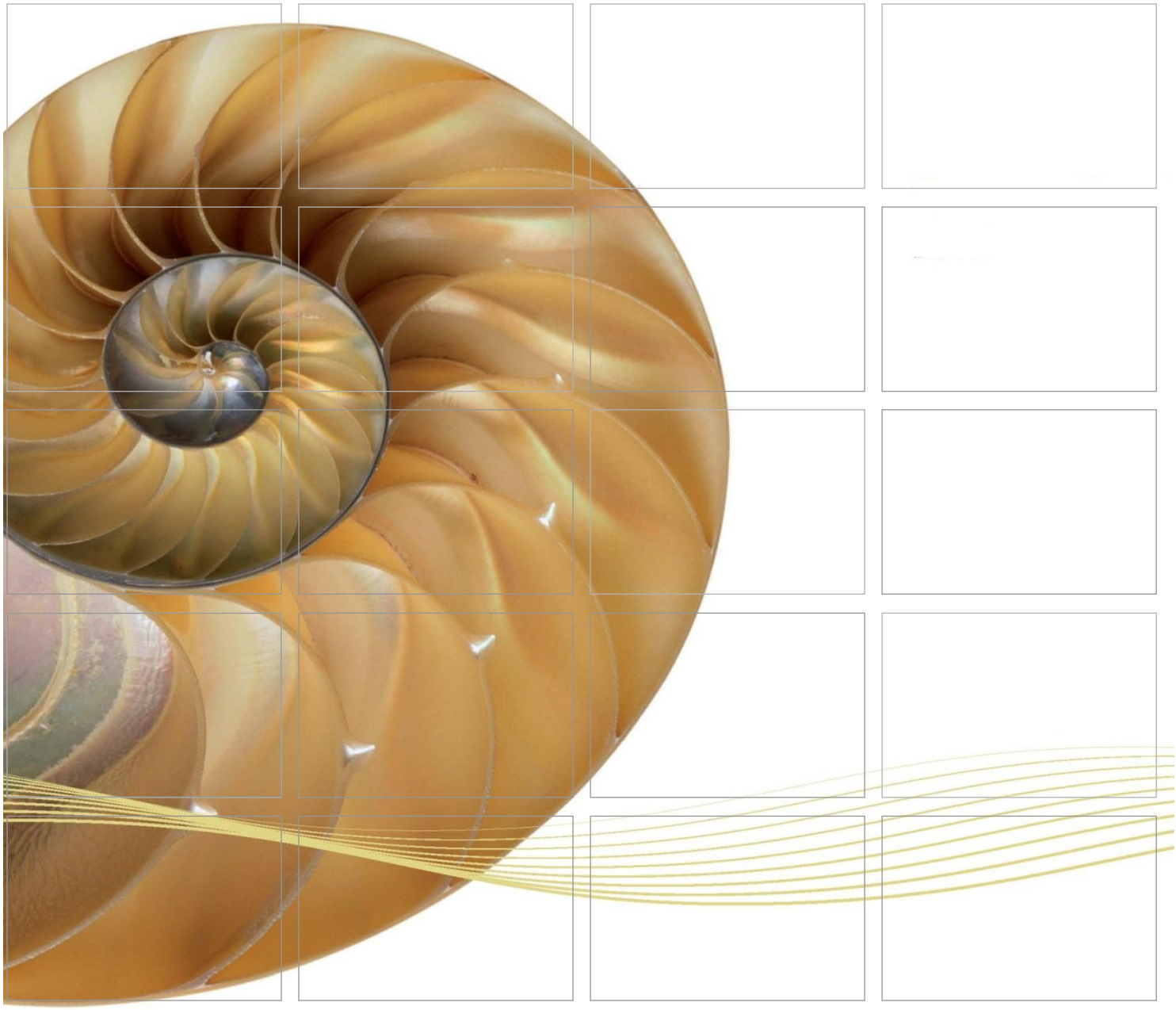
Report



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

Eleventh Quarterly Environmental Monitoring & Audit (EM&A) Report

2 December 2016

Environmental Resources Management
16/F, Berkshire House
25 Westlands Road
Quarry Bay, 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

Eleventh Quarterly Environmental Monitoring & Audit (EM&A) Report

Document Code:
0215660_11th Qtr EM&A_20161202.doc

Environmental Resources Management

16/F, Berkshire House
25 Westlands Road
Quarry Bay, Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
http://www.erm.com

Client:	Project No:
Gammon	0215660
Summary:	Date: 2 December 2016
This document presents the Eleventh Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Southern Connection Viaduct Section.	Approved by: *Mr Craig Reid* *Partner*
	Certified by: *Mr Jovy Tam* *ET Leader*

Revision	Description	By	Checked	Approved	Date
	11th Quarterly EM&A Report	VAR	JT	CAR	2/12/16

This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

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Ref.: HYDHZMBEEM00_0_4894L.16

29 December 2016

AECOM
Supervising Officer's Representative's Office
780 Cheung Tung Road, Lantau, N.T.

By Fax (3691 2899) and By Post

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
11th Quarterly EM&A Summary Report (June 2016 to August 2016)

Reference is made to the 11th Quarterly Environmental Monitoring and Audit (EM&A) Report (June 2016 to August 2016) (ET's ref.: "0215660_11th Qtr EM&A_20161202.doc" dated 2 December 2016) certified by the ET Leader and provided to us via e-mail on 5 December 2016.

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

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

Yours sincerely,

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

c.c. HyD – Mr. Stephen Chan (By Fax: 3188 6614)
HyD – Mr. Vico Cheung (By Fax: 3188 6614)
AECOM – Mr. Conrad Ng (By Fax: 3922 9797)
ERM – Mr. Jovy Tam (By Fax: 2723 5660)
Gammon – Mr. Roy Leung (By Fax: 3520 0486)

Internal: DY, YH, ENPO Site

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Ramboll Environ 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-Environ.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 Environ 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 2018. 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 Eleventh Quarterly EM&A Report presenting the EM&A works carried out during the period from 1 June to 31 August 2016 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 2016</u>

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;

- Construction of marine section of berth at Southern Landfall;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Construction of land section of berth at Southern Landfall;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

July 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Construction of land section of berth at Southern Landfall;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

August 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Construction of land section of berth at Southern Landfall;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

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

24-hour TSP monitoring	18 sessions
1-hour TSP monitoring	18 sessions
Noise monitoring	18 sessions
Water quality monitoring	38 sessions
Dolphin monitoring	6 sessions
Joint Environmental site inspection	13 sessions

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Levels was recorded for air quality monitoring 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

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

Impact Dolphin Monitoring

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June and August 2016. 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. The exceedances are considered unlikely due to the works of this Project upon further investigation.

Daily marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. No Passive Acoustic Monitoring (PAM) was implemented as the marine piling works were not carried out

outside the daylight hours in this reporting period. No sighting of Chinese White Dolphin was recorded in the monitoring period during the exclusion zone monitoring.

Environmental Complaints, Non-compliance & Summons

No environmental complaint, notification of summons and successful prosecution was received 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:

<u>September 2016</u>

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

<u>October 2016</u>

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

November 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are mainly associated with air quality, noise, marine water quality, marine ecology and 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 Environ 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 2018. 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 Eleventh 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 2016.

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
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Daniel Ip	3553 3800	2492 2057
	Resident Engineer	Kingman Chan	3691 2950	3691 2899
ENPO / IEC (Ramboll Environ Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3547 2133	3465 2899
	IEC	Dr. F.C. Tsang	3547 2134	3465 2899
Contractor (Gammon Construction Limited)	Environmental Manager	Brian Kam	3520 0387	3520 0486
	Environmental Officer	Roy Leung	3520 0387	3520 0486
	24-hour Complaint Hotline		9738 4332	
ET (ERM-HK)	ET Leader	Jovy Tam	2271 3113	2723 5660

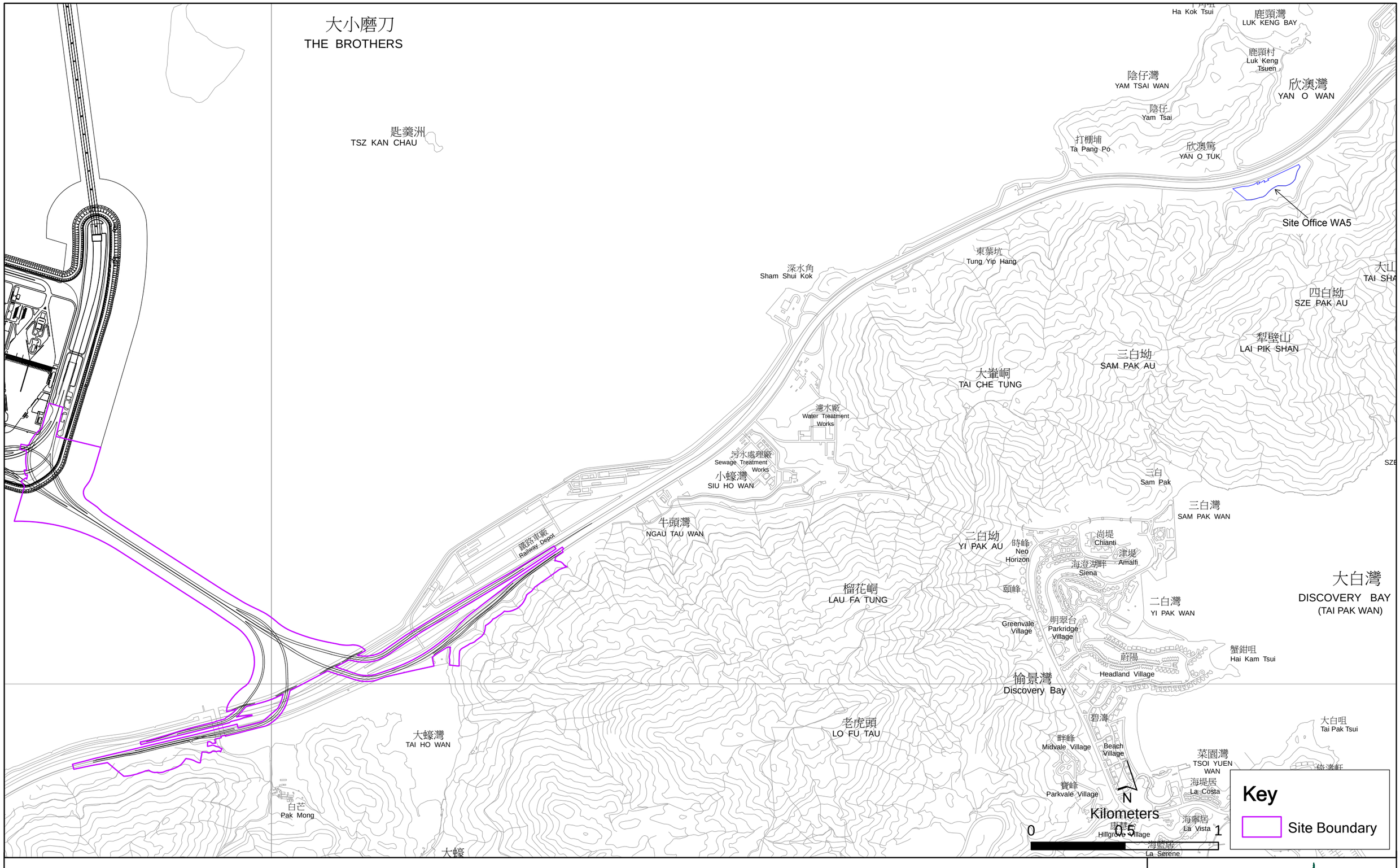

Figure 1.1

General Layout Plan of the Project

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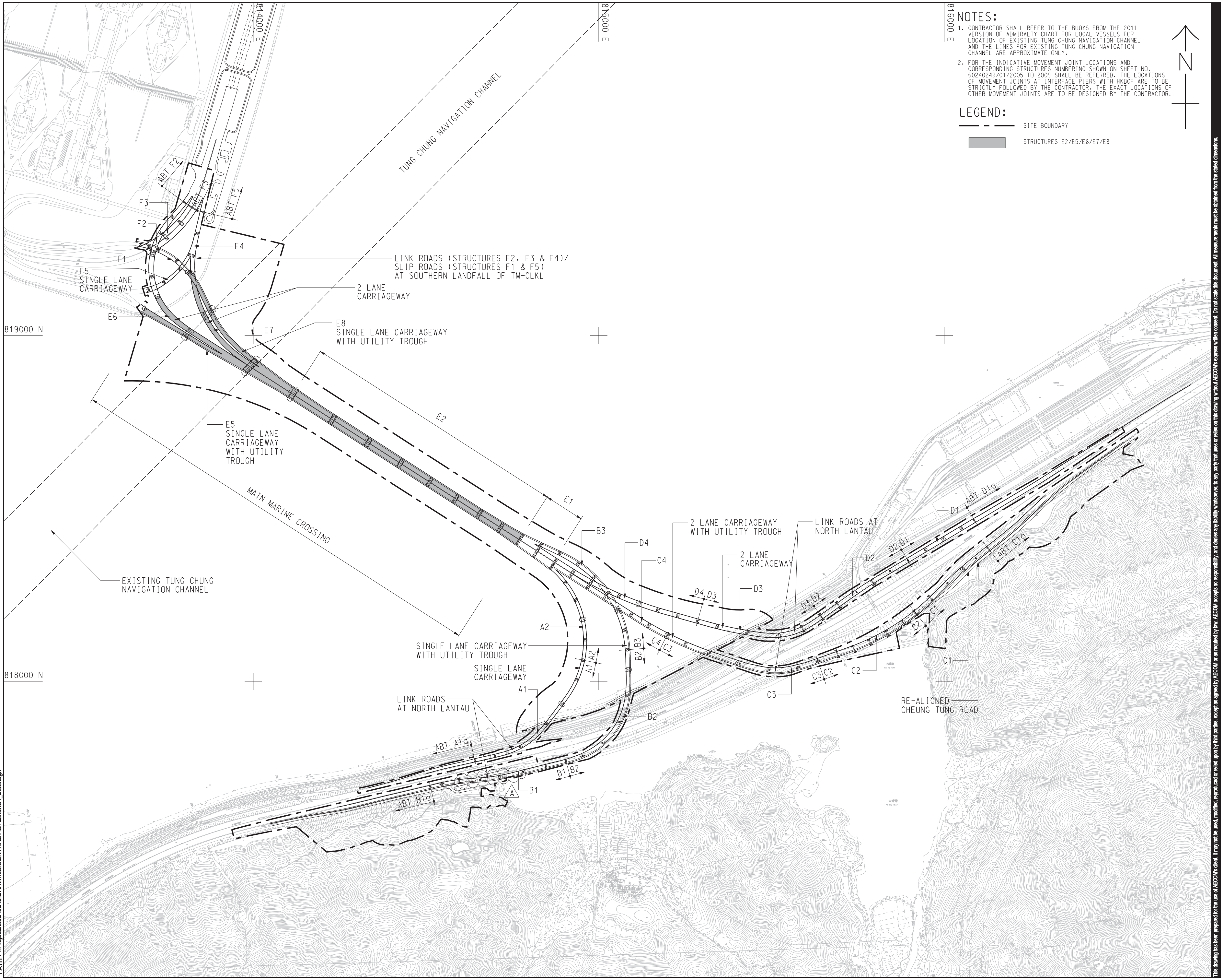
Environmental Resources Management

ERM



NOTES:

1. CONTRACTOR SHALL REFER TO THE BUOYS FROM THE 2011 VERSION OF ADMIRALTY CHART FOR LOCAL VESSELS FOR LOCATION OF EXISTING TUNG CHUNG NAVIGATION CHANNEL AND THE LINES FOR EXISTING TUNG CHUNG NAVIGATION CHANNEL ARE APPROXIMATE ONLY.
2. FOR THE INDICATIVE MOVEMENT JOINT LOCATIONS AND CORRESPONDING STRUCTURES NUMBERING SHOWN ON SHEET NO. 60240249/C1/2005 TO 2009 SHALL BE REFERRED. THE LOCATIONS OF MOVEMENT JOINTS AT INTERFACE PIERS WITH HKBCF ARE TO BE STRICTLY FOLLOWED BY THE CONTRACTOR. THE EXACT LOCATIONS OF OTHER MOVEMENT JOINTS ARE TO BE DESIGNED BY THE CONTRACTOR.

LEGEND:

SITE BOUNDARY

STRUCTURES E2/E5/E6/E7/E8

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

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AECOM

PROJECT 項目

TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE

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

CLIENT 業主

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 工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS 分判工程顧問公司

Figure 1.2a

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-	OCT. 12	TENDER DRAWING	CWN

STATUS 階段

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KEY PLAN 索引圖

PROJECT NO. 項目編號: 60240249

CONTRACT NO. 合約編號: HY/2012/07

SHEET TITLE 圖紙名稱

SOUTHERN CONNECTION GENERAL LAYOUT PLAN

SHEET NUMBER 圖紙編號

60240249/C1/2000A

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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

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B	SUBMISSION	RC	07/13				
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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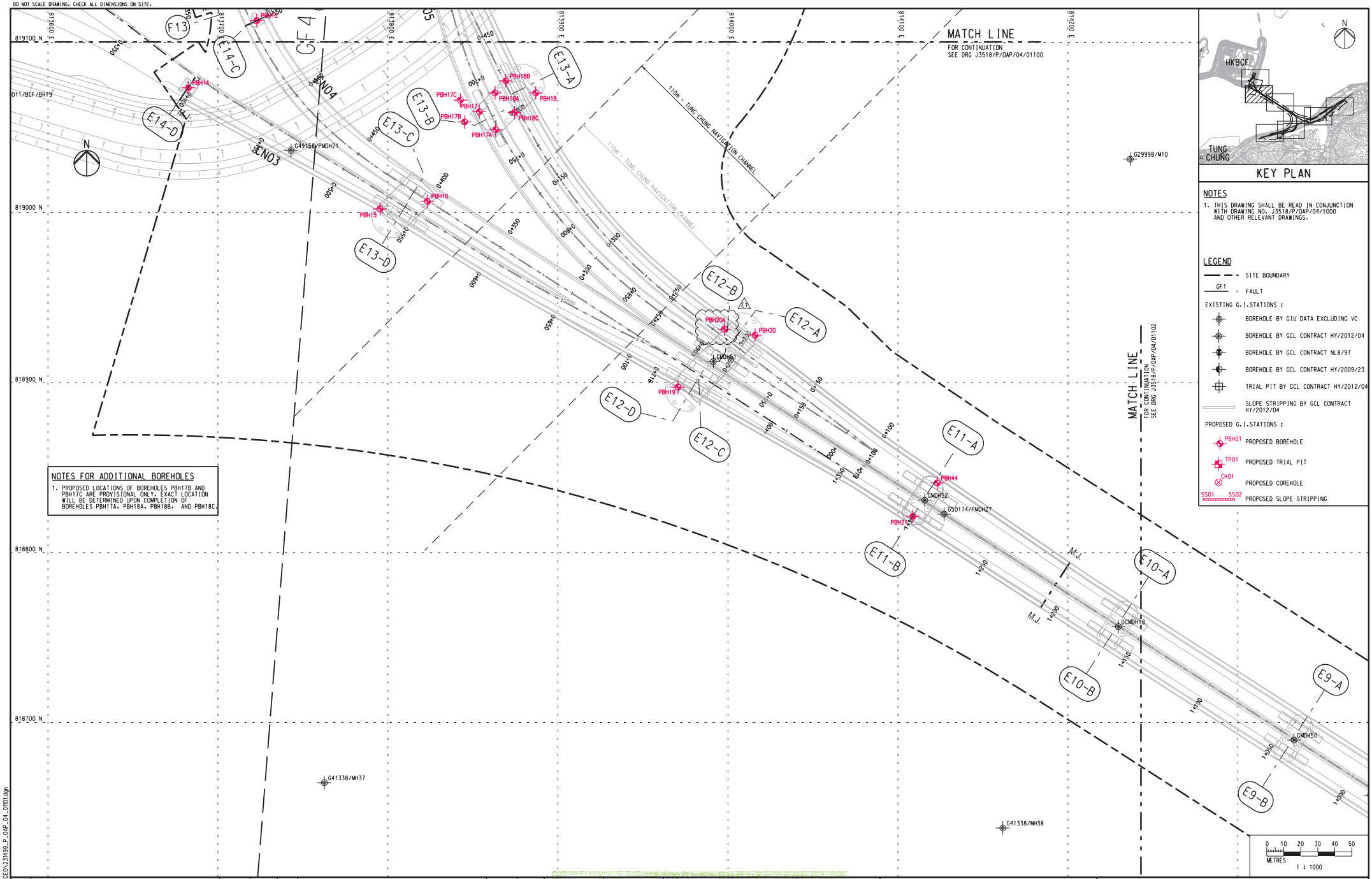

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C	SUBMISSION	RC	09/13				
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E1	FOR INTERNAL REVIEW	RC	11/13				

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Client: 路政署 HIGHWAYS DEPARTMENT 香港項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

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Drawing no. J3518/P/OAP/04/01101 Rev. E1

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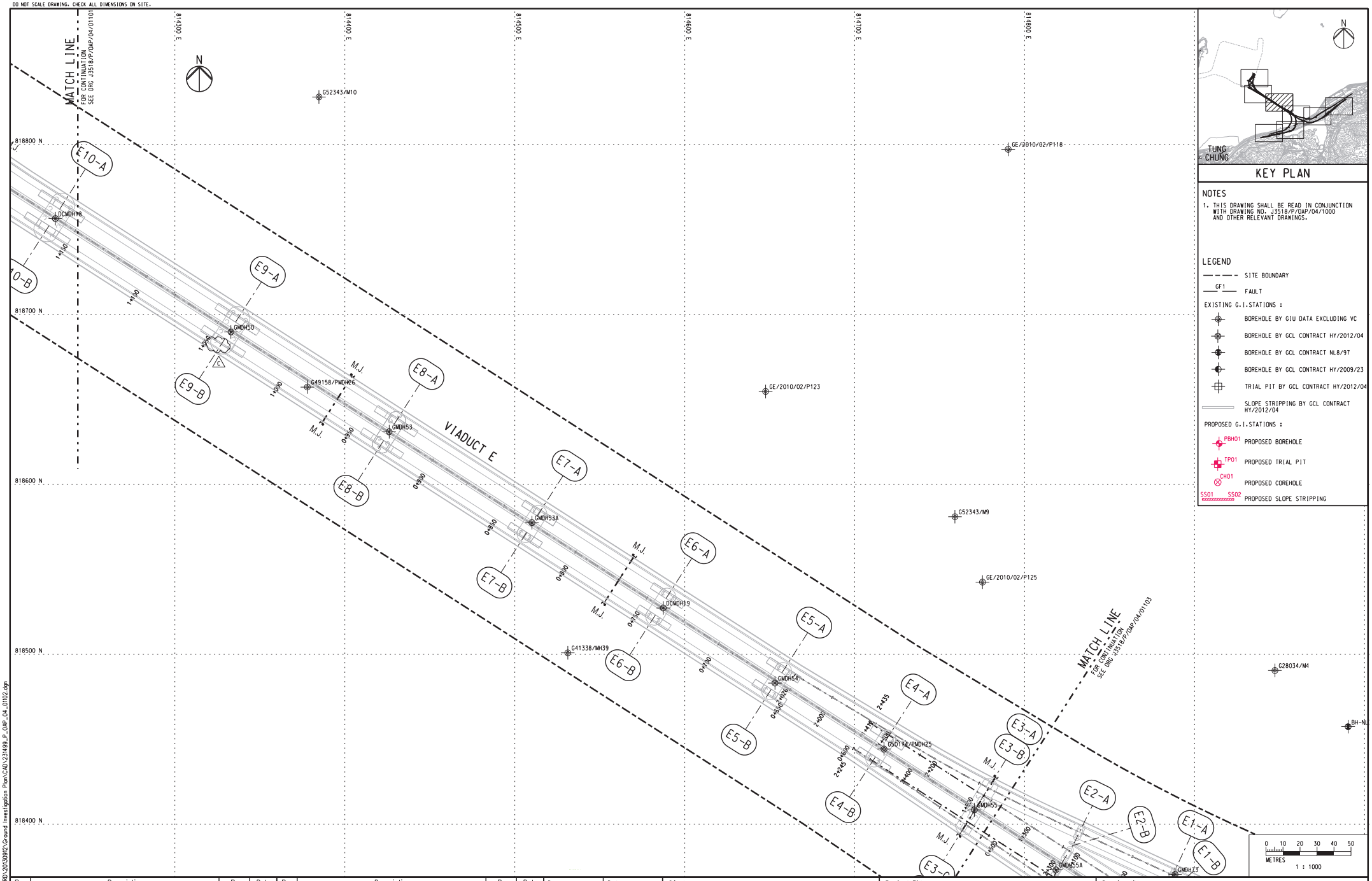

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C	SUBMISSION	RC	09/13

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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 1.2d**

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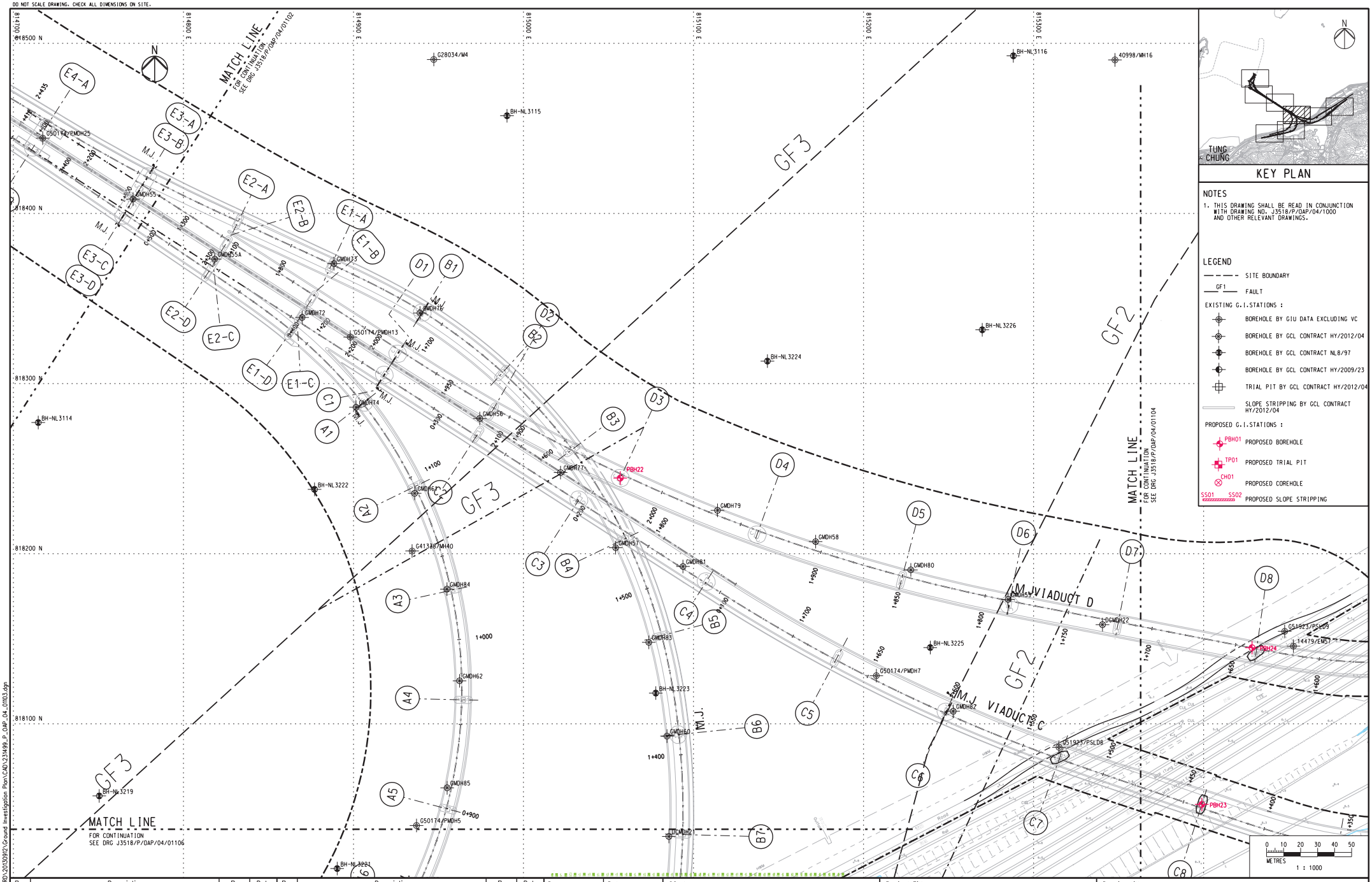

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C	SUBMISSION	RC	09/13				

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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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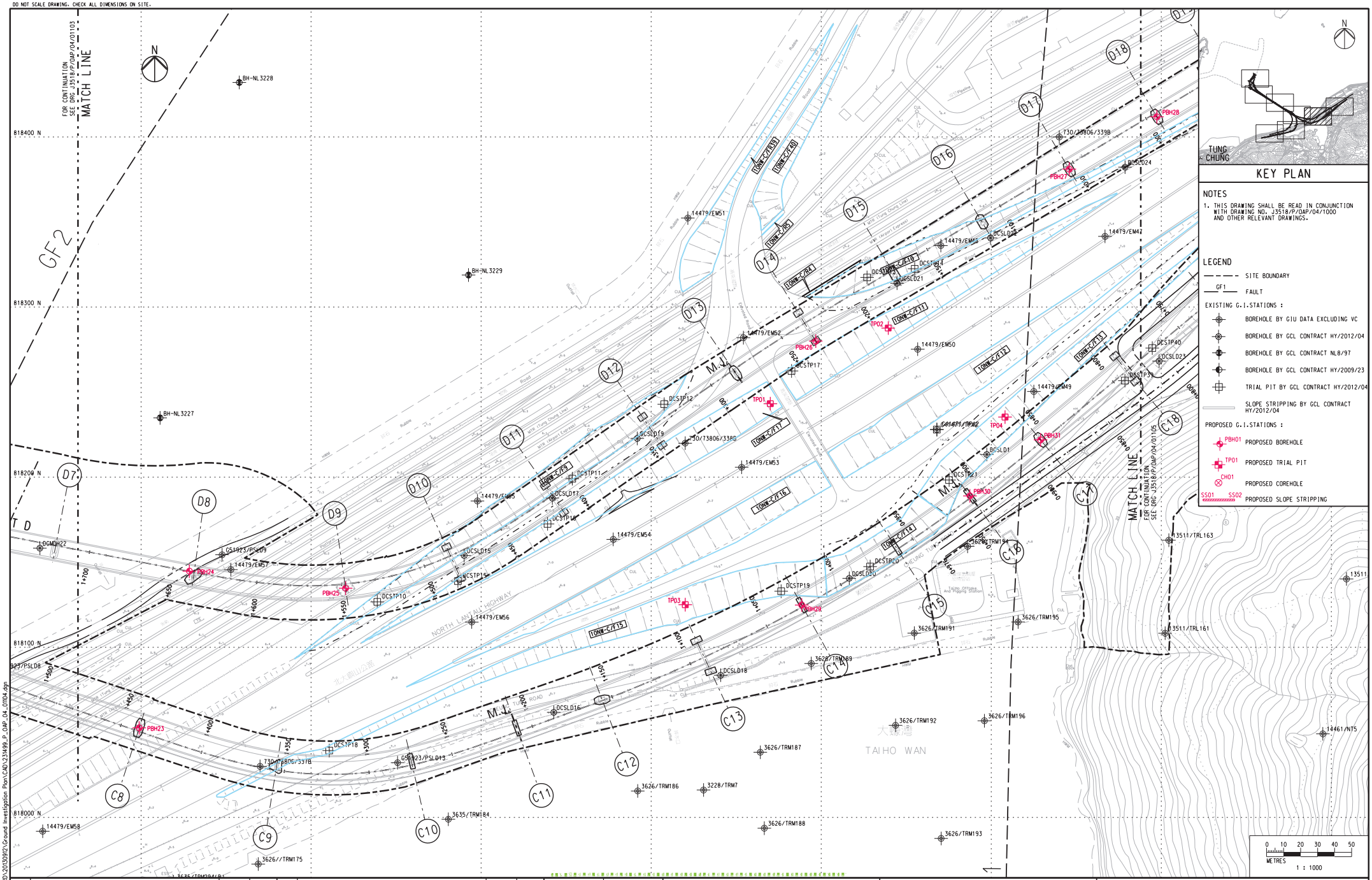

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Project Title: Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section

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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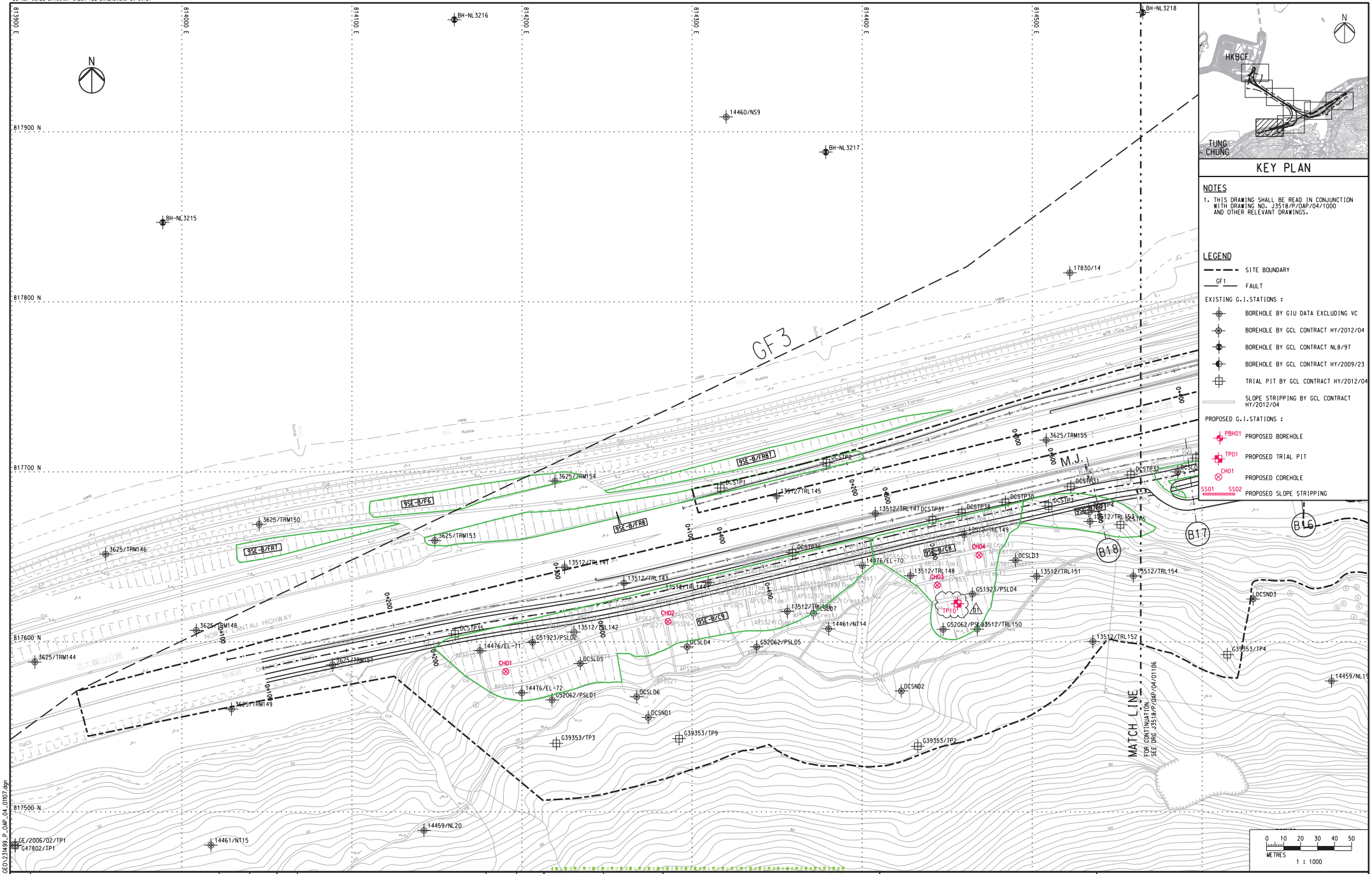

KEY PLAN

NOTES

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LEGEND

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- GF1 FAULT

EXISTING G.I.STATIONS :

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PROPOSED G.I.STATIONS :

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

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B	SUBMISSION	RC	07/13				
C	SUBMISSION	RC	09/13				
D1	FOR INTERNAL REVIEW	RC	11/13				

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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

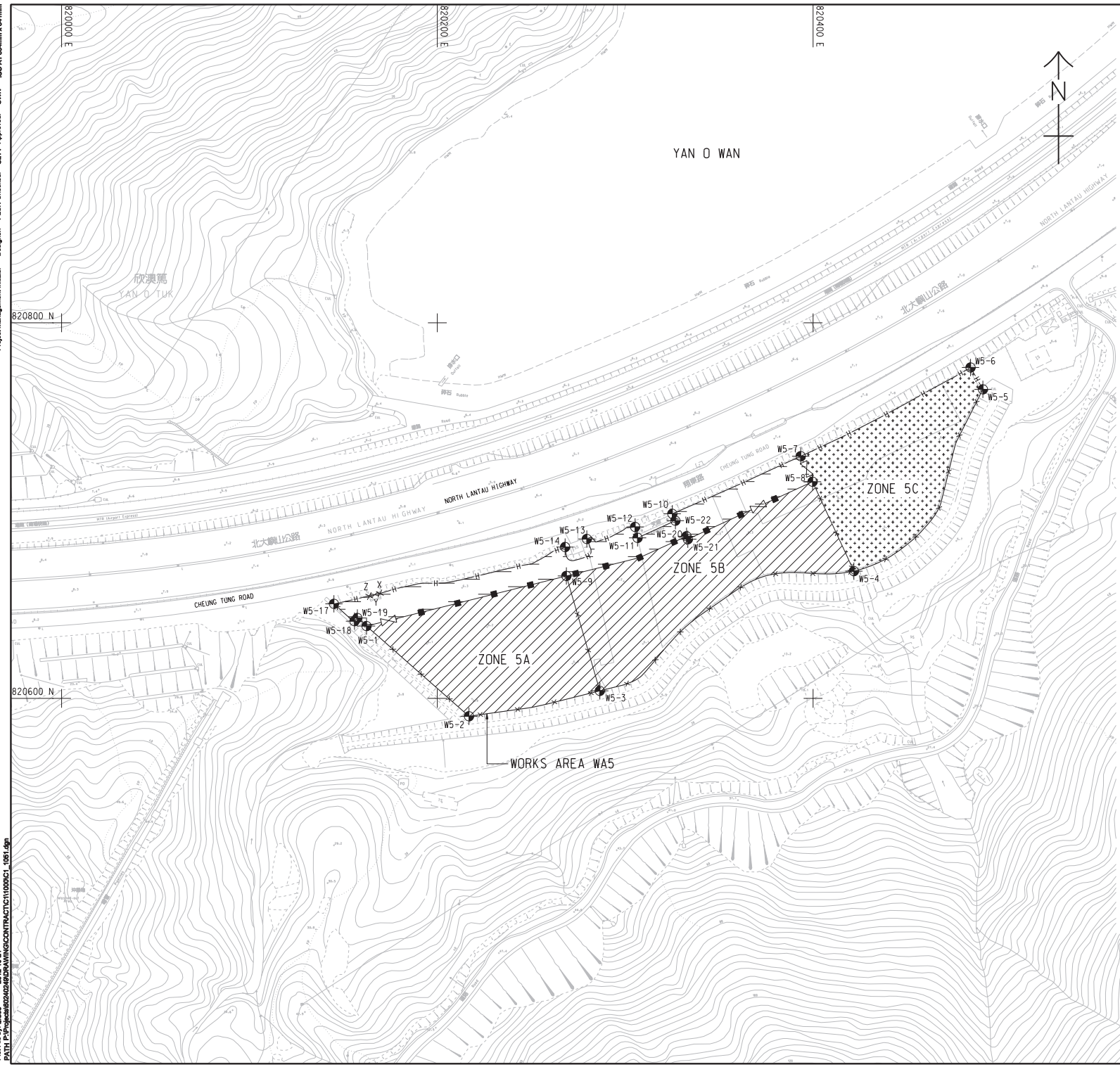
Contractor: Gammon

Originator: ARUP

Drawing title: **Figure 1.2g**

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

Printed by : 07/11/2013
File name : J3518/P/OAP/ARUP/GEO/231499_P_OAP_04_01107.dgn



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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
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
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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
PATH: P:\Projects\60240249\DRAWING\CONTRACT\C1\1000\C1_1051.dgn

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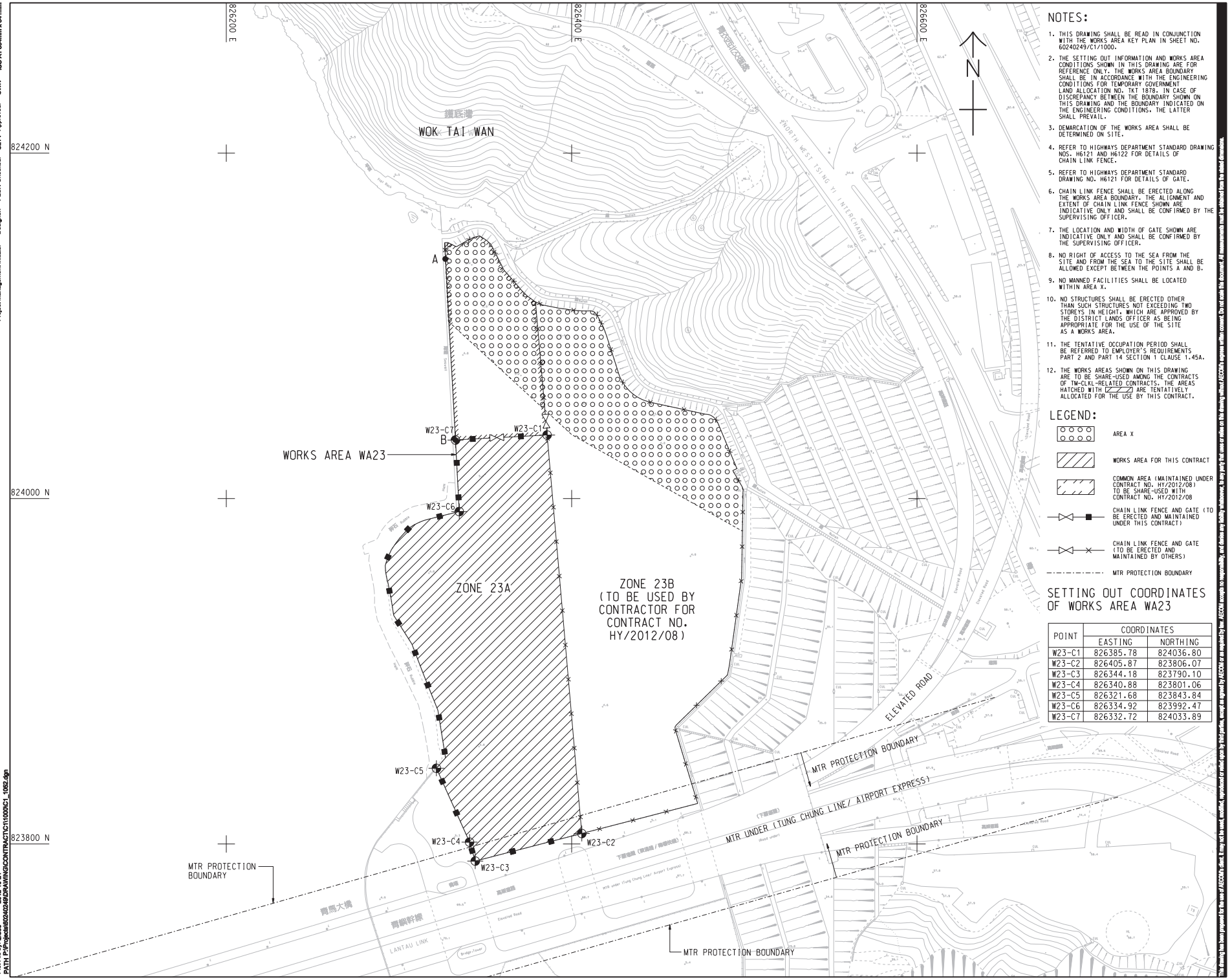

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3. DEMARCATION OF THE WORKS AREA SHALL BE DETERMINED ON SITE.
4. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6121 AND H6122 FOR DETAILS OF CHAIN LINK FENCE.
5. REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NO. H6121 FOR DETAILS OF GATE.
6. 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.
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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

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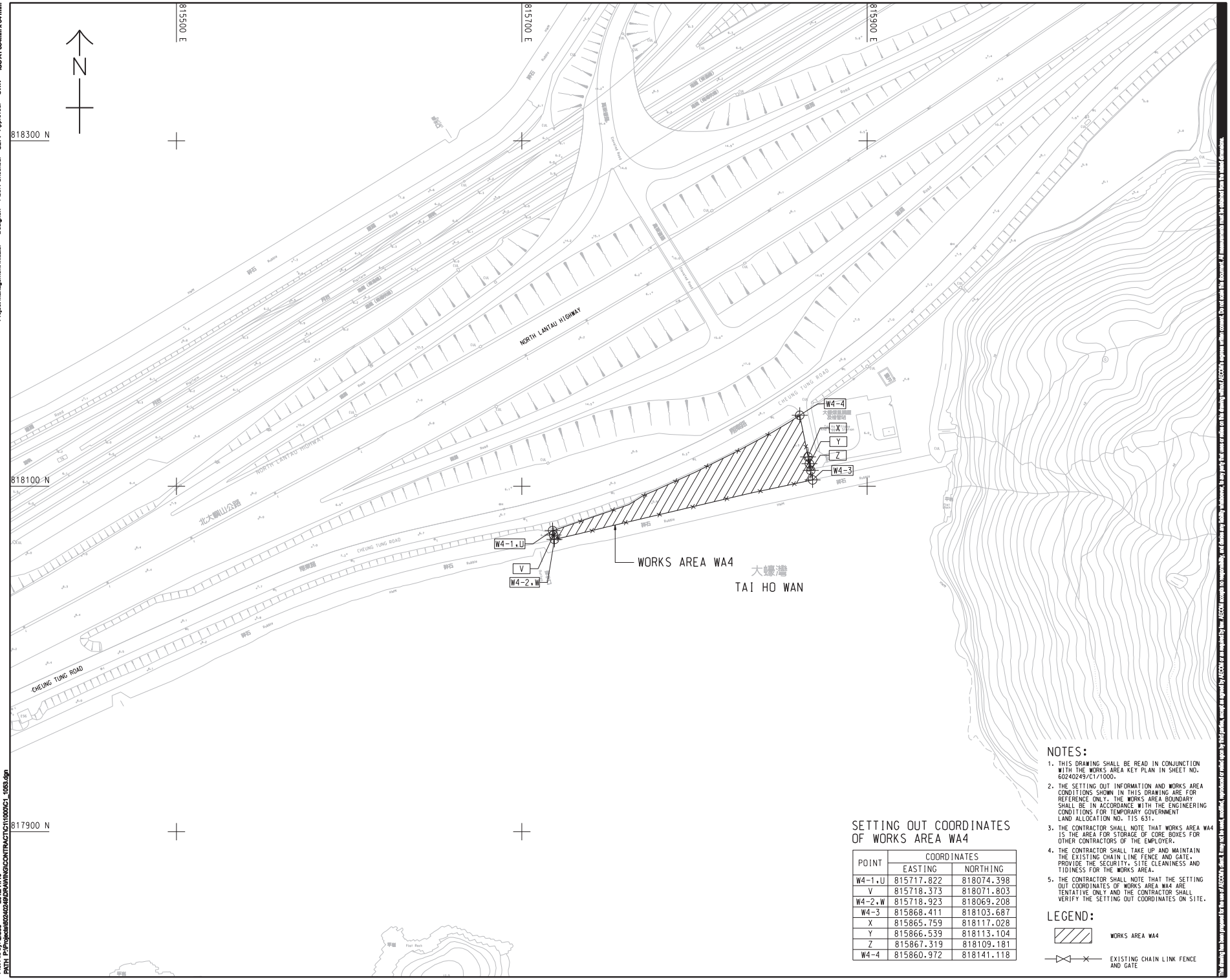

Project Management Initials: Designer: PLCK Checked: SLYY Approved: CWN ISO A1 594mm x 841mm

Plot File by: LIUJ3 2012/11/16
PATH: P:\Projects\60240249\DRAWING\CONTRACT\C1\1000\C1_1053.dgn

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

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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

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Figure 1.2j

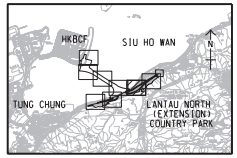
ISSUE/REVISION

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

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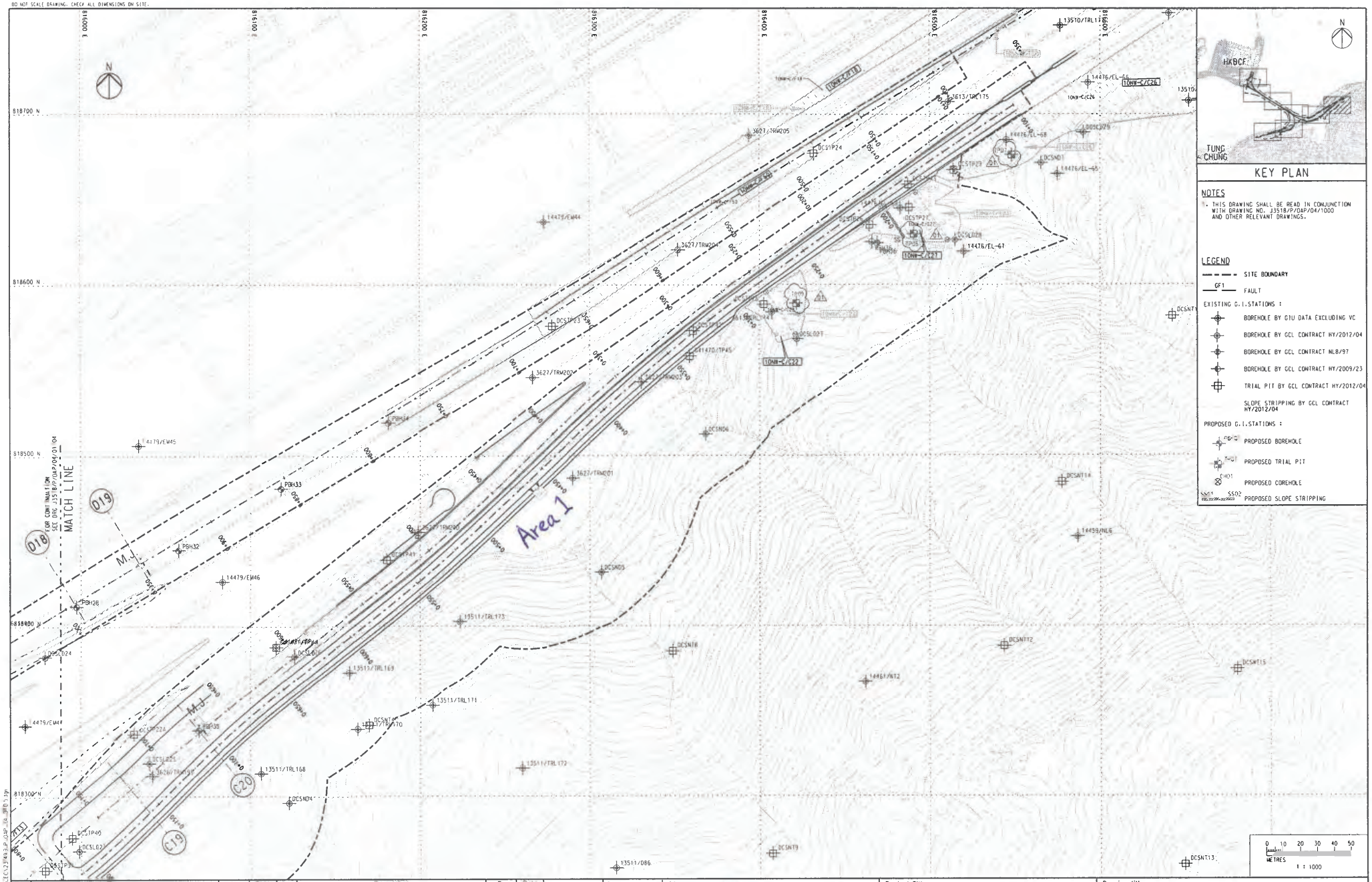

KEY PLAN

NOTES

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NO. J3518/P/OAP/04/1000 AND OTHER RELEVANT DRAWINGS.

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

Rev.	Description	By	Date	Rev.	Description	By	Date
A	[illegible]	RL	07/13				
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

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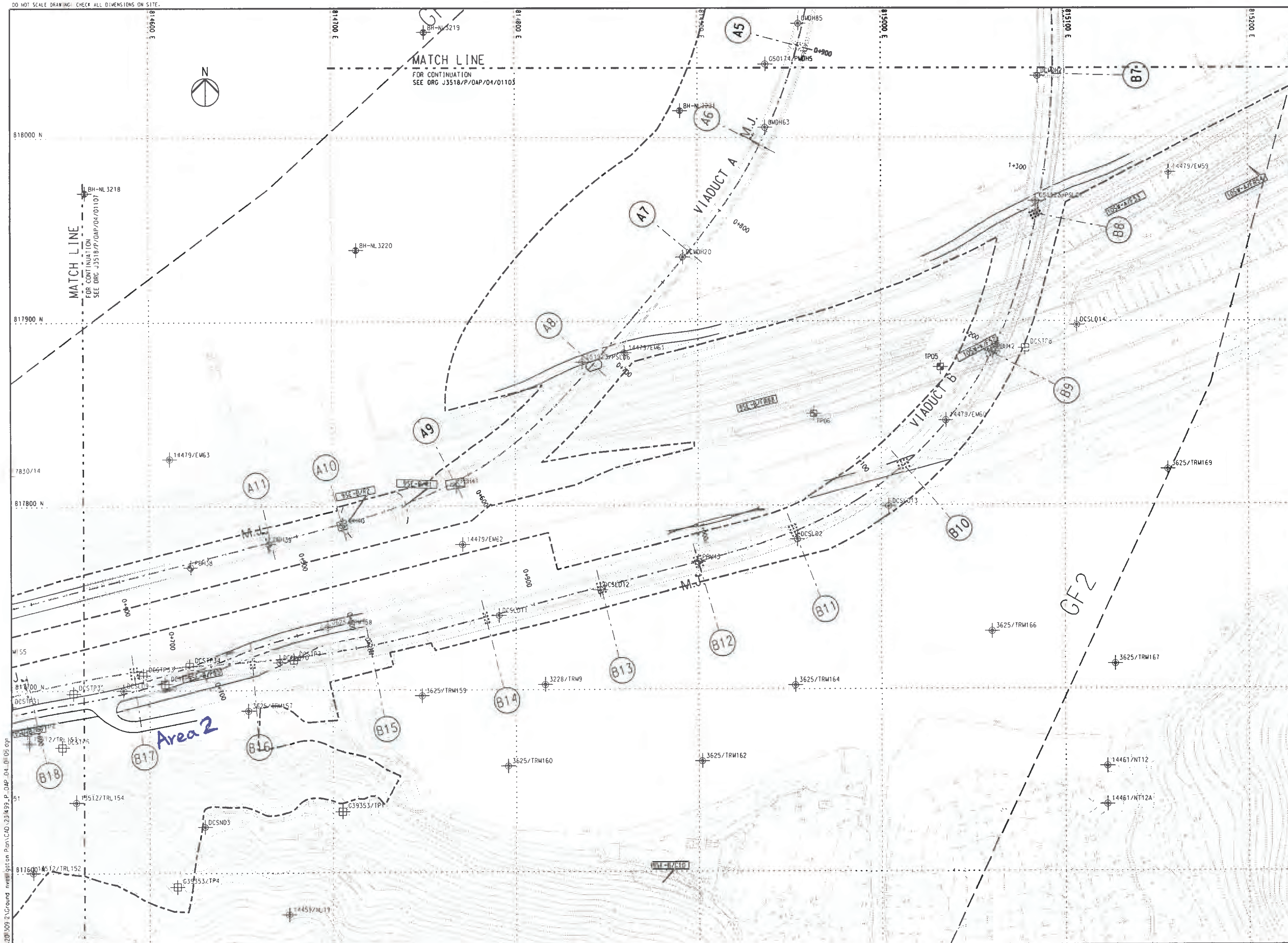


KEY PLAN

TUNG CHUNG

NOTES

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NO. J3518/P/OAP/04/1000 AND OTHER RELEVANT DRAWINGS.

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 :

- PB-01 PROPOSED BOREHOLE
- TP01 PROPOSED TRIAL PIT
- CH01 PROPOSED COREHOLE
- SS01 SS02 PROPOSED SLOPE STRIPPING

0 10 20 30 40 50 METRES 1 : 1000

Rev	Description	By	Date
A	SUBMISSION	RC	07/13
B	SUBMISSION	RC	07/13
C	SUBMISSION	RC	09/13

Drawn	Date
RL	07/13
Checked	Approved
DS	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

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 1.2I

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

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 2016 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 2016

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Construction of marine section of berth at Southern Landfall;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Construction of land section of berth at Southern Landfall;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

July 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Construction of land section of berth at Southern Landfall;
- Installation of pier head and deck segments; and

- Slope work of Viaducts A, B & C.

August 2016

Marine Works

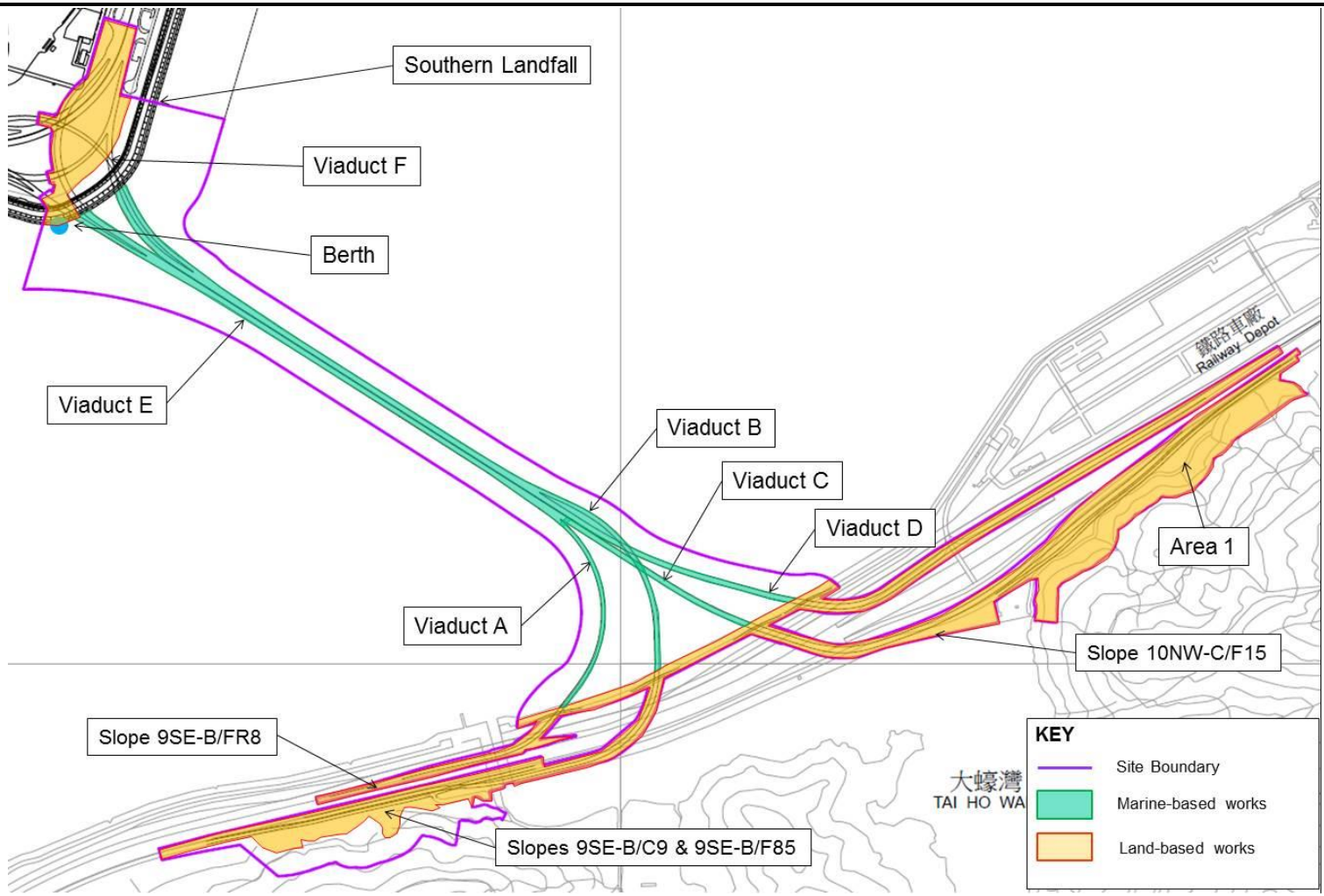
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Construction of land section of berth at Southern Landfall;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

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*.

Figure 1.3 Locations of Construction Activities in the Reporting Period



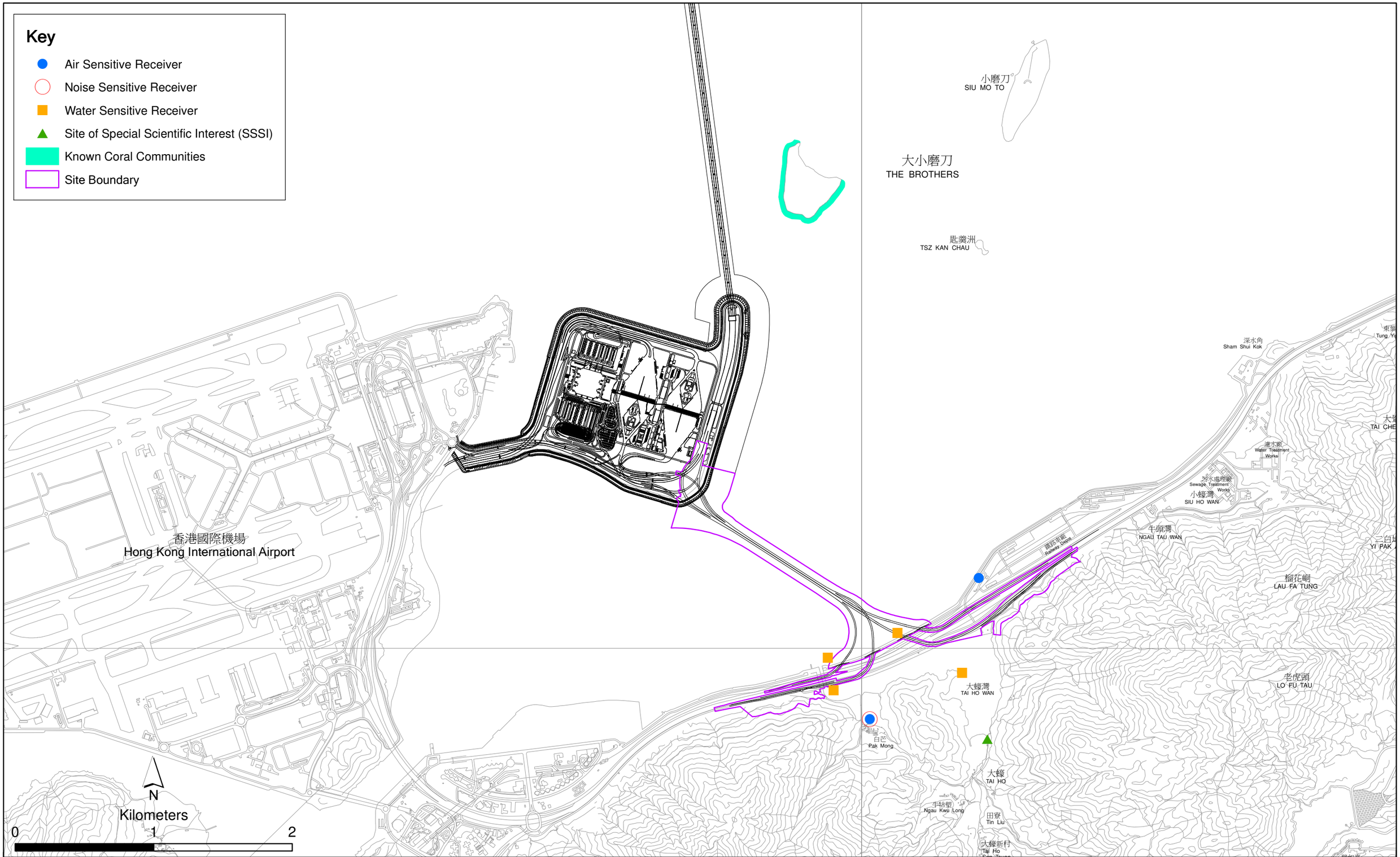


Figure 1.4

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 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.

2 EM&A RESULTS

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.

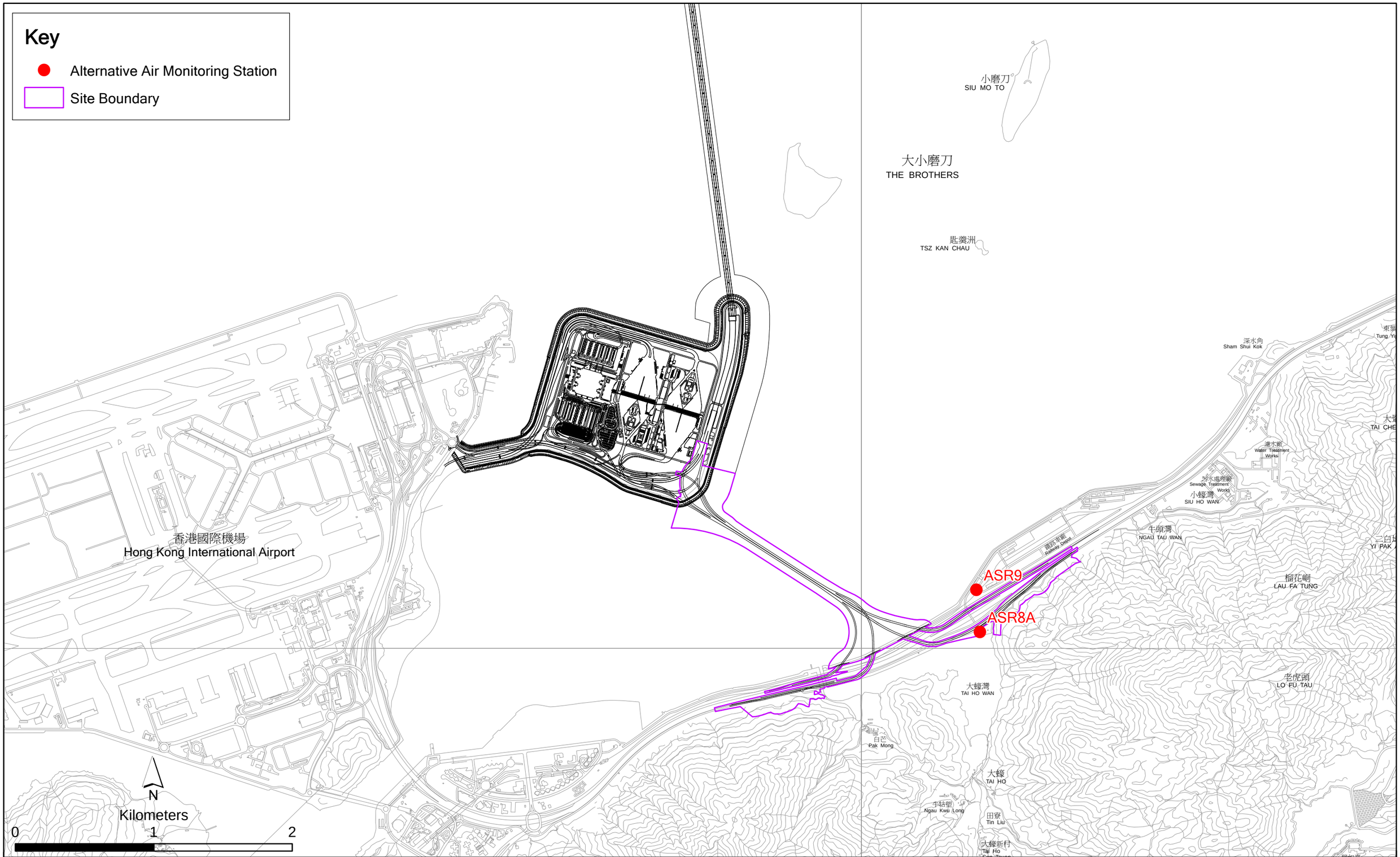


Figure 2.1

Locations of Air Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_AQMS.mxd
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	Location	Description	Parameters & Frequency
ASR8A	1, 7, 13, 16, 22 and 28 June 2016	Area 4	On ground at the works area, Area 4	• 1-hour Total Suspended Particulates (1-hour TSP, μg/m³), 3 times per day every 6 days
ASR9	4, 7, 13, 19, 25 and 29 July 2016 3, 9, 15, 18, 24 and 30 August 2016	MTR Depot	On the ground nearby MTR Depot entrance	• 24-hour Total Suspended Particulates (24-hour TSP, μg/m³), daily for 24-hour every 6 days

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.

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*.

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 *Thirty-second* to *Thirty-fourth Monthly EM&A Reports*.

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

Month	Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
June 2016	ASR 8A	58	48 – 69	394	500
	ASR 9	59	48 - 87	393	500
July 2016	ASR 8A	57	47 – 69	394	500
	ASR 9	68	44 - 107	393	500
August 2016	ASR 8A	61	41 – 116	394	500
	ASR 9	75	45 - 114	393	500

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

Month	Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
June 2016	ASR 8A	45	40 – 50	178	260
	ASR 9	46	40 – 56	178	260
July 2016	ASR 8A	46	43 – 50	178	260
	ASR 9	55	42 – 102	178	260
August 2016	ASR 8A	48	44 – 53	178	260
	ASR 9	59	45 – 101	178	260

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

In this reporting period, a total of 18 monitoring events were undertaken within the reporting period, in which no Action or Limit Level exceedance for 1-hour and 24-hour TSP for air quality was recorded during the reporting period.

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 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.

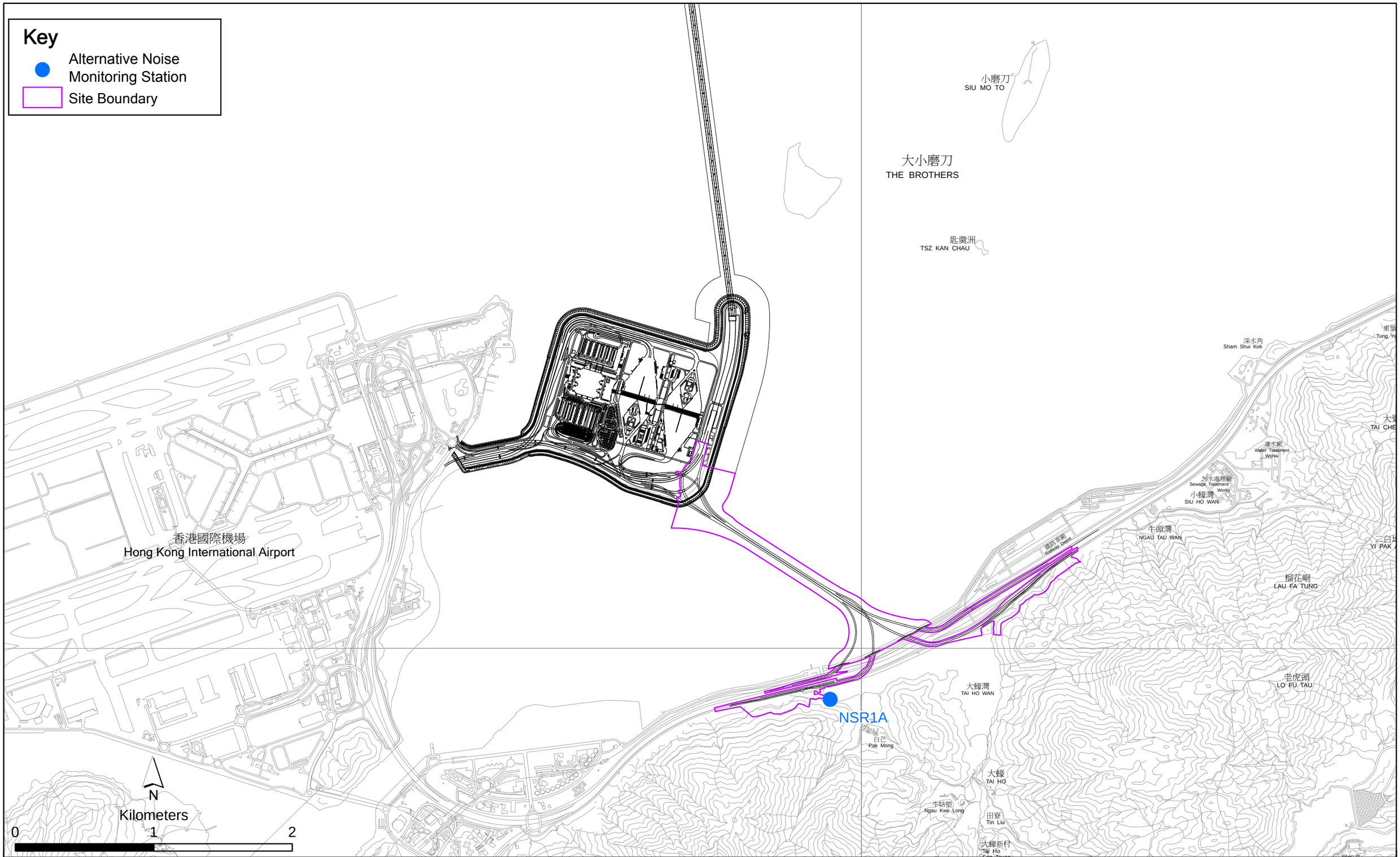


Figure 2.2

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	1, 7, 13, 16, 22 and 28 June 2016 4, 7, 13, 19, 25 and 29 July 2016 3, 9, 15, 18, 24 and 30 August 2016	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 was relocated to NSR1A.

Table 2.6 ***Noise Monitoring Equipment***

Equipment	Brand and Model
Integrated Sound Level Meter	Rion NL-31
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 schedules for noise monitoring in the reporting quarter are provided in *Appendix E*.

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 *Thirty-second* to *Thirty-fourth 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 2016	59	59 - 60	75
July 2016	59	56 - 60	75
August 2016	60	58 - 62	75

A total of 18 monitoring events were undertaken in the reporting period with no Action Level and Limit Level exceedance recorded at the monitoring station in the reporting period. No action is thus required to be undertaken in accordance with the Event Action Plan presented in *Appendix J*.

Major noise sources during the noise monitoring included construction activities, nearby traffic noise and aircraft noise.

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.

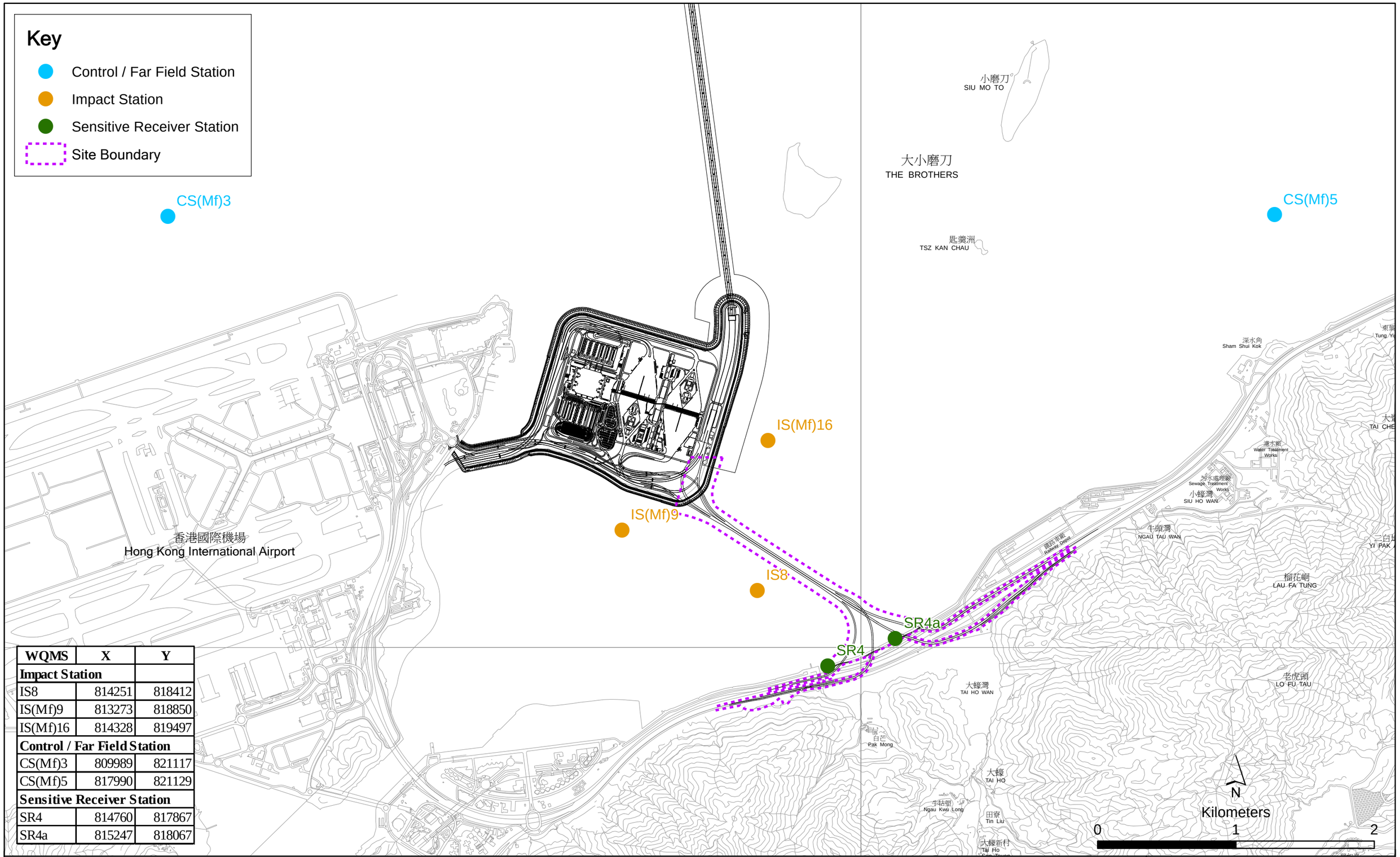
2.3.1 *Monitoring Requirements and Equipment*

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 (*Figure 2.3*; *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 depth less than 6m, mid-depth may be omitted.	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			
SR4	Sensitive receiver (Tai Ho Inlet)	814760	817867			
SR4a	Sensitive receiver	815247	818067			
CS(Mf)3	Control Station	809989	821117			
CS(Mf)5	Control Station	817990	821129			

[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.



WQMS	X	Y
Impact Station		
IS8	814251	818412
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)3	809989	821117
CS(Mf)5	817990	821129
Sensitive Receiver Station		
SR4	814760	817867
SR4a	815247	818067

Figure 2.3

Locations of Water Quality Monitoring Stations

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Date: 6/12/2013

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Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
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.						

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
DO, Temperature meter and Salinity	YSI Pro2030
Turbidimeter	HACH Model 2100Q
pH meter	Thermo Scientific Orion 2 Star
Positioning Equipment	Koden913MK2 with KBG-3 DGPS antenna
Water Depth Detector	Speedtech Instrument SM-5
Water Sampler	Kemmerer 1520 (1520-C25) 2.2L with messenger

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*. The water quality monitoring was cancelled on 2 August 2016 due to adverse weather.

2.3.4 Results and Observations

Impact water quality monitoring was conducted at all designated 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 *Thirty-second* to *Thirty-fourth Monthly EM&A Reports*.

In this reporting period, a total of 38 monitoring events were undertaken with no Action Level and Limit Level exceedance recorded at the monitoring station in the reporting period. No action is thus required to be undertaken in accordance with the Event Action Plan 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 dolphins. 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.

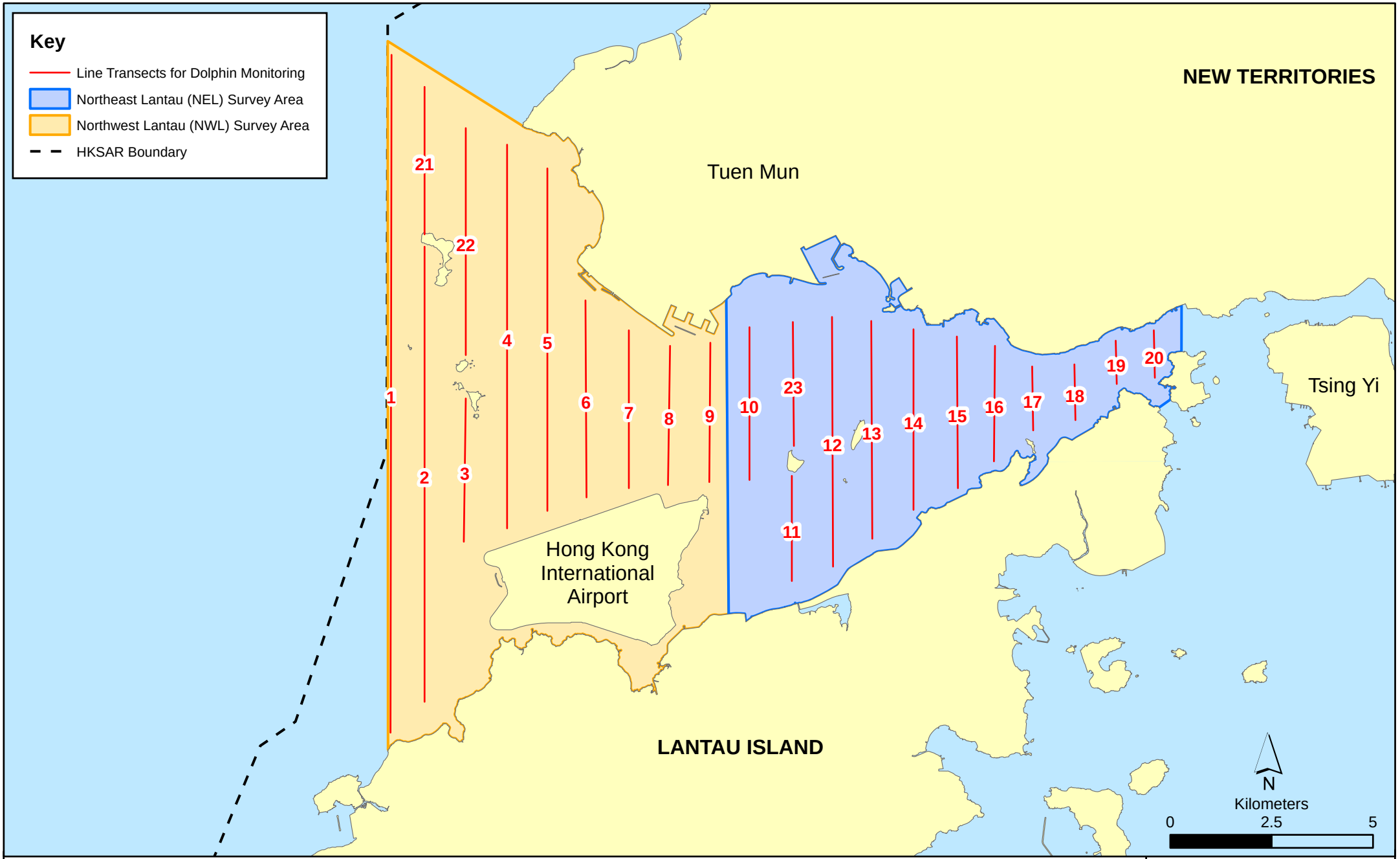

Figure 2.4

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

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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	814456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805475	815913	14	Start Point	817537	820220
2	End Point	805477	826654	14	End Point	817537	824613
3	Start Point	806464	819435	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	819771	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	820220	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	820466	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	820880	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	820872	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				
12	End Point	815542	824882				

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 897.06 km of survey effort was collected, with 92.5% 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,

341.80 km and 555.26 km of survey effort were conducted in NEL and NWL survey areas respectively. The total survey effort conducted on primary lines was 648.70 km, while the effort on secondary lines was 248.36 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 2016, a total of ten (10) groups of 34 Chinese White Dolphins were sighted. Seven (7) dolphin sightings were made on primary lines during on-effort search. In this quarterly period, all dolphin groups were sighted in NWL, except one off-effort sighting of one dolphin was sighted in NEL. Summary table of the dolphin sightings is shown in *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: 1st / 6th Jun 2016	0.0	0.0
	Set 2: 13th / 17th Jun 2016	0.0	0.0
	Set 3: 5th /12th Jul 2016	0.0	0.0
	Set 4: 18th / 27th Jul 2016	0.0	0.0
	Set 5: 5th / 9th Aug 2016	0.0	0.0
	Set 6: 17th /23rd Aug 2016	0.0	0.0
NWL	Set 1: 1st / 6th Jun 2016	0.0	0.0
	Set 2: 13th / 17th Jun 2016	0.0	0.0
	Set 3: 5th /12th Jul 2016	4.6	9.2
	Set 4: 18th / 27th Jul 2016	0.0	0.0
	Set 5: 5th / 9th Aug 2016	4.2	28.3
	Set 6: 17th /23rd Aug 2016	1.5	7.4

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 2016	**September - November 2011**	**June – August 2016**	**September - November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	1.72 ± 2.17	9.85 ± 5.85	7.48 ± 10.98	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 eleven (11) individuals per group in North Lantau region during June to August 2016. 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 - August 2016	**September - November 2011**
Overall	3.40 ± 3.34 (n = 10)	3.72 ± 3.13 (n = 66)
Northeast Lantau	1.00 (n = 1)	3.18 ± 2.16 (n = 17)
Northwest Lantau	3.67 ± 3.43 (n = 9)	3.92 ± 3.40 (n = 49)

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June and August 2016.

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 NEL, 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 during the period of marine works under this Contract. No sighting of the Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphin) was recorded in the monitoring period during the exclusion zone monitoring.

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 1, 6, 15, 24 and 30 June 2016, 6, 13, 20 and 28 July 2016, 4, 10, 17 and 25 August 2016.

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
1 June 2016	Abutment D • Excessive soil was found in drainage outside site access. Near Pier D18 • Contact person for wetsep was not displayed. • Stagnant water was accumulated in a drip tray for chemical container. • A chemical container was not placed in drip tray. • A drip tray for generator was not plugged. Landing area of Abutment D • The land was partially dry. • Stagnant water was accumulated in a drip tray for chemical container. • A chemical container was not placed in drip tray.	Abutment D • Excessive soil should be cleaned up regularly Near Pier D18 • Contact person for wetsep should be displayed. • Stagnant water in a drip tray should be cleaned up regularly. • Chemical container should be placed in drip tray. • Drip tray should be plugged. Landing area of Abutment D • Watering should be applied regularly to avoid dust emission. • Stagnant water in a drip tray should be cleaned up regularly. • Chemical container should be placed in drip tray.
6 June 2016	Area 1 • A chemical container was not placed in drip tray. • Refuse was found in drainage. • Equipment was placed too close to natural habitat. • Oil stain was found on the ground.	Area 1 • Chemical container should be placed in drip tray. • Refuse in drainage should be cleaned up regularly. • Equipment should be placed away from natural habitat. • Oil stain should be removed.

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
15 June 2016	Pier E5 • A chemical container was not placed in drip tray. • A drip tray for generator was not plugged.	Pier E5 • Chemical container should be placed in drip tray. • Drip tray should be plugged.
24 June 2016	Pier E8 • Waste was not properly stored. • A drip tray for generator was not plugged. • Surface runoff control along edge of pile cap was insufficient.	Pier E8 • Waste should be cleaned up regularly. • Drip tray should be plugged. • Toe board or sand bag should be provided at the edge to avoid runoff.
30 June 2016	Pier E8 • Waste was not properly stored. • A drip tray for generator was not plugged.	Pier E8 • Waste should be cleaned up regularly. • Drip tray should be plugged.
6 July 2016	Abutment D • Refuse and excessive soil were found in the drainage outside entrance. • A drip tray was not plugged. • Stagnant water was accumulated in a drip tray.	Abutment D • Refuse and excessive soil in the drainage should be cleaned up regularly. • Drip tray should be plugged. • Stagnant water accumulated in drip tray should be cleaned up regularly.
13 July 2016	Seafront • Chemical containers were not placed in drip tray. • Oil stain was found on the ground.	Seafront • Chemical containers should be placed in drip tray. • Oil stain should be removed.
20 July 2016	Southern landfall • A chemical container was not placed in drip tray. • The land was partially dry. • The label for general fill storage was not displayed. • The checklist for a wetsep was not displayed.	Southern landfall • Chemical container should be placed in drip tray. • Watering should be applied regularly. • General fill storage should be properly labelled. • Checklist for wetsep should be displayed.
28 July 2016	Pier E1 • A chemical container was not placed in drip tray. • The gutter was not properly installed. Pier C18 • The soil stockpile was not well covered. • The unpaved area was partially dry.	Pier E1 • Chemical container should be placed in drip tray. • Gutter should be properly installed. Pier C18 • The soil stockpile should be well covered. • Watering should be applied regularly.
4 August 2016	Pier E12 • A chemical container was not placed in drip tray. Pier E4 • 2 chemical containers were not placed in drip tray. • The gutter was not properly installed.	Pier E12 • Chemical containers should be placed in drip tray. E4 • Chemical containers should be placed in drip tray. • Gutter should be properly installed.
10 August 2016	Area 4 • A chemical container was not placed in drip tray. Pier C12 • Label for a chemical container was missing. • Refuse was not properly stored. Pier C14 • Stagnant water was accumulated in drip tray. Area 2 • Soil stockpile was not well covered.	Area 4 • Chemical containers should be placed in drip tray. Pier C12 • Label for chemical container should be properly displayed. • Refuse should be properly stored. Pier C14 • Stagnant water accumulated in drip tray should be removed. Area 2 • Soil stockpile should be well covered.

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
17 August 2016	Seafront area • Oil stain was found on the ground. • A drip tray for chemical container was not plugged. Pier E6 • Surface runoff control was insufficient. • The gutter was not properly installed. • Excessive soil was found in gutter.	Seafront area • Oil stain on the ground should be removed. • A drip tray for chemical container should be plugged. Pier E6 • Sandbag or toe board should be provided for surface runoff control. • The gutter should be properly installed. • Excessive soil in gutter should be removed.
25 August 2016	Pier E4 • Refuse was found in gutter. Pier D14 • The unpaved area was dry. • Grouting material was not well covered. • Some chemical containers were not placed in drip tray.	Pier E4 • Refuse in gutter should be cleaned up regularly. Pier D14 • The unpaved area should be watered regularly • Grouting material should be well covered. • Chemical containers should be placed in drip tray.

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) and recyclable materials. 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 Construction Waste [(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
June 2016	383	0	116	103,270	105	0	0	0
July 2016	277	0	230	94,760	1,890	2,200	0	0
August 2016	610	0	684	116,990	9,888	0	0	0
Total	1270	0	1030	315020	11883	2000	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 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
Waste Water Discharge License	WT00019017-2014	13-May-14	31-May-19	GCL	Discharge for marine portion
Waste Water Discharge License	WT00019018-2014	13-May-14	31-May-19	GCL	Discharge for land portion
Construction Noise Permit for night works and works in general holidays	GW-RS0109-16	05-Feb-16	14-Aug-16	GCL	Pre-casted pile cap shell installation at E10-E13
Construction Noise Permit for night works and works in general holidays	GW-RS0383-16	20-Apr-16	19-Oct-16	GCL	For Broad Permit
Construction Noise Permit for night works and works in general holidays	GW-RS0718-16	13-Jul-16	13-Jan-17	GCL	Pre-casted pile cap shell installation at E10-E13
Construction Noise Permit for night works and works in general holidays	GW-RW0339-16	17-Jun-16	19-Dec-16	GCL	General works at WA5
Construction Noise Permit for night works and works in general holidays	GW-RW0504-16	25-May-16	31-Aug-16	GCL	Broad Permit for Segment Launching at Land Portion
Construction Noise Permit for night works and works in general holidays	GW-RW0707-16	11-Jul-16	30-Sep-16	GCL	Broad Permit for Segment Launching at Land Portion
Marine Dumping Permit	EP/MD/17-037	14-Jun-16	13-Dec-16	GCL	For dumping Type I sediment
Marine Dumping Permit	EP/MD/17-047	22-Jun-16	31-Jul-16	GCL	For dumping Type I (Dedicated Site) and Type II

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
					sediment
Marine Dumping Permit	EP/MD/17-066	19-Jul-16	31-Aug-16	GCL	For dumping Type I (Dedicated Site) and Type II sediment

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

Results for 1-hour TSP, 24-hour TSP, construction noise and water quality complied with the Action/ Limit levels 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 corresponding ambient mean values (*Table 2.18*). Quarterly-averaged SS levels at CS(Mf)5, CS(Mf)3 and SR4a during mid-ebb tide were higher than their corresponding ambient levels. One-way ANOVA was conducted to examine if there was any significant difference between ambient levels and impact monitoring results for these stations. By setting α=0.05, significant difference was not detected at any control or impact monitoring stations (CS(Mf)3: $F_{1,68}$, p=0.212; CS(Mf)5: $F_{1,73}$, p=0.25; SR4a: $F_{1,49}$, p=0.59). The average results higher than their corresponding ambient levels in these stations are likely due to fluctuation of water quality. There was no significant deterioration at all impact monitoring stations when comparing to their corresponding ambient levels. The depth-averaged SS results suggest that the Project 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 2016)	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
CS(Mf)3	9.2	12.8	12.0	16.6	13.3	12.8
CS(Mf)5	9.2	11.5	11.9	14.9	13.0	12.8
SR4	10.3	12.3	13.4	16.0	12.8	12.7
SR4a	9.1	9.8	11.9	12.7	12.8	12.4
IS8	11.3	13.5	14.6	17.6	12.9	12.7
IS(Mf)9	10.9	14.3	14.2	18.5	12.8	12.6
IS(Mf)16	11.4	10.3	14.8	13.4	13.1	12.7

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

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*.

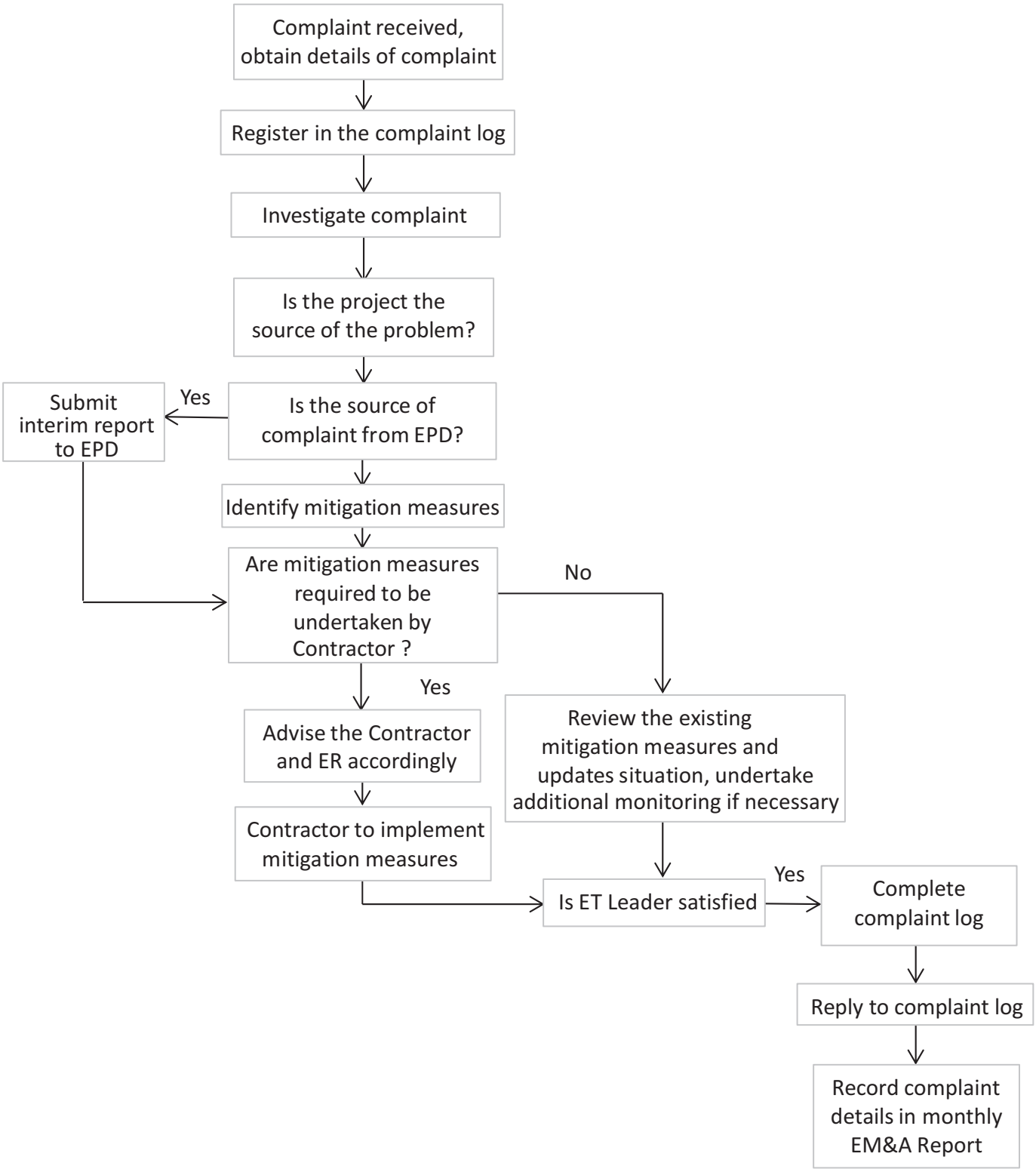

Figure 2.5 Environmental Complaint Handling Procedure

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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 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

October 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;

- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

November 2016

Marine Works

- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

Land-based Works

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Installation of pier head and deck segments; and
- Slope work of Viaducts A, B & C.

3.2 KEY ISSUES FOR THE COMING QUARTER

Potential environmental impacts arising from the above upcoming construction activities are mainly associated with air quality, noise, marine water quality, marine ecology and waste management issues.

3.3 MONITORING SCHEDULE FOR THE COMING QUARTER

Impact monitoring for air quality, noise, marine water quality and dolphin monitoring are scheduled to continue for the next reporting period.

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

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

The Eleventh Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 June to 31 August 2016, in accordance with the Updated EM&A Manual and the requirements of the *Environmental Permits* (*EP-354/2009/D* and *EP-353/2009/K*).

Neither Action Level nor Limit Level exceedances were observed for air quality, noise and water quality monitoring in this reporting period.

A total of ten (10) groups of thirty-four (34) Chinese White Dolphins were sighted during the six sets of survey from June to August 2016. One (1) Limit Level exceedance was recorded for the quarterly dolphin monitoring data between June and August 2016, 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.

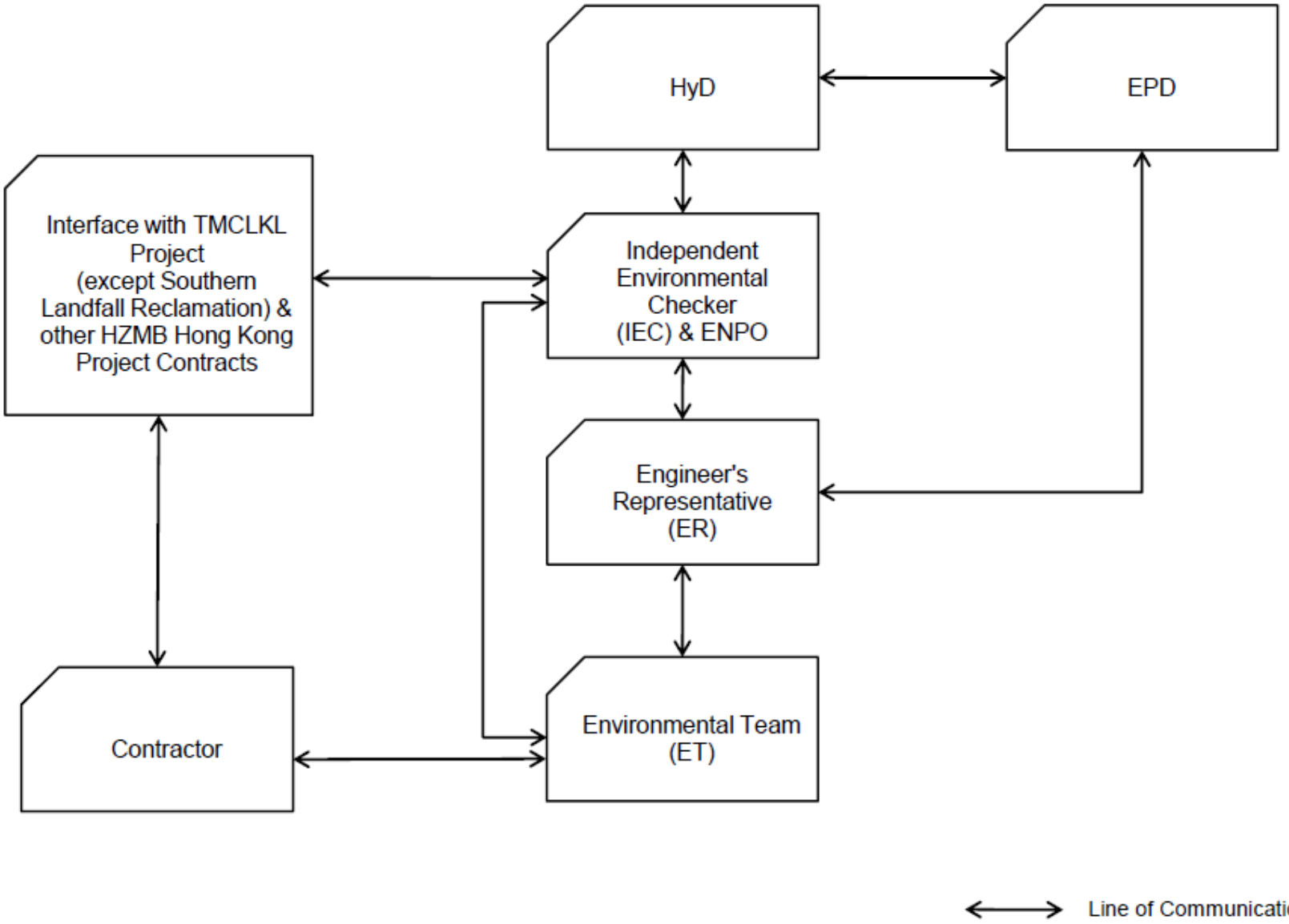
Environmental site inspection was carried out 13 times in the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audits.

There was no environmental complaint, notification of summon or successful prosecution 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

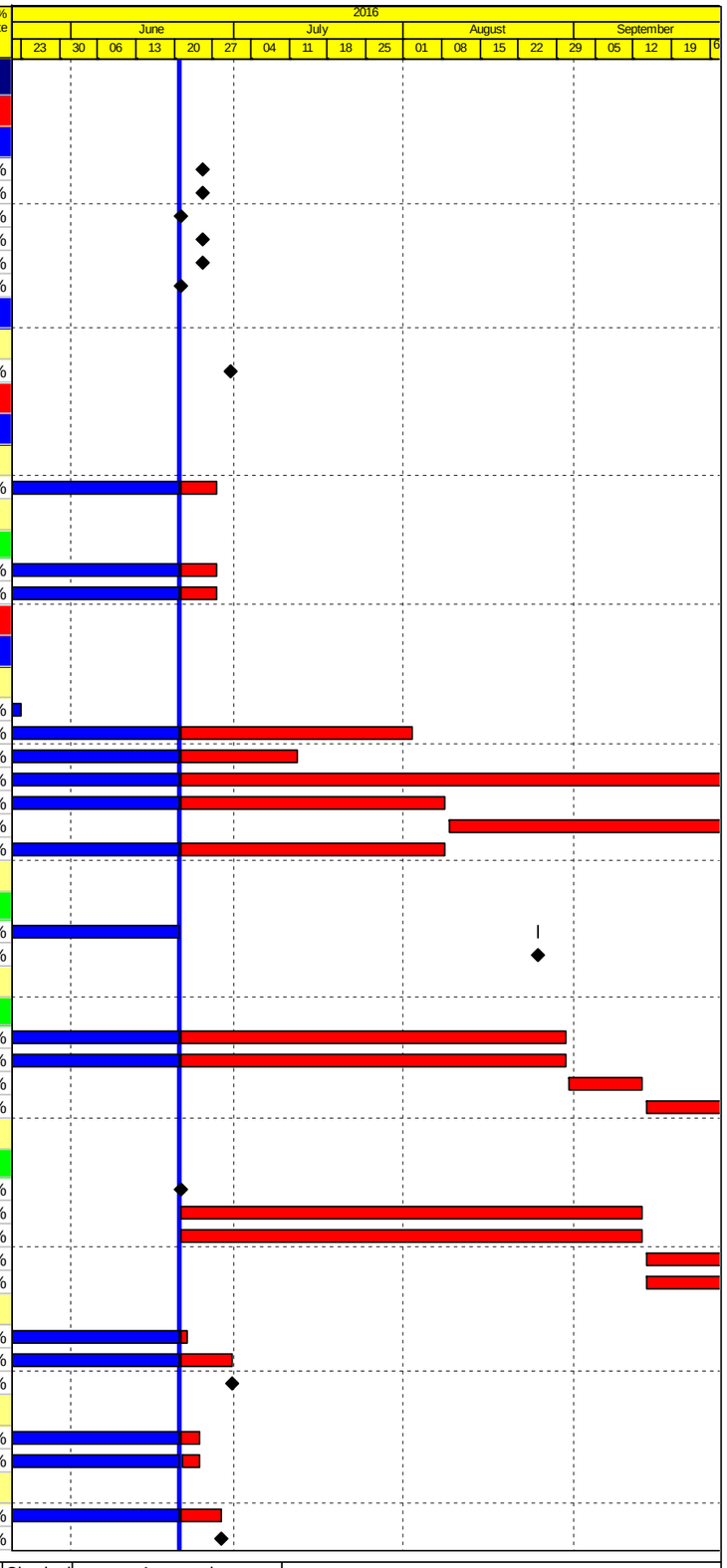
Environmental Resources Management

ERM

Appendix B

Construction Programme for the Reporting Quarter

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
HY/2012/07 - TM-CLK Link-SC [DWP Revision G] - Status Update 21-06-2016											
Contract Key Dates											
Possession Dates / Access Period											
POS02-3	Portion A - Area 3	0	25-Jun-16*	0%	0		25-Jun-16		0	0	0%
POS02-4	Portion A - Area 4	0	25-Jun-16*	0%	0		25-Jun-16		0	0	0%
POS02-5	Portion A - Area 5	0	21-Jun-16*	0%	0		17-May-16		-35	0	0%
POS02-6	Portion A - Area 6	0	25-Jun-16*	0%	0		25-Jun-16		0	0	0%
POS03-7	Portion B - Area 7	0	25-Jun-16*	0%	0		25-Jun-16		0	0	0%
POS03-8	Portion B - Area 8	0	21-Jun-16*	0%	0		17-May-16		-35	0	0%
Section Completion Dates											
Vacate Works Area											
VAC05	Vacate Works Area WA5 (Zone 5C) (CoW + 758 days) - Letter D06850	0		0%	0	30-Jun-16*		29-Jun-16	0	1313	0%
General Submissions											
General Requirements											
Temporary Works Design											
PR00130	Unloading Jetty at HKBCF - Working Platform design and approval	90	02-Jun-14 A	93.33%	6	27-Jun-16	18-Jan-16	23-Jan-16	-123	8	75%
Land Works											
Land GI Works											
PR02204	SQR Sampling & Testing and Approval	110	14-Aug-14 A	94.55%	6	27-Jun-16	30-Mar-15	09-Apr-15	-361	75	95%
PR03110	Trial Pits along Cheung Tung Road	20	21-Oct-13 A	70%	6	27-Jun-16	09-Jul-15	15-Jul-15	-282	100	95%
Design Submissions											
Detailed Design (v18.8 18-08-14)											
General Submissions											
ARDD0037-1	Preparation of Seismic Performance Report Viaduct A,B,C,D - AP12.01	50	21-Aug-15 A	100%	0	23-May-16 A					100%
ARDD0037-2	IC/SO Approval of Seismic Performance Report Viaduct A,B,C,D - AP12.01	75	22-Feb-16 A	60%	30	02-Aug-16	25-May-16	07-Jul-16	-18	361	60%
ARDD0037-5	IC/SO Approval of Seismic Performance Report Viaduct E - AP12.02	75	22-Feb-16 A	80%	15	12-Jul-16	16-Jun-16	07-Jul-16	-3	376	80%
ARDD0037-7	Preparation of Seismic Performance Report Viaduct F - AP12.03	160	21-Aug-15 A	5%	152	26-Jan-17	06-Aug-15	16-Mar-16	-215	0	5%
ARDD0040-1	Preparation of Operation and Maintenance Manual - AP08.00	30	01-Sep-15 A	0%	34	08-Aug-16	26-Jan-16	16-Mar-16	-97	0	0%
ARDD0040-2	IC/SO Approval of Operation and Maintenance Manual - AP08.00	75	09-Aug-16	0%	75	23-Nov-16	17-Mar-16	07-Jul-16	-97	282	0%
ARDD0042-2	IC/SO Approval of O&M Facility Provisions DDA - BP11.01	75	14-Jan-15 A	54.67%	34	08-Aug-16	26-Jan-16	16-Mar-16	-97	0	50%
Viaduct A											
Viaduct Design											
ARDD0435-8	Viaduct A - IC/SO Consent of Supplemental Working Drawings Viaduct A	10	10-Sep-15 A	98%	0	25-Aug-16	30-May-16	30-May-16	-61	0	98%
ARDD0435-9	Viaduct A - IC/SO Consent of Supplemental Working Drawings Viaduct A	0		0%	0	25-Aug-16		30-May-16	-61	0	0%
Viaduct F1 & F3											
Viaduct Design											
ARDD0486-2	Viaduct F1 & F3 - Coordination and Further Issue of Construction Method a	60	02-Mar-15 A	16.67%	50	30-Aug-16	22-Dec-15	07-Mar-16	-120	0	16.7%
ARDD0486-3	Viaduct F1 & F3 - Preparation of Draft Working Drawing Set	60	02-Mar-15 A	16.67%	50	30-Aug-16	22-Dec-15	07-Mar-16	-120	0	16.7%
ARDD0486-5	Viaduct F1 & F3 - Preparation and Coordination of DDA/Working Drawing	10	31-Aug-16	0%	10	13-Sep-16	08-Mar-16	21-Mar-16	-120	0	0%
ARDD0486-7	Viaduct F1 & F3 - IC/SO Consent of Supplemental Working Drawings Viad	10	14-Sep-16	0%	10	28-Sep-16	22-Mar-16	07-Apr-16	-120	0	0%
Viaduct F2, F4 and F5											
Viaduct Design											
ARDD0530-2	Viaduct F2, F4 & F5 - GCL/FRE Issue of Construction Method/Temporary	0		0%	0	21-Jun-16		05-Nov-15	-152	0	0%
ARDD0530-3	Viaduct F2, F4 & F5 - Coordination and Further Issue of Construction Meth	60	21-Jun-16	0%	60	13-Sep-16	06-Nov-15	01-Feb-16	-152	0	0%
ARDD0530-4	Viaduct F2, F4 & F5 - Preparation of Draft Working Drawing Set	60	21-Jun-16	0%	60	13-Sep-16	06-Nov-15	01-Feb-16	-152	0	0%
ARDD0530-6	Viaduct F2, F4 & F5 - Preparation and Coordination of DDA/Working Draw	10	14-Sep-16	0%	10	28-Sep-16	02-Feb-16	18-Feb-16	-152	0	0%
ARDD0530-8	Viaduct F2, F4 & F5 - IC/SO Consent of Supplemental Drawings of Viaduc	10	14-Sep-16	0%	10	28-Sep-16	22-Mar-16	07-Apr-16	-120	0	0%
Parapet and Utility Trough											
ARDD0562-4	IC/SO Approval of DDA -DP30.01	75	31-Jul-14 A	98%	2	22-Jun-16	15-Feb-16	16-Feb-16	-86	32	98%
ARDD0566	IC/SO Approval of DDA -DP31.01	75	24-Oct-14 A	89.33%	8	30-Jun-16	02-Feb-16	16-Feb-16	-92	0	80%
ARDD0566-1	IC/SO Approval of DDA -DP31.01	0		0%	0	30-Jun-16		16-Feb-16	-92	93	0%
Slopeworks for Viaduct B: 9SE- B/C8, B/C9, B/F9, B/F85+ 10SW-A/F52, A/F53											
ARDD0580-5	Preparation of Slope A/F52 Submission - CP12.03	20	10-Feb-15 A	80%	4	24-Jun-16	02-Oct-15	07-Oct-15	-176	0	100%
ARDD0580-6	IC/SO Approval of Slope - CP12.03	75	21-Sep-15 A	95%	4	24-Jun-16	02-Oct-15	07-Oct-15	-176	0	95%
Slopeworks for Viaduct D: 10NW -C/R4, C/F9, C/F10, C/F11, C/F17, C/F50											
ARDD0603	IC/SO Approval of Slope Combined AIP/DDA -CP14.01	75	16-Dec-14 A	92%	6	28-Jun-16	18-Jun-15	25-Jun-15	-249	0	95%
ARDD0603-1	IC/SO Approval of Slope Combined AIP/DDA -CP14.01	0		0%	0	28-Jun-16		25-Jun-15	-249	0	0%



Actual Work
Planned Bar
Critical Bar
Milestone

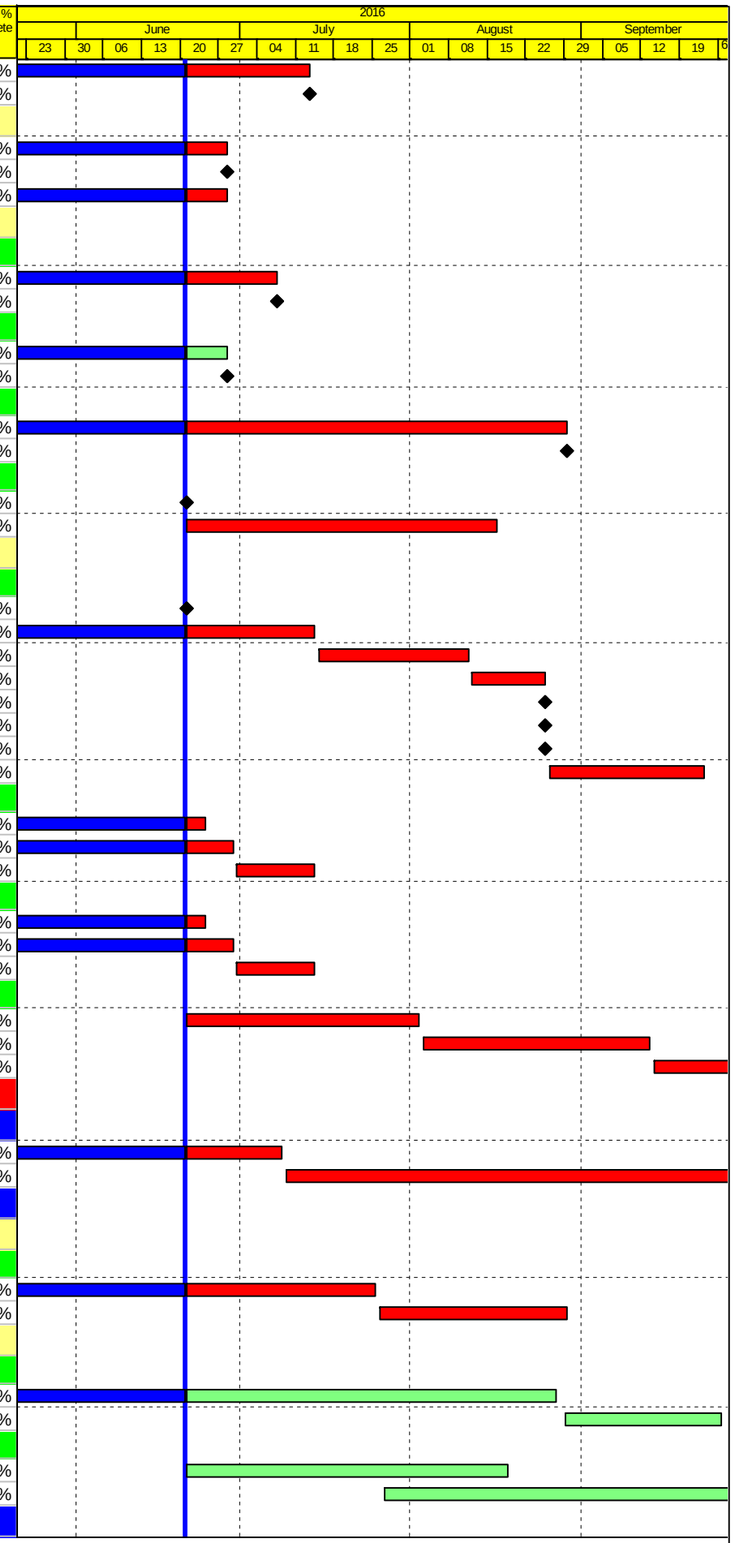
Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 1 of 13 Pages)
(Progress as of 21-Jun-16)

Date	Revision	Checked	Approved
29-Apr-16		PKN	HF
31-May-...		PKN	HF
02-Jul-16		PKN	HF

DWG. No.:
J3518/GCL/PGM/3MRP-M37

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
ARDD0604-2	IC/SO Approval of Slope Combined AIP/DDA-CP14.02	75	23-May-15 A	78.67%	16	13-Jul-16	13-Oct-15	04-Nov-15	-169	0	75%
ARDD0604-3	IC/SO Approval of Revised Slope Combined AIP/DDA-CP14.02	0		0%	0	13-Jul-16		04-Nov-15	-169	80	0%
Waterworks, Drainage & Utility Diversions											
ARDD0629	IC/SO Approval of Waterworks, Drainage & Utility DDA - BP20.01	75	22-Jul-14 A	92%	6	28-Jun-16	26-Jan-16	02-Feb-16	-97	0	95%
ARDD0629-1	IC/SO Approval of Waterworks, Drainage & Utility DDA - BP20.01	0		0%	0	28-Jun-16		02-Feb-16	-97	296	0%
ARDD0629-2	Gov't Approval of Submissions for Waterworks, Drainage & Utility Diversior	75	02-Jan-14 A	92%	6	28-Jun-16	26-Jan-16	02-Feb-16	-97	0	95%
Viaduct Approach Ramp Retaining Walls											
Approach Ramp B											
ARDD0664	Approach B - IC/SO Approval of Approach Ramp B DDA-DP21.01	75	14-Oct-14 A	84%	12	07-Jul-16	15-Jan-16	01-Feb-16	-104	0	90%
ARDD0664-1	Approach B - IC/SO Approval of Approach Ramp B DDA-DP21.01	0		0%	0	07-Jul-16		01-Feb-16	-104	26	0%
Approach A											
ARDD0670	Approach A - IC/SO Approval of Approach Ramp A DDA - DP20.01	75	03-Oct-14 A	92%	6	28-Jun-16	22-Jan-20	31-Jan-20	887	0	95%
ARDD0670-1	Approach A - IC/SO Approval of Approach Ramp A DDA - DP20.01	0		0%	0	28-Jun-16		31-Jan-20	887	887	0%
Approach F											
ARDD0676	Approach F - IC/SO Approval of Approach Ramp F DDA-DP24.01	75	23-Dec-14 A	34.67%	49	29-Aug-16	16-Jan-15	27-Mar-15	-351	0	70%
ARDD0676-1	Approach F - IC/SO Approval of Approach Ramp F DDA-DP24.01	0		0%	0	29-Aug-16		17-Mar-16	-111	190	0%
Landscape											
ARDD0701	Water Supply Application to WSD	0		0%	0	21-Jun-16		17-Dec-15	-122	0	0%
ARDD0702	Gov't Approval of LVIA	40	21-Jun-16	0%	40	16-Aug-16	18-Dec-15	18-Feb-16	-122	127	0%
Segment Target Geometry And Erection Engineering											
Viaduct A											
ARDD0716	Viaduct A - Confirmation of Erection Sequence from Freyssinet	0		0%	0	21-Jun-16		31-Jan-20	893	893	0%
ARDD0717	Viaduct A - Erection Sequence Analysis	31	23-Jan-16 A	45.16%	17	14-Jul-16	15-Feb-16	08-Mar-16	-86	0	40%
ARDD0718	Viaduct A - Target Geometry Analysis	20	15-Jul-16	0%	20	11-Aug-16	09-Mar-16	08-Apr-16	-86	0	0%
ARDD0719	Viaduct A - Segment Geometry Schedules	10	12-Aug-16	0%	10	25-Aug-16	11-Apr-16	22-Apr-16	-86	0	0%
ARDD0719-1	Viaduct A - Issue of Pierhead Segments Bridge A1, A2	0		0%	0	25-Aug-16		30-May-16	-61	0	0%
ARDD0719-3	Viaduct A - Issue of Casting Data and Segment Catalogue Bridge A2 (Final	0		0%	0	25-Aug-16		30-May-16	-61	0	0%
ARDD0719-4	Viaduct A - Issue of Casting Data and Segment Catalogue Bridge A1 (Final	0		0%	0	25-Aug-16		22-Apr-16	-86	0	0%
ARDD0719-5	Viaduct A - Issue Erection Manual	20	26-Aug-16	0%	20	23-Sep-16	25-Apr-16	23-May-16	-86	0	0%
Viaduct E5 and E6											
ARDD0734	Viaduct E5 & E6 - Segment Geometry Schedules	10	05-May-14 A	60%	4	24-Jun-16	22-Mar-16	29-Mar-16	-60	3	90%
TGP0570	Viaduct E5 & E6 - Issue of Optimised Casting Data and Segment Catalogu	40	30-Apr-15 A	82.5%	7	29-Jun-16	17-Mar-16	29-Mar-16	-63	0	90%
TGP0590	Viaduct E5 & E6 - Issue Erection Manual	10	30-Jun-16	0%	10	14-Jul-16	30-Mar-16	13-Apr-16	-63	222	0%
Viaduct E7 & E8											
ARDD0739	Viaduct E7 & E8 - Segment Geometry Schedules	10	05-May-14 A	60%	4	24-Jun-16	22-Mar-16	29-Mar-16	-60	3	90%
TGP0760	Viaduct E7 & E8 - Issue of Optimised Casting Data and Segment Catalogu	40	31-Jul-15 A	82.5%	7	29-Jun-16	17-Mar-16	29-Mar-16	-63	0	90%
TGP0790	Viaduct E7 & E8 - Issue Erection Manual	10	30-Jun-16	0%	10	14-Jul-16	30-Mar-16	13-Apr-16	-63	222	0%
Viaduct F											
ARDD0752	Viaduct F - Erection Sequence Analysis	30	21-Jun-16	0%	30	02-Aug-16	06-Nov-15	17-Dec-15	-152	0	0%
ARDD0753	Viaduct F - Target Geometry Analysis	30	03-Aug-16	0%	30	13-Sep-16	18-Dec-15	01-Feb-16	-152	0	0%
ARDD0754	Viaduct F - Segment Geometry Schedules	10	14-Sep-16	0%	10	28-Sep-16	02-Feb-16	18-Feb-16	-152	0	0%
Major Procurement											
Marine Permanent Navigaion Aids											
PR65011	Design & Approvals for Marine Navigation Aids	150	23-Oct-13 A	90%	15	08-Jul-16	30-Nov-15	16-Dec-15	-162	0	90%
PR65012	Procure & Deliver Marine Navigation Aids	240	09-Jul-16	0%	240	29-Apr-17	17-Dec-15	11-Oct-16	-162	0	0%
Deck Segment Installation Equipment											
Lifting Frames											
Lifting Frames 3 & 4											
PR68017	Lifting Frame 3&4 Fabrication	85	29-Sep-14 A	65.88%	29	25-Jul-16	06-Aug-15	08-Sep-15	-258	0	67%
PR68018	Lifting Frame 3&4 Delivery	30	26-Jul-16	0%	30	29-Aug-16	09-Sep-15	15-Oct-15	-258	41	0%
Unloading Frames											
Type 1 (at B6 and D6)											
PR69110	Unloading Frame Type 1 Fabrication	80	23-Feb-15 A	27.5%	58	27-Aug-16	25-Nov-16	07-Feb-17	131	0	28%
PR69120	Unloading Frame Type 1 Delivery (UF-1A & UF-1B)	24	29-Aug-16	0%	24	26-Sep-16	08-Feb-17	07-Mar-17	131	0	0%
Type 2 (at Bridge E1)											
PR69170	Unloading Frame Type 2 Design	50	21-Jun-16	0%	50	18-Aug-16	08-Aug-19	08-Oct-19	928	0	0%
PR69180	Unloading Frame Type 2 Fabrication	80	27-Jul-16	0%	80	31-Oct-16	12-Sep-19	17-Dec-19	928	0	0%
Deck Segments & Precast Pile Cap Shells											



Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
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Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 2 of 13 Pages)
(Progress as of 21-Jun-16)

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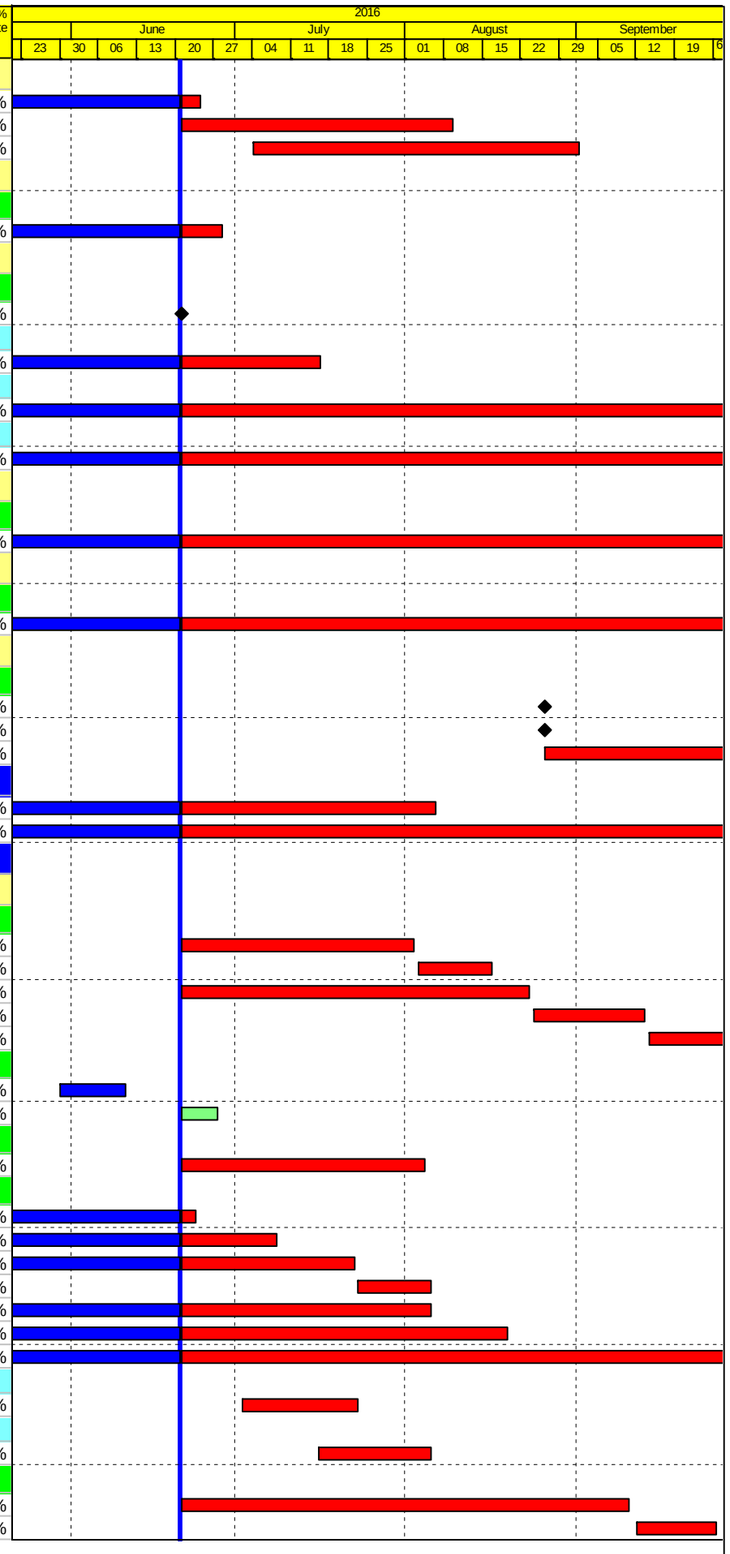
DWG. No.:
J3518/GCL/PGM/3MRP-M37

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
Preliminaries											
MBBE0050	Precast Segment Mould Fabrication & Erection (Viaduct A)	52	24-Dec-14 A	92.31%	4	24-Jun-16	31-May-16	03-Jun-16	-17	1068	100%
MBBE0054	Precast Segment Mould Design (Viaduct F1 to F5)	42	21-Jun-16*	0%	42	09-Aug-16	29-Feb-16	21-Apr-16	-90	0	0%
MBBE0056	Precast Segment Mould Fabrication & Erection (Viaduct F1 to F5)	52	04-Jul-16	0%	52	01-Sep-16	11-Mar-16	17-May-16	-90	54	0%
Viaduct B											
Precast Deck Segments											
MBBE130-1	B: Progressive Match Cast Segment Manufacture & Delivery remaining seg	597	24-Oct-14 A	98.83%	7	28-Jun-16	20-May-16	27-May-16	-26	172	99.4%
Viaduct E											
Precast Deck Segments											
MBE00014	Viaduct E2 - Pier Head Segment Casting	0	21-Jun-16	0%	0		01-Feb-20		1072	1072	0%
Viaduct E1											
MBEE0130-5	E1: Progressive Segment Manufacture & Delivery remaining segments (18	456	08-Apr-15 A	95.2%	22	16-Jul-16	20-Oct-15	14-Nov-15	-196	1050	95.2%
Viaduct E2											
MBEE0130-7	E2: Progressive Segment Manufacture & Delivery remaining segments (41	376	06-May-15 A	34.57%	246	19-Apr-17	17-Nov-15	14-Sep-16	-173	826	34.8%
Viaduct E5, E6, E7 & E8											
MBEE0130-9	E5-6-7-8: Progressive Segment Manufacture & Delivery remaining segmer	360	06-May-15 A	11.2%	320	19-Jul-17	06-Feb-16	08-Mar-17	-106	752	11.2%
Viaduct D											
Precast Deck Segments											
MBDE0130-7	D: Progressive Match Cast Segment Manufacture & Delivery (311 Nr)	315	05-May-15 A	56.9%	136	30-Nov-16	23-Oct-15	09-Apr-16	-194	154	56.9%
Viaduct C											
Precast Deck Segments											
MBCE0130-1	C: Progressive Segment Manufacture & Delivery remaining segments (388	265	19-May-15 A	41%	156	24-Dec-16	23-Nov-15	06-Jun-16	-168	62	41%
Viaduct A											
Precast Deck Segments											
MBAA1100	Viaduct A - Pier Head Segment Casting	0	26-Aug-16	0%	0		31-May-16		-73	0	0%
MBAE0120	A: Commence Segment Casting on Approval of DDA	0	26-Aug-16	0%	0		31-May-16		-73	0	0%
MBAE0130-1	A: Progressive Segment Manufacture & Delivery remaining segments (179	122	26-Aug-16	0%	122	21-Jan-17	31-May-16	25-Oct-16	-73	30	0%
Parapets											
PP6010	Procure Sub-Contractor for Precast Parapets/Barriers	40	21-Aug-15 A	0%	40	06-Aug-16	28-Dec-15	16-Feb-16	-140	80	37.5%
PP6011	Precast Parapets/Barriers Detail Design & Procure Moulds	120	06-Oct-15 A	0%	120	11-Nov-16	29-Jul-15	18-Dec-15	-265	0	37.5%
Materials											
Bearings											
Viaduct A											
PPBRA5	SO review & comment on design submission - Viaduct A	36	21-Jun-16	0%	36	02-Aug-16	22-Apr-16	04-Jun-16	-48	0	0%
PPBRA6	Bearing Design Amendment & re-issue - Viaduct A	12	03-Aug-16	0%	12	16-Aug-16	14-Jun-16	27-Jun-16	-42	6	0%
PPBRA7	Manufacture of Bearing - Viaduct A	54	21-Jun-16	0%	54	23-Aug-16	22-Apr-16	27-Jun-16	-48	0	0%
PPBRA8	Testing Bearing - Viaduct A	18	24-Aug-16	0%	18	13-Sep-16	28-Jun-16	19-Jul-16	-48	0	0%
PPBRA9	Bearing Delivery - Viaduct A	48	14-Sep-16	0%	48	11-Nov-16	20-Jul-16	13-Sep-16	-48	0	0%
Viaduct C											
PPBRC6	Bearing Design Ammendment & re-issue - Viaduct C	12	30-May-16 A	100%	0	11-Jun-16 A					100%
PPBRC99	Site preparation Bearings for Viaduct C	6	21-Jun-16	0%	6	27-Jun-16	23-Jan-20	01-Feb-20	1066	1066	0%
Viaduct D											
PPBRD99	Site preparation Bearings for Viaduct D	38	21-Jun-16	0%	38	04-Aug-16	11-Dec-15	27-Jan-16	-152	0	0%
Viaduct E											
PPBRE3	Bearing design and submission - Viaduct E (E1, E2, E5, E6, E7 & E8)	12	28-Nov-13 A	75%	3	23-Jun-16	04-Jan-16	06-Jan-16	-135	0	100%
PPBRE4	Design check by ICE - Viaduct E (E1, E2, E5, E6, E7 & E8)	24	04-Apr-14 A	37.5%	15	08-Jul-16	04-Jan-16	20-Jan-16	-135	0	100%
PPBRE5	SO review & comment on design submission - Viaduct E (E1, E2, E5, E6, E	36	26-Sep-14 A	25%	27	22-Jul-16	04-Jan-16	03-Feb-16	-135	0	100%
PPBRE6	Bearing Design Amendment & re-issue - Viaduct E (E1, E2, E5, E6, E7 & E	12	23-Jul-16	0%	12	05-Aug-16	04-Feb-16	20-Feb-16	-135	0	0%
PPBRE7	Manufacture of Bearing - Viaduct E (E1, E2, E5, E6, E7 & E8)	54	02-Jun-14 A	27.78%	39	05-Aug-16	04-Jan-16	20-Feb-16	-135	0	100%
PPBRE8	Testing Bearing - Viaduct E (E1, E2, E5, E6, E7 & E8)	24	03-Aug-15 A	0%	51	19-Aug-16	04-Jan-16	05-Mar-16	-135	0	100%
PPBRE9	Bearing Delivery - Viaduct E (E1, E2, E5, E6, E7 & E8)	48	19-Nov-14 A	0%	87	03-Oct-16	04-Jan-16	21-Apr-16	-135	0	100%
Bridge E1											
PP7360	Site preparation Bearings for Viaduct E1	18	02-Jul-16	0%	18	23-Jul-16	23-Mar-16	16-Apr-16	-79	8	0%
Bridge E2											
PP7290	Site preparation Bearings for Viaduct E2	18	16-Jul-16	0%	18	05-Aug-16	31-Mar-16	21-Apr-16	-87	48	0%
Viaduct F											
PPBRF1	Preliminary Design of Bearings - Viaduct F	70	21-Jun-16	0%	70	10-Sep-16	07-Aug-15	30-Oct-15	-257	0	0%
PPBRF3	Bearing design and submission - Viaduct F	12	12-Sep-16	0%	12	26-Sep-16	31-Oct-15	13-Nov-15	-257	0	0%



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Planned Bar
Critical Bar
Milestone

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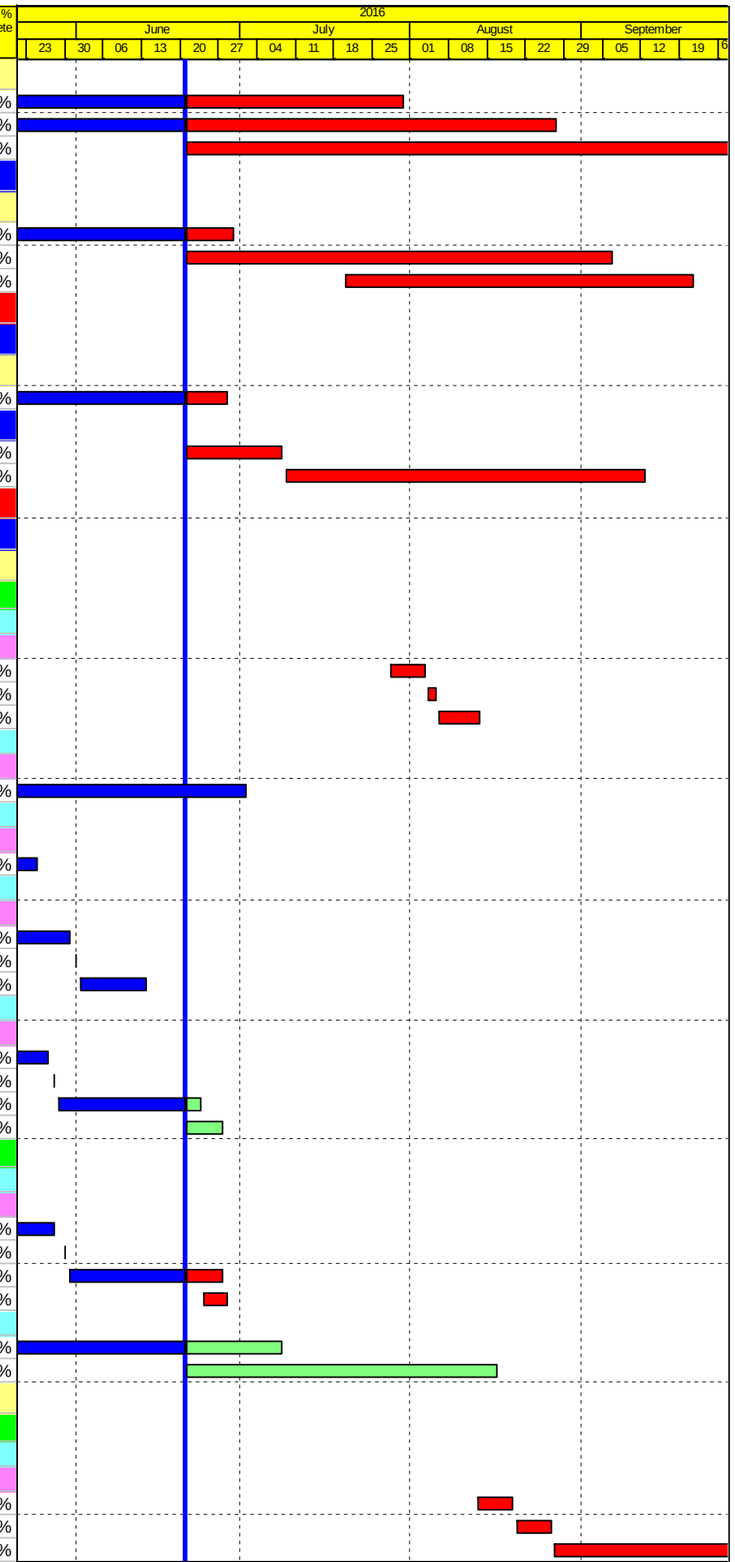
Movement Joints											
PPMJ01	Design & Submission of MJ	138	08-Feb-14 A	75.36%	34	30-Jul-16	19-Oct-15	27-Nov-15	-197	1038	30%
PPMJ02-1	MJ Design Approval	96	26-May-14 A	39.58%	58	27-Aug-16	19-Oct-15	28-Dec-15	-197	0	40%
PPMJ02-2	Manufacture & delivery of MJ	188	21-Jun-16	0%	188	06-Feb-17	19-Oct-15	08-Jun-16	-197	0	0%
Other Sub-Contract Procurement											
Structural Health Monitoring System (SHMS)											
PP7778	SHMS - So approval of Final System Proposal	30	16-Dec-14 A	73.33%	8	29-Jun-16	30-Jul-15	07-Aug-15	-264	0	75%
PP7780	SHMS - Prepare Civil Work Provision	66	21-Jun-16	0%	66	06-Sep-16	30-Jul-15	16-Oct-15	-264	0	0%
PP7788	SHMS - FAT & Delivery for Bridge E5-E6-E7-E8 equipment	54	20-Jul-16	0%	54	21-Sep-16	27-Aug-15	31-Oct-15	-264	100	0%
Site Preparation / Mobilisations											
Tree Felling / Transplant											
Approved Trees in Contract											
TR00220	Tree transplant for Viaduct B - affecting Pier B18 & Abutment B	90	17-Feb-14 A	92.22%	7	28-Jun-16	02-Feb-16	12-Feb-16	-110	1065	96%
Unloading Jetty at HKBCF											
PR09060	Unloading Jetty at HKBCF - Conditional survey & temp jetty formation	15	21-Jun-16	0%	15	08-Jul-16	08-Jan-16	25-Jan-16	-131	0	0%
PR09070	Unloading Jetty at HKBCF - Install Unloading Frame incl. testing/commissio	56	09-Jul-16	0%	56	12-Sep-16	26-Jan-16	07-Apr-16	-131	215	0%
CONSTRUCTION											
PILING AND SUBSTRUCTURE											
Viaduct A											
Bridge A2											
Pier A1 (A2e)											
Pier Head Segments											
SA2E0380	A1 (A2e) - Pier Head Segment - Temporary Platform	6	28-Jul-16*	0%	6	03-Aug-16	09-Jul-16	15-Jul-16	-16	0	0%
SA2E0381	A1 (A2e) - Pier Head Segment Bearings	2	04-Aug-16	0%	2	05-Aug-16	16-Jul-16	18-Jul-16	-16	0	0%
SA2E0382	A1 (A2e) - Pier Head Segment Lift & Temp Support (2 seg)	7	06-Aug-16	0%	7	13-Aug-16	19-Jul-16	26-Jul-16	-16	87	0%
Pier A2 (A2d)											
Pier Works											
SA2D0340	A2 (A2d) - Type 4B Pier Head Curing/Striking of Forms/Remove Scaffoldin	6	23-Apr-16 A	100%	0	02-Jul-16 A					100%
Pier A4 (A2b)											
Pier Works											
SA2B0340	A4 (A2b) - Type 4B Pier Head Curing/Striking of Forms/Remove Scaffoldin	6	14-May-16 A	100%	0	25-May-16 A					100%
Pier A5 (A2a)											
Pier Works											
SA2A0310	A5 (A2a) - Type 4B Pier Head Rebarwork, Formwork & Prep	10	10-May-16 A	100%	0	31-May-16 A					100%
SA2A0330	A5 (A2a) - Type 4B Pier Head Concreting	1	01-Jun-16 A	100%	0	01-Jun-16 A					100%
SA2A0340	A5 (A2a) - Type 4B Pier Head Curing/Striking of Forms/Remove Scaffoldin	6	02-Jun-16 A	100%	0	14-Jun-16 A					100%
Pier A6 (A1f)											
Pier Works											
SA1F0310	A6 (A1f) - Type 4B-MJ Pier Head Rebarwork, Formwork & Prep	9	08-Apr-16 A	100%	0	27-May-16 A					100%
SA1F0330	A6 (A1f) - Type 4B-MJ Pier Head Concreting	1	28-May-16 A	100%	0	28-May-16 A					100%
SA1F0340	A6 (A1f) - Type 4B-MJ Pier Head Curing/Striking of Forms/Remove Scaffo	6	29-May-16 A	50%	3	23-Jun-16	10-Sep-16	13-Sep-16	69	77	50%
SA1F0350	A6 (A1f) - Type 4B-Bearing Plinth	6	21-Jun-16	0%	6	27-Jun-16	07-Sep-16	13-Sep-16	66	74	0%
Bridge A1											
Pier A9 (A1c)											
Pier Works											
SA1C0210	A9 (A1c) - Type 5B Pier Head Formwork & Prep for Concreting	3	18-May-16 A	100%	0	28-May-16 A					100%
SA1C0220	A9 (A1c) - Type 5B Pier Head Concreting	1	30-May-16 A	100%	0	30-May-16 A					100%
SA1C0270	A9 (A1c) - Type 5B Pier Head Curing & Striking of Forms & Remove Scaffo	6	31-May-16 A	0%	6	27-Jun-16	11-Jun-16	17-Jun-16	-8	0	0%
SA1C0280	A9 (A1c) - Type 5B Pier Backfilling Works	4	24-Jun-16	0%	4	28-Jun-16	15-Jun-16	18-Jun-16	-8	73	0%
Abutment & Approach Ramp A											
SA1A0250	AR-A - RE Walls - Excavation/formation/drainage fillter & bottom layer to g	72	14-Mar-16 A	79.17%	15	08-Jul-16	13-Jan-20	01-Feb-20	1057	1057	10%
SA1A0290	AR-A - RC Walls construction	48	21-Jun-16	0%	48	16-Aug-16	08-Jul-16	01-Sep-16	14	126	0%
Viaduct B											
Bridge B1											
Pier B17 (B1c)											
Socketted H-Pile Installation											
GFXX324-3	B17 (B1c) - Predrilling	6	13-Aug-16	0%	6	19-Aug-16	02-Mar-16	08-Mar-16	-133	0	0%
GFXX324-5	B17 (B1c) - Confirm Rockhead Levels	6	20-Aug-16	0%	6	26-Aug-16	09-Mar-16	15-Mar-16	-133	0	0%
GFXX325-3	B17 (B1c) - Install SH Pile (10 nr) (incl. proof drilling)	45	27-Aug-16	0%	45	21-Oct-16	16-Mar-16	12-May-16	-133	0	0%



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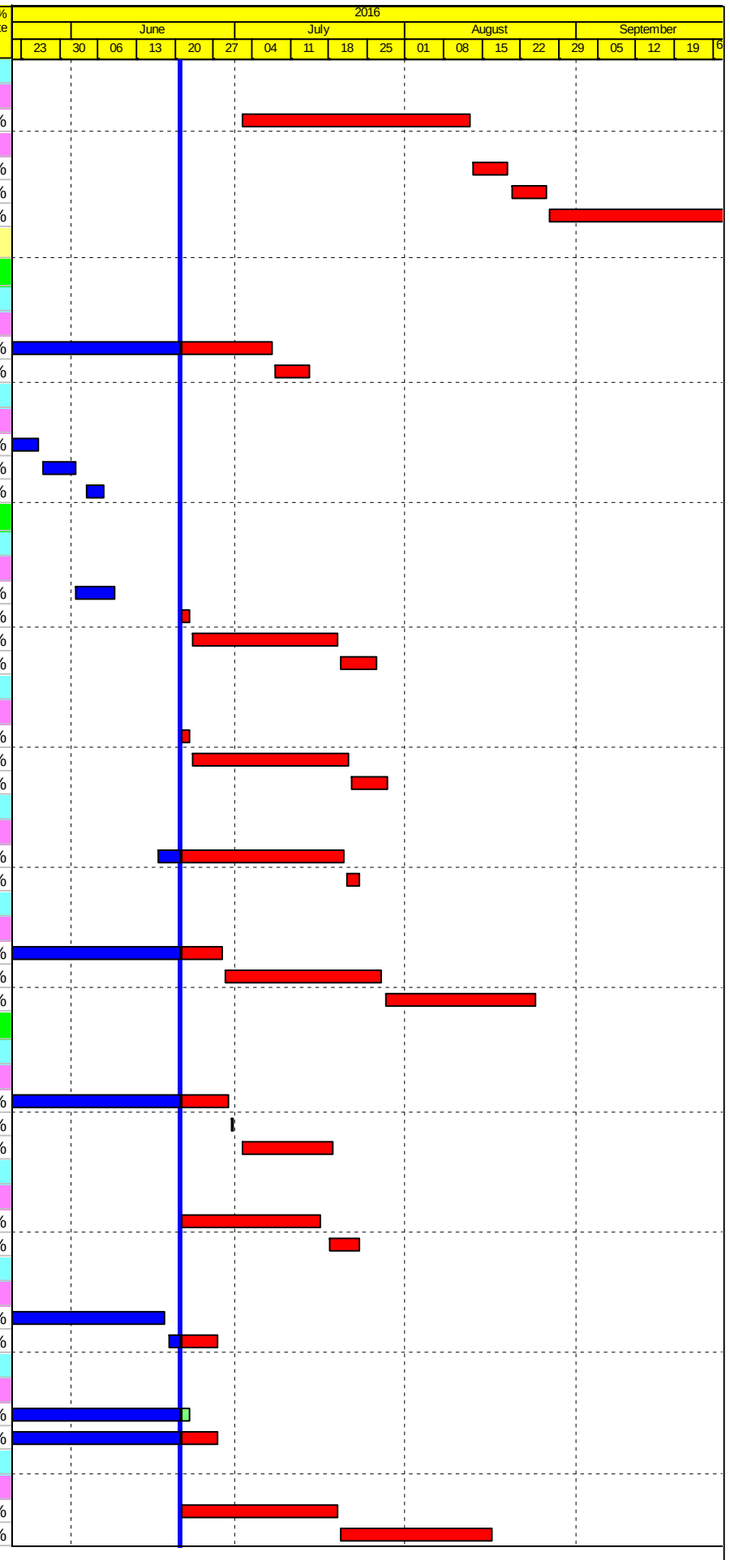
Pier B18 (B1b) & Abutment B											
Preliminary Works for Land Piling											
PB180030	B18 (B1b) - Install Geo. Instru. & Baseline Monitoring	36	02-Jul-16	0%	36	12-Aug-16	18-Dec-15	01-Feb-16	-155	0	0%
Socketted H-Pile Installation											
GFXX324-4	B18 (B1b) - Predrilling	6	13-Aug-16	0%	6	19-Aug-16	02-Feb-16	11-Feb-16	-155	0	0%
GFXX324-6	B18 (B1b) - Confirm Rockhead Levels	6	20-Aug-16	0%	6	26-Aug-16	12-Feb-16	18-Feb-16	-155	0	0%
GFXX325-4	B18 (B1b) - Install SH Pile (6 no.) (incl. proof drilling)	27	27-Aug-16	0%	27	28-Sep-16	19-Feb-16	21-Mar-16	-155	0	0%
Viaduct C											
Bridge C4											
Pier C3 (C4c)											
Pier Head Segments											
SC4C0378	C3 (C4c) - Pier Head Segment Diaphragm - Rebar, Formwork, Concreting	22	20-May-16 A	36.36%	14	07-Jul-16	12-Nov-15	27-Nov-15	-177	0	30%
SC4C0380	C3 (C4c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	08-Jul-16	0%	6	14-Jul-16	28-Nov-15	05-Dec-15	-176	22	0%
Pier C6 (C3f)											
Pier Head Segments											
SC3F0370	C6 (C3f) - Pier Head Segment - Temporary Platform	6	16-May-16 A	100%	0	26-May-16 A					100%
SC3F0371	C6 (C3f) - Pier Head Segment Bearings	2	27-May-16 A	100%	0	02-Jun-16 A					100%
SC3F0372	C6 (C3f) - Pier Head Segment Lift & Temp Support (2 seg)	7	04-Jun-16 A	100%	0	07-Jun-16 A					100%
Bridge C3											
Pier C8 (C3d)											
Pier Head Segments											
SC3D0370	C8 (C3d) - Pier Head Segment - Temporary Platform	6	02-Jun-16 A	100%	0	09-Jun-16 A					100%
SC3D0372	C8 (C3d) - Pier Head Segment Lift & Fix (1 seg)	2	21-Jun-16	0%	2	22-Jun-16	21-Dec-15	22-Dec-15	-144	0	0%
SC3D0378	C8 (C3d) - Pier Head Segment Diaphragm - Rebar, Formwork, Concreting	22	23-Jun-16	0%	22	19-Jul-16	23-Dec-15	20-Jan-16	-144	0	0%
SC3D0380	C8 (C3d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	20-Jul-16	0%	6	26-Jul-16	21-Jan-16	27-Jan-16	-144	86	0%
Pier C10 (C3b)											
Pier Head Segments											
SC3B0372	C10 (C3b) - Pier Head Segment Lift & Fix (1 seg)	2	21-Jun-16	0%	2	22-Jun-16	01-Apr-16	02-Apr-16	-65	0	0%
SC3B0378	C10 (C3b) - Pier Head Segment Diaphragm - Rebar, Formwork, Concretir	24	23-Jun-16	0%	24	21-Jul-16	05-Apr-16	03-May-16	-65	0	0%
SC3B0380	C10 (C3b) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	22-Jul-16	0%	6	28-Jul-16	04-May-16	10-May-16	-65	165	0%
Pier C9 (C3c)											
Pier Head Segments											
SC3C0378	C9 (C3c) - Pier Head Segment Diaphragm - Rebar, Formwork, Concreting	30	17-Jun-16 A	16.67%	25	20-Jul-16	24-Feb-16	23-Mar-16	-94	0	0%
SC3C0380	C9 (C3c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	3	21-Jul-16	0%	3	23-Jul-16	24-Mar-16	30-Mar-16	-94	0	0%
Pier C11 (C3a)											
Pier Head Segments											
SC3A0372	C11 (C3a) - Pier Head Segment Lift & Fix (2 seg)	7	13-May-16 A	0%	7	28-Jun-16	02-Apr-16	11-Apr-16	-64	0	0%
SC3A380	C11 (C3a) - C11-A Diaphragm	24	29-Jun-16	0%	24	27-Jul-16	12-Apr-16	10-May-16	-64	0	0%
SC3A382	C11 (C3a) - C11-B Diaphragm	24	28-Jul-16	0%	24	24-Aug-16	11-May-16	08-Jun-16	-64	166	0%
Bridge C2											
Pier C13 (C2e) Portal											
Portal											
SC2ER302	C13 (C2e) - Portal Beam Side Formwork & Prep for Concreting	20	12-Mar-16 A	60%	8	29-Jun-16	18-Feb-16	26-Feb-16	-99	0	100%
SC2ER310	C13 (C2e) - Portal Beam Concreting	1	30-Jun-16	0%	1	30-Jun-16	27-Feb-16	27-Feb-16	-99	0	0%
SC2ER320	C13 (C2e) - Portal Beam Curing/Striking of Forms/Remove Scaffolding	14	02-Jul-16	0%	14	18-Jul-16	29-Feb-16	15-Mar-16	-99	2	0%
Pier C15 (C2c)											
Pier Head Segments											
SC2C0378	C15 (C2c) - Pier Head Segment Diaphragm - Rebar, Formwork, Concretir	22	21-Jun-16	0%	22	16-Jul-16	14-Apr-16	10-May-16	-55	0	0%
SC2C0380	C15 (C2c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	18-Jul-16	0%	6	23-Jul-16	11-May-16	18-May-16	-55	43	0%
Pier C12 (C2f)											
Pier Head Segments											
SC2F0378	C12 (C2f) - Pier Head Segment Diaphragm - Rebar, Formwork, Concreting	22	18-May-16 A	100%	0	18-Jun-16 A					100%
SC2F0380	C12 (C2f) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	19-Jun-16 A	0%	6	27-Jun-16	21-May-16	27-May-16	-25	0	5%
Pier C14 (C2d)											
Pier Head Segments											
SC2D0378	C14 (C2d) - Pier Head Segment Diaphragm - Concreting	2	16-Mar-16 A	0%	2	22-Jun-16	31-Jan-20	01-Feb-20	1070	1070	50%
SC2D0380	C14 (C2d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	17-Mar-16 A	0%	6	27-Jun-16	12-Apr-16	18-Apr-16	-57	22	50%
Pier C16 (C2b)											
Pier Head Segments											
SC2B380	C16 (C2b) - C16A Diaphragm	24	21-Jun-16	0%	24	19-Jul-16	15-Feb-16	12-Mar-16	-102	0	0%
SC2B382	C16 (C2b) - C16B Diaphragm	24	20-Jul-16	0%	24	16-Aug-16	14-Mar-16	14-Apr-16	-102	23	0%



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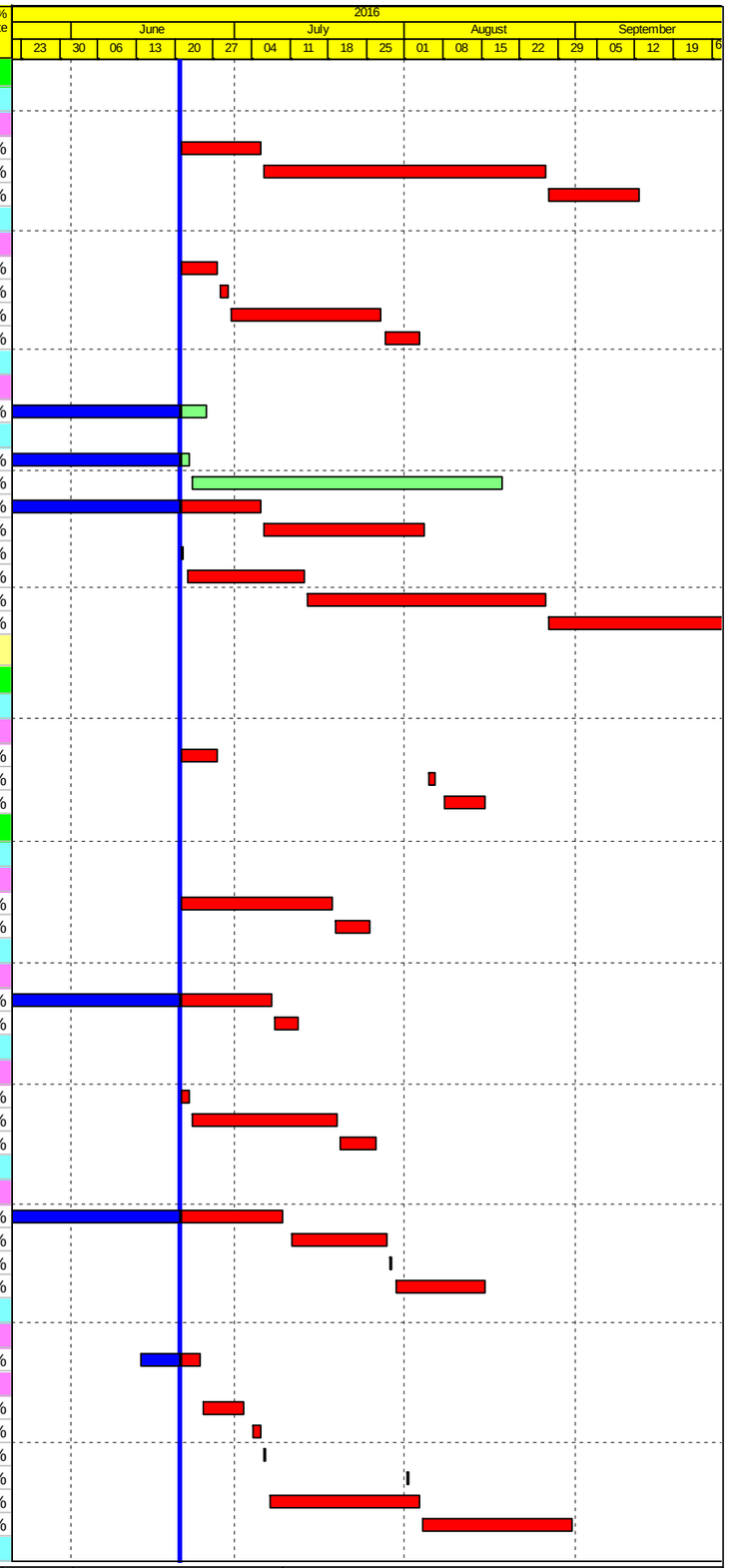
Bridge C1											
Pier C18 (C3d) Portal											
Portal											
SC1ER280	C18 (C1e) - Portal Beam Scaffolding	12	21-Jun-16*	0%	12	05-Jul-16	11-Dec-15	24-Dec-15	-152	0	0%
SC1ER310	C18 (C1e) - Portal Beam Rebar, Formwork, Concreting	45	06-Jul-16	0%	45	26-Aug-16	28-Dec-15	22-Feb-16	-152	0	0%
SC1ER320	C18 (C1e) - Pier Head Curing/Striking of Forms/Remove Scaffolding	14	27-Aug-16	0%	14	12-Sep-16	23-Feb-16	09-Mar-16	-152	0	0%
Pier C17 (C2a)											
Pier Head Segments											
SC2A0370	C17 (C2a) - Pier Head Segment - Temporary Platform	6	21-Jun-16*	0%	6	27-Jun-16	15-Dec-15	21-Dec-15	-149	0	0%
SC2A0372	C17 (C2a) - Pier Head Segment Lift & Fix (1 seg)	2	28-Jun-16	0%	2	29-Jun-16	22-Dec-15	23-Dec-15	-149	0	0%
SC2A0378	C17 (C2a) - Pier Head Segment Diaphragm - Rebar, Formwork, Concretir	23	30-Jun-16	0%	23	27-Jul-16	24-Dec-15	22-Jan-16	-149	0	0%
SC2A0380	C17 (C2a) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	28-Jul-16	0%	6	03-Aug-16	23-Jan-16	29-Jan-16	-149	0	0%
Pier C19 (C1d)											
Pier Head Segments											
SC1D0380	C19 (C1d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	19-Mar-16 A	16.67%	5	25-Jun-16	05-Oct-16	11-Oct-16	88	126	16%
Abutment & Approach Ramp C											
SC1C0250	AR-C - RE Walls - Erect fencing, Excavation/formation/ drainage filter & bo	12	22-Apr-15 A	83.33%	2	22-Jun-16	29-Nov-19	30-Nov-19	1022	0	90%
SC1C0251	AR-C - RE Walls - Upper layers with backfill in stages (exclude 800dia Tcc a	48	23-Jun-16	0%	48	18-Aug-16	02-Dec-19	01-Feb-20	1022	1022	0%
SC1C0254	AR-C - RC Walls - Backfill	12	16-May-16 A	0%	12	05-Jul-16	25-Apr-16	09-May-16	-46	0	0%
SC1C0256	AR-C - RC Walls - Concrete Parapets	26	06-Jul-16	0%	26	04-Aug-16	10-May-16	10-Jun-16	-46	55	0%
SC1C0257	ARC - Utility work - Termination of 800 dia Tcc	1	21-Jun-16*	0%	1	21-Jun-16	16-Feb-16	16-Feb-16	-101	0	0%
SC1C0258	ARC - Utility work - Remove 800 dia Tcc and backfill	18	22-Jun-16	0%	18	13-Jul-16	17-Feb-16	08-Mar-16	-101	0	0%
SC1C0259	ARC - RE Walls - Remaining bay @800 Tcc	38	14-Jul-16	0%	38	26-Aug-16	09-Mar-16	26-Apr-16	-101	0	0%
SC1C0259A	ARC - RC Walls - Remaining bays @800Tcc	36	27-Aug-16	0%	36	11-Oct-16	27-Apr-16	10-Jun-16	-101	0	0%
Viaduct D											
Bridge D3											
Pier D6 (D4a)											
Pier Head Segments											
SD4A0370	D6 (D4a) - Pier Head Segment - Temporary Platform	6	21-Jun-16*	0%	6	27-Jun-16	21-Jan-16	27-Jan-16	-120	32	0%
SD4A0371	D6 (D4a) - Pier Head Segment Bearings	2	05-Aug-16	0%	2	06-Aug-16	28-Jan-16	29-Jan-16	-152	0	0%
SD4A0372	D6 (D4a) - Pier Head Segment Lift & Temp Support (2 seg)	7	08-Aug-16	0%	7	15-Aug-16	30-Jan-16	06-Feb-16	-152	46	0%
Bridge D2											
Pier D8 (D3d)											
Pier Head Segments											
SD3D0378	D8 (D3d) - Pier Head Segment Diaphragm - Rebar, Formwork, Concreting	23	21-Jun-16	0%	23	18-Jul-16	19-Jan-16	17-Feb-16	-122	0	0%
SD3D0380	D8 (D3d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	19-Jul-16	0%	6	25-Jul-16	18-Feb-16	25-Feb-16	-121	77	0%
Pier D12 (D2e)											
Portal											
SD2ER320	D12 (D2e) - Pier Head Curing/Striking of Forms/Remove Scaffolding	14	09-May-16 A	0%	14	07-Jul-16	12-Apr-16	27-Apr-16	-57	0	0%
SD2ER325	D12 (D2e) - Pier Backfilling Works	4	08-Jul-16	0%	4	12-Jul-16	13-Jun-16	16-Jun-16	-21	206	0%
Pier D9 (D3c)											
Pier Head Segments											
SD3C0372	D9 (D3c) - Pier Head Segment Lift & Fix (1 seg)	2	21-Jun-16	0%	2	22-Jun-16	20-Feb-16	22-Feb-16	-97	0	0%
SD3C0378	D9 (D3c) - Pier Head Segment Diaphragm - Rebar, Formwork, Concreting	22	23-Jun-16	0%	22	19-Jul-16	23-Feb-16	18-Mar-16	-97	0	0%
SD3C0380	D9 (D3c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	20-Jul-16	0%	6	26-Jul-16	19-Mar-16	29-Mar-16	-97	0	0%
Pier D10 (D3b)											
Portal											
SD3BR300	D10 (D3b) - Portal Beam Rebarwork & Inserts	16	29-Apr-16 A	0%	16	09-Jul-16	09-Mar-16	30-Mar-16	-82	0	0%
SD3BR305	D10 (D3b) - Portal Beam Side Formwork & Prep for Concreting	16	11-Jul-16	0%	16	28-Jul-16	31-Mar-16	19-Apr-16	-82	0	0%
SD3BR310	D10 (D3b) - Portal Beam Concreting	1	29-Jul-16	0%	1	29-Jul-16	20-Apr-16	20-Apr-16	-82	0	0%
SD3BR320	D10 (D3b) - Pier Head Curing/Striking of Forms/Remove Scaffolding	14	30-Jul-16	0%	14	15-Aug-16	21-Apr-16	07-May-16	-82	0	0%
Pier D13 (D2d)											
Pier Works											
SD2D0360	D13 (D2d) - Type 5B-MJ Pier Backfilling Works	4	14-Jun-16 A	0%	4	24-Jun-16	19-Feb-16	23-Feb-16	-98	0	10%
Pier Head Segments											
SD2D0370	D13 (D2d) - Pier Head Segment - Temporary Platform	6	25-Jun-16*	0%	6	02-Jul-16	24-Feb-16	01-Mar-16	-98	0	0%
SD2D0371	D13 (D2d) - Pier Head Segment Bearings	2	04-Jul-16	0%	2	05-Jul-16	02-Mar-16	03-Mar-16	-98	0	0%
SD2D0372	D13 (D2d) - D13A - Pier Head Segment Lift & Fix (1 seg)	1	06-Jul-16	0%	1	06-Jul-16	04-Mar-16	04-Mar-16	-98	0	0%
SD2D380	D13 (D2d) - D13B - Pier Head Segment Lift & Fix (1 seg)	1	01-Aug-16	0%	1	01-Aug-16	02-Apr-16	02-Apr-16	-98	0	0%
SD2D382	D13 (D2d) - D13A - Diaphragm	24	07-Jul-16	0%	24	03-Aug-16	05-Mar-16	06-Apr-16	-98	0	0%
SD2D384	D13 (D2d) - D13B - Diaphragm	24	04-Aug-16	0%	24	31-Aug-16	07-Apr-16	05-May-16	-98	54	0%
Pier D11 (D3a)											



Actual Work
Planned Bar
Critical Bar
Milestone

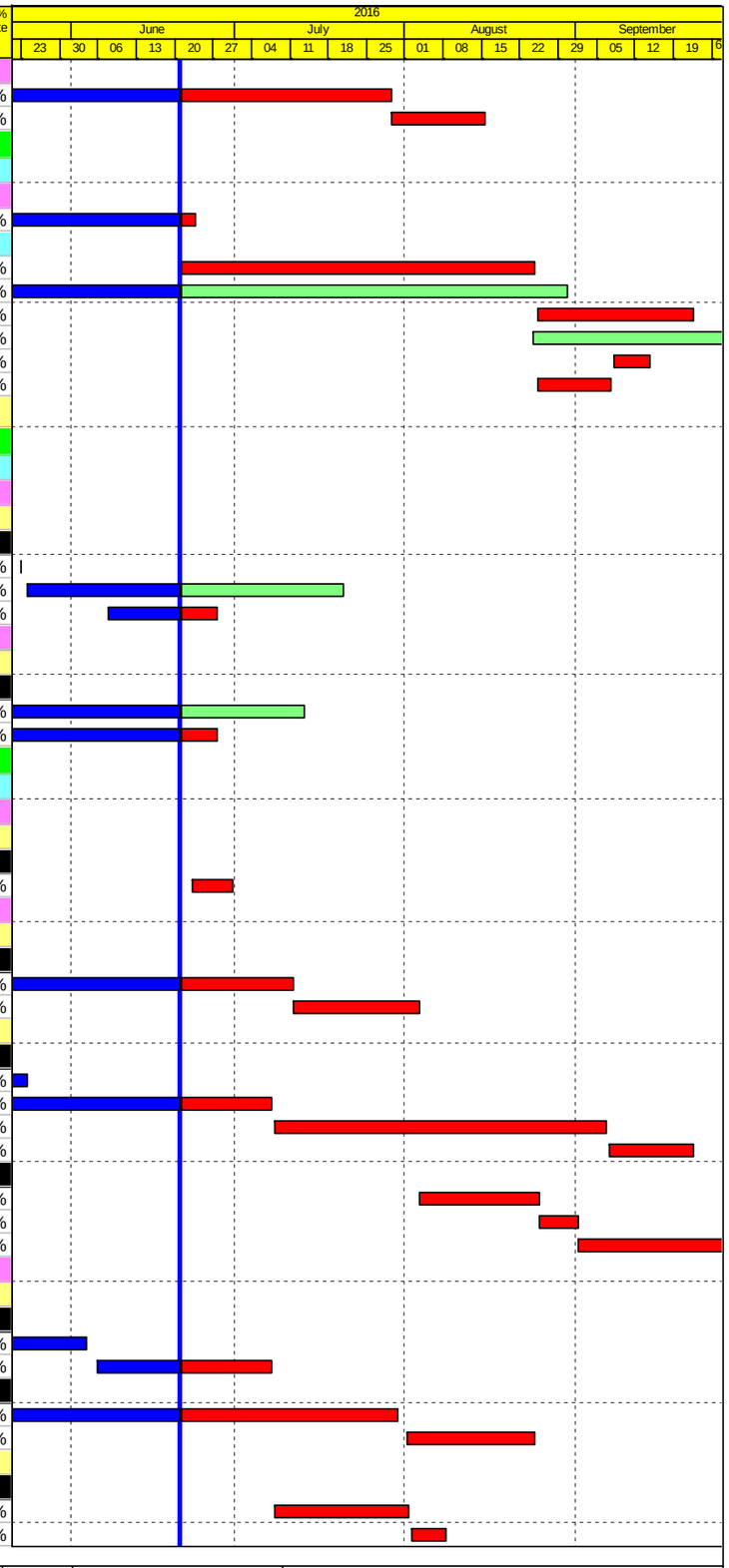
Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 6 of 13 Pages)
(Progress as of 21-Jun-16)

Date	Revision	Checked	Approved
29-Apr-16		PKN	HF
31-May-...		PKN	HF
02-Jul-16		PKN	HF

DWG. No.:
J3518/GCL/PGM/3MRP-M37

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
Portal											
SD3AR310	D11 (D3a) - Portal Beam Rebar, Formwork, Concreting	45	08-Apr-16 A	27%	33	29-Jul-16	15-Apr-16	25-May-16	-54	0	27%
SD3AR320	D11 (D3a) - Pier Head Curing/Striking of Forms/Remove Scaffolding	14	29-Jul-16	0%	14	15-Aug-16	26-May-16	11-Jun-16	-54	63	0%
Bridge D1											
Pier D15 (D2b)											
Pier Head Segments											
SD2B0380	D15 (D2b) - Pier Head Segment Diaphragm - Curing & Striking of Forms	3	21-May-16 A	0%	3	23-Jun-16	23-May-16	25-May-16	-24	22	0%
Abutment & Approach Ramp D											
SD1B0252	AR-D - Box structure - Bay 1 & Bay 8	55	21-Jun-16*	0%	55	24-Aug-16	24-Mar-16	02-Jun-16	-69	0	0%
SD1B0290	AR-D - Backfill embankment	90	02-Nov-15 A	33.33%	60	30-Aug-16	08-Oct-16	17-Dec-16	91	0	0%
SD1B0300	AR-D - RC Walls - Concrete parapets / Profile barriers	24	25-Aug-16	0%	24	22-Sep-16	11-Aug-16	07-Sep-16	-12	0	0%
SD1B0400	AR-D - Drainage	45	24-Aug-16	0%	45	18-Oct-16	12-Dec-16	08-Feb-17	91	0	0%
SD1B0402	AR-D - Subbase	6	08-Sep-16	0%	6	14-Sep-16	18-Jun-16	24-Jun-16	-69	6	0%
SD1B0420	AR-D - Ductings for TCSS civil work provisions (for KD4)	12	25-Aug-16	0%	12	07-Sep-16	03-Jun-16	17-Jun-16	-69	0	0%
Viaduct E											
Viaduct E1											
Bridge E1 - Piling & Substructure											
E1A, E1B, E1C & E1D (E1a1-2-3-4)											
Pier Head Segments - E1A, E1B, E1C & E1D											
Pier Head Segments - E1D (E1a1)											
SE1A1372	E1D (E1a1) - Pier Head Segment Lift & Fix (1 seg)	2	23-May-16 A	100%	0	23-May-16 A					100%
SE1A1378	E1D (E1a1) - Pier Head Segment Diaphragm - Rebar, Formwork, Concret	25	24-May-16 A	0%	25	20-Jul-16	31-Dec-19	01-Feb-20	1047	1047	50%
SE1A1380	E1D (E1a1) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	08-Jun-16 A	0%	6	27-Jun-16	28-May-16	03-Jun-16	-19	57	50%
E2A, E2B, E2C & E2D (E1b1-2-3-4)											
Pier Head Segments - E2A, E2B, E2C & E2D											
Pier Head Segments - E2D (E1b1)											
SE1B1378	E2D (E1b1) - Pier Head Segment Diaphragm - Rebar, Formwork, Concret	22	03-May-16 A	13.64%	19	13-Jul-16	08-Jan-20	01-Feb-20	1053	1053	50%
SE1B1380	E2D (E1b1) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	17-May-16 A	0%	6	27-Jun-16	18-May-16	24-May-16	-28	19	50%
Viaduct E2											
Bridge E2 - Piling & Substructure											
E3A,E3B, E3C & E3D (E2a - 1/2/3/4)											
Pier Head Segements - E3A,E3B, E3C & E3D											
Pier Head Segment - E3D (E2a1)											
SE2A1372	E3D (E2a1) - Pier Head Segment Lift & Temp Support (2 seg)	7	23-Jun-16*	0%	7	30-Jun-16	16-May-16	24-May-16	-31	113	0%
E4A & E4B (E2b - 1/2)											
Pier Works - E4A & E4B											
Pier Works - E4B (E2b1)											
E4B2030	E4B - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Upper Dia	24	09-May-16 A	30%	17	11-Jul-16	11-Jul-15	30-Jul-15	-280	0	30%
E4B2040	E4B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	20	11-Jul-16	0%	20	03-Aug-16	31-Jul-15	22-Aug-15	-280	0	0%
Pier Head Segements - E4A & E4B											
Pier head Segment - E4A (E2b2)											
E4A3110	E4A - Temp. Work, Grillages, Megashore Towers, Rail Beams	22	11-Mar-16 A	100%	0	24-May-16 A					100%
E4A3120	E4A - Install Pierhead Segments (4 nr)	6	29-Apr-16 A	0%	14	07-Jul-16	17-Jun-15	04-Jul-15	-299	0	50%
E4A3130	E4A - Diaphragm of PHS - Formwork, Rebar, Concreting	52	08-Jul-16	0%	52	06-Sep-16	06-Jul-15	03-Sep-15	-299	0	0%
E4A3140	E4A - Remove Rail Beams, Megashore Towers	13	07-Sep-16	0%	13	22-Sep-16	04-Sep-15	18-Sep-15	-299	0	0%
Pier head Segment - E4B (E2b1)											
E4B3110	E4B - Temp. Work, Grillages, Megashore Towers, Rail Beams	19	03-Aug-16	0%	19	25-Aug-16	24-Aug-15	14-Sep-15	-280	0	0%
E4B3120	E4B - Install Pierhead Segments (4 nr)	6	25-Aug-16	0%	6	01-Sep-16	15-Sep-15	21-Sep-15	-280	0	0%
E4B3130	E4B - Diaphragm of PHS - Formwork, Rebar, Concreting	53	01-Sep-16	0%	53	05-Nov-16	22-Sep-15	25-Nov-15	-280	0	0%
E5A & E5B (E2c - 1/2)											
Pier Works - E5A & E5B											
Pier Works - E5A (E2c2)											
E5A2020	E5A - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Solic	38	23-Feb-16 A	100%	0	04-Jun-16 A					100%
E5A2030	E5A - Seagull Pier Curing, CJ, Remove Formwork & Falsework	14	06-Jun-16 A	0%	14	07-Jul-16	21-Dec-15	08-Jan-16	-144	0	50%
Pier Works - E5B (E2c1)											
E5B2020	E5B - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Solid	73	19-Mar-16 A	53.42%	34	30-Jul-16	16-Mar-16	28-Apr-16	-76	0	60%
E5B2030	E5B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	01-Aug-16	0%	21	24-Aug-16	29-Apr-16	25-May-16	-76	0	0%
Pier Head Segements - E5A & E5B											
Pier Head Segment - E5A (E2c2)											
E5A3110	E5A - Temp. Work, Rail Beams	21	08-Jul-16	0%	21	01-Aug-16	09-Jan-16	02-Feb-16	-144	0	0%
E5A3120	E5A - Install Pierhead Segments (4 nr)	6	02-Aug-16	0%	6	08-Aug-16	03-Feb-16	12-Feb-16	-144	0	0%



Actual Work
Planned Bar
Critical Bar
Milestone

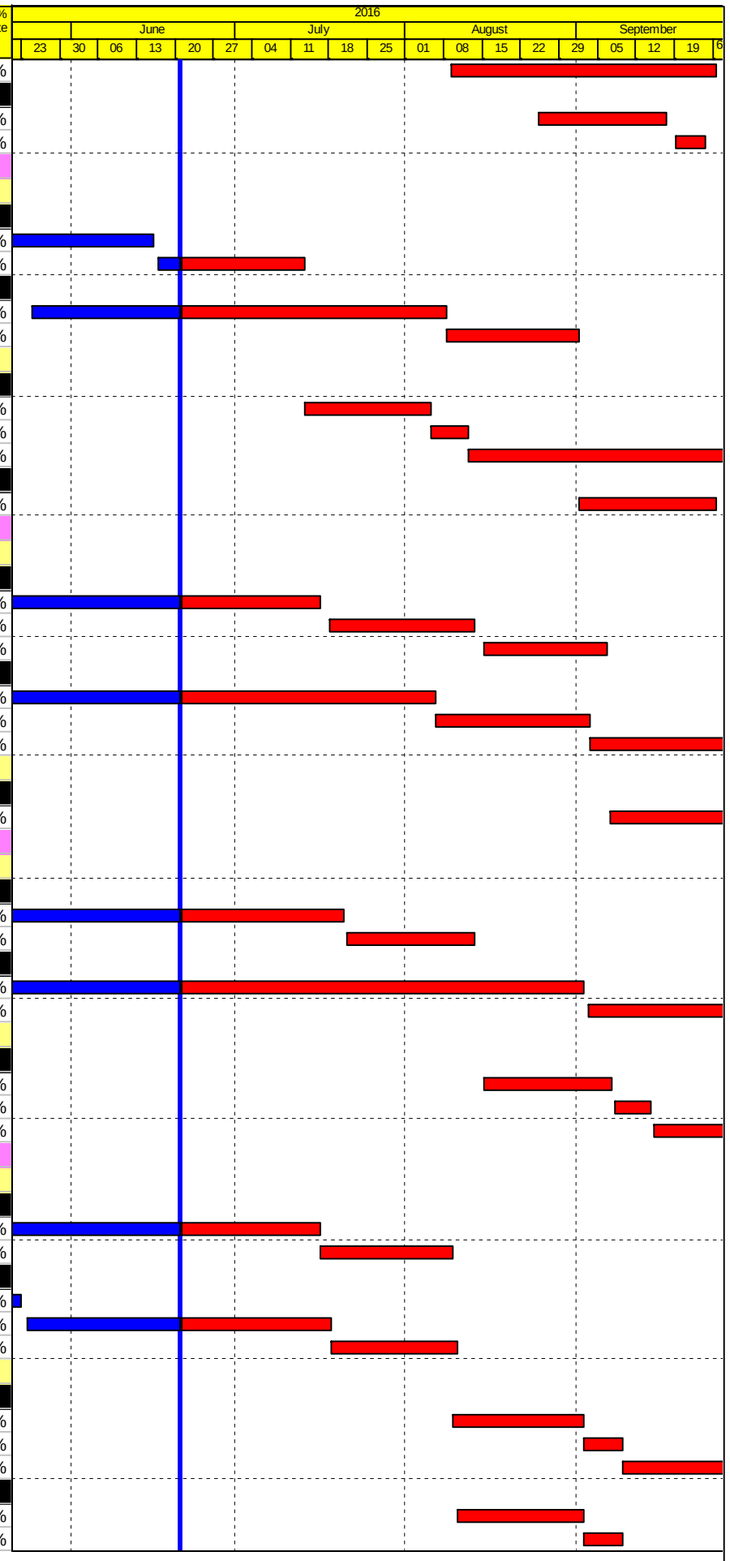
Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 7 of 13 Pages)
(Progress as of 21-Jun-16)

Date	Revision	Checked	Approved
29-Apr-16		PKN	HF
31-May-...		PKN	HF
02-Jul-16		PKN	HF

DWG. No.:
J3518/GCL/PGM/3MRP-M37

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
E5A3130	E5A - Diaphragm of PHS - Formwork, Rebar, Concreting	41	09-Aug-16	0%	41	26-Sep-16	13-Feb-16	05-Apr-16	-144	0	0%
Pier head Segment - E5B (E2c1)											
E5B3110	E5B - Temp. Work, Rail Beams	20	25-Aug-16	0%	20	17-Sep-16	26-May-16	18-Jun-16	-76	0	0%
E5B3120	E5B - Install Pierhead Segments (4 nr)	6	19-Sep-16	0%	6	24-Sep-16	20-Jun-16	25-Jun-16	-76	0	0%
E6A & E6B (E2d - 1/2)											
Pier Works - E6A & E6B											
Pier Works - E6A (E2d2)											
E6A2020	E6A - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Solid)	59	27-Feb-16 A	100%	0	16-Jun-16 A					100%
E6A2030	E6A - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	17-Jun-16 A	10%	19	13-Jul-16	14-Jul-15	04-Aug-15	-278	0	10%
Pier Works - E6B (E2d1)											
E6B2020	E6B - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Solid)	68	25-May-16 A	40%	41	08-Aug-16	03-Mar-16	23-Apr-16	-87	0	40%
E6B2030	E6B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	08-Aug-16	0%	21	01-Sep-16	25-Apr-16	20-May-16	-87	0	0%
Pier head Segment - E6A & E6B											
Pier head Segment - E6A (E2d2)											
E6A3110	E6A - Temp. Work, Rail Beams	20	13-Jul-16	0%	20	05-Aug-16	05-Aug-15	27-Aug-15	-278	0	0%
E6A3120	E6A - Install Pierhead Segments (4 nr)	6	05-Aug-16	0%	6	12-Aug-16	28-Aug-15	03-Sep-15	-278	0	0%
E6A3130	E6A - Diaphragm of PHS - Formwork, Rebar, Concreting	43	12-Aug-16	0%	43	04-Oct-16	04-Sep-15	27-Oct-15	-278	0	0%
Pier head Segment - E6B (E2d1)											
E6B3110	E6B - Temp. Work, Rail Beams	20	01-Sep-16	0%	20	26-Sep-16	21-May-16	14-Jun-16	-87	0	0%
E7A & E7B (E2e - 1/2)											
Pier Works - E7A & E7B											
Pier Works - E7A (E2e2)											
E7A2020	E7A - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Hollo	44	29-Mar-16 A	50%	22	16-Jul-16	28-Nov-15	23-Dec-15	-163	0	60%
E7A2030	E7A - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Upper Diap	24	18-Jul-16	0%	24	13-Aug-16	24-Dec-15	23-Jan-16	-163	0	0%
E7A2040	E7A - Seagull Pier Curing, CJ, Remove Formwork & Falsework	20	15-Aug-16	0%	20	06-Sep-16	25-Jan-16	19-Feb-16	-163	0	0%
Pier Works - E7B (E2e1)											
E7B2020	E7B - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Hollo	66	12-Apr-16 A	40%	40	06-Aug-16	24-Jun-15	10-Aug-15	-294	0	40%
E7B2030	E7B - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Upper Diap	24	06-Aug-16	0%	24	03-Sep-16	11-Aug-15	07-Sep-15	-294	0	0%
E7B2040	E7B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	20	03-Sep-16	0%	20	28-Sep-16	08-Sep-15	02-Oct-15	-294	0	0%
Pier head Segment - E7A & E7B											
Pier head Segment - E7A (E2e2)											
E7A3110	E7A - Temp. Work, Rail Beams	20	07-Sep-16	0%	20	30-Sep-16	20-Feb-16	14-Mar-16	-163	0	0%
E8A & E8B (E2f - 1/2)											
Pier Works - E8A & E8B											
Pier Works - E8A (E2f2)											
E8A2020	E8A - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Solid)	50	26-Apr-16 A	50%	25	20-Jul-16	15-Mar-16	16-Apr-16	-77	0	75%
E8A2030	E8A - Seagull Pier Temp. Work, Curing, CJ, Remove Formwork & Falsewo	21	21-Jul-16	0%	21	13-Aug-16	18-Apr-16	12-May-16	-77	0	0%
Pier Works - E8B (E2f1)											
E8B2020	E8B - Seagull Pier Temp. Work, Rebar, Formwork,Concreting - Arm (Solid)	70	27-Apr-16 A	10%	63	02-Sep-16	17-Dec-15	05-Mar-16	-147	0	15%
E8B2030	E8B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	03-Sep-16	0%	21	28-Sep-16	07-Mar-16	02-Apr-16	-147	0	0%
Pier head Segment - E8A & E8B											
Pier head Segment - E8A (E2f2)											
E8A3110	E8A - Temp. Work, Rail Beams	21	15-Aug-16	0%	21	07-Sep-16	13-May-16	07-Jun-16	-77	0	0%
E8A3120	E8A - Install Pierhead Segments (4 nr)	6	08-Sep-16	0%	6	14-Sep-16	08-Jun-16	15-Jun-16	-77	0	0%
E8A3130	E8A - Diaphragm of PHS - Formwork, Rebar, Concreting	48	15-Sep-16	0%	48	12-Nov-16	16-Jun-16	11-Aug-16	-77	0	0%
E9A & E9B (E2g - 1/2)											
Pier Works - E9A & E9B											
Pier Works - E9A (E2g2)											
E9A2040	E9A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Dia	24	09-May-16 A	10%	22	16-Jul-16	13-Feb-16	09-Mar-16	-103	0	25%
E9A2050	E9A - Seagull Pier Curing, CJ, Remove Formwork & Falsework	20	16-Jul-16	0%	20	09-Aug-16	10-Mar-16	06-Apr-16	-103	0	0%
Pier Works - E9B (E2g1)											
E9B2030	E9B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Arm (Hollo	62	19-Feb-16 A	100%	0	23-May-16 A					100%
E9B2040	E9B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Dia	24	24-May-16 A	5%	23	18-Jul-16	10-Mar-16	09-Apr-16	-81	0	10%
E9B2050	E9B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	20	18-Jul-16	0%	20	10-Aug-16	11-Apr-16	04-May-16	-81	0	0%
Pier head Segment - E9A & E9B											
Pier head Segment - E9A (E2g2)											
E9A3110	E9A - Temp. Work, Rail Beams	21	09-Aug-16	0%	21	02-Sep-16	07-Apr-16	30-Apr-16	-103	0	0%
E9A3120	E9A - Install Pierhead Segments (4 nr)	6	02-Sep-16	0%	6	09-Sep-16	03-May-16	09-May-16	-103	0	0%
E9A3130	E9A - Diaphragm of PHS - Formwork, Rebar, Concreting	48	09-Sep-16	0%	48	08-Nov-16	10-May-16	07-Jul-16	-103	0	0%
Pier head Segment - E9B (E2g1)											
E9B3110	E9B - Temp. Work, Rail Beams	20	10-Aug-16	0%	20	02-Sep-16	05-May-16	28-May-16	-81	0	0%
E9B3120	E9B - Install Pierhead Segments (4 nr)	6	02-Sep-16	0%	6	09-Sep-16	30-May-16	04-Jun-16	-81	0	0%



Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

Tuen Mun - Chek Lap Kok Link - Southern Connection
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DWG. No.:

J3518/GCL/PGM/3MRP-M37

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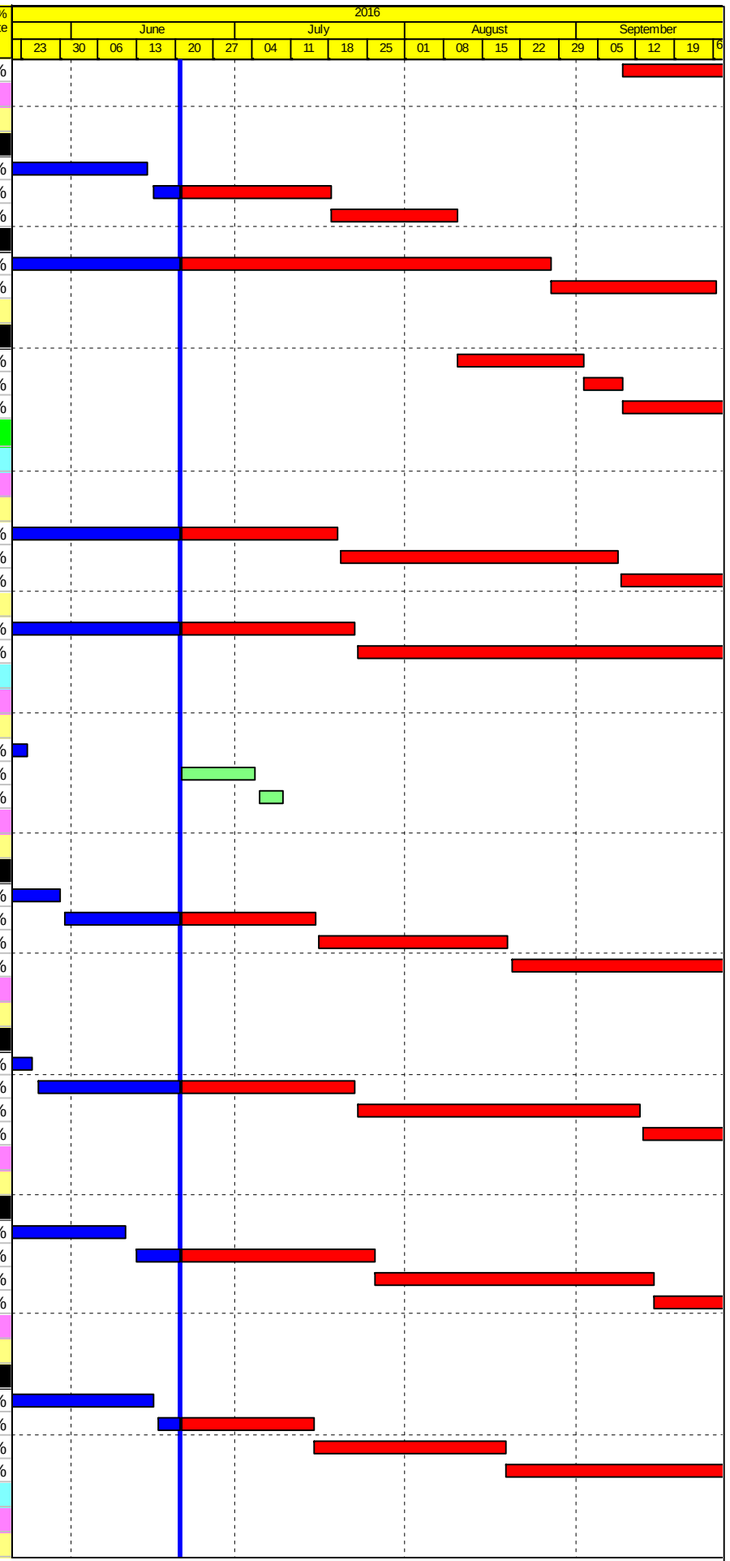
E9B3130	E9B - Diaphragm of PHS - Formwork, Rebar, Concreting	48	09-Sep-16	0%	48	08-Nov-16	06-Jun-16	02-Aug-16	-81	0	0%
E10A & E10B (E2h - 1/2)											
Pier Works - E10A & E10B											
Pier Works - E10A (E2h2)											
E10A2030	E10A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Arm (Hol	44	23-Mar-16 A	100%	0	15-Jun-16 A					100%
E10A2040	E10A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Di	24	16-Jun-16 A	5%	23	18-Jul-16	10-Mar-16	09-Apr-16	-81	0	5%
E10A2050	E10A - Seagull Pier Curing, CJ, Remove Formwork & Falsework	20	18-Jul-16	0%	20	10-Aug-16	11-Apr-16	04-May-16	-81	0	0%
Pier Works - E10B (E2h1)											
E10B2030	E10B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Arm (Hol	68	05-Apr-16 A	15%	58	27-Aug-16	28-Oct-15	06-Jan-16	-190	0	15%
E10B2040	E10B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper D	24	27-Aug-16	0%	24	26-Sep-16	07-Jan-16	03-Feb-16	-190	0	0%
Pier head Segments - E10A & E10B											
Pier head Segments - E10A (E2h2)											
E10A3110	E10A - Temp. Work, Rail Beams	20	10-Aug-16	0%	20	02-Sep-16	05-May-16	28-May-16	-81	0	0%
E10A3120	E10A - Install Pierhead Segments (4 nr)	6	02-Sep-16	0%	6	09-Sep-16	30-May-16	04-Jun-16	-81	0	0%
E10A3130	E10A - Diaphragm of PHS - Formwork, Rebar, Concreting	52	09-Sep-16	0%	52	12-Nov-16	06-Jun-16	06-Aug-16	-81	0	0%
Viaduct E5, E6, E7 & E8											
E11A & E11B (E5E6a/E7E8a)											
Pier Works - E11A & E11B											
Pier Works - E11A (E7E8a)											
E11A2030	E11A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	30	27-Apr-16 A	20%	24	19-Jul-16	06-May-15	03-Jun-15	-334	0	20%
E11A2040	E11A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	44	20-Jul-16	0%	44	08-Sep-16	04-Jun-15	27-Jul-15	-334	0	0%
E11A2050	E11A - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	09-Sep-16	0%	21	05-Oct-16	28-Jul-15	20-Aug-15	-334	0	0%
Pier Works - E11B (E5E6a)											
E11B2030	E11B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	30	13-May-16 A	10%	27	22-Jul-16	09-May-15	10-Jun-15	-331	0	10%
E11B2040	E11B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	64	23-Jul-16	0%	64	07-Oct-16	11-Jun-15	26-Aug-15	-331	0	0%
E12A, E12B, E12C & E12D (E8b/E7b/E6b/E5b)											
Pile Cap Works - E12A, E12B, E12C & E12D											
Pile Cap Works - Dolphin E12A (E8b)											
SE8BD080	E12A (E8b) Dolphin - Marine Pile Cap - Install precast shell in position	24	17-May-16 A	100%	0	24-May-16 A					100%
SE8BD130	E12A (E8b)- Dolphin - Marine Pile Cap - Fixings, Dewatering & Trimming o	11	21-Jun-16	0%	11	04-Jul-16	10-Feb-17	22-Feb-17	191	0	0%
SE8BD150	E12A (E8b) - Dolphin - Marine Pile Cap - Rebar, Concreting	5	05-Jul-16	0%	5	09-Jul-16	23-Feb-17	28-Feb-17	191	295	0%
Bridge E8 - Pier E12A (E8b)											
Pier Works - E12A											
Pier Works											
E12A2010	E12A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper St	31	02-Apr-16 A	100%	0	30-May-16 A					100%
E12A2020	E12A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Di	21	31-May-16 A	0%	21	15-Jul-16	20-Apr-15	14-May-15	-347	0	40%
E12A2030	E12A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	30	16-Jul-16	0%	30	19-Aug-16	15-May-15	19-Jun-15	-347	0	0%
E12A2040	E12A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	44	20-Aug-16	0%	44	13-Oct-16	22-Jun-15	12-Aug-15	-347	0	0%
Bridge E7 - Pier E12B (E7b)											
Pier Works - E12B											
Pier Works											
E12B2030	E12B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower D	21	03-May-16 A	100%	0	25-May-16 A					100%
E12B2040	E12B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	30	26-May-16 A	10%	27	22-Jul-16	28-Mar-15	04-May-15	-362	0	10%
E12B2050	E12B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	44	23-Jul-16	0%	44	12-Sep-16	05-May-15	26-Jun-15	-362	0	0%
E12B2060	E12B - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	13-Sep-16	0%	21	08-Oct-16	27-Jun-15	22-Jul-15	-362	0	0%
Bridge E6 - Pier E12C (E6b)											
Pier Works - E12C											
Pier Works											
E12C2020	E12C - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower D	21	18-May-16 A	100%	0	11-Jun-16 A					100%
E12C2030	E12C - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	30	13-Jun-16 A	3%	29	26-Jul-16	12-Aug-15	15-Sep-15	-252	0	5%
E12C2040	E12C - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	44	26-Jul-16	0%	44	15-Sep-16	16-Sep-15	09-Nov-15	-252	0	0%
E12C2050	E12C - Seagull Pier Curing, CJ, Remove Formwork & Falsework	21	15-Sep-16	0%	21	13-Oct-16	10-Nov-15	03-Dec-15	-252	0	0%
Bridge E5 - Pier E12D (E5b)											
Pier Works - E12D											
Pier Works											
E12D2010	E12D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper S	30	18-Apr-16 A	100%	0	16-Jun-16 A					100%
E12D2020	E12D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower D	21	17-Jun-16 A	3%	20	15-Jul-16	01-Sep-15	24-Sep-15	-235	0	5%
E12D2030	E12D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	30	15-Jul-16	0%	30	19-Aug-16	25-Sep-15	02-Nov-15	-235	0	0%
E12D2040	E12D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	44	19-Aug-16	0%	44	13-Oct-16	03-Nov-15	23-Dec-15	-235	0	0%
E13A, E13B, E13C & E13D (E8c/E7c/E6c/E5c)											
Pile Cap Works - E13C & E13D											
Pile Cap Works											



Actual Work
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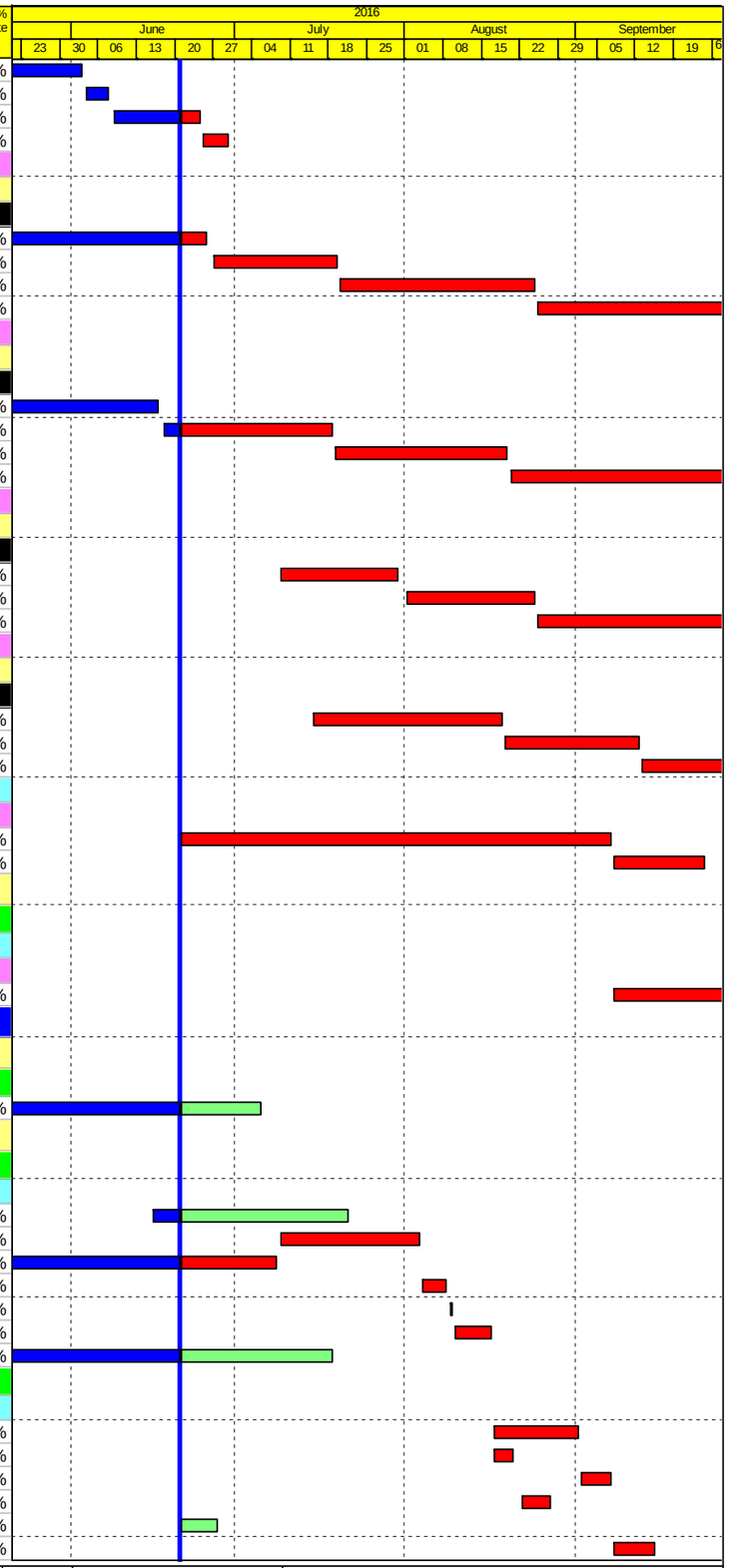
SE5C0152	E13C/D (E6c/E5c) - Marine Pile Cap - Rebar, Concreting (2nd pour)	15	12-May-16 A	100%	0	03-Jun-16 A					100%
SE5C0154	E13C/D (E6c/E5c) - Marine Pile Cap - CJ preparation	4	04-Jun-16 A	100%	0	08-Jun-16 A					100%
SE5C0162	E13C/D (E6c/E5c) - Marine Pile Cap - Rebar, Concreting (Final pour)	7	09-Jun-16 A	42.86%	4	24-Jun-16	24-Mar-15	27-Mar-15	-366	0	70%
SE5C0164	E13C/D (E6c/E5c) - Marine Pile Cap - Curing incl. CJ preparation	4	25-Jun-16	0%	4	29-Jun-16	28-Mar-15	01-Apr-15	-366	0	0%
Bridge E8 - Pier E13A (E8c)											
Pier Works - E13A											
Pier Works											
E13A2010	E13A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper St	30	13-Apr-16 A	83.33%	5	25-Jun-16	20-Mar-15	25-Mar-15	-369	0	95%
E13A2020	E13A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Di	19	27-Jun-16	0%	19	19-Jul-16	26-Mar-15	21-Apr-15	-369	0	0%
E13A2030	E13A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	31	20-Jul-16	0%	31	24-Aug-16	22-Apr-15	29-May-15	-369	0	0%
E13A2040	E13A - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	44	25-Aug-16	0%	44	18-Oct-16	30-May-15	22-Jul-15	-369	0	0%
Bridge E7 - Pier E13B (E7c)											
Pier Works - E13B											
Pier Works											
E13B2000	E13B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Stem	19	05-Mar-16 A	100%	0	17-Jun-16 A					100%
E13B2010	E13B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower D	18	18-Jun-16 A	0%	23	18-Jul-16	24-Feb-15	21-Mar-15	-390	0	5%
E13B2020	E13B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ar	28	19-Jul-16	0%	28	19-Aug-16	23-Mar-15	28-Apr-15	-390	0	0%
E13B2030	E13B - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Upper Ar	40	20-Aug-16	0%	40	07-Oct-16	29-Apr-15	16-Jun-15	-390	0	0%
Bridge E6 - Pier E13C (E6c)											
Pier Works - E13C											
Pier Works											
E13C2000	E13C - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Stem	19	09-Jul-16	0%	19	30-Jul-16	15-Apr-15	07-May-15	-366	0	0%
E13C2010	E13C - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower D	21	01-Aug-16	0%	21	24-Aug-16	08-May-15	02-Jun-15	-366	0	0%
E13C2020	E13C - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ai	30	25-Aug-16	0%	30	29-Sep-16	03-Jun-15	09-Jul-15	-366	0	0%
Bridge E5 - Pier E13D (E5c)											
Pier Works - E13D											
Pier Works											
E13D2000	E13D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Stem	30	15-Jul-16	0%	30	18-Aug-16	08-May-15	12-Jun-15	-352	0	0%
E13D2010	E13D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower D	21	19-Aug-16	0%	21	12-Sep-16	13-Jun-15	09-Jul-15	-352	0	0%
E13D2020	E13D - Seagull Pier Temp. Work, Rebar, Formwork, Concreting - Lower Ai	30	13-Sep-16	0%	30	20-Oct-16	10-Jul-15	13-Aug-15	-352	0	0%
E14A, E14B, E14C & E14D (E8d/E7d/E6d/E5d)											
Foundation Works - E14											
GFXX540	Review BCF Foundation Design, Pile Test & Finalize Design	67	21-Jun-16	0%	67	07-Sep-16	17-Sep-14	05-Dec-14	-519	0	0%
GFXX545	Mobilization & Assembling Bored Pile Plant & Equipment for Viaducts in HKI	14	08-Sep-16	0%	14	24-Sep-16	06-Dec-14	22-Dec-14	-519	0	0%
Viaduct F											
Approach Ramp F											
Approach Ramp Land Foundation - HKBCF											
Approach Ramp F Piling											
GFXX593	AR-F - Pre-drilling for Piles (25 nos)	24	08-Sep-16	0%	24	07-Oct-16	17-Feb-15	19-Mar-15	-460	0	0%
SUPERSTRUCTURE											
Assembling, relocation and dismantle of lifting equipment											
Launching Gantry 2											
FR000099	Assembly of Launching Gantry LG2 on Temp.Loading Platform	12	06-May-15 A	0%	12	05-Jul-16	16-Jan-20	01-Feb-20	1060	1060	0%
Viaduct B Superstructure											
Bridge B2 Superstructure											
Deck installation											
FR000011B	Viaduct B2 - Cantilever at Pier B10 (B2c) (16 seg) - by crane	17	16-Jun-16 A	0%	26	21-Jul-16	30-Dec-19	01-Feb-20	1046	1046	28.6%
FR000011C	Viaduct B2 - Complete stitches and launch to B11	22	09-Jul-16	0%	22	03-Aug-16	22-Apr-16	19-May-16	-63	0	0%
FR000012	Viaduct B2 - Cantilever at Pier B9 (B2d) (20 seg) - MTR Crossing - LG1	26	21-Apr-16 A	42.31%	15	08-Jul-16	05-Apr-16	21-Apr-16	-63	0	80%
FR000014	Viaduct B2 - Cantilever at Pier B11 (B2b) (16 seg) - LG1 (2 shifts)	4	04-Aug-16	0%	4	08-Aug-16	20-May-16	24-May-16	-63	0	0%
FR000014A	Viaduct B2 - Launching LG1 B11 to B12 - 2 shifts	1	09-Aug-16	0%	1	09-Aug-16	25-May-16	25-May-16	-63	0	0%
FR000015	Viaduct B2 - End Span at Pier B12 (B2a) (6 seg) - LG1 (2 shifts)	6	10-Aug-16	0%	6	16-Aug-16	26-May-16	01-Jun-16	-63	0	0%
FR0000211	Viaduct B2 - Complete B6/B7/B8 stitches & stressing & transport segments	49	13-Jan-16 A	52.58%	23	18-Jul-16	27-Aug-16	23-Sep-16	57	187	100%
Bridge B1 Superstructure											
Deck installation											
FR000017	Viaduct B1 - End Span at Pier B12 (B2a) (6 seg) - LG1 (2 shifts)	14	17-Aug-16	0%	14	01-Sep-16	01-Aug-16	16-Aug-16	-14	0	0%
FR000017-T	Viaduct B1 - Launching LG1 B12 to B14 & 1st pair - 2 shifts	4	17-Aug-16	0%	4	20-Aug-16	11-Aug-16	15-Aug-16	-5	0	0%
FR000017A	Viaduct B1 - Launching B12 to B15 & 1st pair - 2 shifts	5	02-Sep-16	0%	5	07-Sep-16	17-Aug-16	22-Aug-16	-14	0	0%
FR000018	Viaduct B1 - Cantilever at Pier B14 (B1f) (24 seg) - LG1 (2 shifts)	6	22-Aug-16	0%	6	27-Aug-16	16-Aug-16	22-Aug-16	-5	9	0%
FR000018B	Viaduct B1 - Cantilever at B13 (24 seg) - 2 shifts	6	21-Jun-16	0%	6	27-Jun-16	25-Jul-16	30-Jul-16	28	42	0%
FR000019	Viaduct B1 - Cantilever at Pier B15 (B1e) (26 seg) - LG1 (2 shifts)	7	08-Sep-16	0%	7	15-Sep-16	23-Aug-16	30-Aug-16	-14	0	0%



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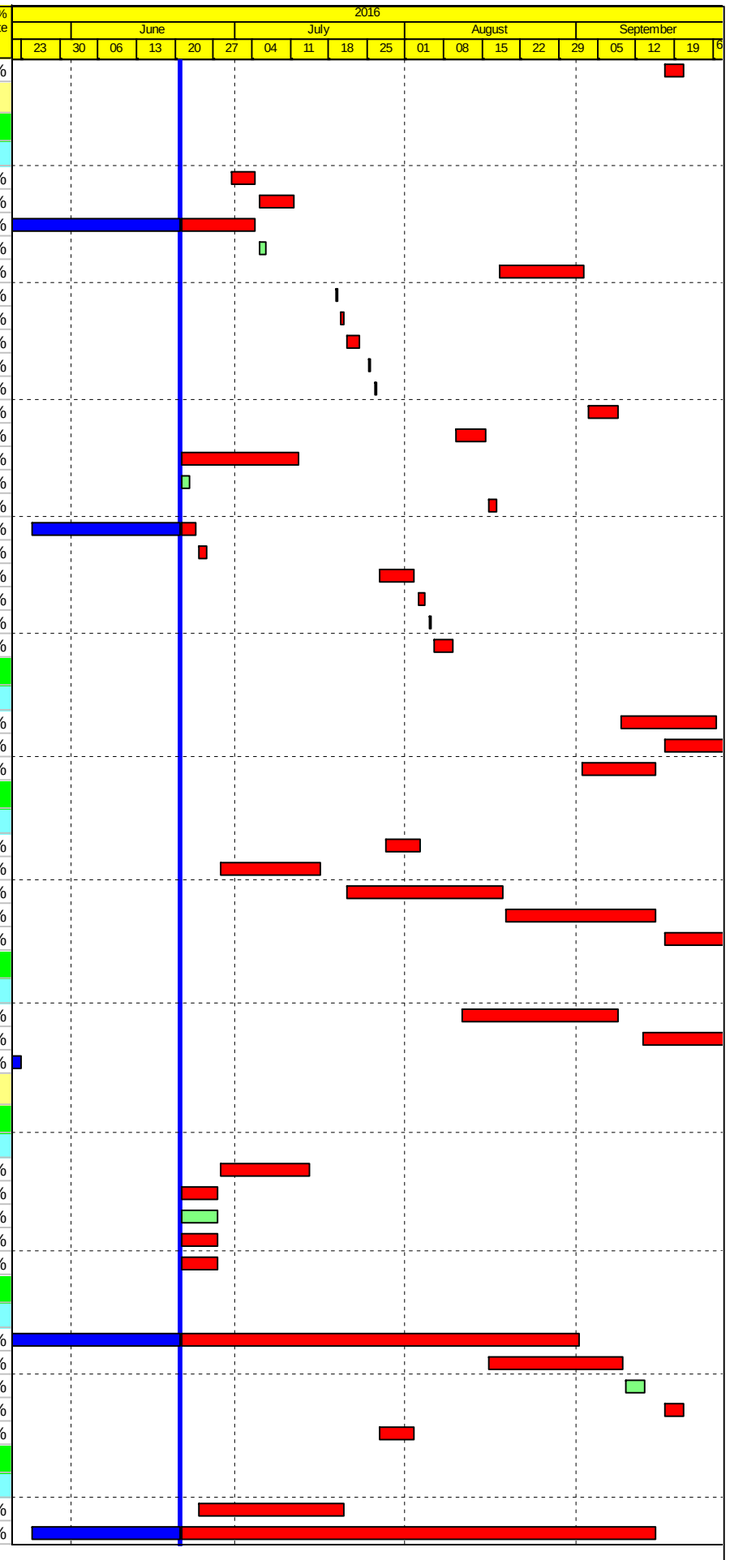
FR000019A	Viaduct B1 - Launching B15 to B16 & 1st pair - 2 shifts	3	17-Sep-16	0%	3	20-Sep-16	31-Aug-16	02-Sep-16	-14	0	0%
Viaduct C Superstructure											
Bridge C4 Superstructure											
Deck installation											
FR000041B	Viaduct C4 - Launching LG2 E3C to C1 - 2 shifts	3	30-Jun-16	0%	3	04-Jul-16	28-Oct-15	30-Oct-15	-198	0	0%
FR000049	Viaduct C4 - End Span at Pier C1 (C4e) (8 seg) - LG2	6	05-Jul-16	0%	6	11-Jul-16	31-Oct-15	06-Nov-15	-198	0	0%
FR000050	Viaduct C4 - Cantilever at Pier C2 (C4d) (12 seg) - ALF 1/2	12	13-Apr-16 A	8.33%	11	04-Jul-16	03-Jun-16	16-Jun-16	-14	0	83.33%
FR000050A	Viaduct C4 - Relocate ALF 1/2 C2 to C5	2	05-Jul-16	0%	2	06-Jul-16	31-Jan-20	01-Feb-20	1059	1059	0%
FR000051	Viaduct C4 - End Span at Pier C1 (C4e) (7 seg) - LG2 (2 Shifts)	14	18-Aug-16	0%	14	02-Sep-16	15-Dec-15	02-Jan-16	-198	0	0%
FR000051-1	Viaduct C4 - Launching LG2 C1 to C2	1	19-Jul-16	0%	1	19-Jul-16	14-Nov-15	14-Nov-15	-198	0	0%
FR000051-2	Viaduct C4 - Cantilever at C2 remaining (4 seg) -2 shifts	1	20-Jul-16	0%	1	20-Jul-16	16-Nov-15	16-Nov-15	-198	0	0%
FR000051-3	Viaduct C4 - Launching C2 to C5 - 2 shifts	3	21-Jul-16	0%	3	23-Jul-16	17-Nov-15	19-Nov-15	-198	0	0%
FR000051-4	Viaduct C4 - Cantilever at C5 remaining (4 seg)	1	25-Jul-16	0%	1	25-Jul-16	20-Nov-15	20-Nov-15	-198	0	0%
FR000051-5	Viaduct C4 - Launching C5 to C6 - 2 shifts	1	26-Jul-16	0%	1	26-Jul-16	21-Nov-15	21-Nov-15	-198	0	0%
FR000051A	Viaduct C4 - Launching C1 to C6 - 2 shifts	5	03-Sep-16	0%	5	08-Sep-16	04-Jan-16	08-Jan-16	-198	0	0%
FR000052	Viaduct C4 - Cantilever at Pier C3 (C4c) (20 seg) - LG2 (2 shifts)	5	10-Aug-16	0%	5	15-Aug-16	07-Dec-15	11-Dec-15	-198	0	0%
FR000053	Viaduct C4 - Cantilever at Pier C4 (C4b) (18 seg) - THB	18	21-Jun-16	0%	18	12-Jul-16	26-May-16	16-Jun-16	-21	186	0%
FR000053-1	Viaduct C4 - Relocate ALF 1/2 pier D4 to pier C2	2	21-Jun-16	0%	2	22-Jun-16	31-Jan-20	01-Feb-20	1070	1070	0%
FR000053A	Viaduct C4 - Launching C3 to C1 - 2 shifts	2	16-Aug-16	0%	2	17-Aug-16	12-Dec-15	14-Dec-15	-198	0	0%
FR000054	Viaduct C4 - Cantilever at Pier C5 (C4a) (16 seg) - ALF 1/2	16	25-May-16 A	81.25%	3	23-Jun-16	24-Oct-15	27-Oct-15	-193	0	50%
FR000054-1	Viaduct C4 - Relocate ALF 1/2 pier C5 to pier D5	2	24-Jun-16	0%	2	25-Jun-16	28-Oct-15	29-Oct-15	-193	1	0%
FR000057	Viaduct C4 - End Span at Pier C6 (C3f) (7 seg) - LG2 (2 shifts)	6	27-Jul-16	0%	6	02-Aug-16	23-Nov-15	28-Nov-15	-198	0	0%
FR000057A	Viaduct C4 - Launching C6 to C4 - 2 shifts	2	03-Aug-16	0%	2	04-Aug-16	30-Nov-15	01-Dec-15	-198	0	0%
FR000057B	Viaduct C4 - Cantilever at C4 remaining (4 seg) - 2 shifts	1	05-Aug-16	0%	1	05-Aug-16	02-Dec-15	02-Dec-15	-198	0	0%
FR000057C	Viaduct C4 - Launching C4 to C3 & 1st pair - 2 shifts	3	06-Aug-16	0%	3	09-Aug-16	03-Dec-15	05-Dec-15	-198	0	0%
Bridge C3 Superstructure											
Deck installation											
FR000055	Viaduct C3 - End Span at Pier C6 (C3f) (7 seg)- LG2 (2 Shifts)	14	09-Sep-16	0%	14	26-Sep-16	09-Jan-16	25-Jan-16	-198	0	0%
FR000056	Viaduct C3 - Cantilever at Pier C7 (C3e) - MTR Crossing (21 seg) - K Frar	30	17-Sep-16	0%	30	24-Oct-16	07-Dec-15	13-Jan-16	-230	0	0%
FR000103-1	Viaduct C3 - Relocate K Frame from Pier D7 to Pier C7	12	02-Sep-16	0%	12	15-Sep-16	23-Nov-15	05-Dec-15	-230	0	0%
Bridge C2 Superstructure											
Deck installation											
FR000061	Viaduct C2 - End Span at Pier C11 (C3a) (up) (6 seg) - Crane	6	28-Jul-16	0%	6	03-Aug-16	12-Jul-16	18-Jul-16	-14	169	0%
FR000062	Viaduct C2 - Cantilever at Pier C12 (C2f) (16 seg) - crane	16	28-Jun-16*	0%	16	16-Jul-16	28-May-16	16-Jun-16	-25	9	0%
FR000064	Viaduct C2 - Cantilever at Pier C13 (C2e) (17 seg) - Crane	25	21-Jul-16*	0%	25	18-Aug-16	16-Mar-16	18-Apr-16	-101	0	0%
FR000065	Viaduct C2 - Cantilever at Pier C14 (C2d) (16 seg) - Crane	24	19-Aug-16	0%	24	15-Sep-16	19-Apr-16	18-May-16	-101	0	0%
FR000066	Viaduct C2 - Cantilever at Pier C15 (C2c) (16 seg) - Crane	24	17-Sep-16	0%	24	17-Oct-16	19-May-16	16-Jun-16	-101	82	0%
Bridge C1 Superstructure											
Deck installation											
FR000068	Viaduct C1 - Cantilever at Pier C17 (C2a) (24 seg) - Crane	25	11-Aug-16*	0%	25	08-Sep-16	06-Feb-16	09-Mar-16	-149	3	0%
FR000070	Viaduct C1 - Cantilever at Pier C18 (C1e) (26 seg) - Crane	27	13-Sep-16	0%	27	17-Oct-16	10-Mar-16	14-Apr-16	-152	0	0%
FR000072	Viaduct C1 - Abutment End Span at Pier C20 (C1c) (7 seg) - Crane	6	16-May-16 A	100%	0	23-May-16 A					100%
Viaduct D Superstructure											
Bridge D3 Superstructure											
Deck installation											
FR001212	Viaduct D3 - Cantilever at Pier D5 (D4b) (14 seg) - ALF 1/2	14	28-Jun-16	0%	14	14-Jul-16	30-Oct-15	16-Nov-15	-193	106	0%
FR100058	Viaduct D3 - Pier D3 (D4d) (2 seg)	6	21-Jun-16	0%	6	27-Jun-16	30-May-16	04-Jun-16	-18	180	0%
FR100059	Viaduct D3 - Pier D4 (D4c) (2 seg)	6	21-Jun-16	0%	6	27-Jun-16	23-Jan-20	01-Feb-20	1066	1066	0%
FR100059-1	Viaduct D3 - Pier D5 (D4b) (2 seg)	6	21-Jun-16	0%	6	27-Jun-16	23-Oct-15	29-Oct-15	-194	0	0%
FR100070	Viaduct D3 - Pier D2 (D4e) (2 seg)	6	21-Jun-16	0%	6	27-Jun-16	08-Jun-16	15-Jun-16	-10	188	0%
Bridge D2 Superstructure											
Deck installation											
FR000103	Viaduct D2 - Cantilever at Pier D7 (D3e) (14 seg) - K Frame	33	26-Feb-16 A	0%	62	01-Sep-16	08-Sep-15	21-Nov-15	-230	0	42.9%
FR000108	Viaduct D2 - Cantilever at Pier D10 (D3b) (14 seg) - THB	22	16-Aug-16*	0%	22	09-Sep-16	09-May-16	03-Jun-16	-82	0	0%
FR000108A	Viaduct D2 - Relocate D10 to D14	3	10-Sep-16	0%	3	13-Sep-16	30-Jan-20	01-Feb-20	1000	1000	0%
FR000112A	Viaduct D1 - Relocate D14 to D12	3	17-Sep-16	0%	3	20-Sep-16	25-Apr-16	27-Apr-16	-120	0	0%
FR10062	Viaduct D2 - Pier D9 (D3c) (2 seg)	6	27-Jul-16	0%	6	02-Aug-16	30-Mar-16	07-Apr-16	-96	102	0%
Bridge D1 Superstructure											
Deck installation											
FR000073	Viaduct D1 - Cantilever at D16 (4 seg) - Crane	22	24-Jun-16	0%	22	20-Jul-16	28-Apr-16	25-May-16	-46	0	0%
FR000112	Viaduct D1 - Cantilever at Pier D14 (D2c) (12 seg) - THB	22	25-May-16 A	0%	74	15-Sep-16	21-Jan-16	23-Apr-16	-120	0	16.67%



Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

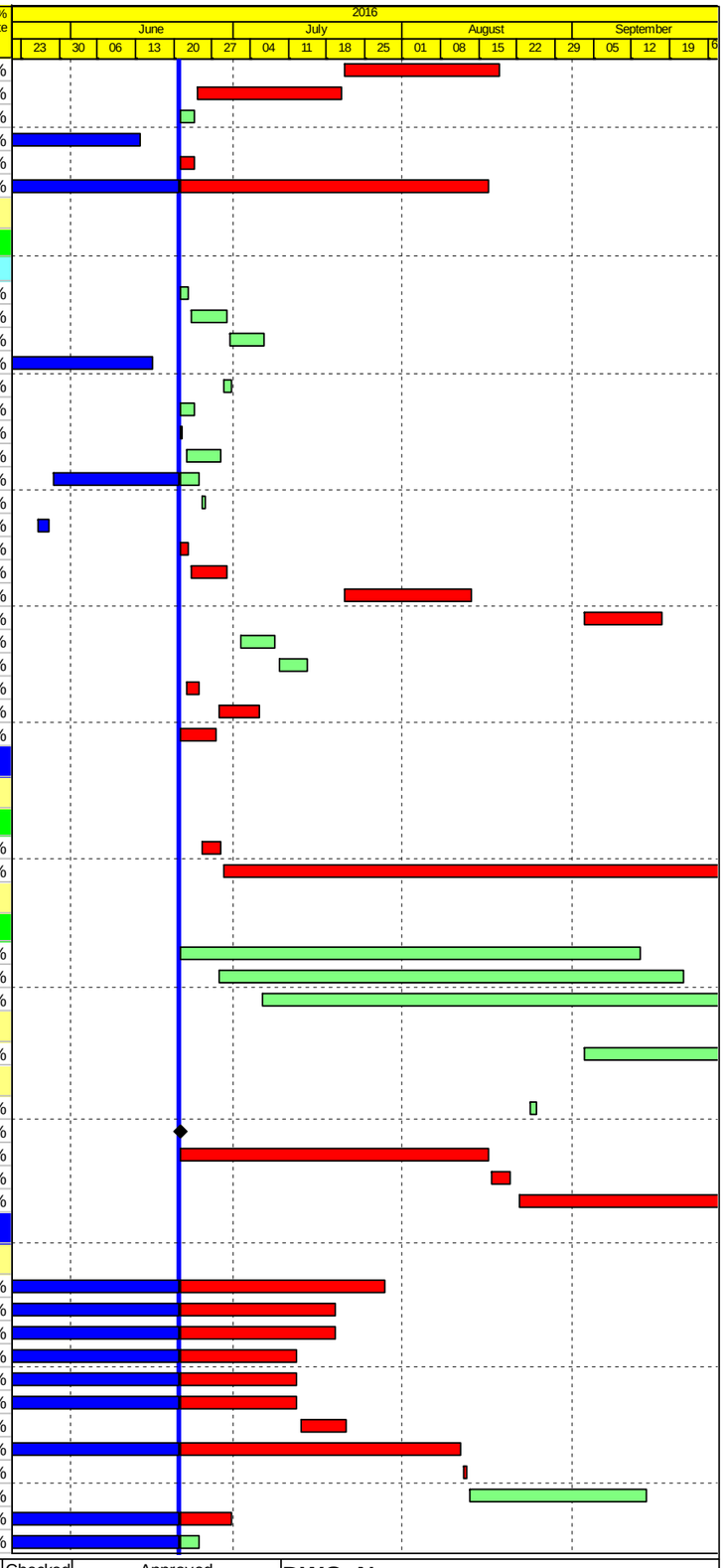
Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 11 of 13 Pages)
(Progress as of 21-Jun-16)

Date	Revision	Checked	Approved
29-Apr-16		PKN	HF
31-May-...		PKN	HF
02-Jul-16		PKN	HF

DWG. No.:

J3518/GCL/PGM/3MRP-M37

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
FR000114	Viaduct D1 - Cantilever at Pier D15 (D2b) (14 seg) - Crane	25	21-Jul-16	0%	25	18-Aug-16	26-May-16	24-Jun-16	-46	59	0%
FR000115-1	Viaduct D1 - Cantilever at Pier D16 (D2a) (14 seg) - THB	22	24-Jun-16	0%	22	20-Jul-16	30-May-16	24-Jun-16	-21	159	0%
FR000116-1	Viaduct D1 - Relocate THB from Pier D17 to Pier D18	3	21-Jun-16	0%	3	23-Jun-16	30-Jan-20	01-Feb-20	1069	1069	0%
FR000117	Viaduct D1 - Cantilever at Pier D18 (D1c) (14 seg) - THB	33	19-Apr-16 A	100%	0	14-Jun-16 A					100%
FR000117-1	Viaduct D1 - Relocate THB from Pier D18 to Pier D16	3	21-Jun-16	0%	3	23-Jun-16	25-Apr-16	27-Apr-16	-46	0	0%
FR100068	Viaduct D1 - Abutment End Span at Pier D19 (D1b) (3 seg) - Crane	22	01-Apr-16 A	0%	48	16-Aug-16	27-Apr-16	24-Jun-16	-44	136	66.67%
Viaduct E											
Bridge E1 Superstructure											
Deck Installation											
FR000026A	Viaduct E1 - Launching LG2 B1 to E3A - 2 shifts	2	21-Jun-16	0%	2	22-Jun-16	15-Jan-20	16-Jan-20	1059	0	0%
FR000033	Viaduct E1 - End Span at Pier E3-A (E2a4) (5 seg) - LG2 (2 shifts)	6	23-Jun-16	0%	6	29-Jun-16	17-Jan-20	23-Jan-20	1059	0	0%
FR000033-T	Viaduct E1 - Launching LG2 E3A to E1B & 1st pair	5	30-Jun-16	0%	5	06-Jul-16	24-Jan-20	01-Feb-20	1059	1059	0%
FR000035	Viaduct E1 - Cantilever at Pier E1-B (E1a3) (14 seg) - LG2 (2 shifts)	4	11-Apr-16 A	100%	0	16-Jun-16 A					100%
FR000035-T	Viaduct E1 - Launching LG2 E3B to D1 - 2 shifts	2	29-Jun-16	0%	2	30-Jun-16	15-Jan-20	16-Jan-20	1052	0	0%
FR000035A	Viaduct E1 - Launching E1B to E2B & 1st pair - 2 shifts	3	21-Jun-16	0%	3	23-Jun-16	30-Jan-20	01-Feb-20	1069	1069	0%
FR000037A	Viaduct E1 - Launching LG2 E2B to E3B - 2 shifts	1	21-Jun-16	0%	1	21-Jun-16	07-Jan-20	07-Jan-20	1052	0	0%
FR000038	Viaduct E1 - End Span at Pier E3-B (E2a3) (6 seg) - LG2 (2 shifts)	6	22-Jun-16	0%	6	28-Jun-16	08-Jan-20	14-Jan-20	1052	0	0%
FR000040	Viaduct E1 - Cantilever at Pier E2-C (E1b2) (16 seg) - 2 shifts	4	29-May-16 A	0%	4	24-Jun-16	24-Jan-20	31-Jan-20	1067	0	31.25%
FR000040A	Viaduct E1 - Launching E2C to E1C - 2 shifts	1	25-Jun-16	0%	1	25-Jun-16	01-Feb-20	01-Feb-20	1067	1067	0%
FR000040B	Viaduct E1 - Cantilever at E1C remaining (4 seg) - 2 shifts	1	26-May-16 A	100%	0	28-May-16 A					100%
FR000040C	Viaduct E1 - Launching LG2 E1C to E3C - 2 shifts	2	21-Jun-16	0%	2	22-Jun-16	17-Oct-15	19-Oct-15	-198	0	0%
FR000041	Viaduct E1 - End Span at Pier E3-C (E2a2) (6 seg) - LG2 (2 shifts)	6	23-Jun-16	0%	6	29-Jun-16	20-Oct-15	27-Oct-15	-198	0	0%
FR000043	Viaduct E1 - Cantilever at Pier E2-D (E1b1) (16 seg) - THB	21	21-Jul-16	0%	21	13-Aug-16	25-May-16	18-Jun-16	-47	134	0%
FR000044	Viaduct E1 - Cantilever at Pier E1-D (E1a1) (13 seg) - THB	12	03-Sep-16	0%	12	17-Sep-16	04-Jun-16	18-Jun-16	-76	105	0%
FR000123	Viaduct E1 - End Span at Pier D1 (D4f) (dwn) (7 seg) - LG2 (2 shifts)	6	02-Jul-16	0%	6	08-Jul-16	17-Jan-20	23-Jan-20	1052	0	0%
FR000123A	Viaduct E1 - Launching LG2 D1 to E2C & 1st pair - 2 shifts	5	09-Jul-16	0%	5	14-Jul-16	24-Jan-20	01-Feb-20	1052	1052	0%
FR000128-2	Viaduct E1 - Launching LG2 E3B to E3A - 2 shifts	3	22-Jun-16	0%	3	24-Jun-16	20-Jun-16	22-Jun-16	-2	176	0%
FR000128-3	Viaduct E1 - End Span at Pier E3-C (E2a2) (6 seg) - LG2 (2 shifts)	6	28-Jun-16	0%	6	05-Jul-16	13-Jun-16	18-Jun-16	-13	168	0%
FR000128A	Viaduct E1 - Launching E3A to E3C - 2 shifts	6	21-Jun-16	0%	6	27-Jun-16	04-Jun-16	11-Jun-16	-13	0	0%
At-Grade Roadworks & Other Works along NLH											
Viaduct B Slope Works											
Slope 10SW-A/F52											
GFXX483	10SW-A/F52 - Mobilization for soldier piling	3	25-Jun-16	0%	3	28-Jun-16	08-Oct-15	10-Oct-15	-210	0	0%
GFXX484	10SW-A/F52 - Installation of Soldier Pile (260nos., 2rigs)	126	29-Jun-16	0%	126	26-Nov-16	12-Oct-15	14-Mar-16	-210	0	0%
Viaduct A Slope Works											
Slope 9SE-B/FR8											
GFXX491	9SE-B/FR8 - New wall foundation	72	21-Jun-16	0%	72	13-Sep-16	22-Jun-16	14-Sep-16	1	0	0%
M110010	9SE-B/FR8 - demolish existing Ret. wall	72	28-Jun-16	0%	72	21-Sep-16	29-Jun-16	22-Sep-16	1	0	0%
M110020	9SE-B/FR8 - Wall construction	78	06-Jul-16	0%	78	06-Oct-16	07-Jul-16	07-Oct-16	1	0	0%
At-Grade Roadworks along NLH Westbound											
RW10020	NLH W/B (Viaduct C) - Road Drainage Works for tie-in	90	03-Sep-16	0%	90	20-Dec-16	05-Nov-16	24-Feb-17	51	6	0%
At-Grade Roadworks along NLH Eastbound											
RW20011	NLH E/B (Viaduct D) - Implement TTM for tie-in works	2	24-Aug-16	0%	2	25-Aug-16	12-Dec-16	13-Dec-16	91	38	0%
RW20072	NLH E/B (Gantries footing 324 - 328) - T&TC meeting	0	21-Jun-16*	0%	0		10-Nov-15		-179	0	0%
RW20074	NLH E/B (Gantries 324 - 328) - Gazette	48	21-Jun-16	0%	48	16-Aug-16	10-Nov-15	07-Jan-16	-179	0	0%
RW20076	NLH E/B (Gantries 324 - 328) - Implement TTA	4	17-Aug-16	0%	4	20-Aug-16	08-Jan-16	12-Jan-16	-179	0	0%
RW20078	NLH E/B (Gantries 324 - 328) - Construction footing (10am to 5pm)	60	22-Aug-16	0%	60	02-Nov-16	13-Jan-16	29-Mar-16	-179	0	0%
At-Grade Roadworks and Other Works along Cheung Tung Road											
Re-alignment of Cheung Tung Road adjacent to Viaduct B											
RP00051	Ch300-620: watermain (DN1000+DN450)	101	15-Apr-15 A	68.32%	32	28-Jul-16	08-Dec-15	16-Jan-16	-155	0	80%
RP00052	Ch300-620: road drainage	102	04-May-15 A	76.47%	24	19-Jul-16	17-Dec-15	16-Jan-16	-147	8	80%
RP00053	Ch300-620: towngas(DN250+DN400)	70	10-Nov-15 A	65.71%	24	19-Jul-16	17-Dec-15	16-Jan-16	-147	8	80%
RP00054	Ch300-620: duct laying 11KV	15	14-Nov-15 A	0%	18	12-Jul-16	24-Dec-15	16-Jan-16	-141	14	80%
RP00055	Ch300-650: telecom cables	15	12-Nov-15 A	0%	18	12-Jul-16	24-Dec-15	16-Jan-16	-141	14	80%
RP00056	Ch300-650: street lighting cable & draw pit	17	12-Nov-15 A	0%	18	12-Jul-16	15-Dec-15	07-Jan-16	-149	0	33%
RP00057	Ch300-650: relocate street lighting pillar box	8	13-Jul-16	0%	8	21-Jul-16	08-Jan-16	16-Jan-16	-149	6	0%
RP00058	Ch300-650: Roadwork new CTR with tie in	19	15-Feb-16 A	0%	44	11-Aug-16	08-Dec-15	30-Jan-16	-155	0	25%
RP00059	Ch300-650: TTA to new CTR	1	12-Aug-16	0%	1	12-Aug-16	01-Feb-16	01-Feb-16	-155	0	0%
RP00060	Ch300-650: towngas(DN250+DN400) connection	28	13-Aug-16	0%	28	14-Sep-16	03-Mar-17	04-Apr-17	164	341	0%
RP00063	Ch620-750: backfilling for roadwork	29	06-May-15 A	68.97%	9	30-Jun-16	21-Dec-15	02-Jan-16	-144	6	70%
RP00064	Ch620-750: telecom, 11KV & 132KV ducting	20	20-Aug-15 A	80%	4	24-Jun-16	04-Aug-16	08-Aug-16	37	5	80%



Actual Work
Planned Bar
Critical Bar
Milestone

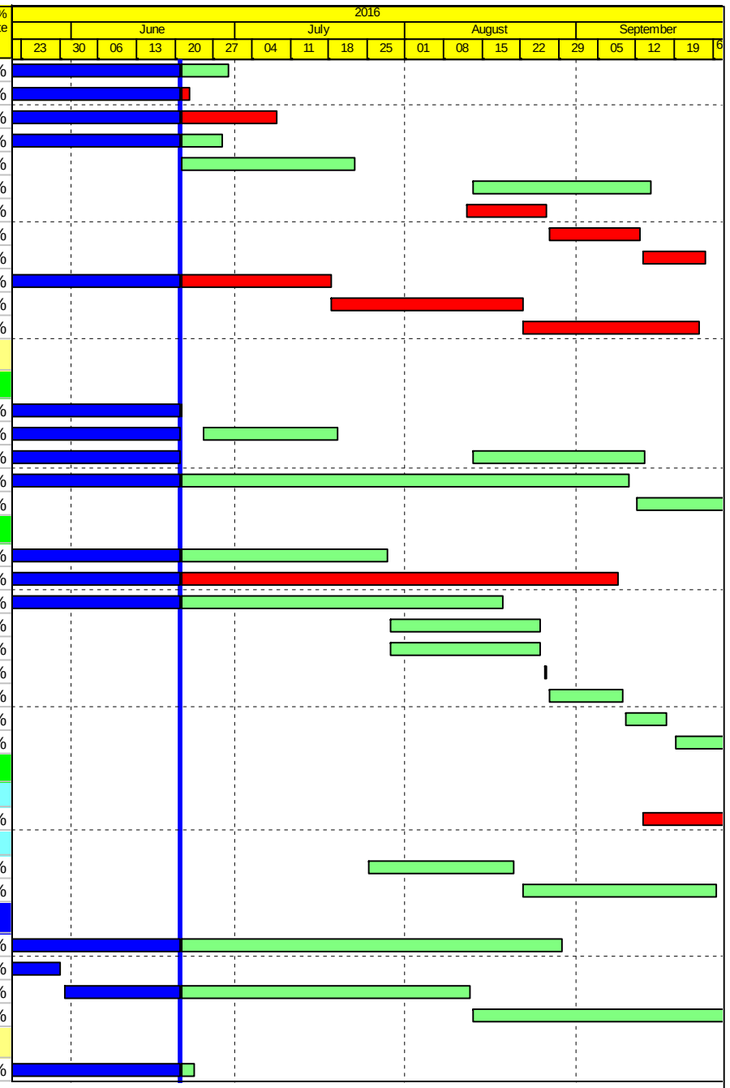
Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

Tuen Mun - Chek Lap Kok Link - Southern Connection
3-Month Rolling Programme (Page 12 of 13 Pages)
(Progress as of 21-Jun-16)

Date	Revision	Checked	Approved
29-Apr-16		PKN	HF
31-May-...		PKN	HF
02-Jul-16		PKN	HF

DWG. No.:
J3518/GCL/PGM/3MRP-M37

Activity ID	Activity Name	Orig. Durn.	Act. Start / FC Early Start	Duration % Complete	Rem. Durn.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete
RP00065	Ch620-750: cross road duct for WM, 11KV, telecom & lighting	16	05-May-15 A	50%	8	29-Jun-16	30-Jul-16	08-Aug-16	33	1	50%
RP00066	Ch620-750: Towngas(DN250+DN400)	14	01-Feb-16 A	85.71%	2	22-Jun-16	31-Dec-15	02-Jan-16	-137	13	90%
RP00067	Ch620-750: road drainage	18	15-Aug-15 A	16.67%	15	08-Jul-16	14-Dec-15	02-Jan-16	-150	5	20%
RP00069	Ch620-750: cross road duct for 11KV, telecom & street light cable	14	15-Feb-16 A	50%	7	28-Jun-16	08-Aug-16	15-Aug-16	40	8	50%
RP00070	Ch620-750: roadwork for new CTR	27	21-Jun-16	0%	27	22-Jul-16	29-Jul-16	29-Aug-16	32	18	0%
RP00071	Ch620-750: towngas(DN250+DN400) connection	28	13-Aug-16	0%	28	14-Sep-16	03-Mar-17	04-Apr-17	164	341	0%
RP00073	Ch100-300: trench excavationin on footpath	13	12-Aug-16	0%	13	26-Aug-16	03-May-16	18-May-16	-84	0	0%
RP00075	Ch100-300: duct laying for 11KV	14	27-Aug-16	0%	14	12-Sep-16	19-May-16	03-Jun-16	-84	0	0%
RP00076	Ch100-300: lay telecom cable	10	13-Sep-16	0%	10	24-Sep-16	04-Jun-16	16-Jun-16	-84	0	0%
RP00079	Ch100-300: watermain(DN450+DN1000)	142	29-Apr-15 A	84%	23	18-Jul-16	03-May-16	30-May-16	-40	0	84%
RP00080	Ch100-300: towngas(DN250)	30	18-Jul-16	0%	30	22-Aug-16	31-May-16	06-Jul-16	-40	0	0%
RP00081	Ch100-300: towngas(DN400)	27	22-Aug-16	0%	27	23-Sep-16	07-Jul-16	06-Aug-16	-40	33	0%
Re-alignment of Cheung Tung Road adjacent to Viaduct C											
West Portion											
RW61000	Realign CTR (West of Abut. C) - Site Clearance	42	03-Sep-14 A	100%	0	21-Jun-16	06-Jan-17	06-Jan-17	165	0	100%
RW61010	Realign CTR (West of Abut. C) - Road drainage works	60	15-Jan-15 A	66.67%	20	19-Jul-16	12-Jan-17	07-Feb-17	165	0	80%
RW61020	Realign CTR (West of Abut. C) - Utilily diversion	90	24-Mar-15 A	70%	27	13-Sep-16	04-Mar-17	04-Apr-17	165	342	90%
RW61030	Realign CTR (West of Abut. C) - Sub-base work	48	15-Dec-15 A	0%	70	10-Sep-16	22-Oct-16	14-Jan-17	102	0	70%
RW61050	Realign CTR (West of Abut. C) - Street Light Poles & street furniture	18	12-Sep-16	0%	18	04-Oct-16	16-Jan-17	08-Feb-17	102	0	0%
East Portion											
RW60005	Realign CTR (East of Abut. C) - Drainage & Road formation with temporar	66	02-Oct-15 A	51.52%	32	28-Jul-16	07-Oct-16	14-Nov-16	90	0	70%
RW60010	Realign CTR (East of Abut. C) - GT325 footing + A frame erection	36	27-Apr-16 A	0%	68	08-Sep-16	09-Jan-16	05-Apr-16	-130	49	30%
RW60020	Realign CTR (East of Abut. C) - Utilily + TCSS ducting	70	02-Jan-16 A	28.57%	50	18-Aug-16	29-Nov-19	01-Feb-20	1022	1022	70%
RW60030	Realign CTR (East of Abut. C) - Drainage and roadwork for permanent tie	24	29-Jul-16	0%	24	25-Aug-16	15-Nov-16	12-Dec-16	90	0	0%
RW60050	Realign CTR (East of Abut. C) - Street Light Poles & street furniture	24	29-Jul-16	0%	24	25-Aug-16	15-Nov-16	12-Dec-16	90	0	0%
RW60052	Realign CTR (East of Abut C) - Divert traffic onto new CTR	1	26-Aug-16	0%	1	26-Aug-16	13-Dec-16	13-Dec-16	90	0	0%
RW60054	Realign CTR (East of Abut C) - 2nd phase drainage	12	27-Aug-16	0%	12	09-Sep-16	14-Dec-16	29-Dec-16	90	0	0%
RW60056	Realign CTR (East of Abut C) - 2nd phase TCSS duct from GT325	6	10-Sep-16	0%	6	17-Sep-16	30-Dec-16	06-Jan-17	90	0	0%
RW60058	Realign CTR (East of Abut C) - Roadwork and reinstatement	42	19-Sep-16	0%	42	08-Nov-16	07-Jan-17	28-Feb-17	90	0	0%
Viaduct C Slope Works											
Slope 10NW-C/F14											
SWVC5000	10NW-C/F14 - Slope works	30	13-Sep-16	0%	30	20-Oct-16	30-Jul-16	02-Sep-16	-38	0	0%
Slope 10NW-C/F15											
SWVC6000	10NW-C/F15 - Slope works	24	25-Jul-16	0%	24	20-Aug-16	03-Sep-16	03-Oct-16	35	0	0%
SWVC6005	10NW-C/F15 - Install Geo. Instru. & Baseline Monitoring	30	22-Aug-16	0%	30	26-Sep-16	04-Oct-16	08-Nov-16	35	332	0%
Watermains & All Assoc Works from Tung Chung to Southern Landfall											
WM00120	Lay DN450 Fresh Water Main along re-aligned CTR (app. 500 m at 12m/c	48	22-Apr-15 A	0%	59	29-Aug-16	19-Nov-19	01-Feb-20	1013	1013	80%
WM00160	Lay DN450 watermain from Tung Chung to realigned CTR (2nd 500m - 2 v	50	28-Dec-15 A	100%	0	30-May-16 A					100%
WM00170	Lay DN450 watermain from Tung Chung to realigned CTR (3rd 500m - 2 v	50	31-May-16 A	10%	45	12-Aug-16	10-Feb-17	03-Apr-17	191	0	22%
WM00180	Lay DN450 watermain from Tung Chung to realigned CTR (last 400m - 2 v	40	13-Aug-16	0%	40	29-Sep-16	04-Apr-17	26-May-17	191	0	0%
Pressure Testing											
TC00010	Pressure Test DN450 Fresh Water Main along re-aligned CTR (app. 520 n	12	18-Sep-15 A	80%	2	23-Jun-16	08-Jun-17	10-Jun-17	286	602	80%



Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: J3518DWPrG-M37
Layout: J3518-DWP-3MRP Submission - M37
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 13 of 13 Pages)
(Progress as of 21-Jun-16)

Date	Revision	Checked	Approved
29-Apr-16		PKN	HF
31-May-...		PKN	HF
02-Jul-16		PKN	HF

DWG. No.:
J3518/GCL/PGM/3MRP-M37

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		✓
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		✓

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		✓
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		✓
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		✓
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		✓
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		✓
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		✓
	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		<>
	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		✓
	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		✓
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	✓
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
8.14	6.3	Implement any recommendations of the bored piling monitoring	Southern marine viaduct/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	
			construction during bored piling						
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		✓
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**
7.13	6.5	Undertaken gabion wall works in Stream NL1 in the dry season	North Lantau slope works/dry	Contractor	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	
			season/construction phase						
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 shall be required to submit, for approval, a detailed working method statement for the protection of trees	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	
		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 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	
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 by

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		(OM4)							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 2016)

Alternative Noise Monitoring at Pak Mong Village Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01-Jun	02-Jun	03-Jun	04-Jun
			Noise Impact Monitoring			
05-Jun	06-Jun	07-Jun	08-Jun	09-Jun	10-Jun	11-Jun
		Noise Impact Monitoring				
12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun
	Noise Impact Monitoring			Noise Impact Monitoring		
19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun
			Noise Impact Monitoring			
26-Jun	27-Jun	28-Jun	29-Jun	30-Jun		
		Noise Impact Monitoring				

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Air Quality Monitoring Schedule (1 to 30 June 2016)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01-Jun	02-Jun	03-Jun	04-Jun
			1-hr TSP Monitoring 24-hr TSP Monitoring			
05-Jun	06-Jun	07-Jun	08-Jun	09-Jun	10-Jun	11-Jun
		1-hr TSP Monitoring 24-hr TSP Monitoring				
12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun
	1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring		
19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun
			1-hr TSP Monitoring 24-hr TSP Monitoring			
26-Jun	27-Jun	28-Jun	29-Jun	30-Jun		
		1-hr TSP Monitoring 24-hr TSP Monitoring				

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Noise Monitoring Schedule (1 to 31 July 2016)

Alternative Noise Monitoring at Pak Mong Village Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-Jul	02-Jul
03-Jul	04-Jul	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul
	Noise Impact Monitoring			Noise Impact Monitoring		
10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul
			Noise Impact Monitoring			
17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul
		Noise Impact Monitoring				
24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul
	Noise Impact Monitoring				Noise Impact Monitoring	
31-Jul						

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Air Quality Monitoring Schedule (1 to 31 July 2016)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-Jul	02-Jul
03-Jul	04-Jul	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul
	1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring		
10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul
			1-hr TSP Monitoring 24-hr TSP Monitoring			
17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul
		1-hr TSP Monitoring 24-hr TSP Monitoring				
24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul
	1-hr TSP Monitoring 24-hr TSP Monitoring				1-hr TSP Monitoring 24-hr TSP Monitoring	
31-Jul						

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Noise Monitoring Schedule (1 to 31 August 2016)

Alternative Noise Monitoring at Pak Mong Village Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug
			Noise Impact Monitoring			
07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug
		Noise Impact Monitoring				
14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug
	Noise Impact Monitoring			Noise Impact Monitoring		
21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug
			Noise Impact Monitoring			
28-Aug	29-Aug	30-Aug	31-Aug			
		Noise Impact Monitoring				

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Air Quality Monitoring Schedule (1 to 31 August 2016)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug
			1-hr TSP Monitoring 24-hr TSP Monitoring			
07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug
		1-hr TSP Monitoring 24-hr TSP Monitoring				
14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug
	1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring		
21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug
			1-hr TSP Monitoring 24-hr TSP Monitoring			
28-Aug	29-Aug	30-Aug	31-Aug			
		1-hr TSP Monitoring 24-hr TSP Monitoring				

HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Marine Water Quality Monitoring (WQM) Schedule (June 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01-Jun	02-Jun	03-Jun	04-Jun
				WQM Mid-Ebb 10:51 (09:06 - 12:36) Mid-Flood 17:02 (15:17 - 18:47)		**WQM** Mid-Ebb 12:21 (10:36 - 14:06) Mid-Flood 19:06 (17:21 - 20:51)
05-Jun	06-Jun	07-Jun	08-Jun	09-Jun	10-Jun	11-Jun
		WQM Mid-Flood 7:39 (05:54 - 09:24) Mid-Ebb 14:37 (12:52 - 16:22)		**WQM** Mid-Flood 9:04 (07:19 - 10:49) Mid-Ebb 16:07 (14:22 - 17:52)		**WQM** Mid-Flood 10:45 (09:00 - 12:30) Mid-Ebb 17:40 (15:55 - 19:25)
12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun
		WQM Mid-Ebb 9:20 (07:35 - 11:05) Mid-Flood 15:11 (13:26 - 16:56)		**WQM** Mid-Ebb 10:48 (09:03 - 12:33) Mid-Flood 17:15 (15:30 - 19:00)		**WQM** Mid-Ebb 11:56 (10:01 - 13:41) Mid-Flood 18:47 (17:02 - 20:32)
19-Jun	20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun
		WQM Mid-Ebb 13:39 (11:54 - 15:24) Mid-Flood 20:45 (19:00 - 22:30)		**WQM** Mid-Flood 8:02 (06:17 - 09:47) Mid-Ebb 14:53 (13:08 - 16:38)		**WQM** Mid-Flood 9:31 (07:46 - 11:16) Mid-Ebb 16:16 (14:31 - 18:01)
26-Jun	27-Jun	28-Jun	29-Jun	30-Jun		
		WQM Mid-Flood 12:59 (11:14 - 14:44) Mid-Ebb 19:06 (17:21 - 20:51)		**WQM** Mid-Ebb 9:37 (07:52 - 11:22) Mid-Flood 15:50 (14:05 - 17:35)		

HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Marine Water Quality Monitoring (WQM) Schedule (July 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26-Jun	27-Jun	28-Jun	29-Jun	30-Jun	01-Jul	02-Jul
						WQM Mid-Ebb 11:20 (09:35 - 13:05) Mid-Flood 18:12 (16:27 - 19:57)
03-Jul	04-Jul	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul
		WQM Mid-Ebb 13:38 (11:53 - 14:23) Mid-Flood 20:42 (18:53 - 21:27)		**WQM** Mid-Flood 8:08 (07:23 - 09:53) Mid-Ebb 15:04 (13:19 - 15:49)		**WQM** Mid-Flood 9:33 (08:48 - 11:18) Mid-Ebb 16:22 (14:37 - 17:07)
10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul
		WQM Mid-Flood 12:27 (11:42 - 14:12) Mid-Ebb 18:30 (16:45 - 19:15)		**WQM** Mid-Ebb 9:21 (08:36 - 11:06) Mid-Flood 15:56 (14:11 - 16:41)		**WQM** Mid-Ebb 10:51 (10:06 - 12:36) Mid-Flood 17:52 (16:07 - 18:37)
17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul
		WQM Mid-Ebb 12:44 (11:59 - 14:29) Mid-Flood 19:50 (18:05 - 20:35)		**WQM** Mid-Flood 7:09 (06:54 - 08:54) Mid-Ebb 13:59 (12:14 - 14:44)		**WQM** Mid-Flood 8:38 (07:53 - 10:23) Mid-Ebb 15:16 (13:31 - 16:01)
24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul
		WQM Mid-Flood 11:27 (10:42 - 13:12) Mid-Ebb 17:34 (15:49 - 18:19)		**WQM** Mid-Ebb 8:03 (07:18 - 09:48) Mid-Flood 14:22 (12:37 - 15:07)		**WQM** Mid-Ebb 10:16 (09:31 - 12:01) Mid-Flood 17:18 (15:33 - 18:03)

HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Marine Water Quality Monitoring (WQM) Schedule (August 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug
		WQM was cancelled due to adverse weather.		**WQM** Mid-Flood 7:15 (05:30 - 09:00) Mid-Ebb 14:04 (12:19 - 15:49)		**WQM** Mid-Flood 8:36 (06:51 - 10:21) Mid-Ebb 15:17 (13:32 - 17:02)
07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug
		WQM Mid-Flood 10:46 (09:01 - 12:31) Mid-Ebb 16:56 (15:11 - 18:41)		**WQM** Mid-Flood 13:13 (11:28 - 14:58) Mid-Ebb 18:46 (17:01 - 20:31)		**WQM** Mid-Ebb 9:20 (07:35 - 11:05) Mid-Flood 16:48 (15:03 - 18:33)
14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug
		WQM Mid-Ebb 11:41 (09:56 - 13:26) Mid-Flood 18:49 (17:04 - 20:34)		**WQM** Mid-Ebb 13:00 (11:15 - 14:45) Mid-Flood 19:53 (18:08 - 21:38)		**WQM** Mid-Flood 7:45 (06:00 - 09:30) Mid-Ebb 14:16 (12:31 - 16:01)
21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug
		WQM Mid-Flood 10:18 (08:33 - 12:03) Mid-Ebb 16:22 (14:37 - 18:07)		**WQM** Mid-Flood 12:52 (11:07 - 14:37) Mid-Ebb 18:26 (16:41 - 20:11)		**WQM** Mid-Ebb 8:52 (07:07 - 10:37) Mid-Flood 16:13 (14:28 - 17:58)
28-Aug	29-Aug	30-Aug	31-Aug			
		WQM Mid-Ebb 11:44 (09:59 - 13:29) Mid-Flood 18:42 (16:57 - 20:27)				

HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Dolphin Monitoring Survey Schedule (1 to 30 June 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01-Jun	02-Jun	03-Jun	04-Jun
			Impact Dolphin Monitoring			
05-Jun	06-Jun	07-Jun	08-Jun	09-Jun	10-Jun	11-Jun
	Impact Dolphin Monitoring					
12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun
	Impact Dolphin Monitoring				Impact Dolphin Monitoring	
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 2016)

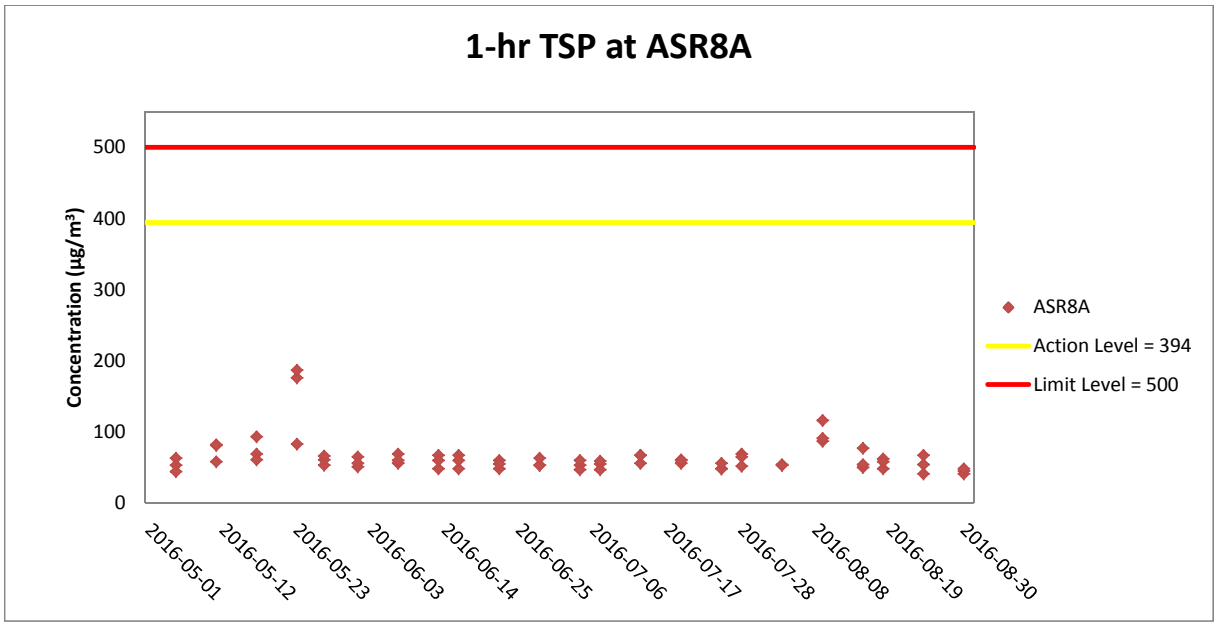
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-Jul	02-Jul
03-Jul	04-Jul	05-Jul	06-Jul	07-Jul	08-Jul	09-Jul
		Impact Dolphin Monitoring				
10-Jul	11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul
		Impact Dolphin Monitoring				
17-Jul	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul
	Impact Dolphin Monitoring					
24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul
			Impact Dolphin Monitoring			
31-Jul						

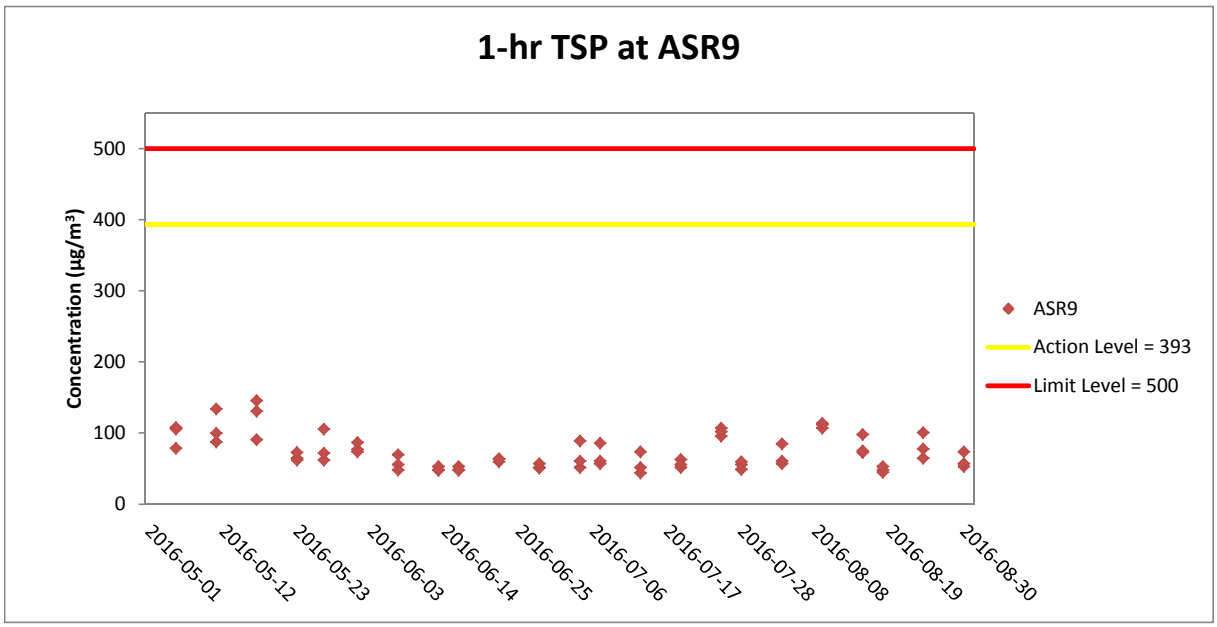
HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
Impact Dolphin Monitoring Survey Schedule (1 to 31 August 2016)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	01-Aug	02-Aug	03-Aug	04-Aug	05-Aug	06-Aug
					Impact Dolphin Monitoring	
07-Aug	08-Aug	09-Aug	10-Aug	11-Aug	12-Aug	13-Aug
		Impact Dolphin Monitoring				
14-Aug	15-Aug	16-Aug	17-Aug	18-Aug	19-Aug	20-Aug
			Impact Dolphin Monitoring			
21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug
		Impact Dolphin Monitoring				
28-Aug	29-Aug	30-Aug	31-Aug			

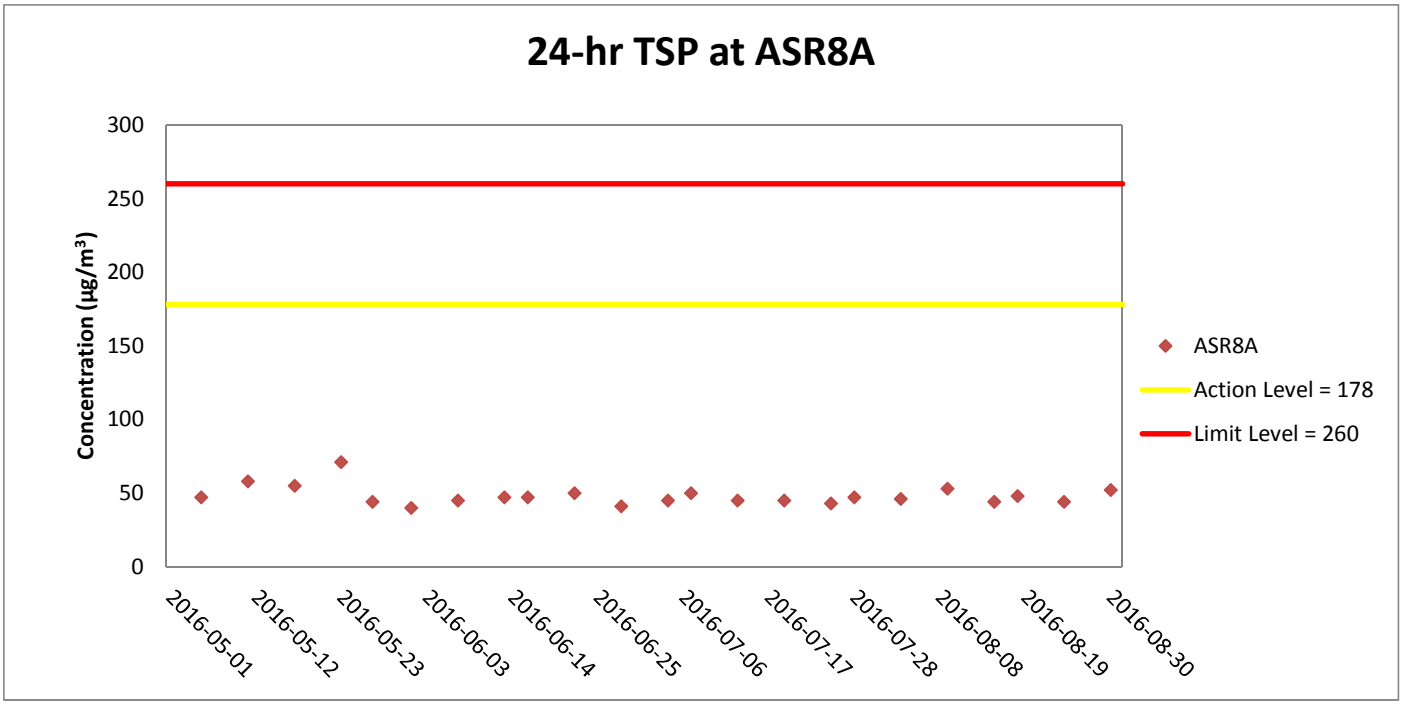
Appendix F

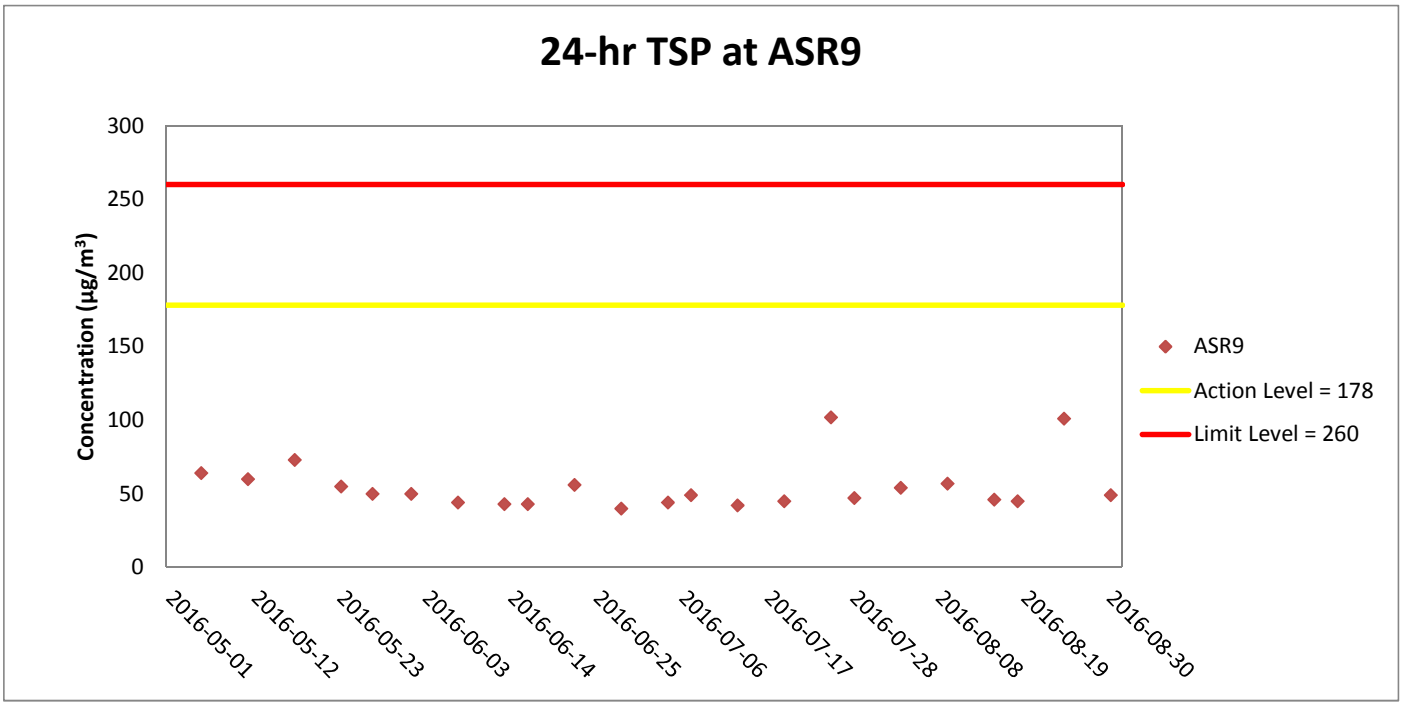
Impact Air Quality Monitoring Graphical Presentation





Weather condition within the reporting period varied between sunny to rainy.
Major construction works undertaken within the reporting period include Pier construction; Re-alignment of Cheung Tung Road; Construction of land section of berth at Southern Landfall; Installation of pier head and deck segments; and Slope work of Viaducts A, B & C.
Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

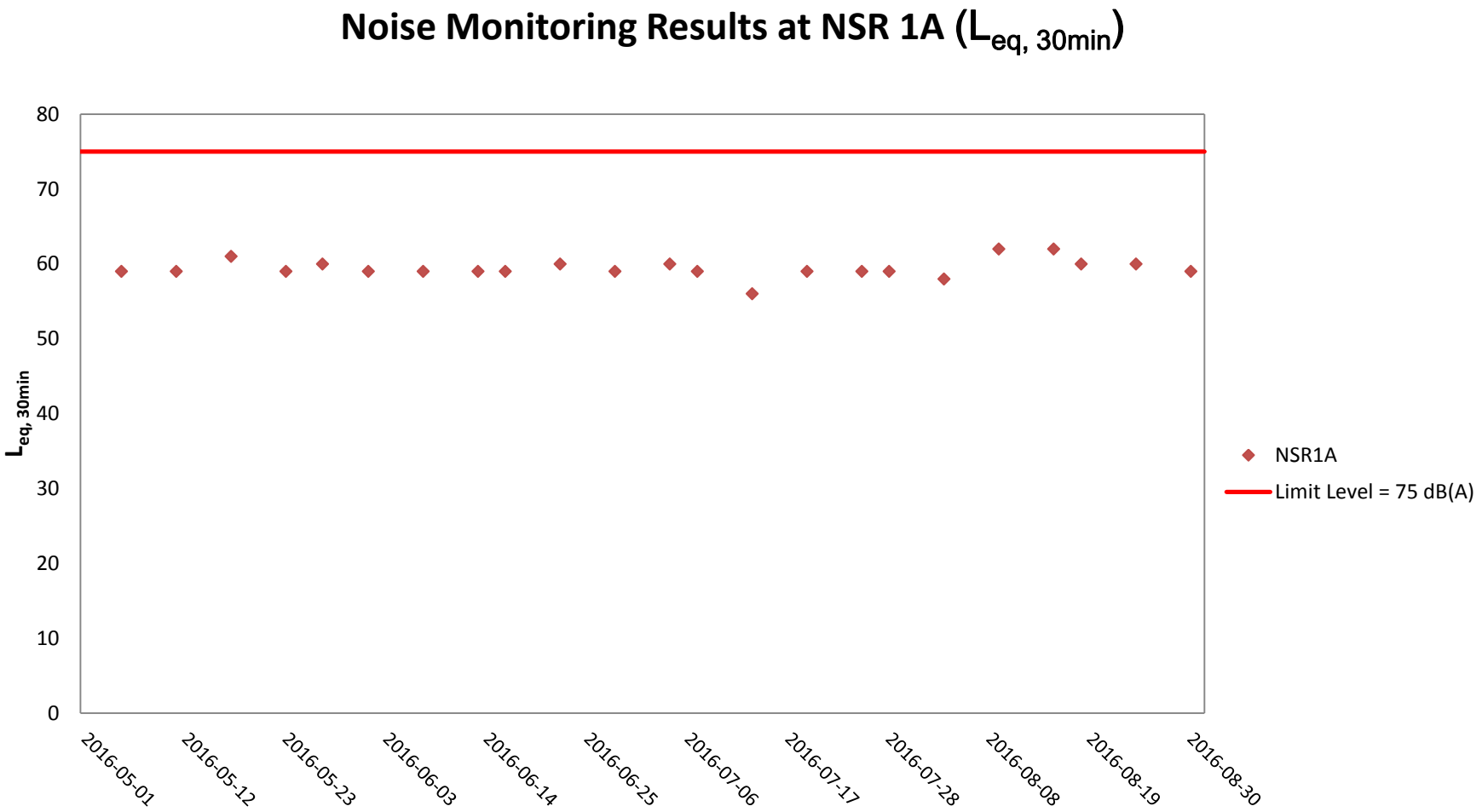




Weather condition within the reporting period varied between sunny to rainy.
Major construction works undertaken within the reporting period include Pier construction; Re-alignment of Cheung Tung Road; Construction of land section of berth at Southern Landfall; Installation of pier head and deck segments; and Slope work of Viaducts A, B & C.
Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Appendix G

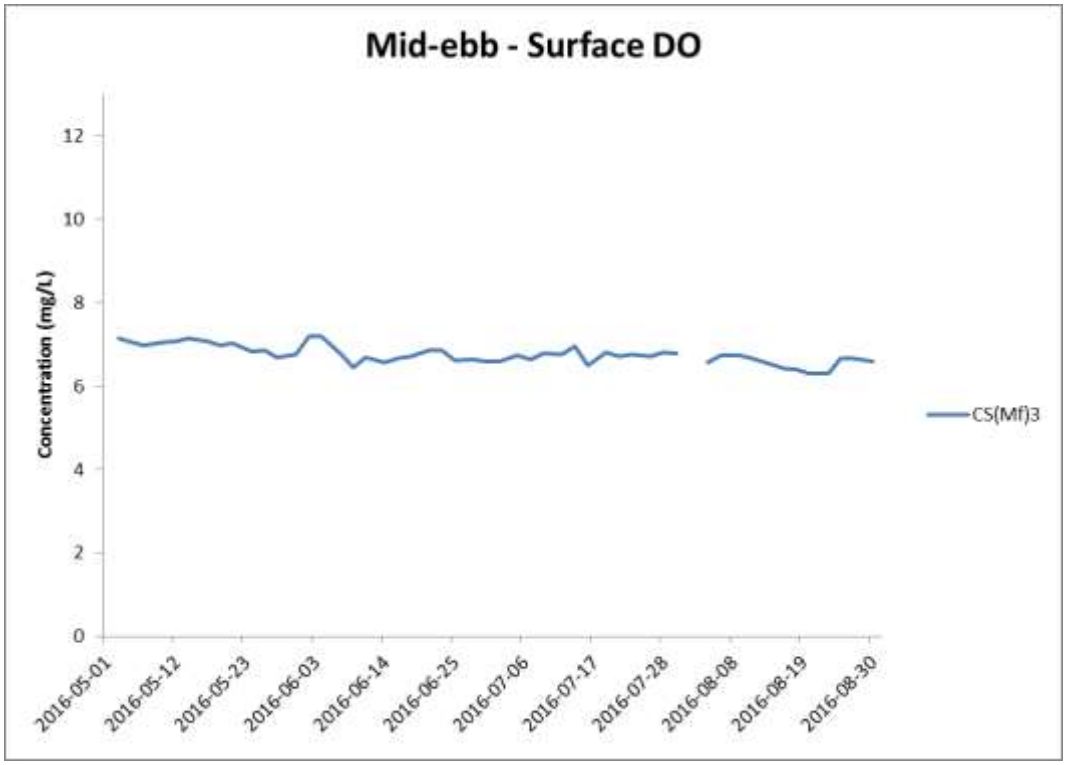
Impact Noise Monitoring Graphical Presentation



Weather condition within the reporting period varied between sunny to rainy.
Major construction works undertaken within the reporting period include Pier construction; Re-alignment of Cheung Tung Road; Construction of land section of berth at Southern Landfall; Installation of pier head and deck segments; and Slope work of Viaducts A, B & C.
Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Appendix H

Impact Water Quality Monitoring Graphical Presentation



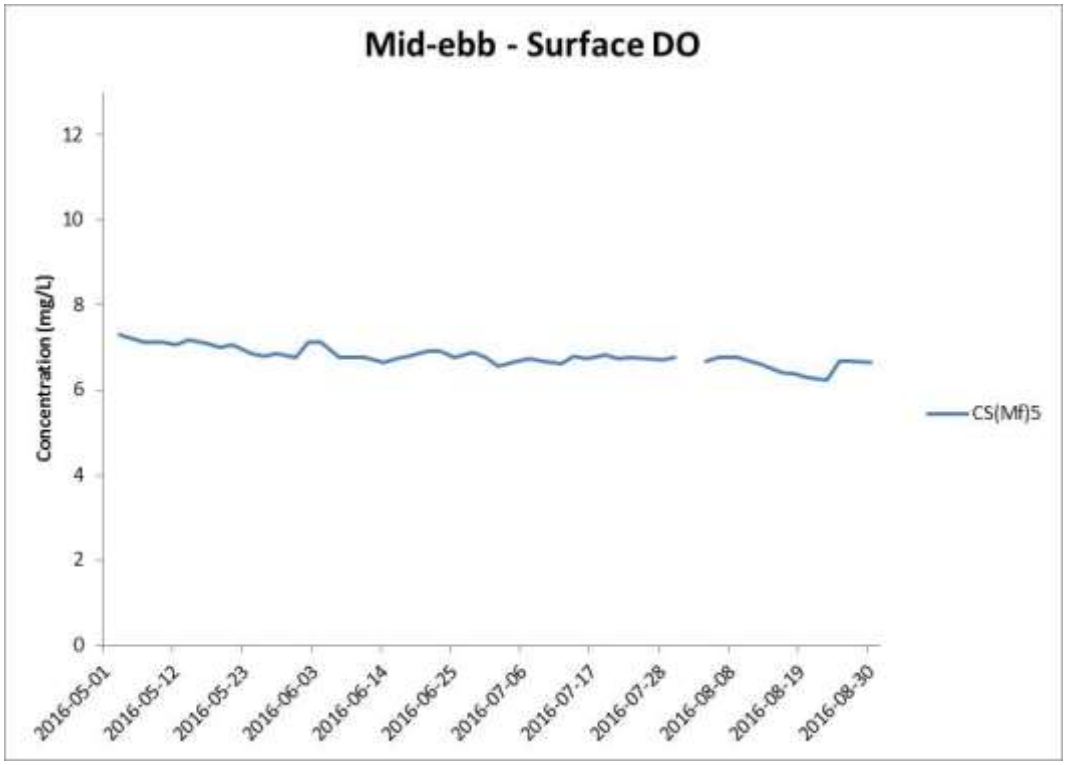
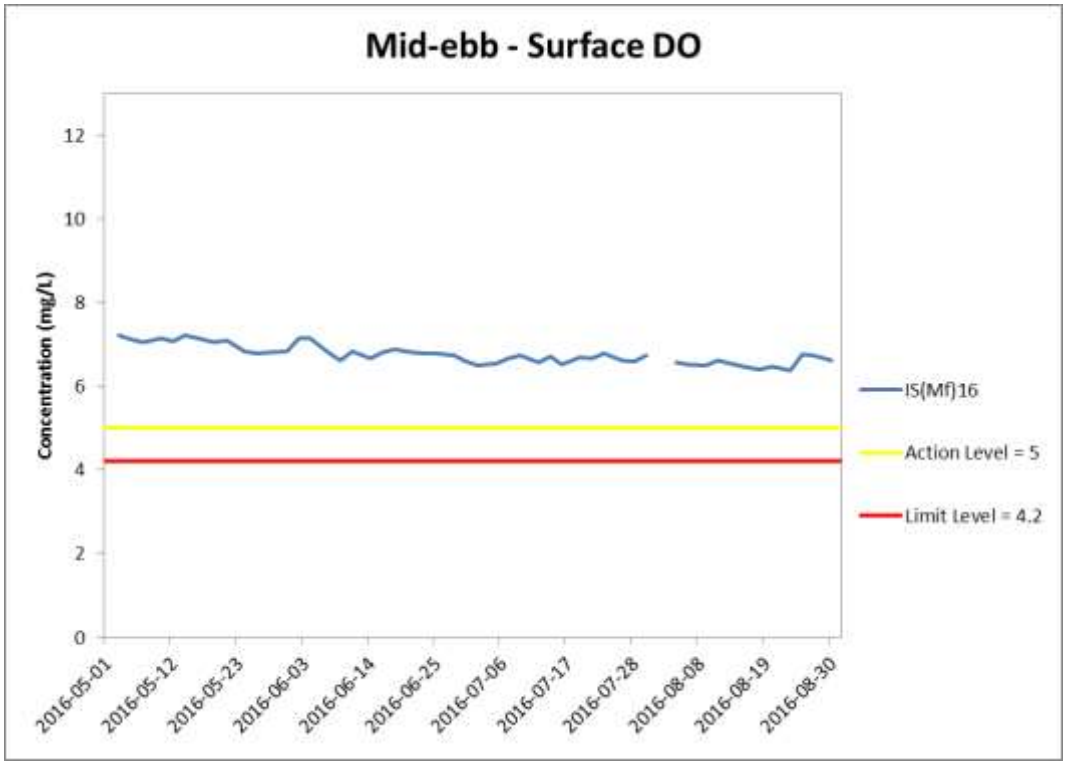


Figure H1 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



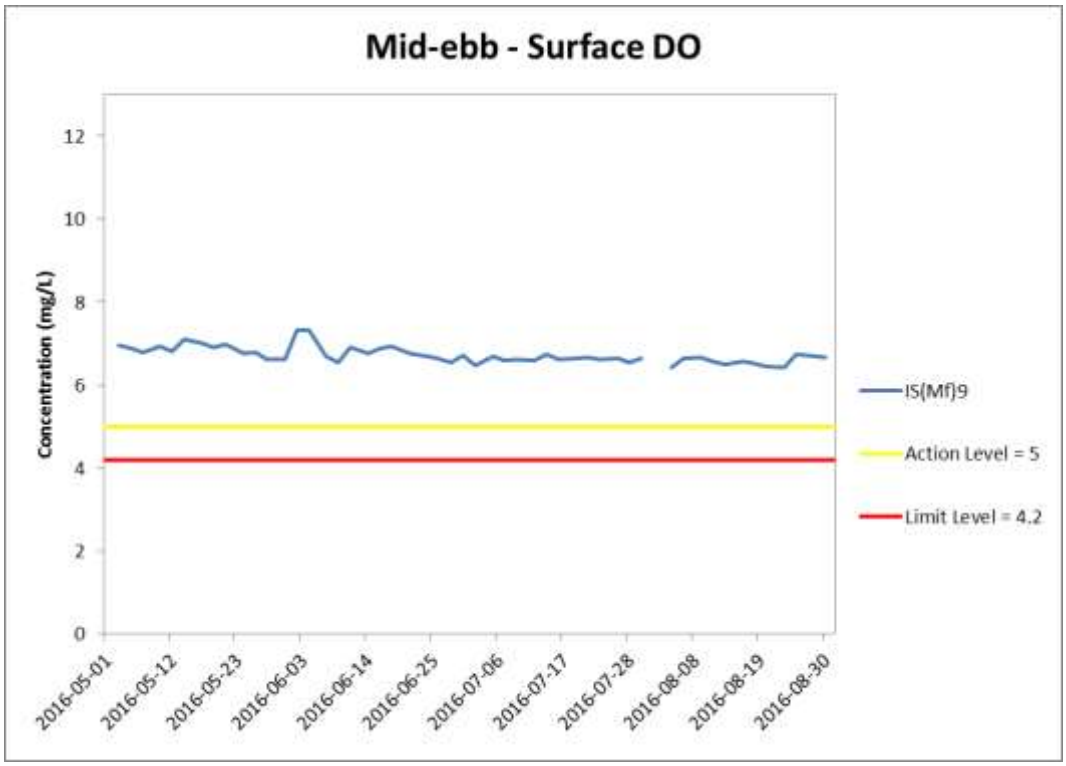
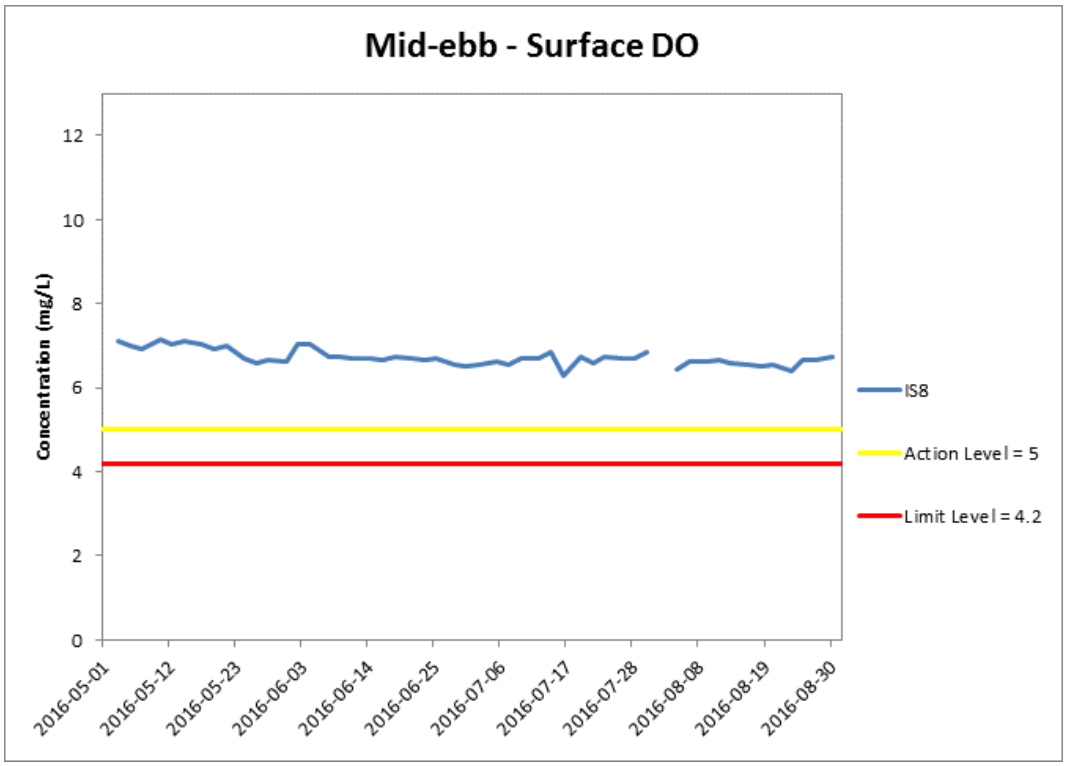


Figure H2 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



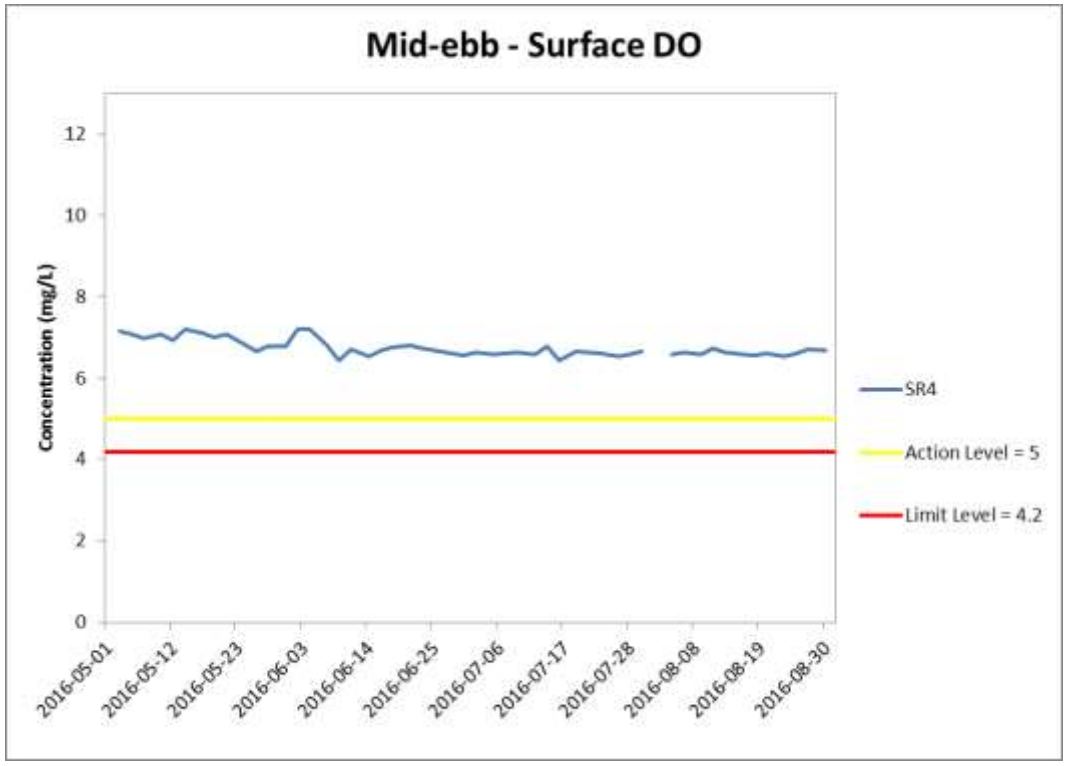


Figure H3 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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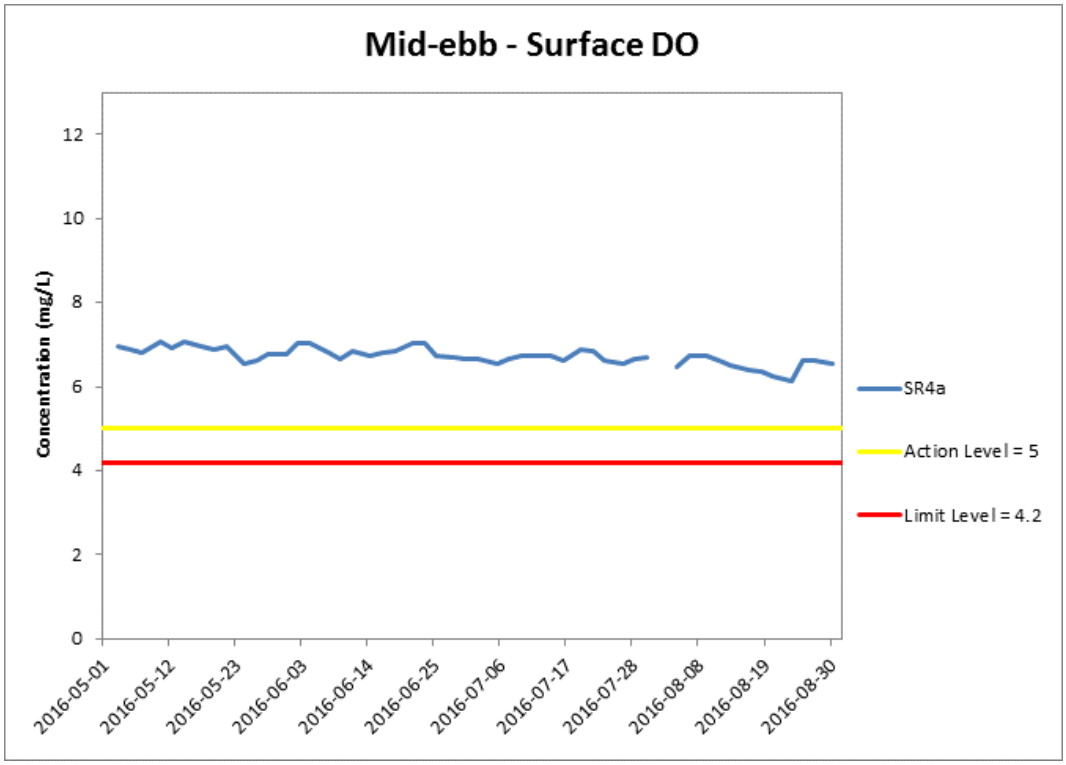

Figure H4 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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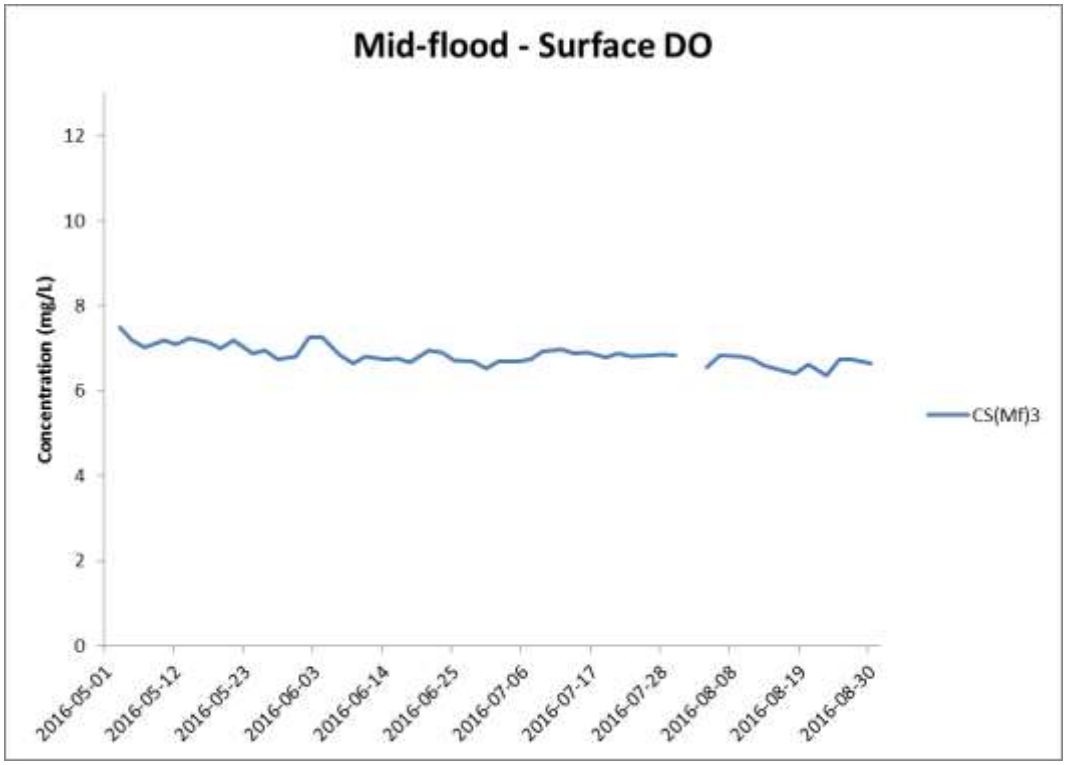

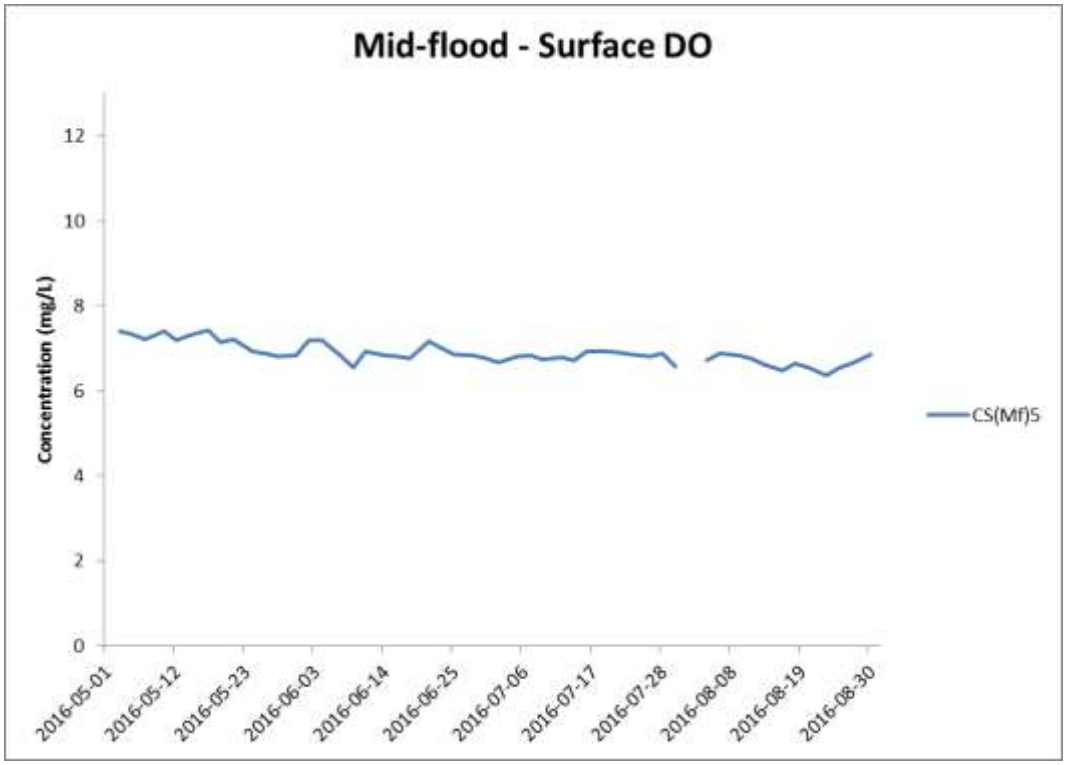

Figure H5 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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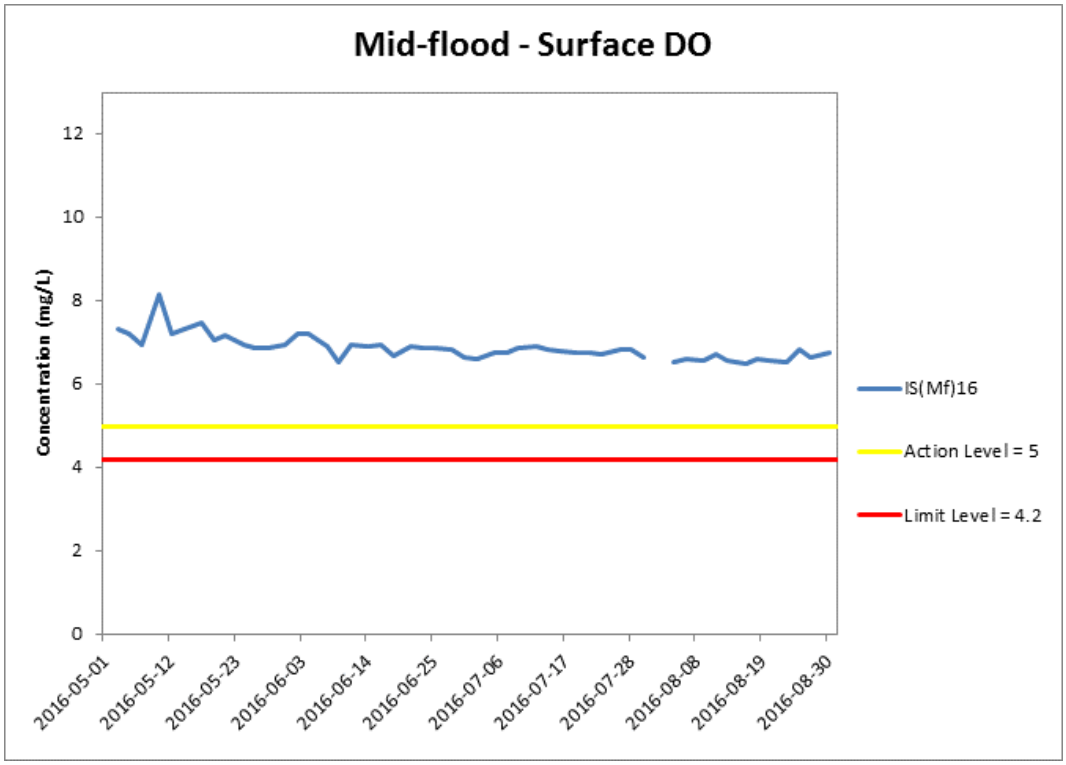

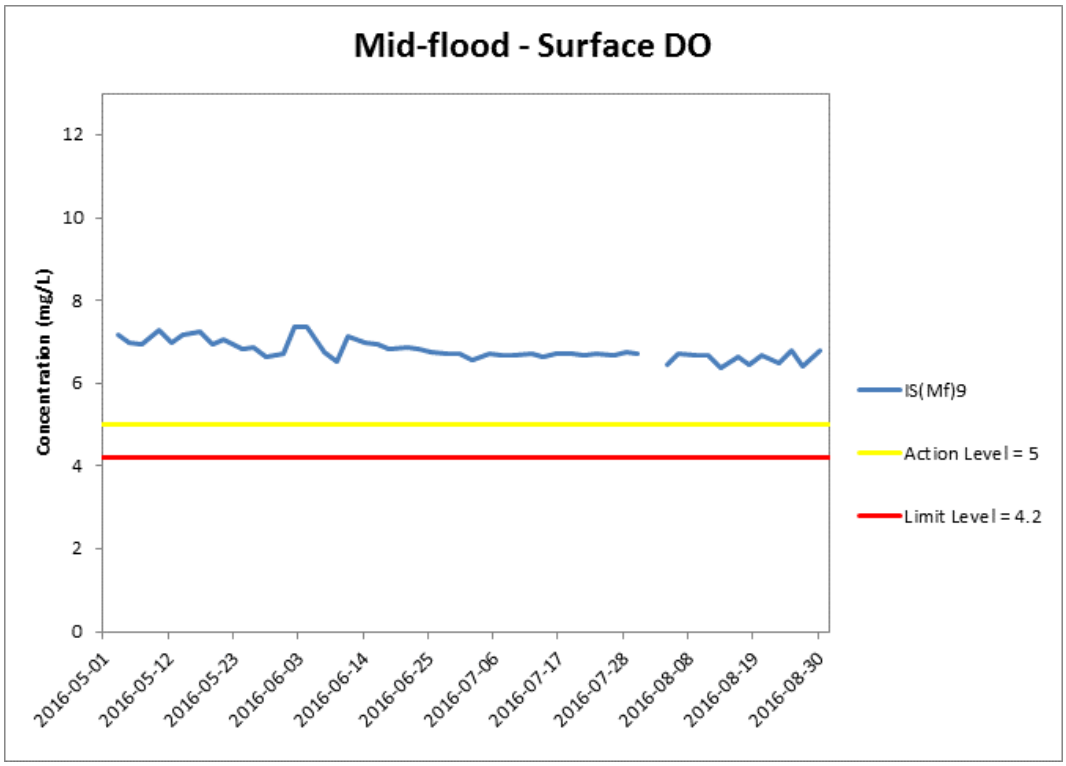

Figure H6 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.)
WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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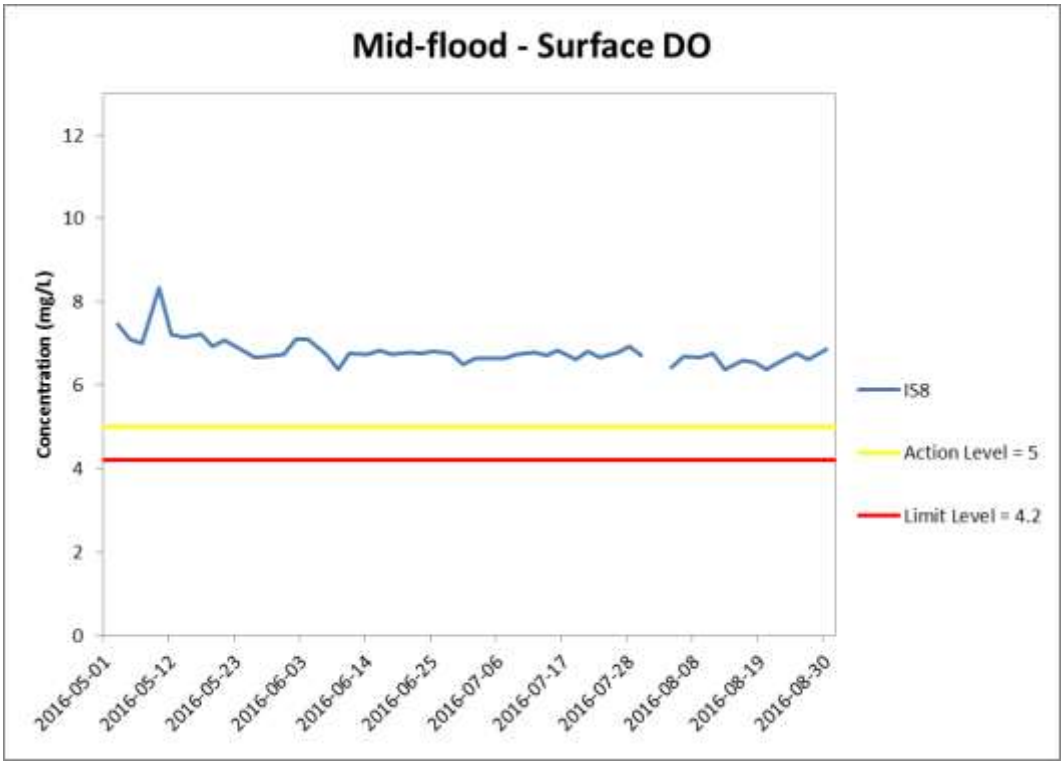


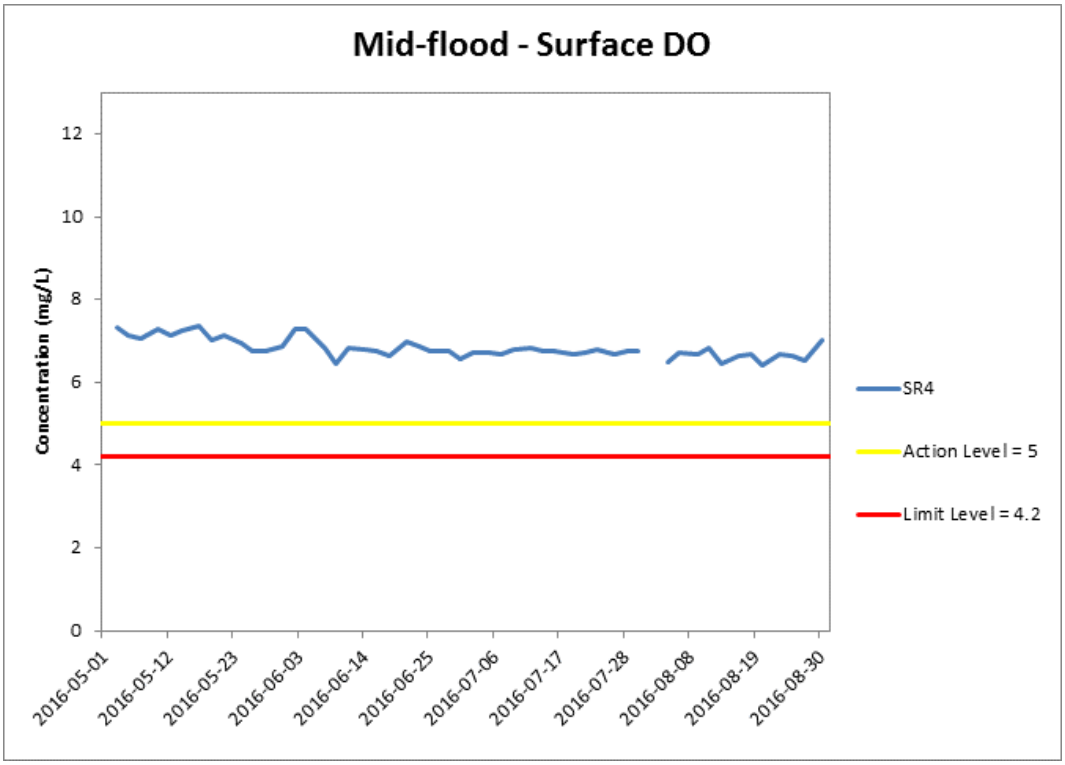


Figure H7 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM

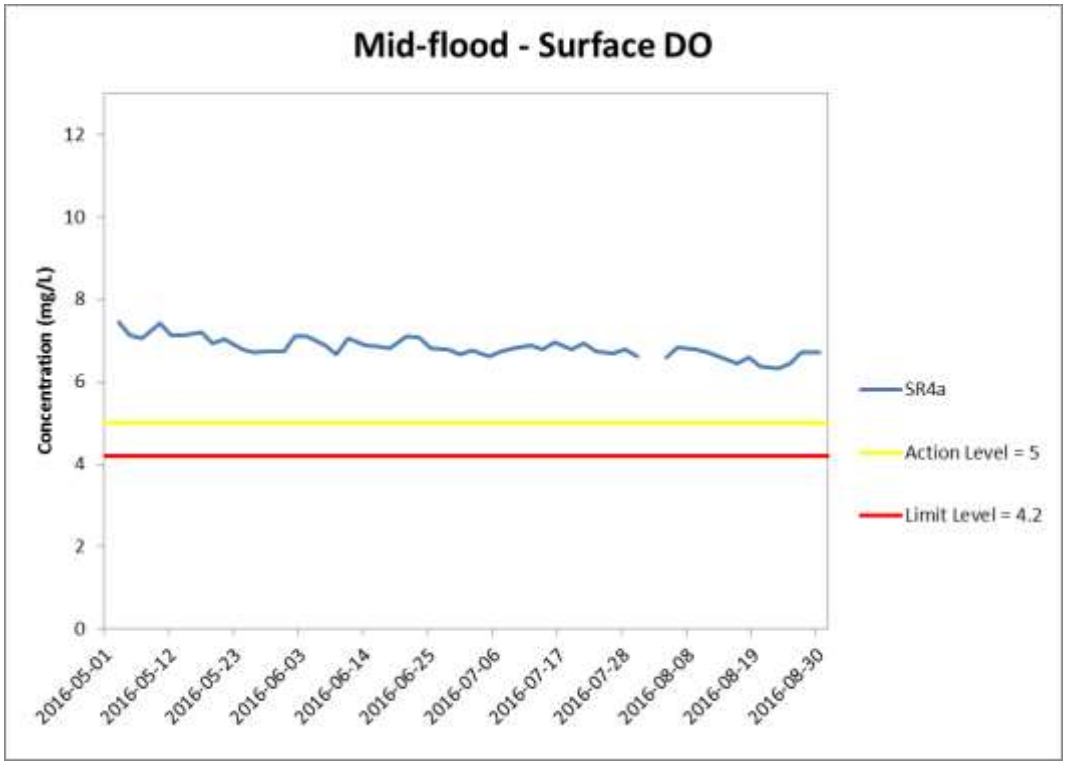
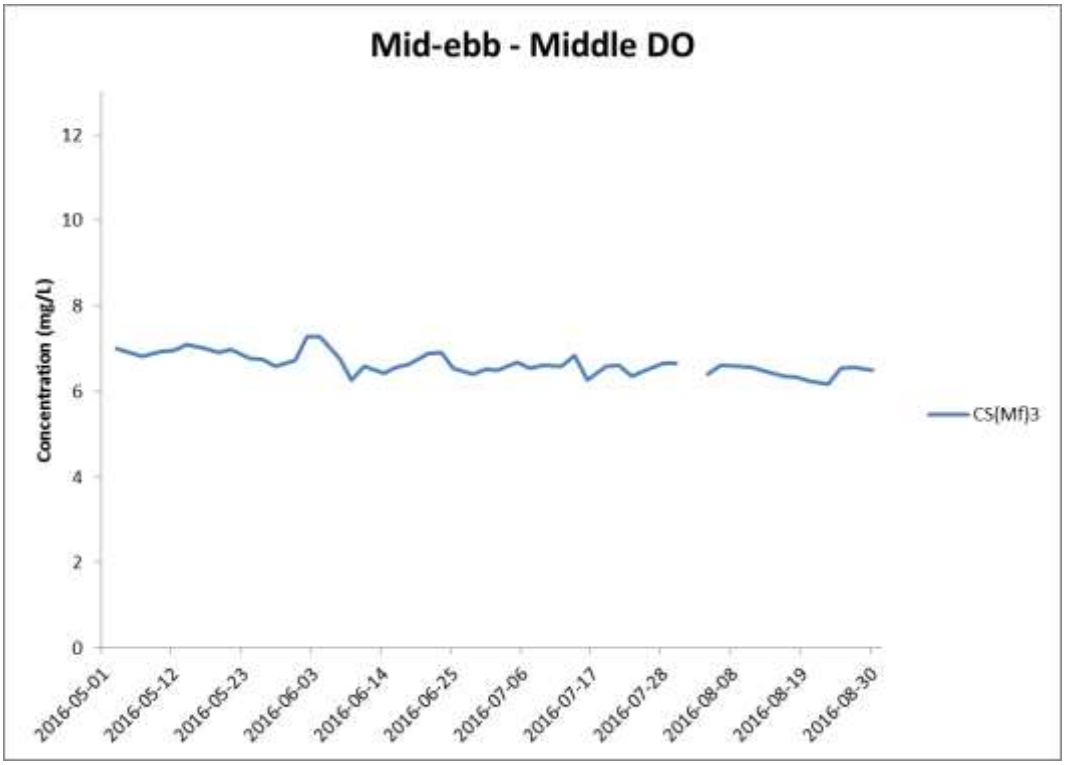


Figure H8 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



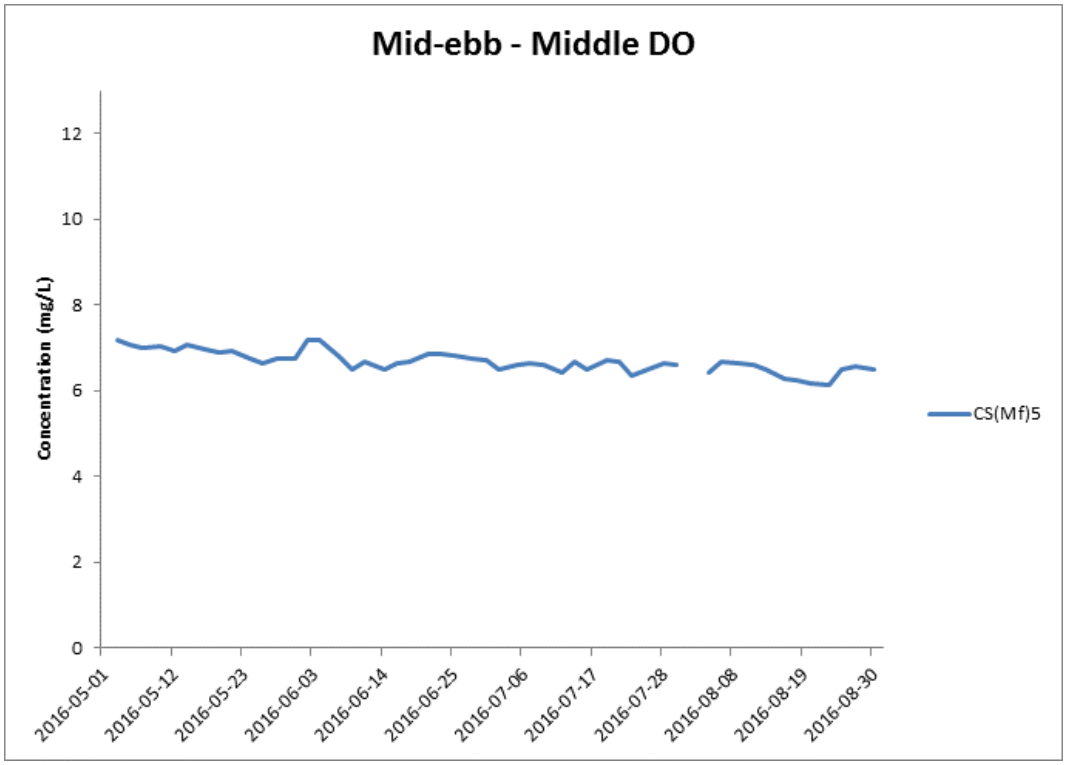


Figure H9 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM

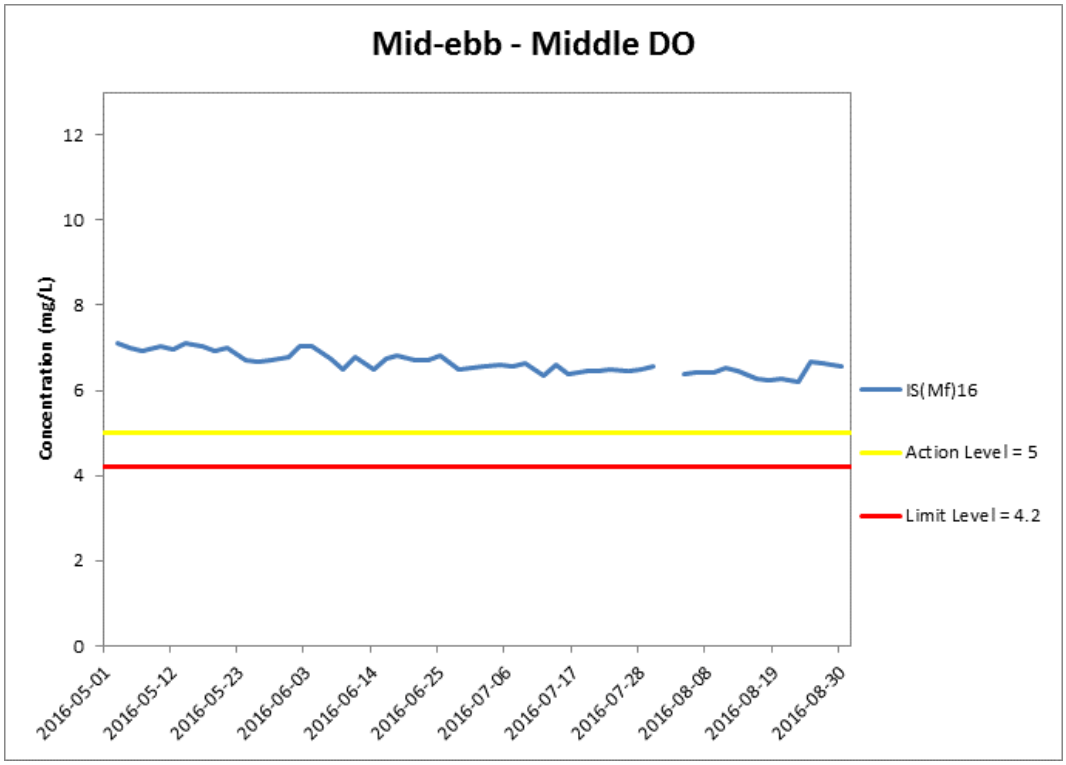
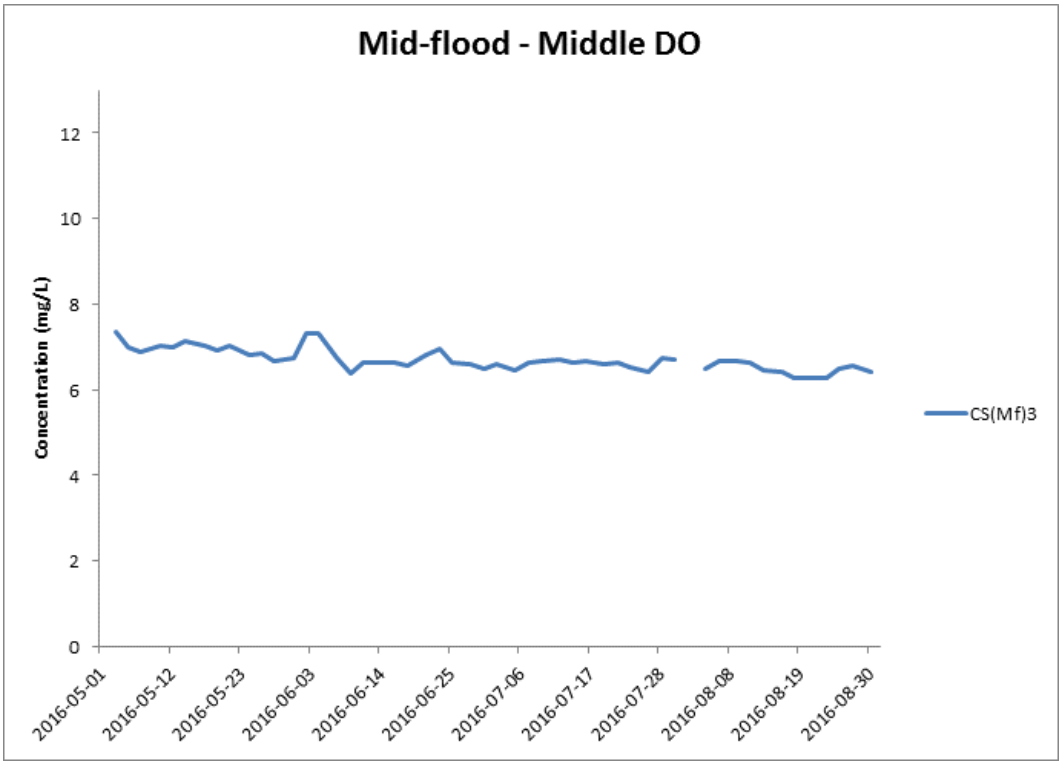


Figure H10 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 May and 31 August 2016 at IS(Mf)16.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



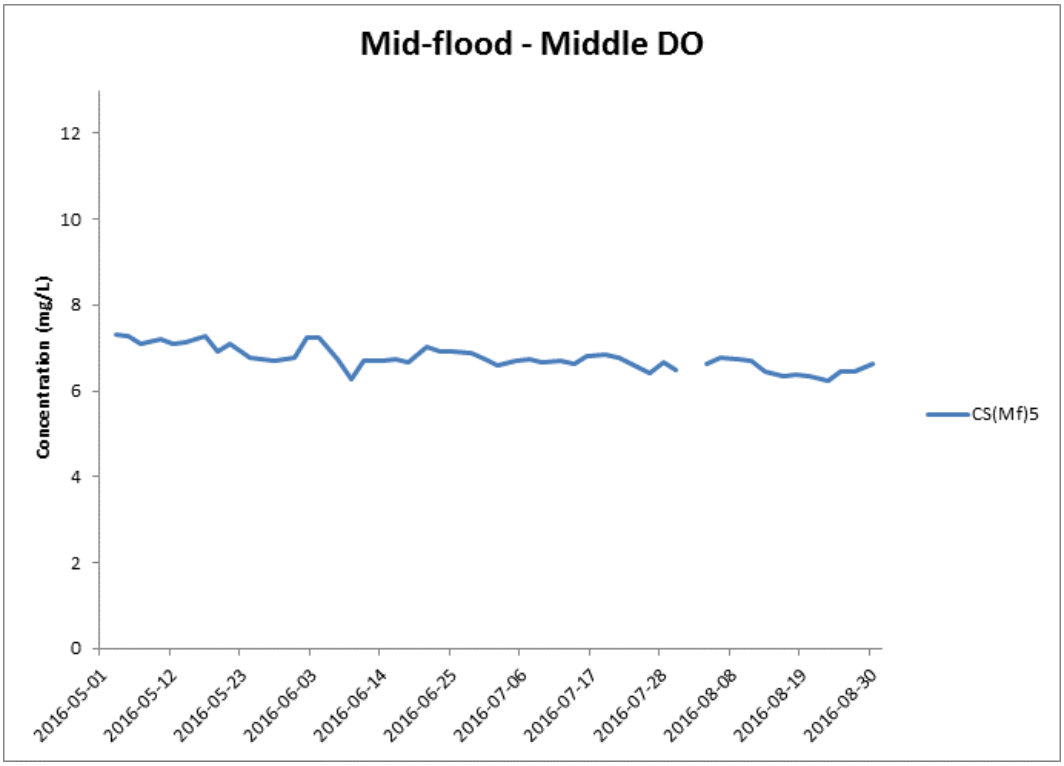


Figure H11 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM

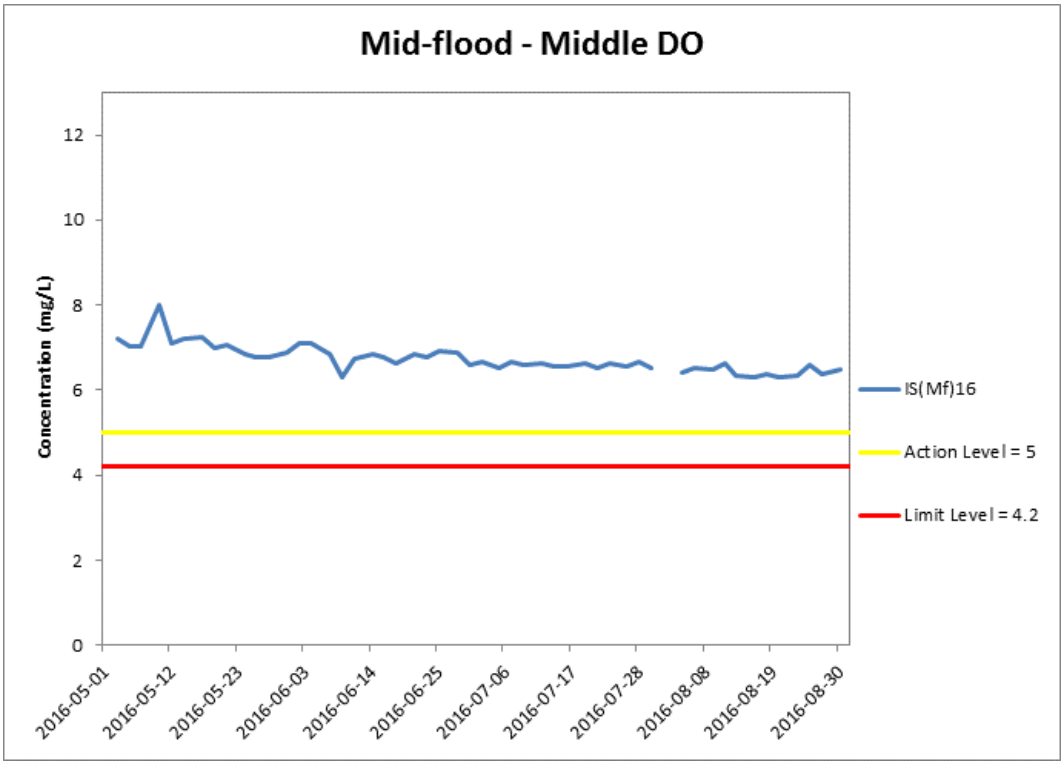
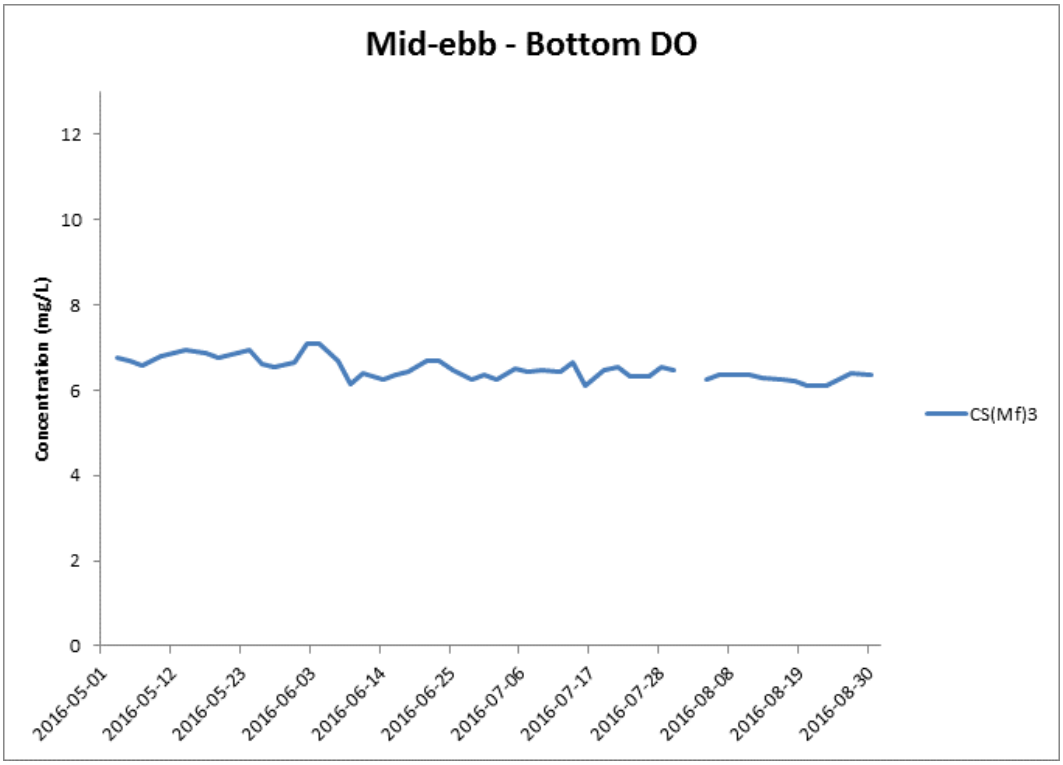


Figure H12 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 May and 31 August 2016 at IS(Mf)16.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



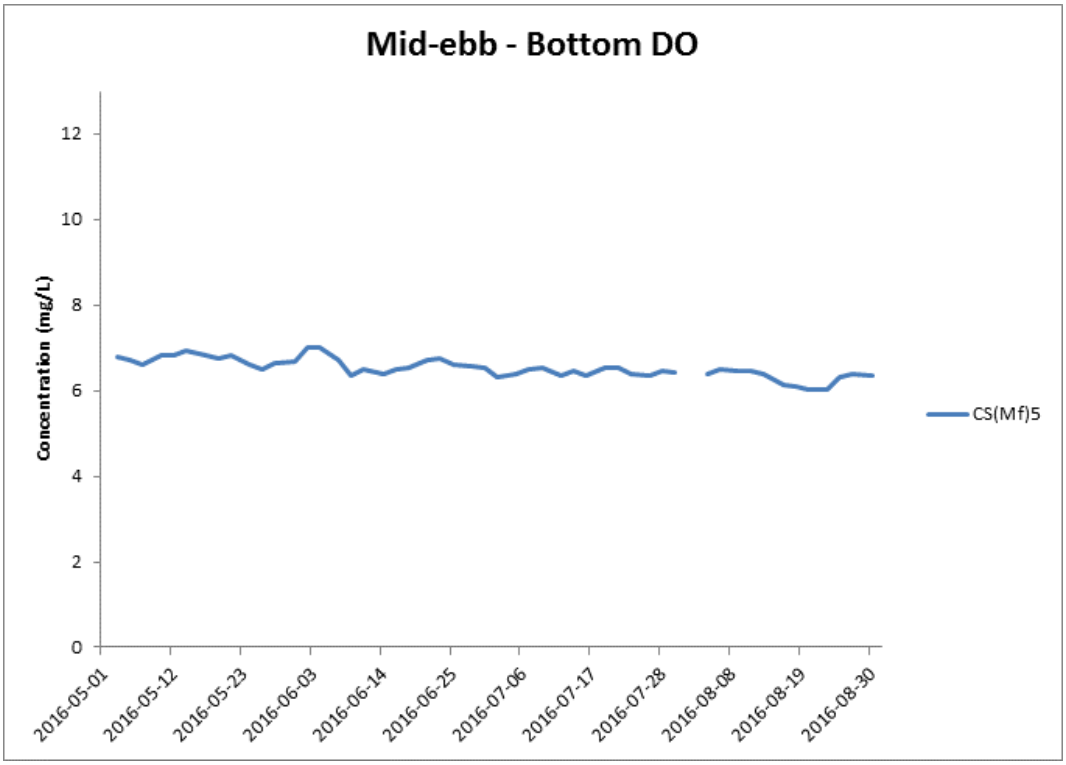
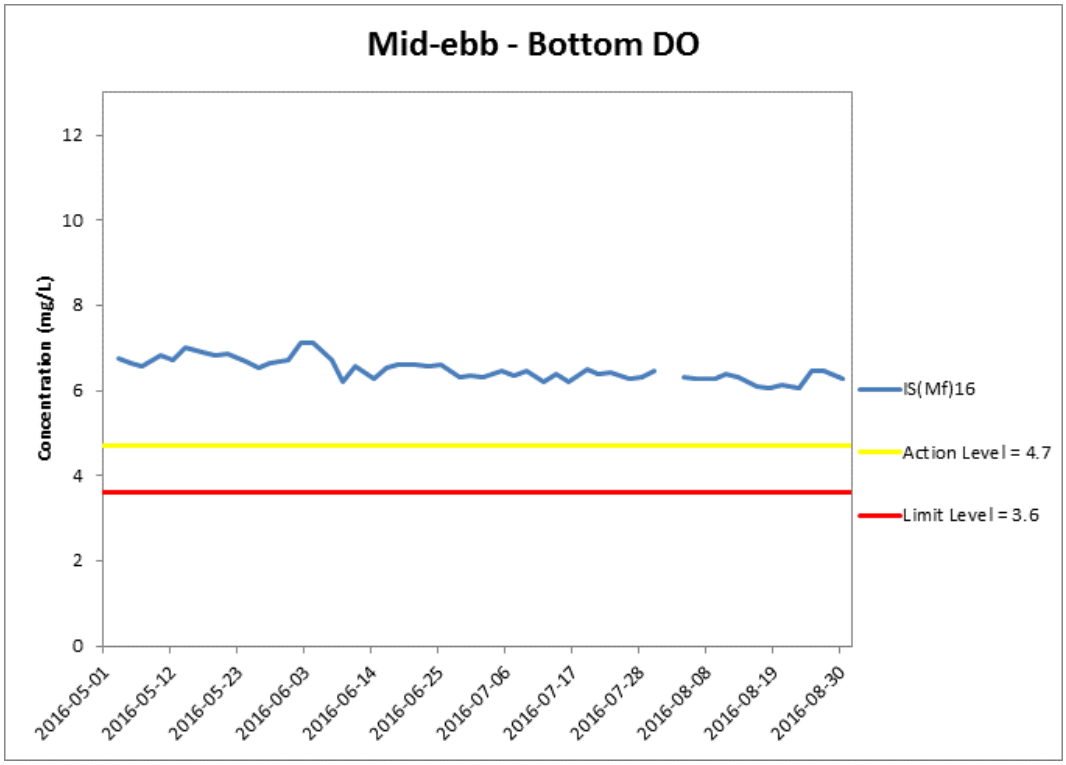


Figure H13 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



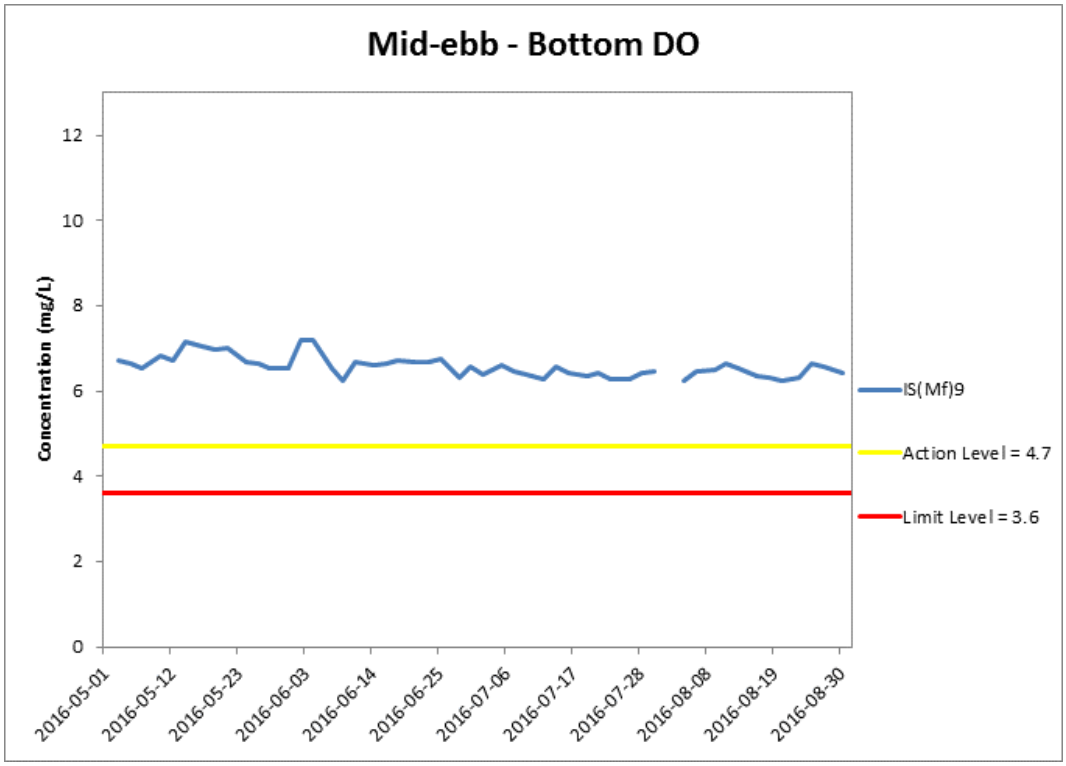
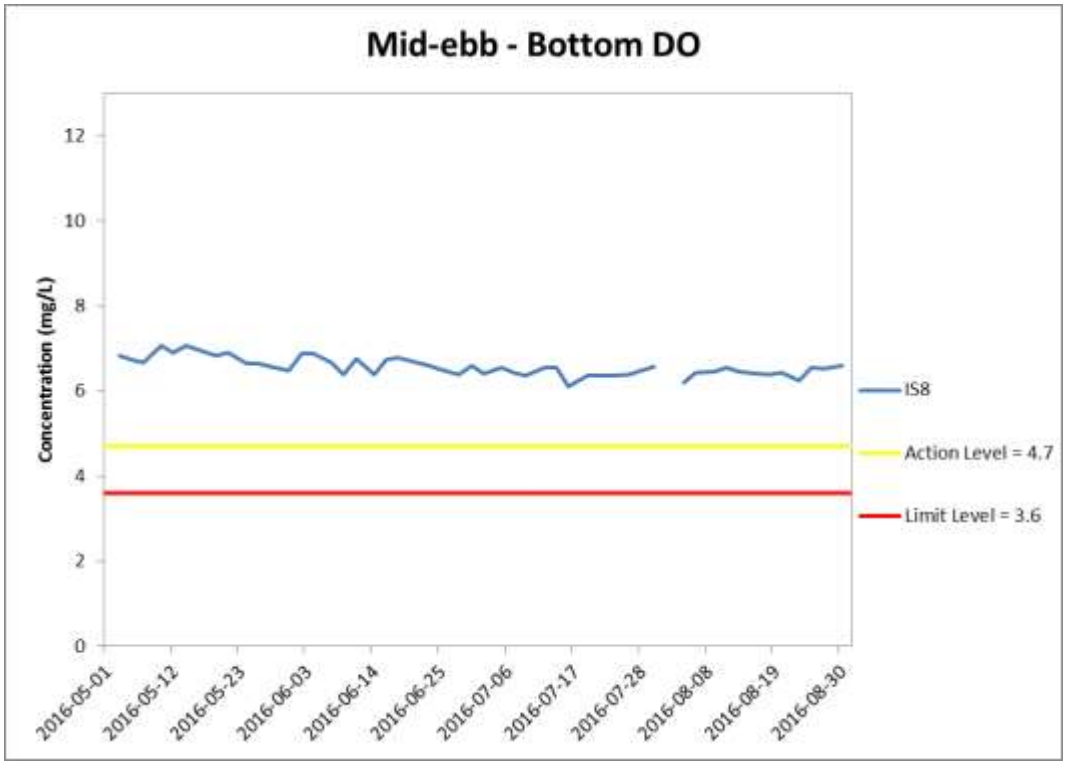


Figure H14 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM



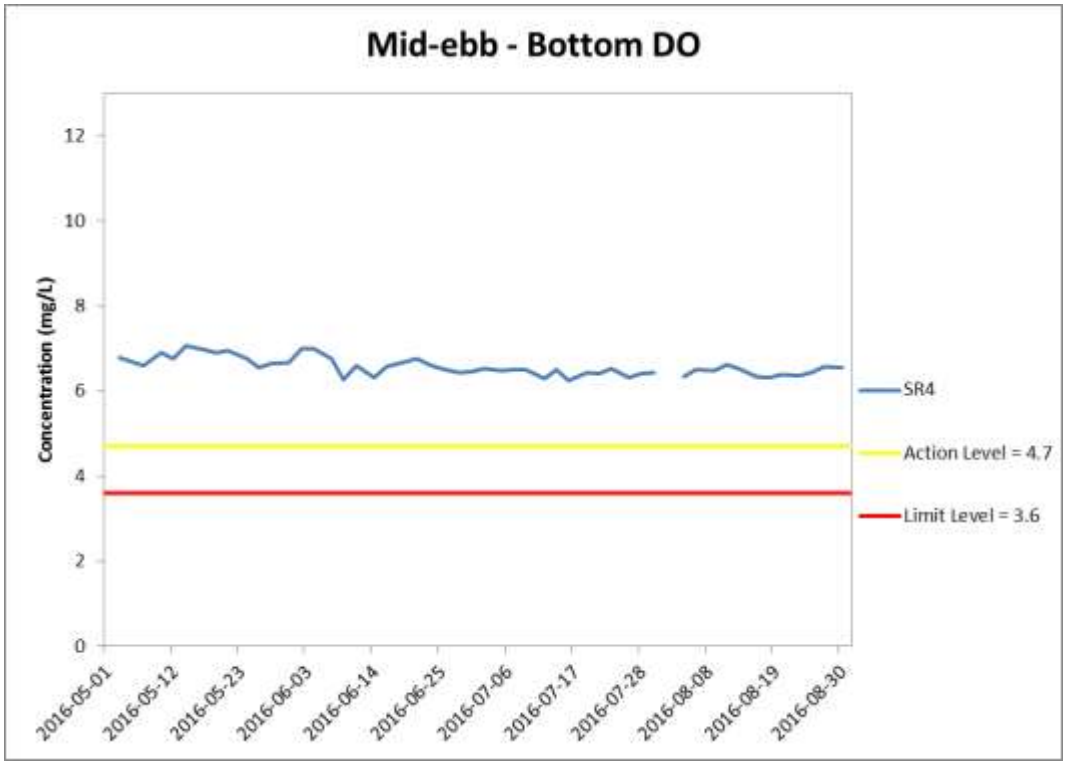


Figure H15 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

ERM

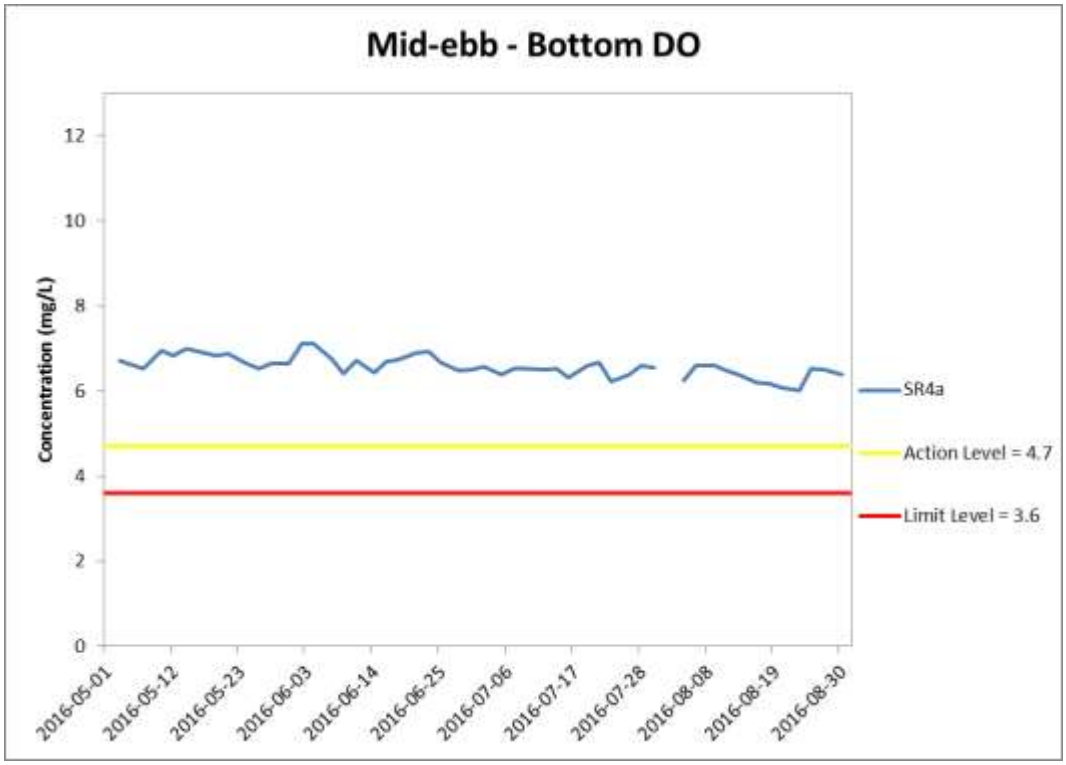


Figure H16 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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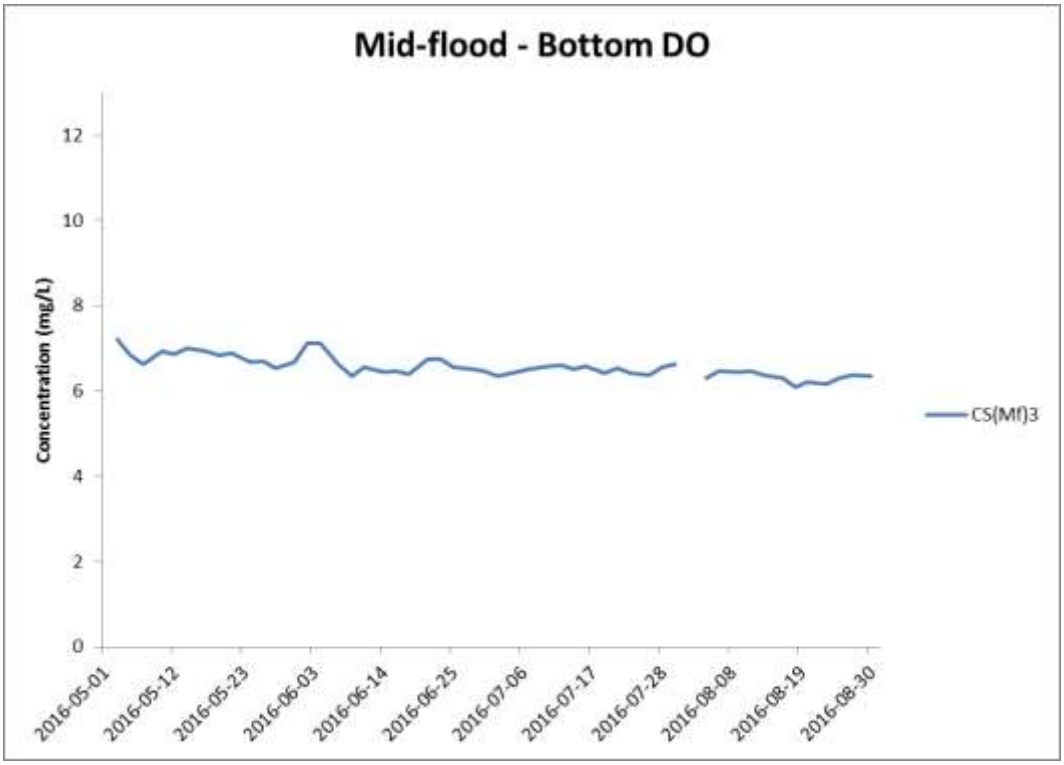

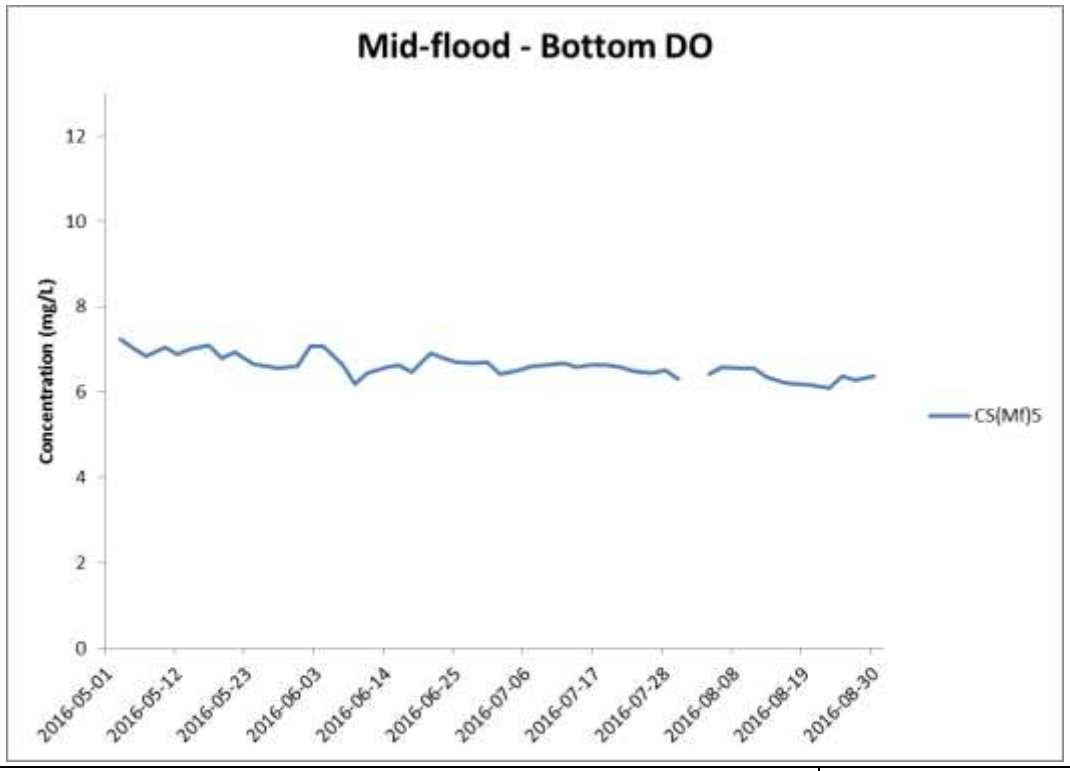

Figure H17 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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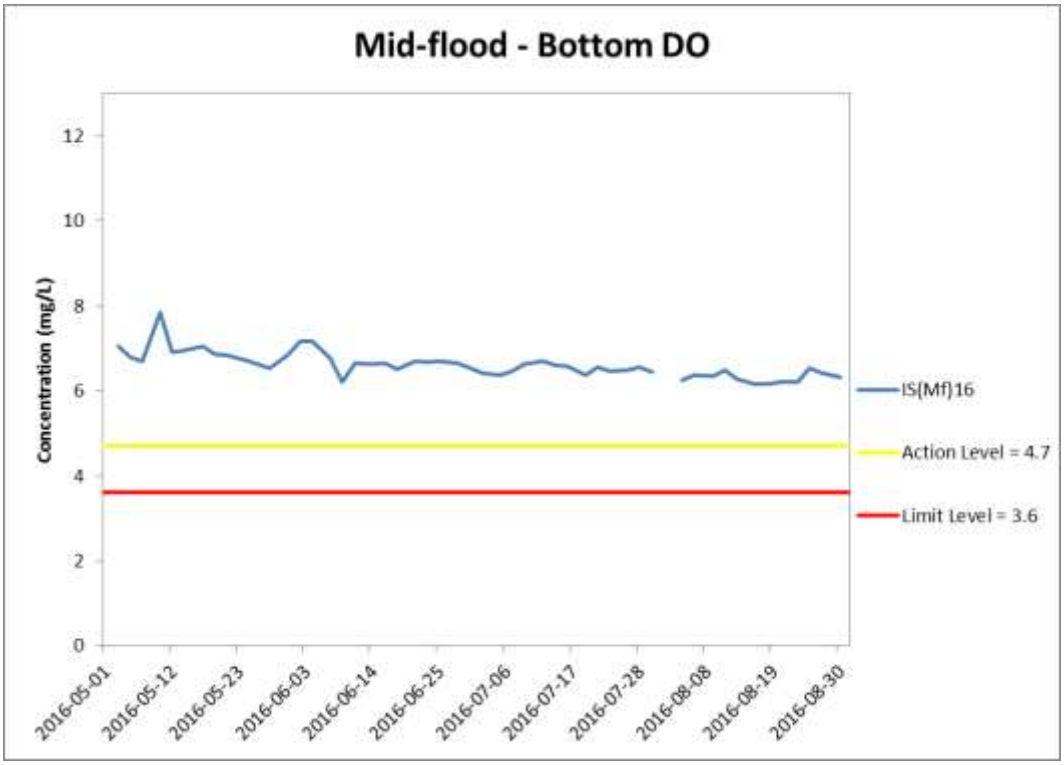


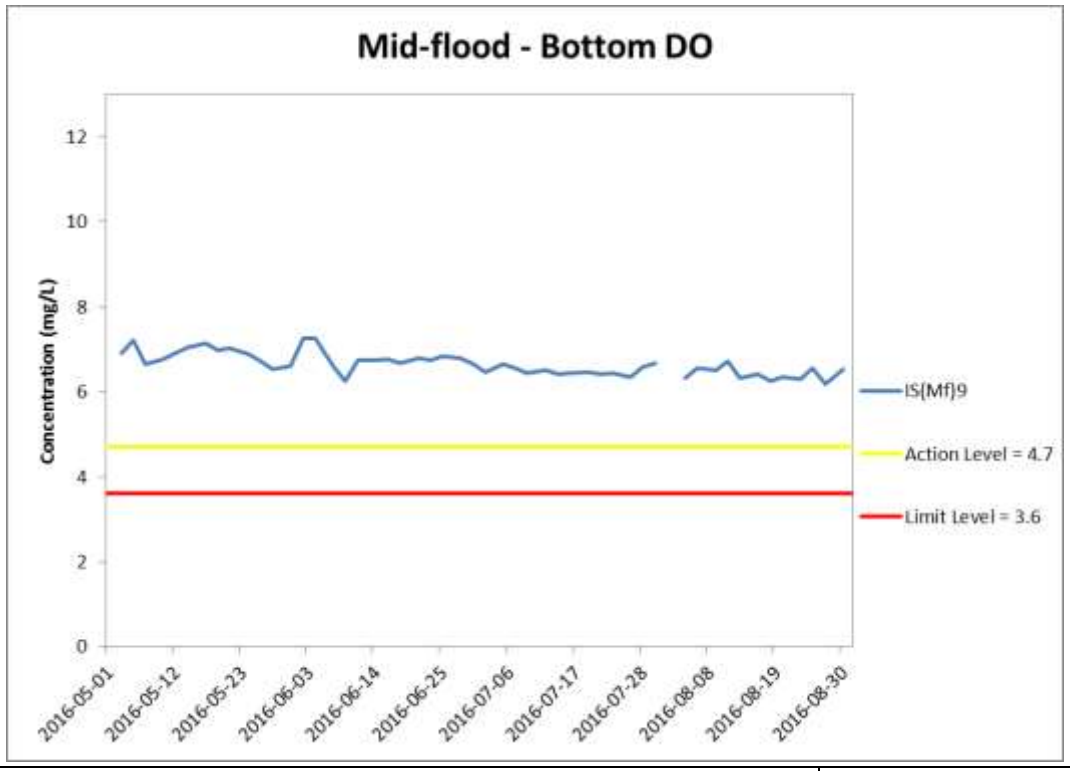
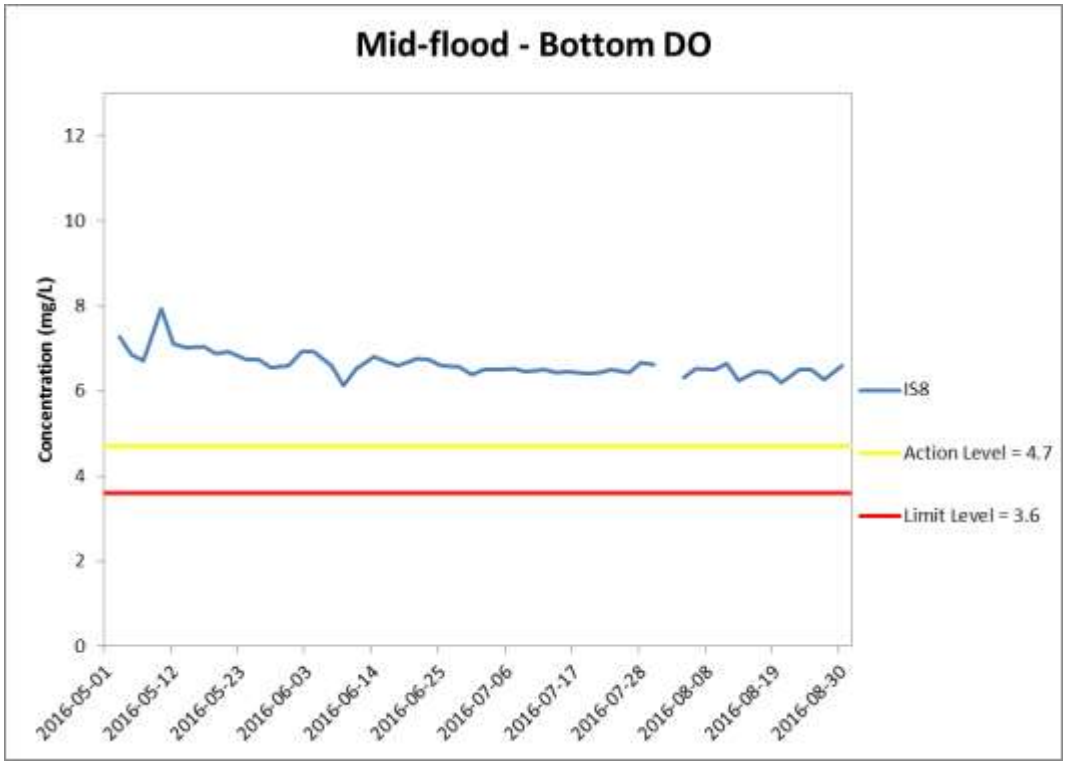


Figure H18 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



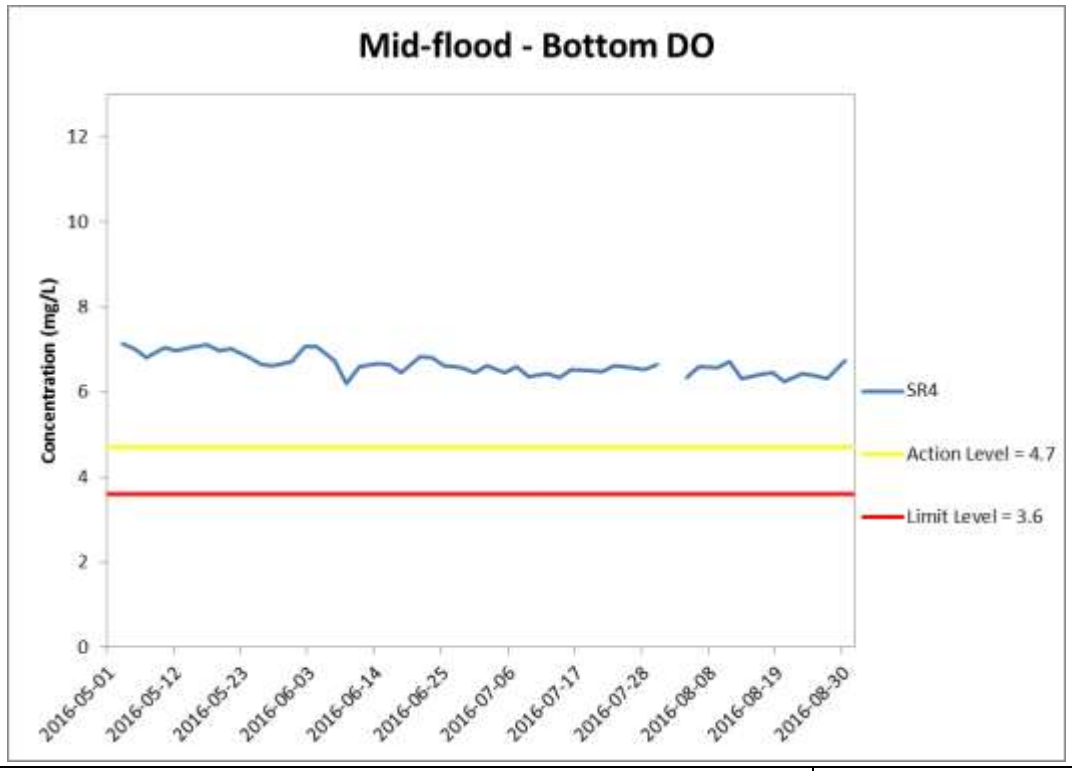


Figure H19 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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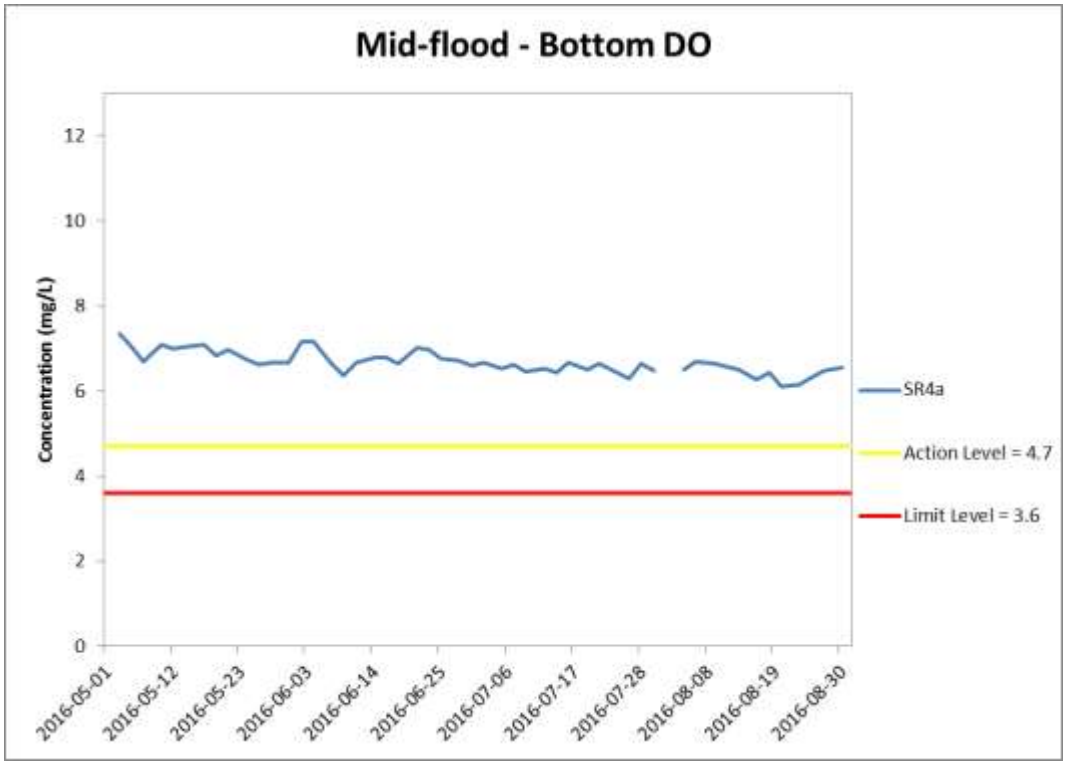

Figure H20 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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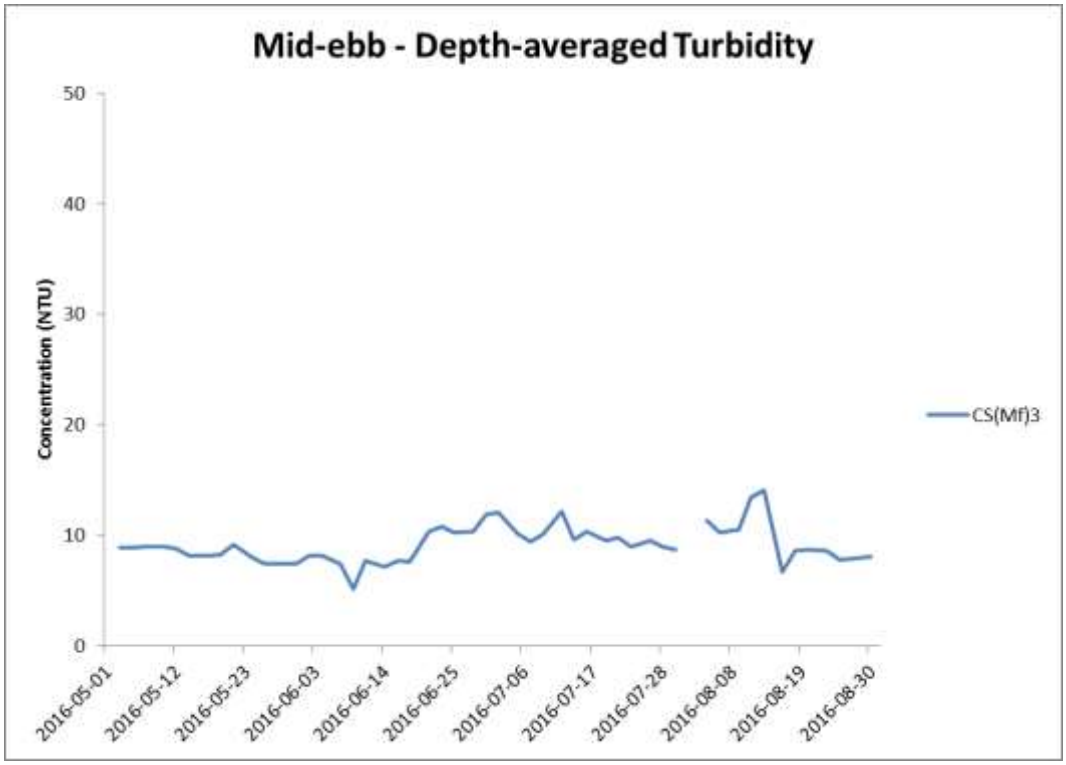

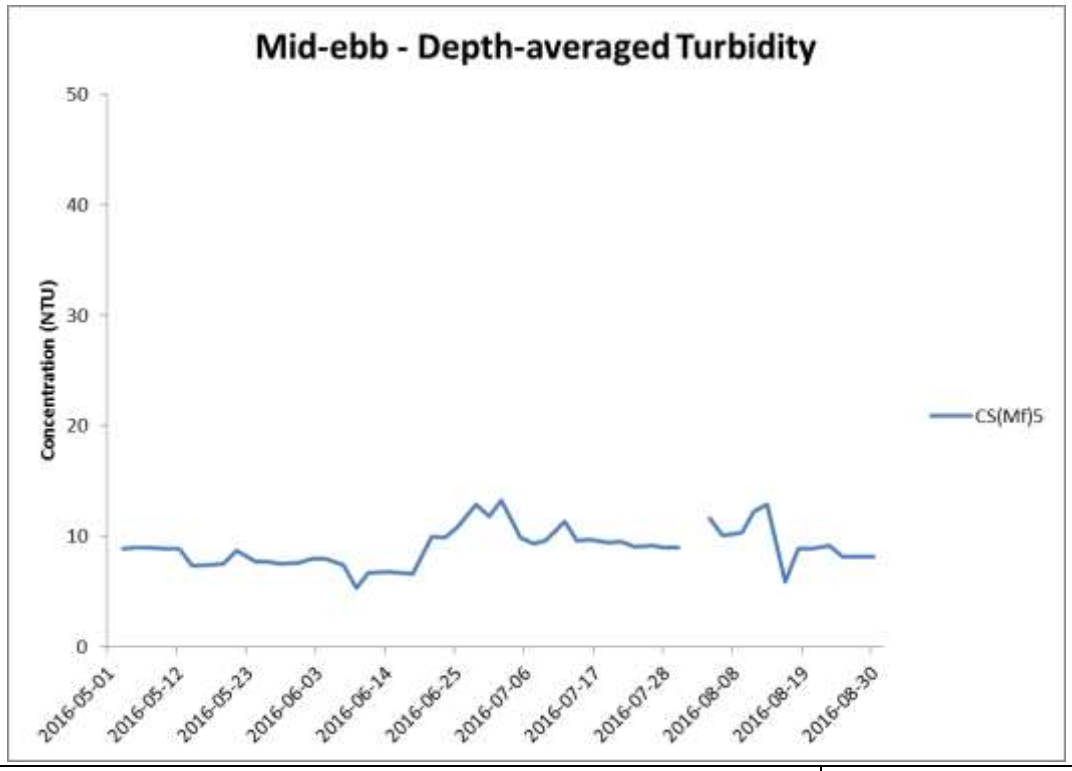

Figure H21 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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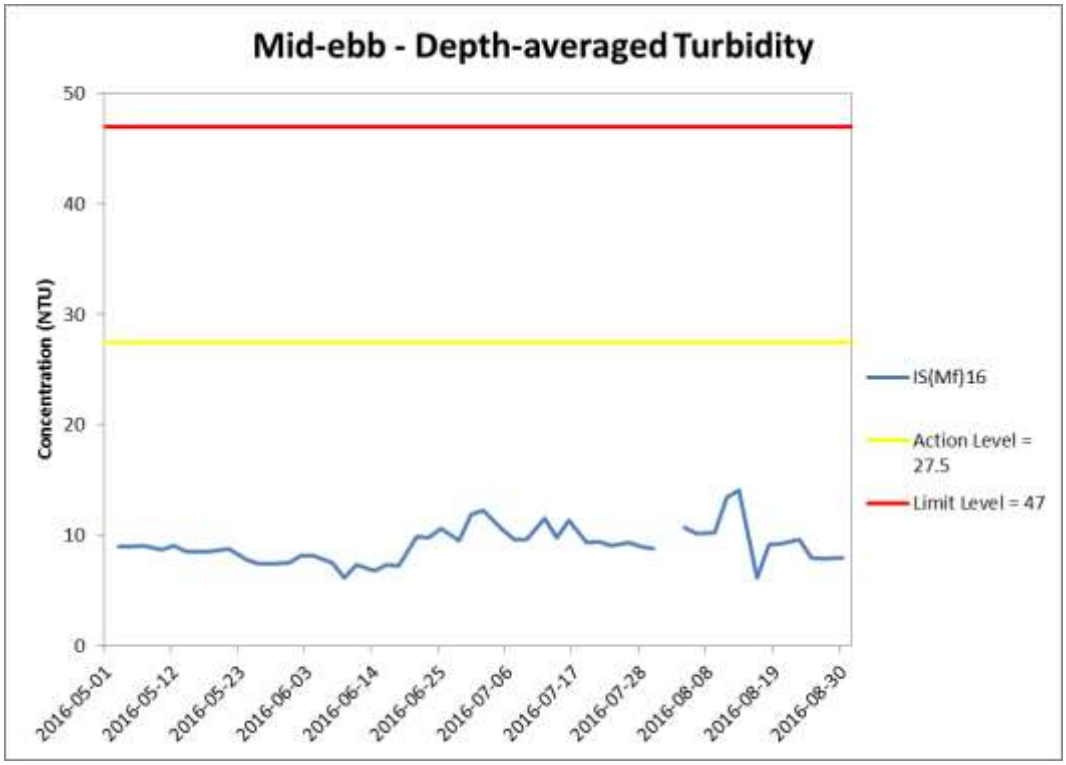


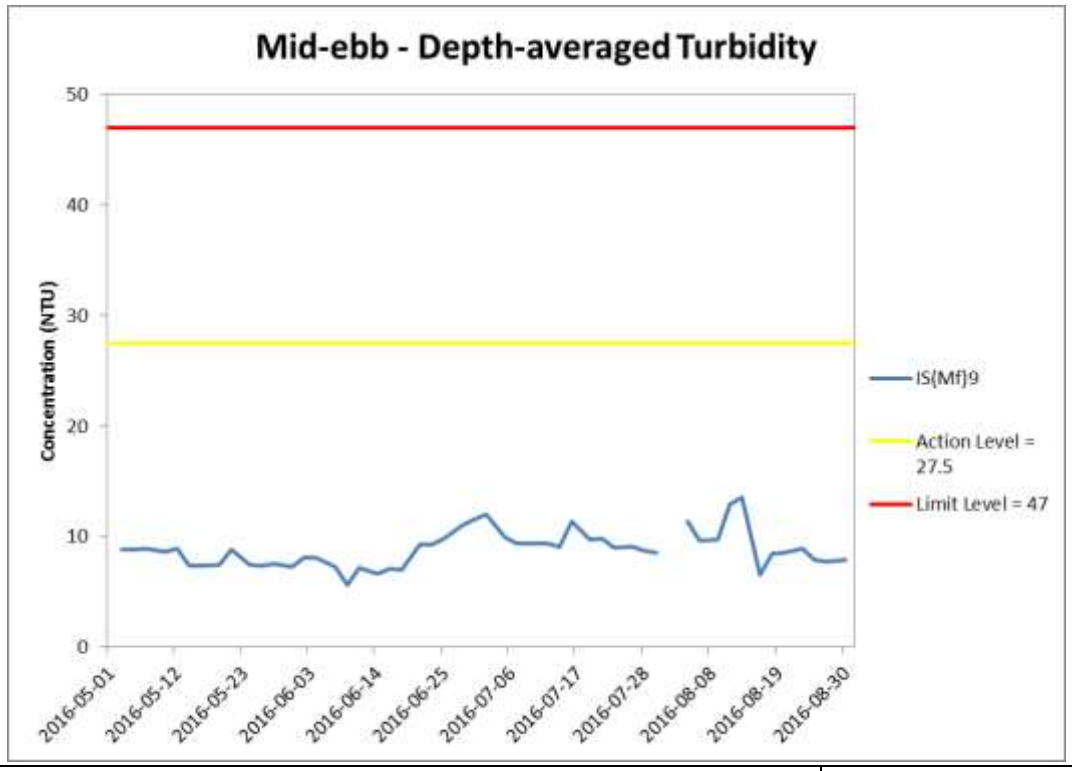
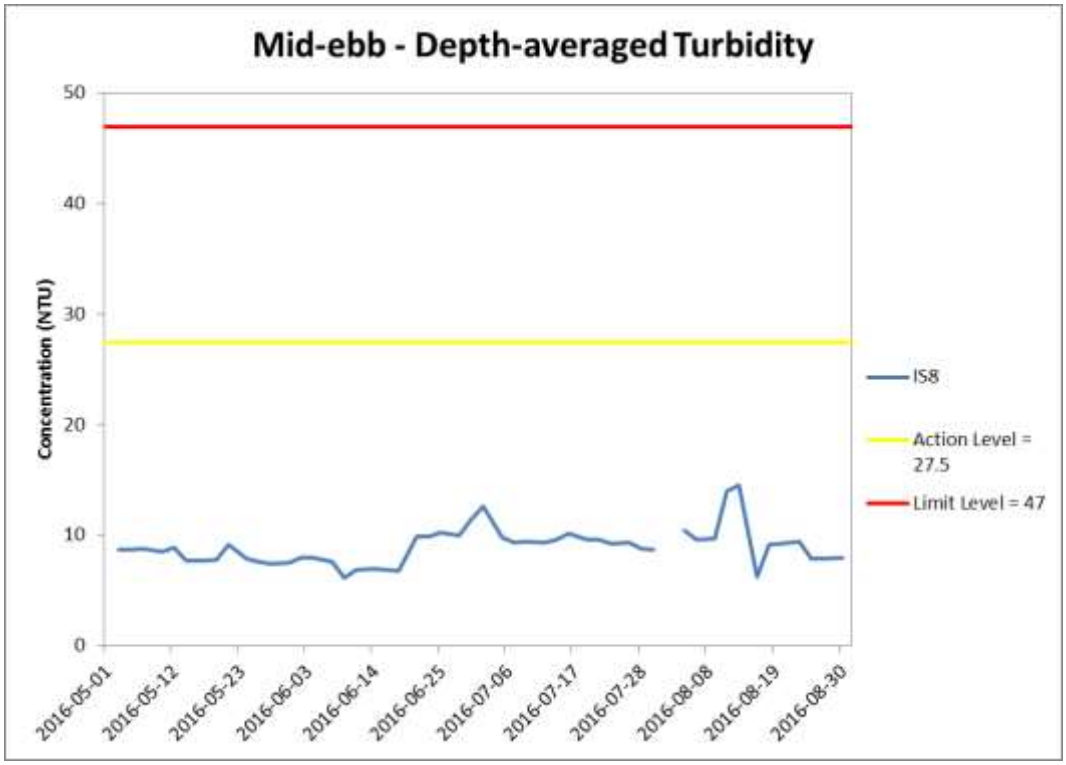


Figure H22 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



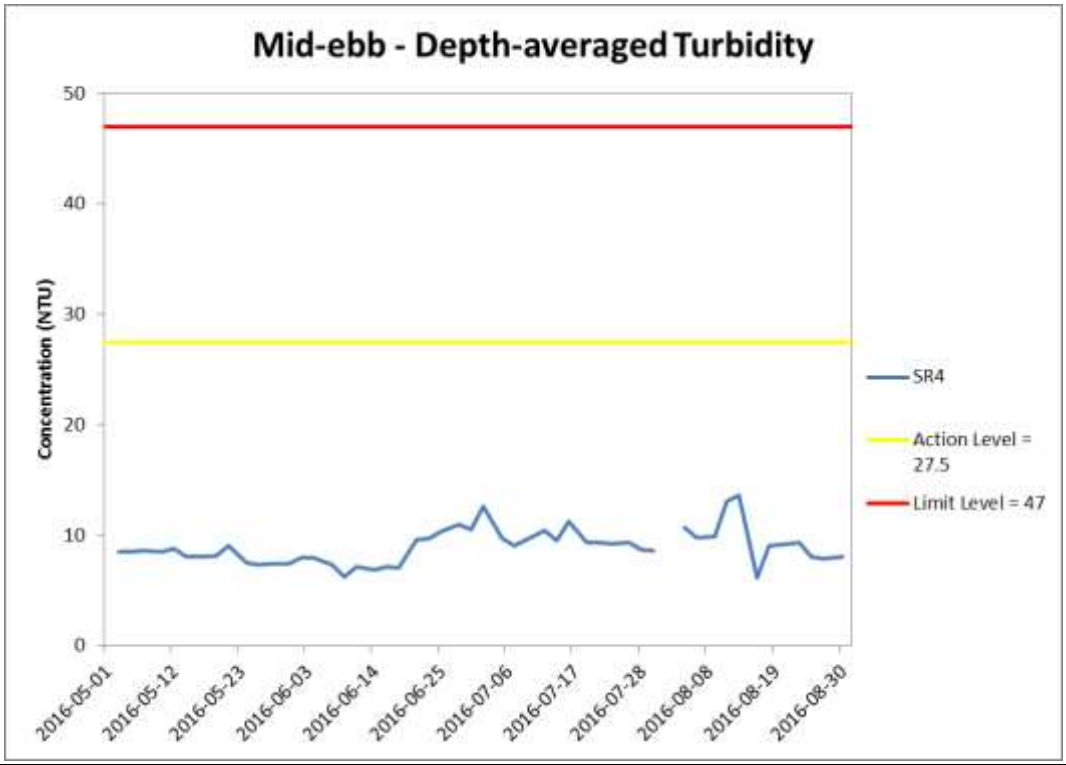


Figure H23 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

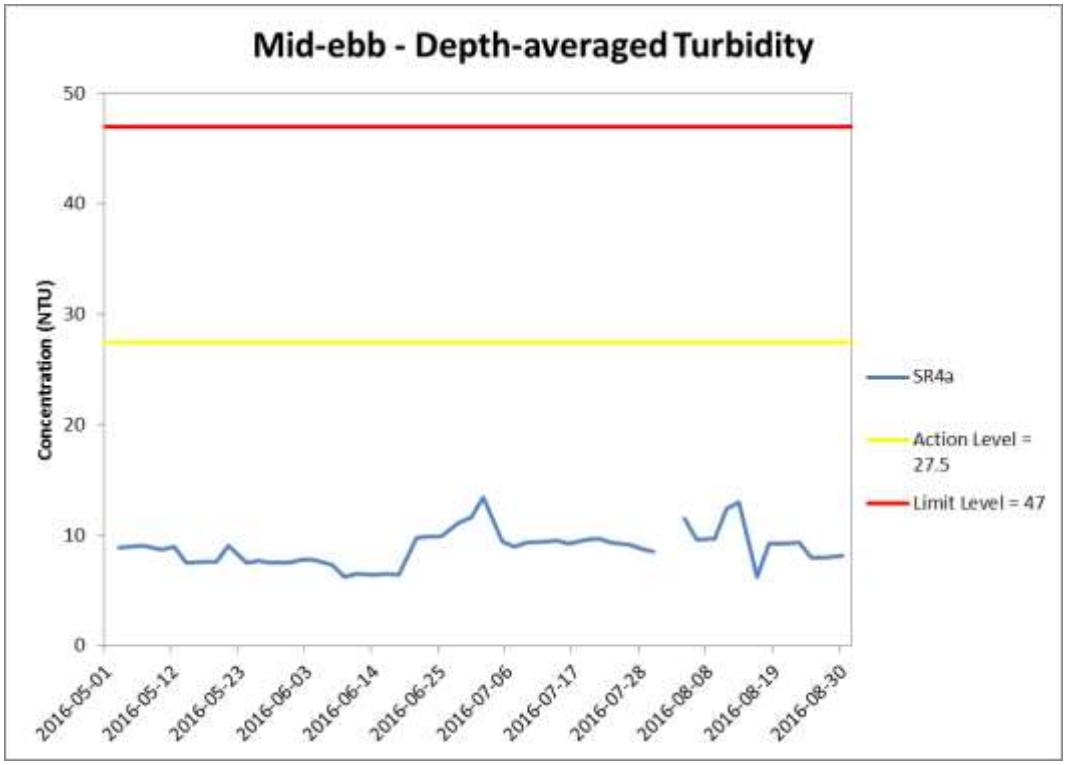


Figure H24 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

Environmental Resources Management

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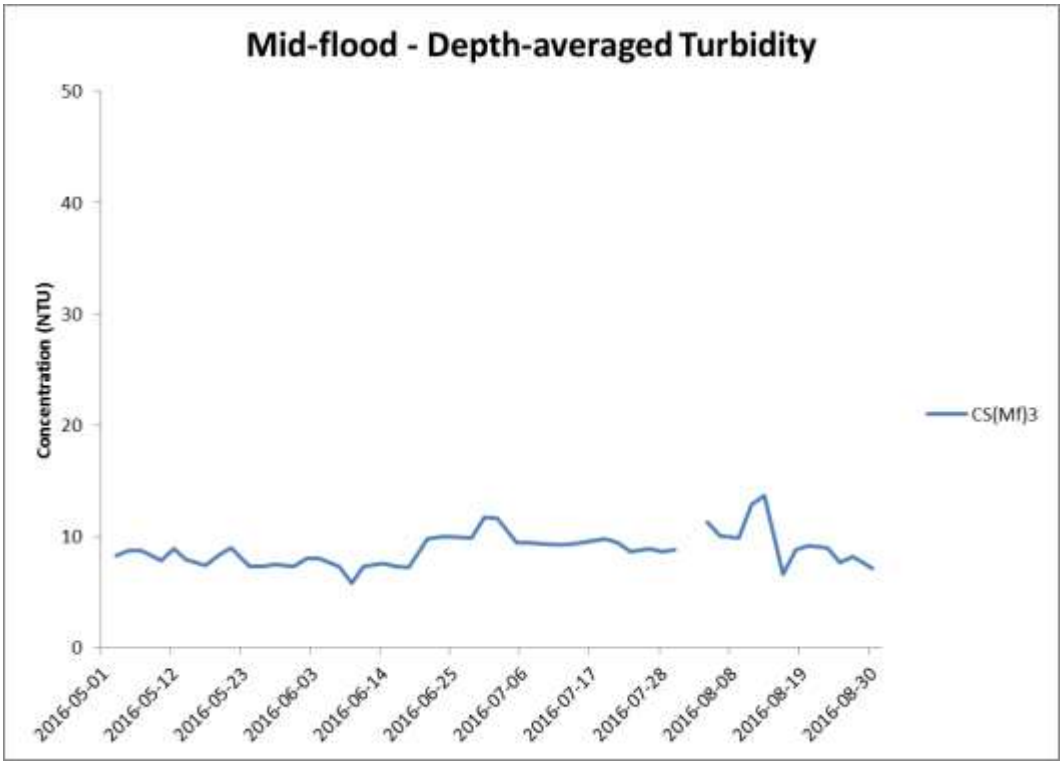


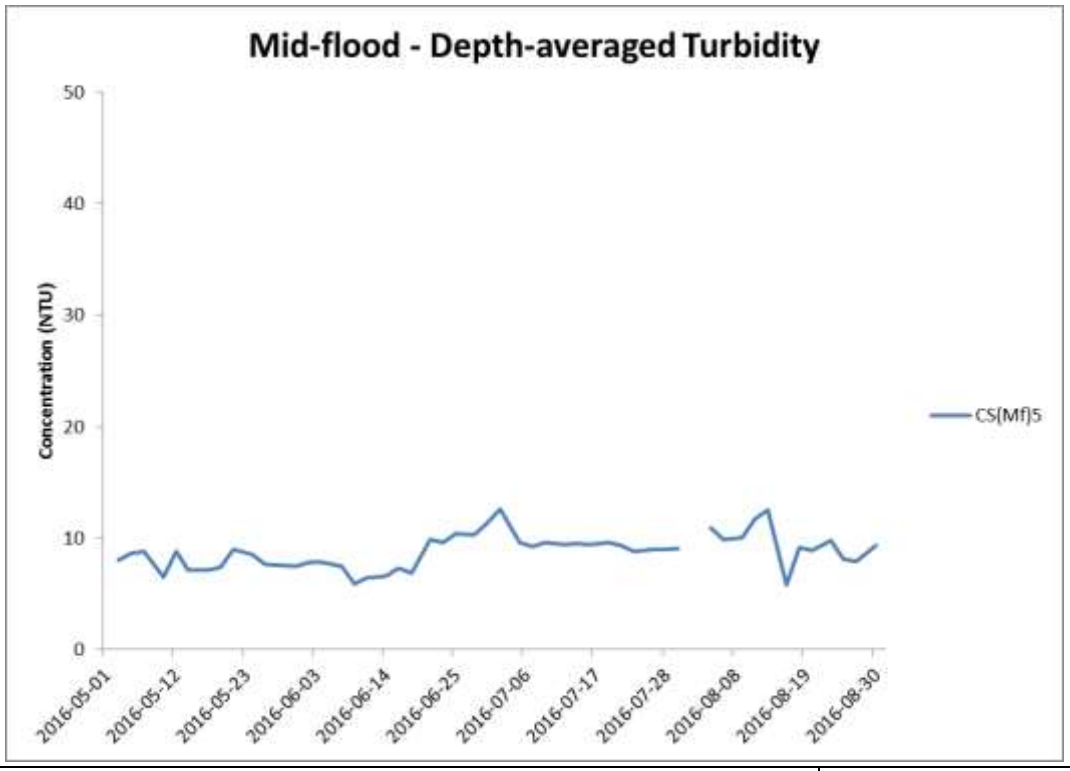
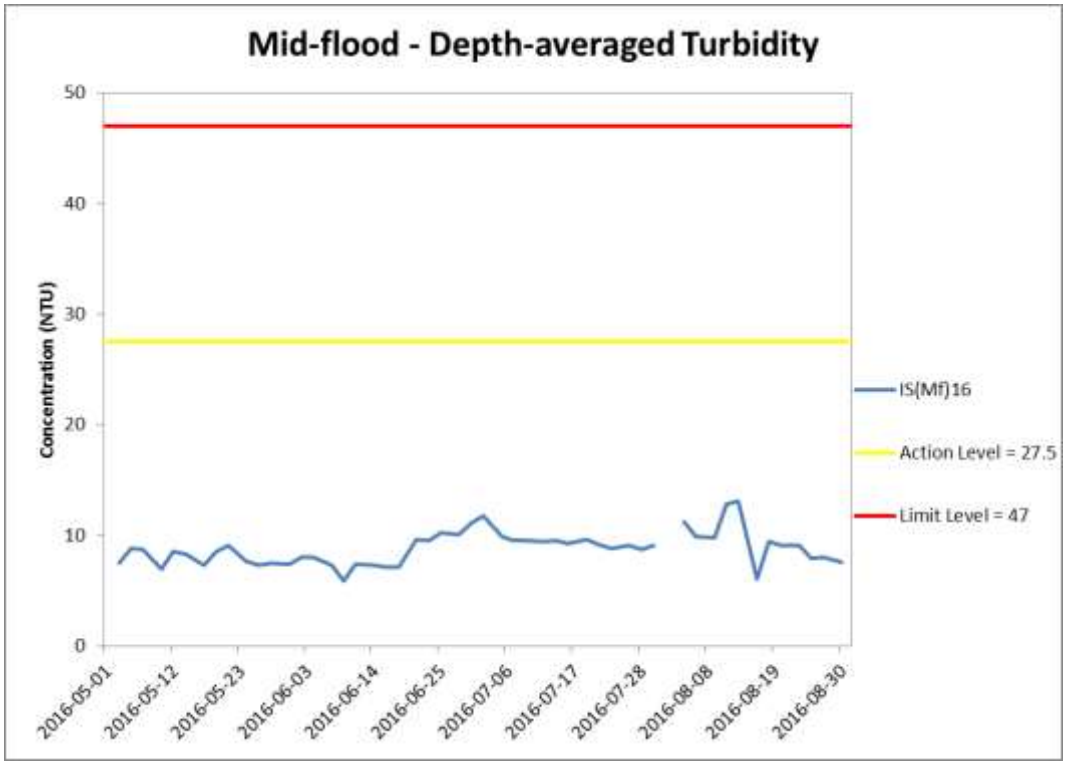


Figure H25 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(MF)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



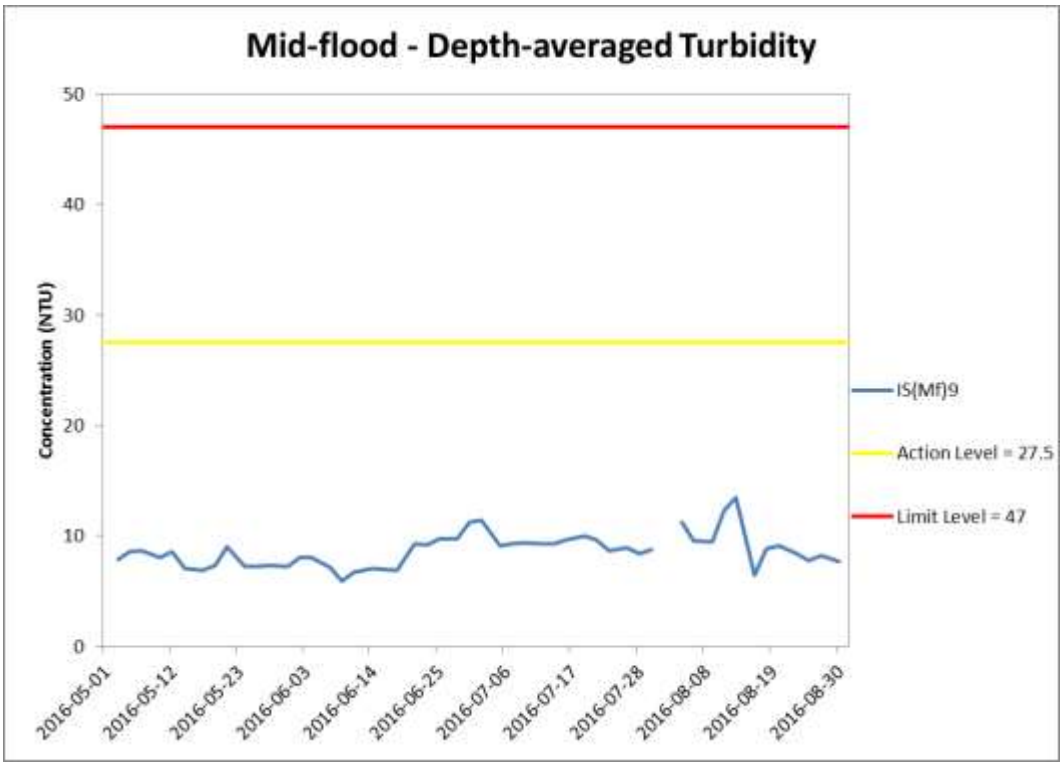
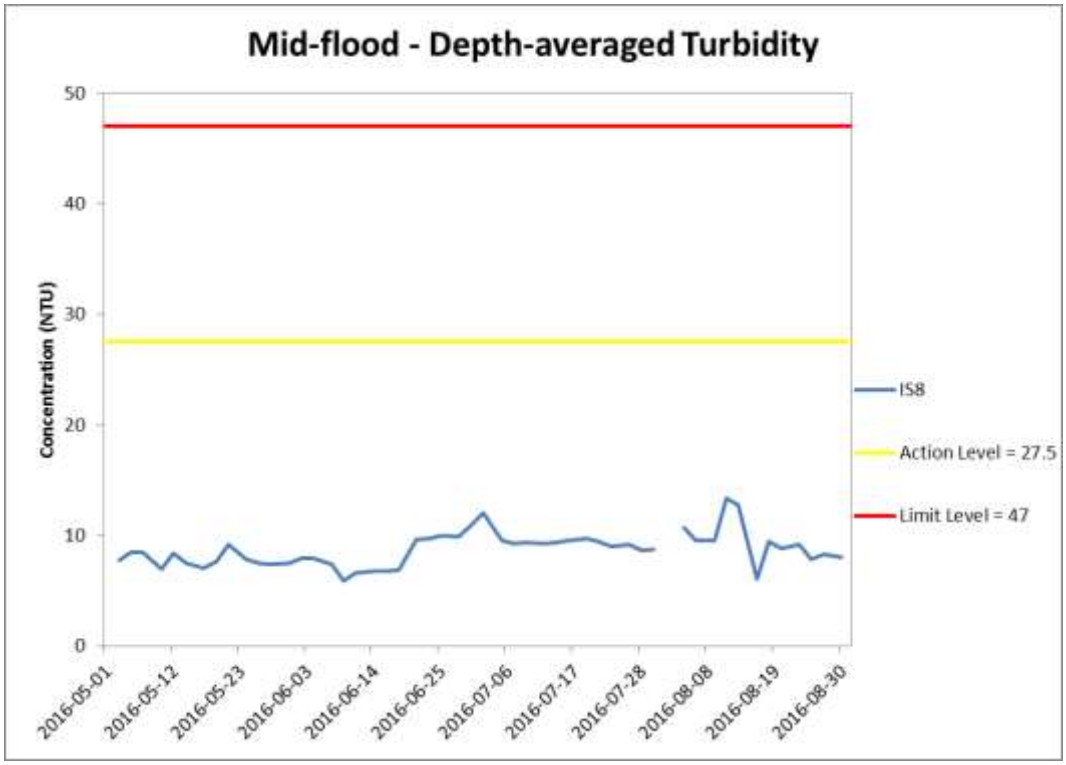
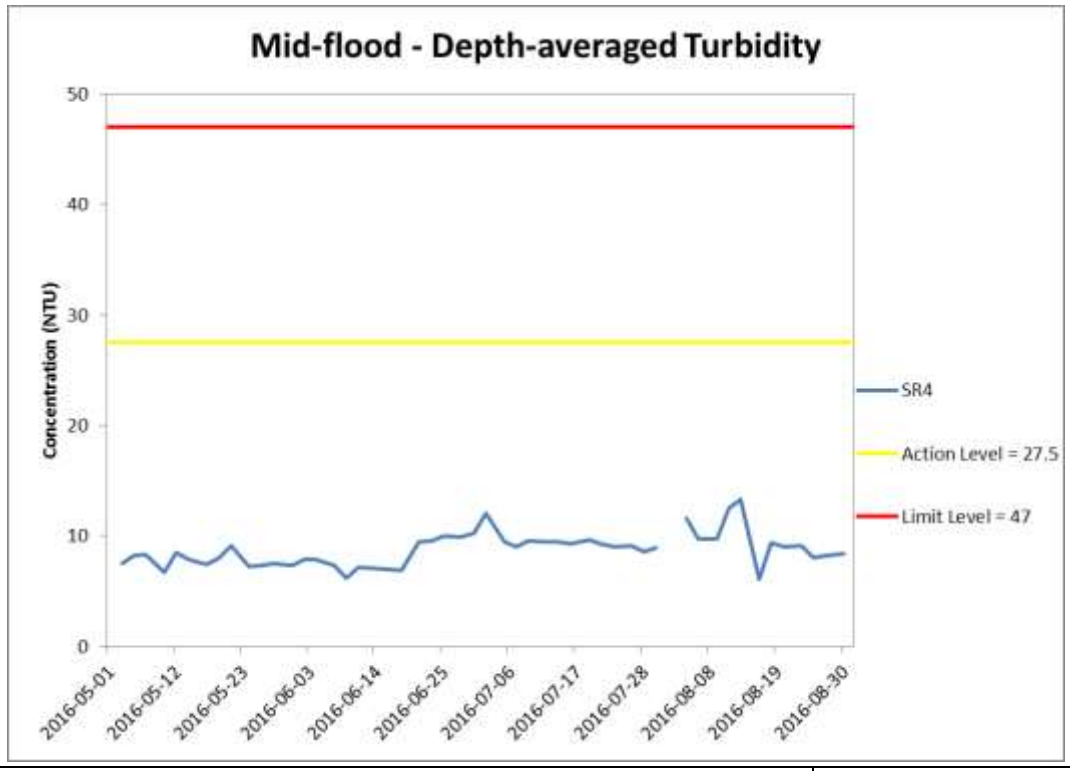


Figure H26 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.





`Figure H27 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

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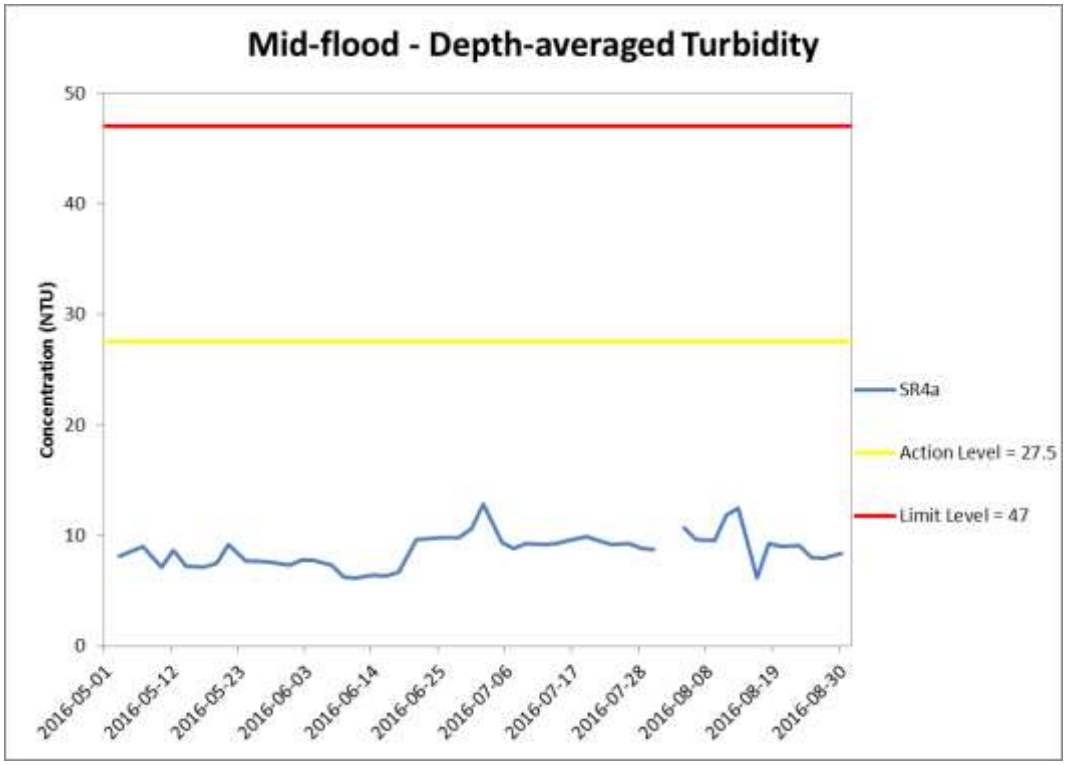

Figure H28 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

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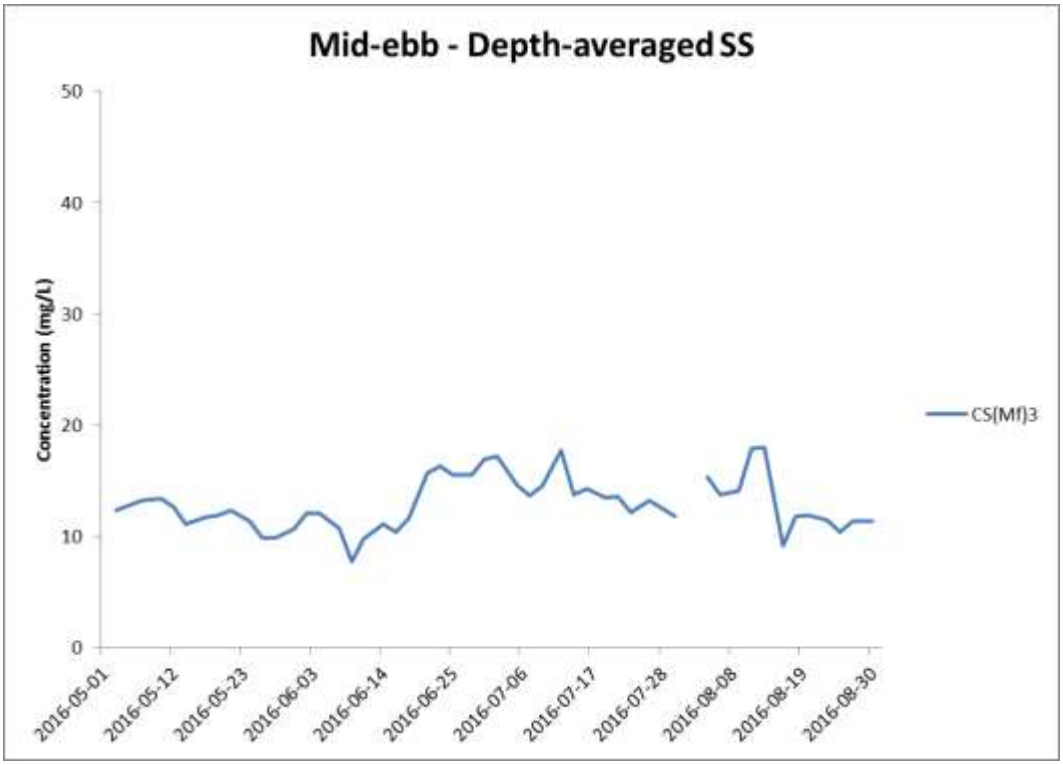


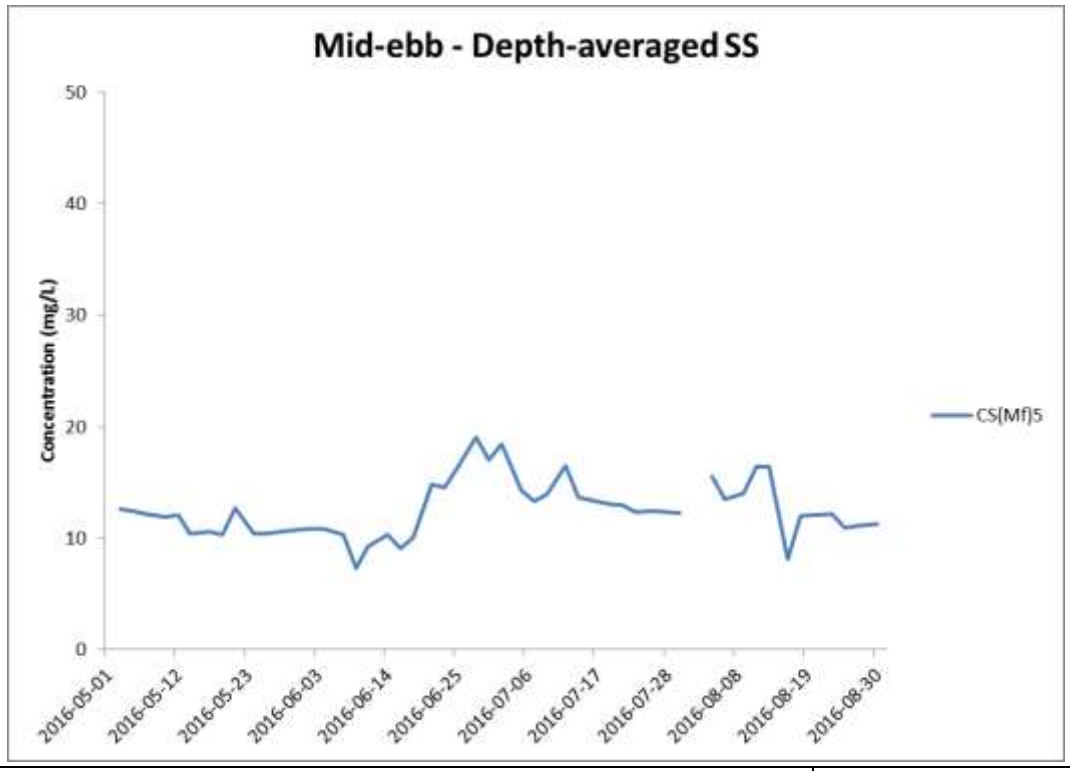
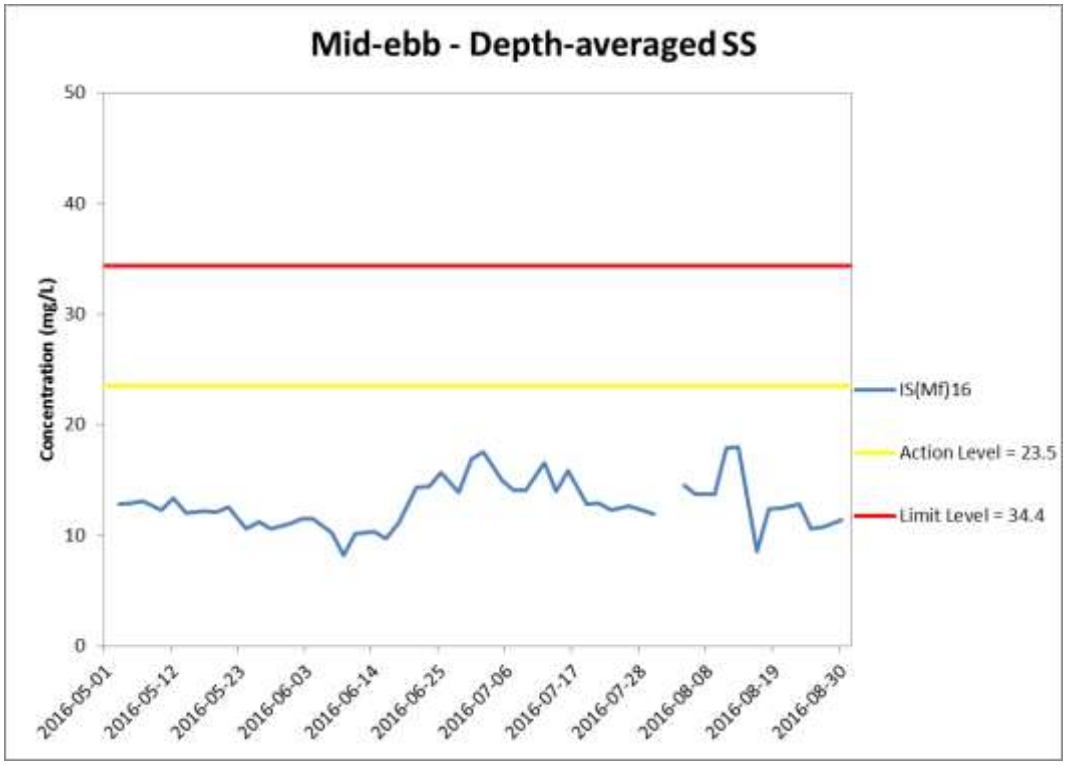


Figure H29 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



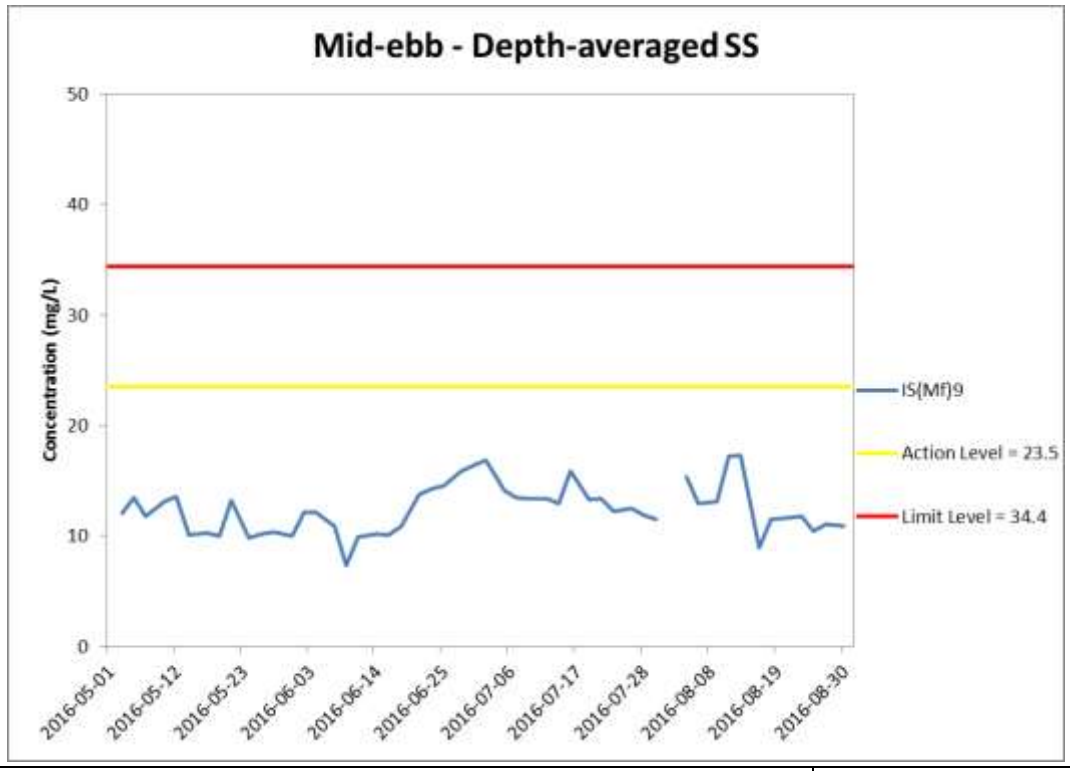
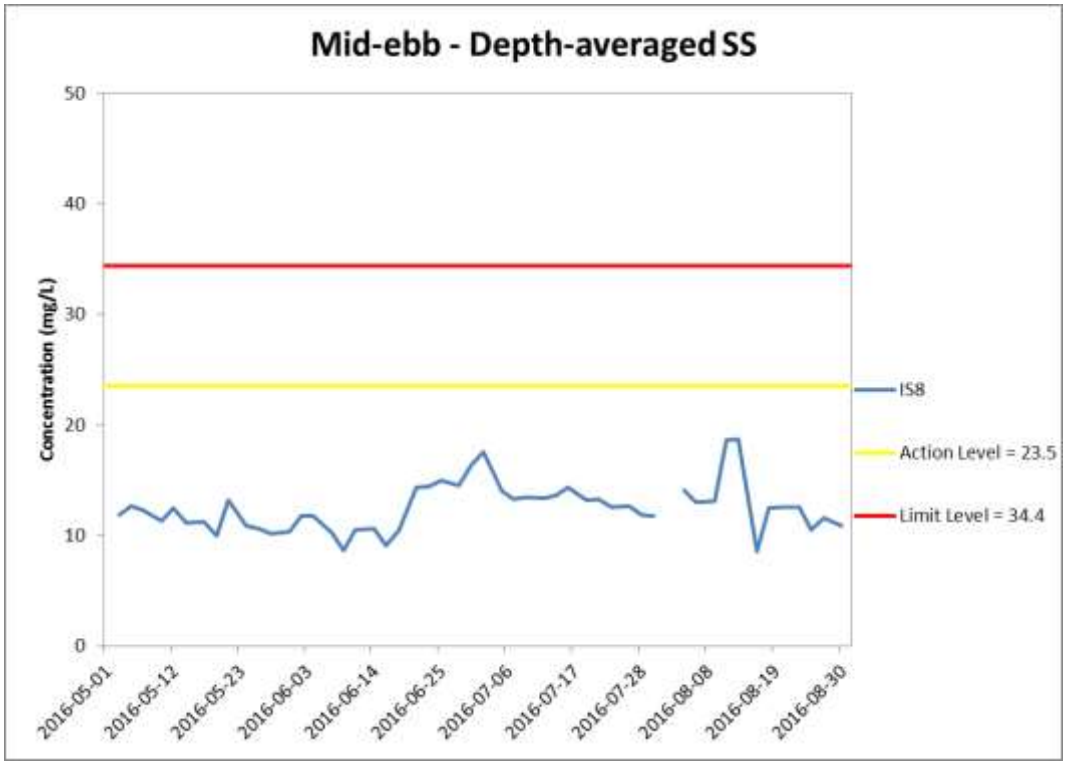


Figure H30 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



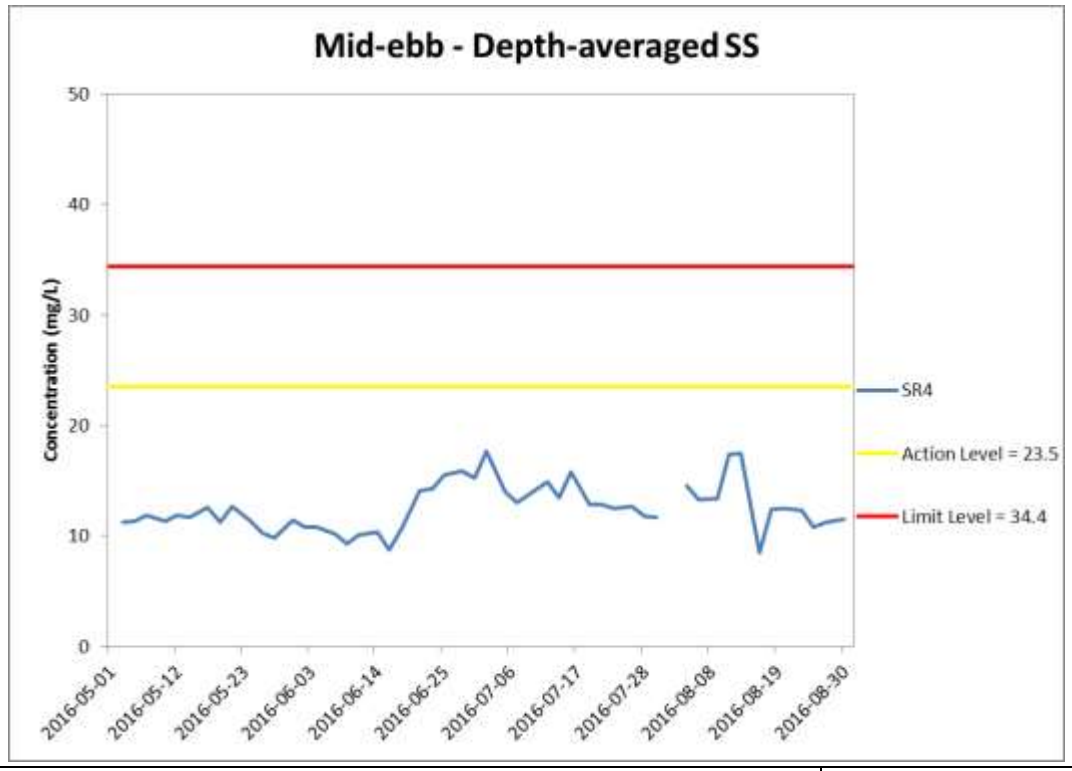


Figure H31 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

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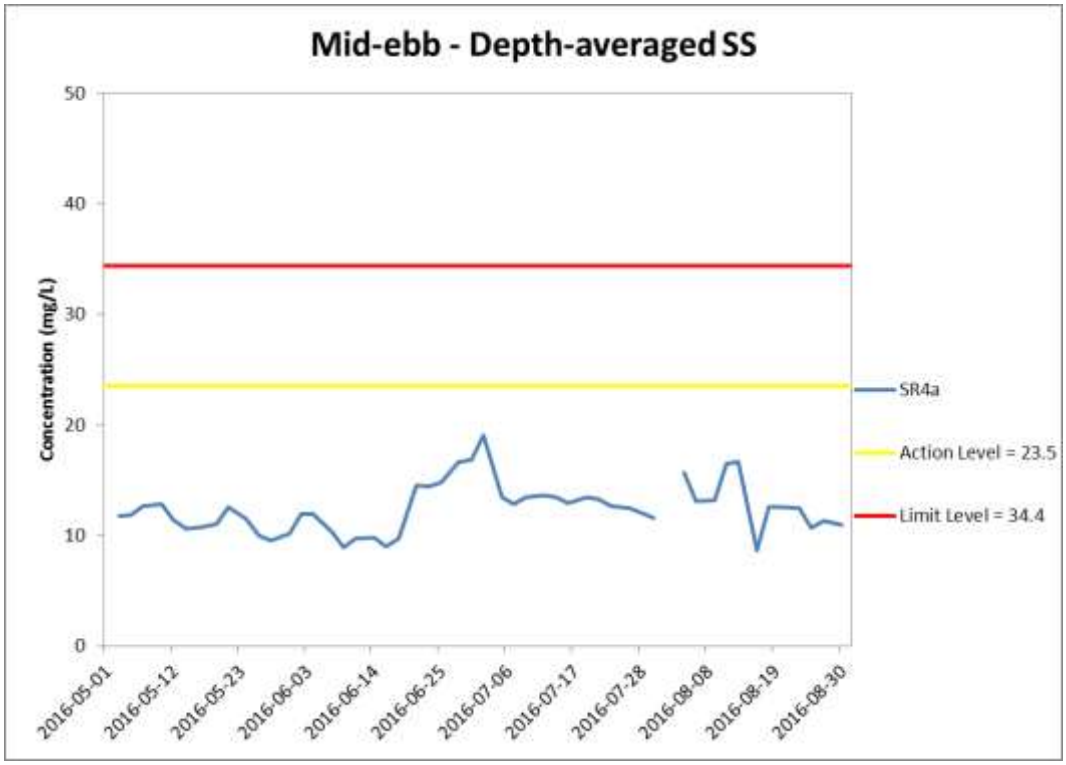

Figure H32 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

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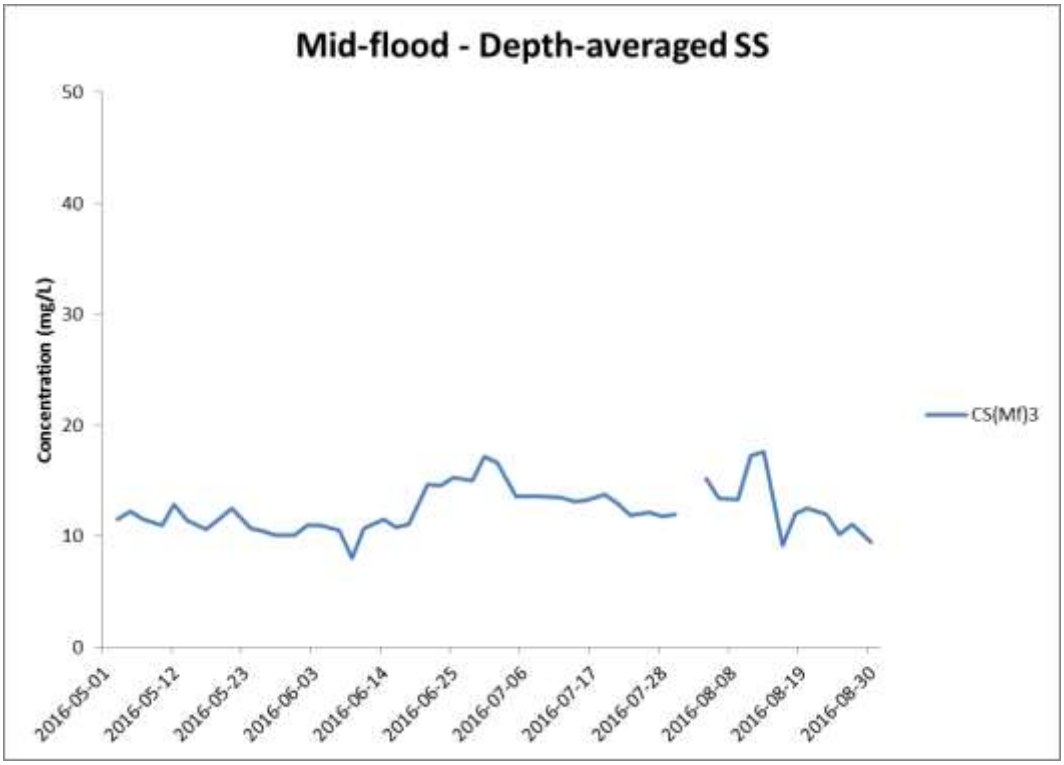


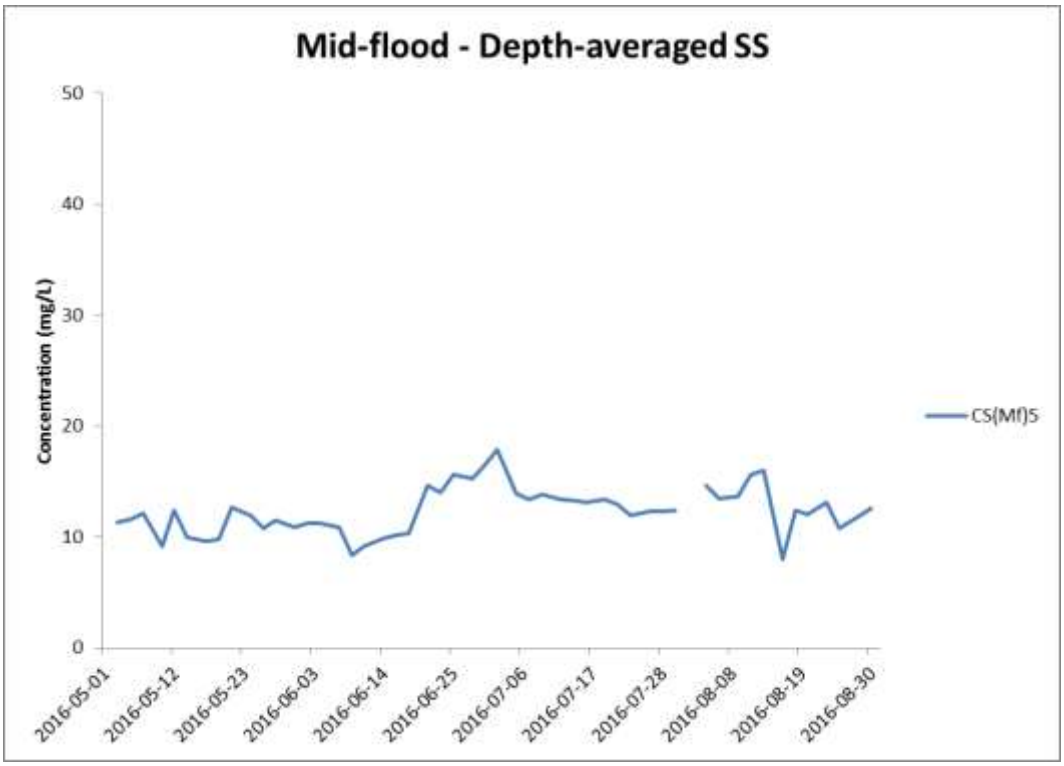
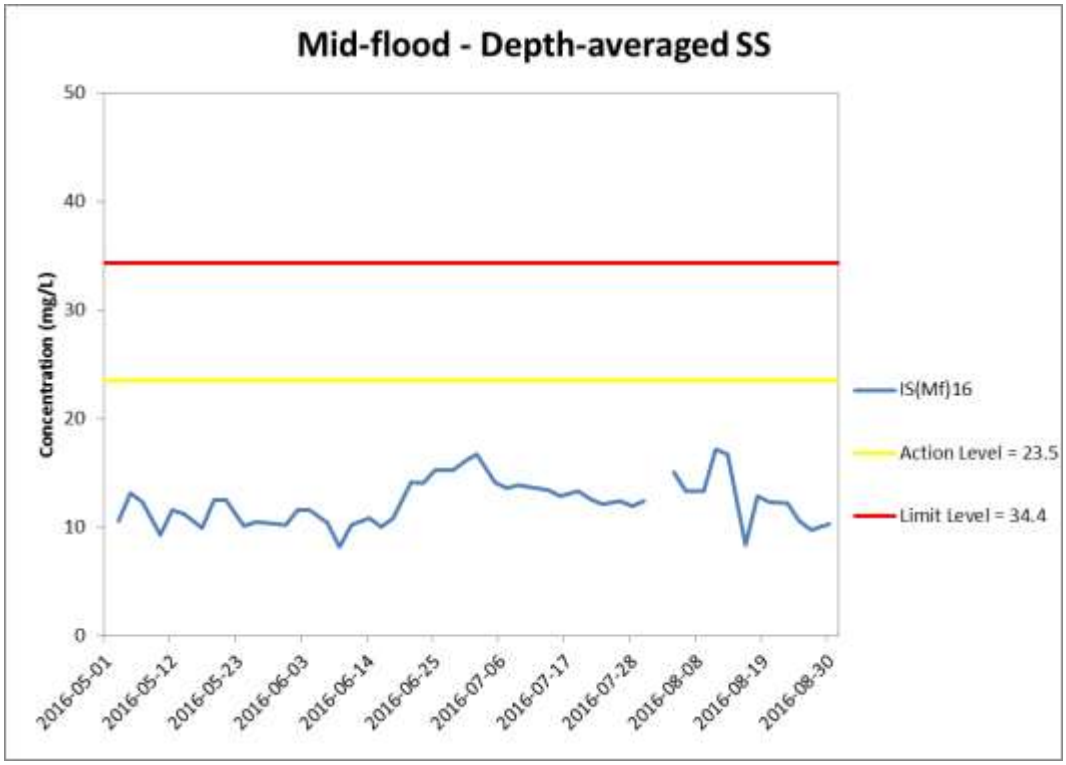


Figure H33 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2016 at CS(Mf)3 and CS(Mf)5.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



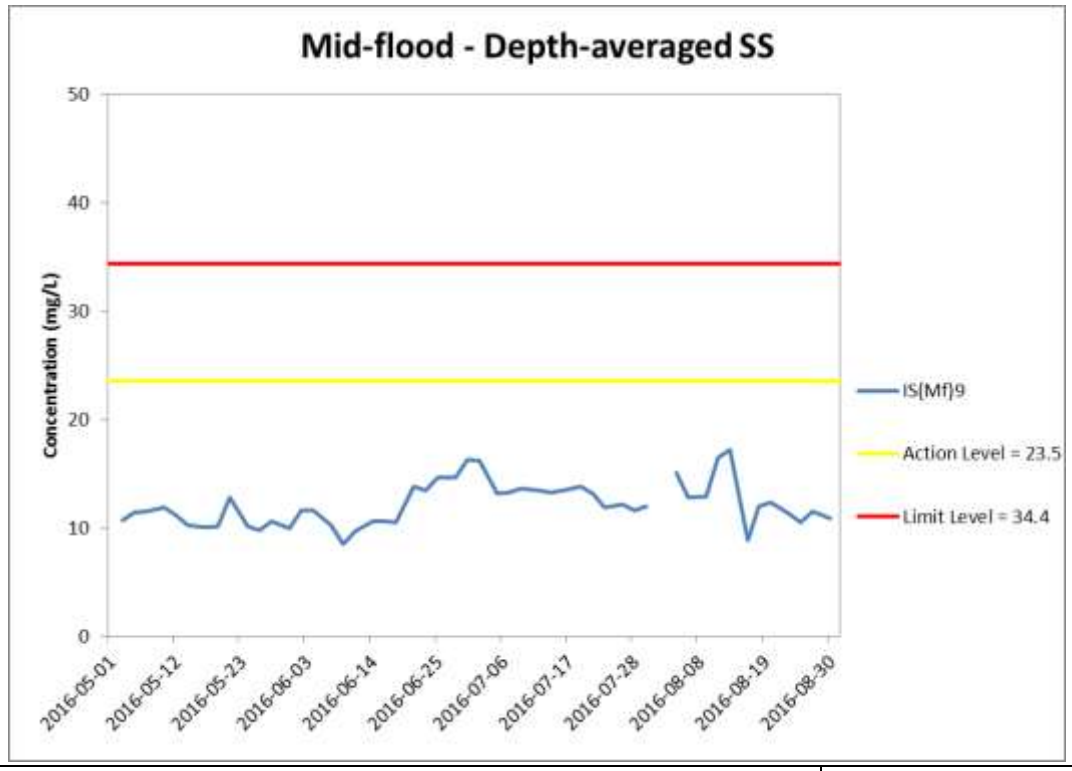
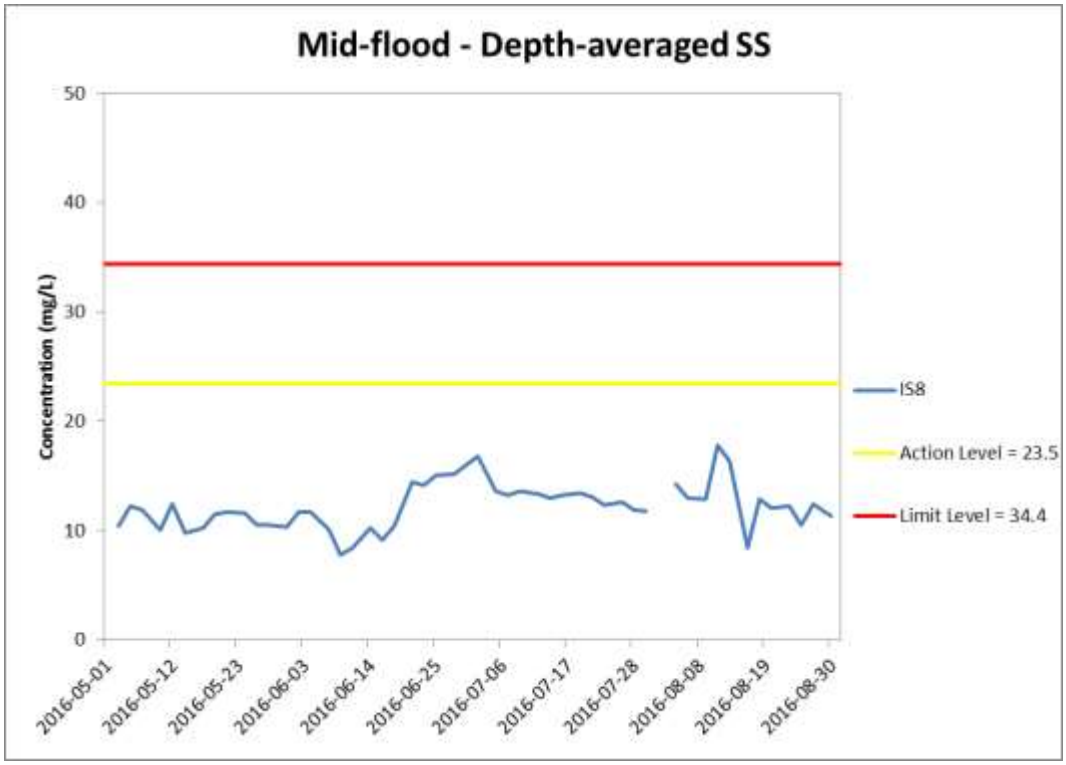


Figure H34 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2016 at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.



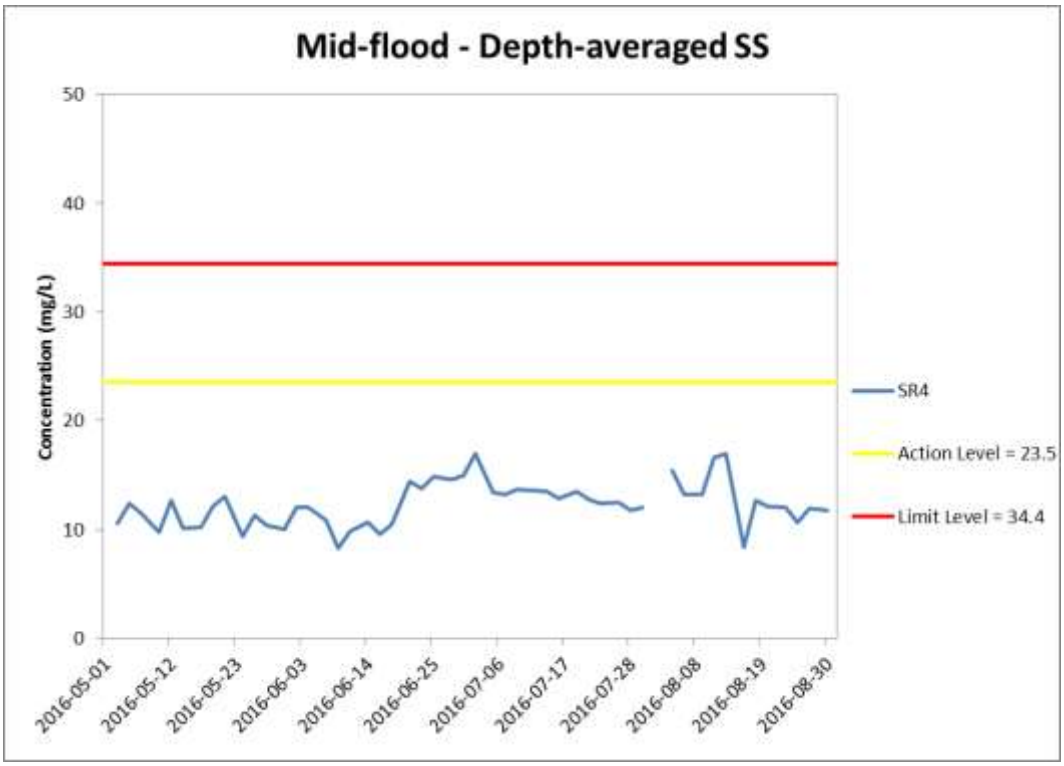


Figure H35 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2016 at IS8 and SR4.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

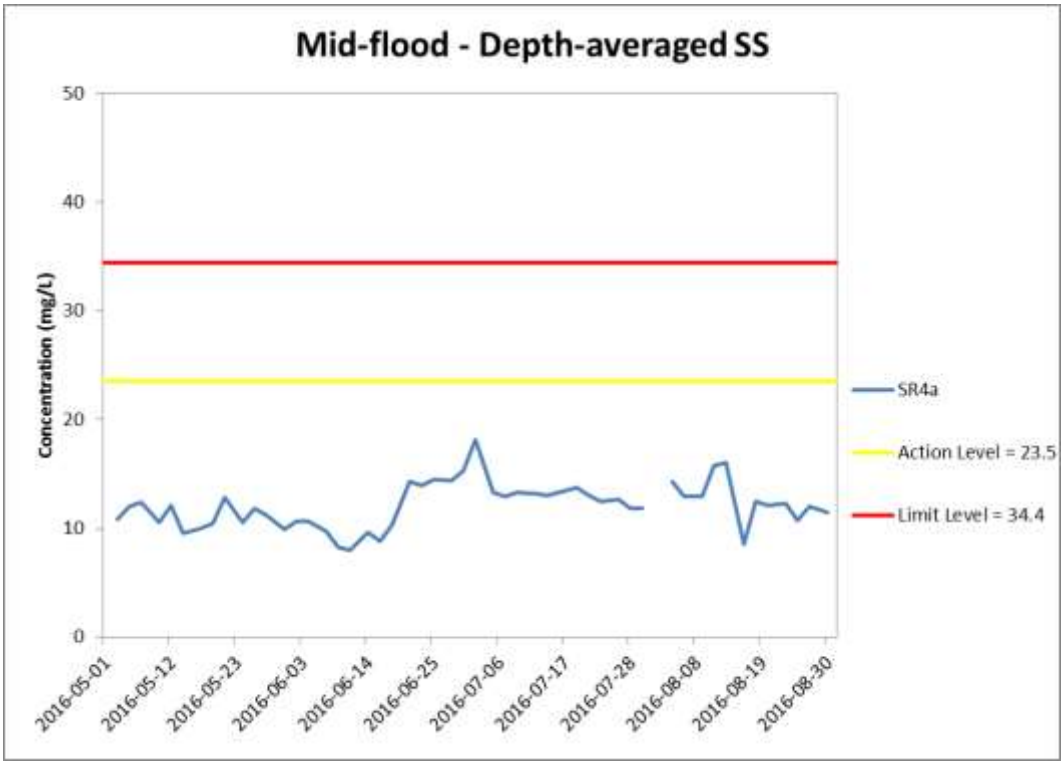


Figure H36 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 May and 31 August 2016 at SR4a.

(Weather condition varied between sunny to rainy within the reporting period.) WQM on 2 Aug was cancelled due to adverse weather. Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Launching gantry operation; and Installation of deck segment and pier head segment.

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Appendix I

Impact Dolphin Monitoring Survey Results

CONTRACT NO. HY/2012/08
Hong Kong-Zhuhai-Macao Bridge Tuen Mun – Chek Lap Kok Link (Northern Connection Sub-sea Tunnel Section)
Dolphin Quarterly Monitoring

11th Quarterly Progress Report (June-August 2016)
submitted to Dragages – Bouygues Joint Venture & ERM Hong Kong Ltd.

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

25 November 2016

1. Introduction

1.1. As part of the Hong Kong-Zhuhai-Macao Bridge, the Tuen Mun-Chek Lap Kok Link (TM-CLKL) Northern Connection Sub-sea Tunnel Section (Contract no. HY/2012/08) comprises the sub-sea TBM tunnels (two tubes with cross passages) across the Urmston Road to connect Tuen Area 40 and Hong Kong Boundary Crossing Facilities (HKBCF) of approximately 4 km in length with dual 2-lane carriageway, the tunnels at both the southern landfall and the northern landfall for construction of approach roads to the sub-sea TBM tunnels of approximately 1.5 km in length, as well as the northern landfall reclamation of approximately 16.5 hectares and about 20.km long seawalls. Dragages – Bouygues Joint Venture (hereinafter called the "Contractor") was awarded as the main contractor for the Northern Connection Sub-sea Tunnel Section, and ERM Hong Kong Limited would serve as the Environmental Team to implement the Environmental Monitoring and Audit (EM&A) programme.

1.2. According to the updated 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.

1.3. In November 2013, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by ERM Hong Kong Limited as the dolphin specialist for the TM-CLKL Northern Connection Sub-sea Tunnel 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 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 11th quarterly progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Contractor, summarizing the results of the surveys findings during the period of June to August 2016, 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. The coordinates of several starting points have been revised due to the obstruction of the permanent structures in association to the construction works of HKLR and the southern viaduct of TM-CLKL, as well as provision of adequate buffer distance from the Airport Restricted Areas. The EPD issued a memo and confirmed that they had no objection on the revised transect lines on 19 August 2015, and the revised coordinates are in red and marked with an asterisk 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	805475	815913*		14	Start Point	817537	820220
2	End Point	805477	826654		14	End Point	817537	824613
3	Start Point	806464	819435		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	819771		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209
5	Start Point	808504	820220		17	Start Point	820451	822125
5	End Point	808504	828602		17	End Point	820451	823671

6	Start Point	809490	820466		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	820880*		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	820872		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					
12	End Point	815542	824882					

Note: Co-ordinates in red and marked with asterisk are revised co-ordinates of transect line.

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 16 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013, 2014). 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° and 90° (in relation to the bow, which is defined as 0°). 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 or 60D 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

survey **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 June to August 2016, 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 897.06 km of survey effort was collected, with 92.5% 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, 341.80 km and 555.26 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 648.70 km, while the effort on

secondary lines was 248.36 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 June to August 2016, a total of ten groups of 34 Chinese White Dolphins were sighted. Seven of the ten dolphin sightings were made during on-effort search, while all seven on-effort dolphin sightings were made on primary lines. A summary table of dolphin sightings is shown in Appendix II. In this quarterly period, all except one group (a lone dolphin) were sighted in NWL, while an off-effort sighting of a lone dolphin was made on June 6th 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 June to August 2016 is shown in Figure 1. Dolphin sightings made in the present quarter were mainly located to the east of Lung Kwu Chau and to the west of Sha Chau near western territorial boundary (Figure 1). Two sightings were made to the west of Shum Wat very close to the Hong Kong Link Road alignment at the southwestern corner of NWL survey area (Figure 1). The lone dolphin sighted in NEL was located between Shum Shui Kok and Yam O (Figure 1).

3.2.2. Notably, all dolphin sightings were located far away from the alignment of TM-CLKL as well as the HKBCF and HKLR03 reclamation sites (Figure 1). On the other hand, two dolphin groups were sighted near the HKLR09 alignment (Figure 1).

3.2.3. Sighting distribution of dolphins during the present impact phase monitoring period (June to August 2016) was drastically different from the one during the baseline monitoring period (September to November 2011). In the present quarter, dolphins have almost disappeared from the NEL region with the exception of a lone dolphin occurred near Shum Shui Kok (Figure 1). This 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 14 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 very different between the baseline and impact phase periods. During the present impact monitoring period, much fewer dolphins occurred in this survey area (mostly to the east of Lung Kwu Chau and west of Sha Chau) than during the baseline period, when many dolphin groups were frequently sighted between Lung Kwu Chau and Black Point, around Sha Chau, near Pillar Point and to the west of the Chek Lap Kok Airport (Figure 1).

3.2.5. Another comparison in dolphin distribution was made between the four quarterly periods of summer months in 2013-16 (Figure 2). Among the four summer periods, dolphins were regularly sighted throughout the North Lantau region in 2013, but their usage there

has gradually diminished in 2014 and subsequently to a very low level in 2015 and 2016 (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 June to August 2016

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 (1 & 6 Jun 2016)	0.00	0.00
	Set 2 (13 & 17 Jun 2016)	0.00	0.00
	Set 3 (5 & 12 Jul 2016)	0.00	0.00
	Set 4 (18 & 27 Jul 2016)	0.00	0.00
	Set 5 (5 & 9 Aug 2016)	0.00	0.00
	Set 6 (17 & 23 Aug 2016)	0.00	0.00
Northwest Lantau	Set 1 (1 & 6 Jun 2016)	0.00	0.00
	Set 2 (13 & 17 Jun 2016)	0.00	0.00
	Set 3 (5 & 12 Jul 2016)	4.60	9.20
	Set 4 (18 & 27 Jul 2016)	0.00	0.00
	Set 5 (5 & 9 Aug 2016)	4.24	28.28
	Set 6 (17 & 23 Aug 2016)	1.48	7.40

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (June – August 2016) 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)	
	June – August 2016	September - November 2011	June – August 2016	September - November 2011
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	1.72 ± 2.17	9.85 ± 5.85	7.48 ± 10.98	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 1.43 sightings and 6.34 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 (both STG and ANI) 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 fourteen quarters of HKLR03 monitoring (Table 4). This is a serious concern as the dolphin occurrence in NEL in the past few years (0.0-1.0 for ER(STG) and 0.0-3.9 for ER(ANI)) 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 on-effort sighting data made along the primary transect lines under favourable conditions; the encounter rates in **summer** 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)	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

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 82.5% and 83.3% respectively) were only small 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).

Table 5. Comparison of average dolphin encounter rates in Northwest Lantau survey area from all quarters of 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; encounter rates in **summer** 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

3.3.5. During the same summer quarters, dolphin encounter rates in NWL during 2016 reached to the lowest point among the four summer periods, and were much lower than the ones recorded in 2013 and 2014 (Table 5). Such temporal trend should be closely monitored in the upcoming monitoring quarters.

3.3.6. As discussed recently in Hung (2016), the dramatic decline in dolphin usage of NEL waters in the past few years (including the declines in abundance, encounter rate and habitat use in NEL, as well as shifts of individual core areas and ranges away from NEL

waters) was possibly related to the HZMB construction works that were commenced since 2012. It appeared that such noticeable decline has already extended to NWL waters progressively in the past few years.

3.3.7. 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).

3.3.8. For the comparison between the baseline period and the present quarter (fifteenth quarter of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0031 and 0.0227 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.

3.3.9. For the comparison between the baseline period and the cumulative quarters in impact phase (i.e. first fifteen quarters of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.000009 and 0.000001 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).

3.3.10. 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. This 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 2016).

3.3.11. To ensure the continuous usage of North Lantau waters by the dolphins, every possible measure should be implemented by the contractors and relevant authorities of HZMB-related works to minimize all disturbances to the dolphins.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from one to eleven individuals per group in North Lantau region during June to August 2016. 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.

3.4.2. The average dolphin group size in NWL waters during June to August 2016 was slightly lower than the one recorded during the three-month baseline period (Table 6). Most of these dolphin groups were composed of 1-3 individuals only, while there were two medium-sized groups of five and seven individuals respectively, and one large group of eleven individuals.

Table 6. Comparison of average dolphin group sizes from impact monitoring period (June – August 2016) and baseline monitoring period (September – November 2011) (Note: ± denotes the standard deviation of the average group size)

	Average Dolphin Group Size	
	June – August 2016	**September – November 2011**
Overall	3.40 ± 3.34 (n = 10)	3.72 ± 3.13 (n = 66)
Northeast Lantau	1.00 (n = 1)	3.18 ± 2.16 (n = 17)
Northwest Lantau	3.67 ± 3.43 (n = 9)	3.92 ± 3.40 (n = 49)

3.4.3. As there was only one single dolphin sighted in NEL waters during this quarter, the average group size was much lower than the one recorded during the baseline period (Table 6).

3.4.4. Distribution of the larger dolphin groups (i.e. five individuals or more per group) during the present quarter is shown in Figure 3, with comparison to the one in baseline period. During the summer months of 2016, the two medium-sized groups were sighted near Pak Chau and to the east of Lung Kwu Chau respectively, while one large group of eleven individuals was sighted to the west of Sha Chau near the western territorial boundary (Figure 3). Such distribution pattern was very different from the baseline period, when the larger dolphin groups were more frequently sighted and more evenly distributed in NWL waters, with a few more sighted in NEL waters (Figure 3).

3.5. Habitat use

3.5.1. From June to August 2016, the more important habitats utilized by Chinese White Dolphins were located to the west of Sha Chau at the western territorial boundary, as well as to the northeast of Lung Kwu Chau (Figures 4a and 4b). One grid located to the west of Shum Wat overlapped with the HKLR09 alignment also recorded moderate density of dolphins. On the contrary, all grids near TM-CLKL alignment as well as the HKLR03/HKBCF reclamation sites did not record any presence of dolphins at all during on-effort search in the present quarterly period (Figure 4b).

3.5.2. It should be emphasized though 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 will be collected throughout the impact phase monitoring programme.

3.5.3. 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 5). 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 5).

3.5.4. The density patterns were also very different in NWL between the baseline and impact phase monitoring periods, with higher dolphin usage throughout the area, especially around Sha Chau, near Black Point, to the west of the airport, as well as between Pillar Point and airport platform during the baseline period. In contrast, the only areas with moderate to high dolphin densities were restricted to the waters near Sha Chau and Lung Kwu Chau during the present impact phase period (Figure 5).

3.6. Mother-calf pairs

3.6.1. During the present quarterly period, neither unspotted calf nor unspotted juvenile was sighted with any female in the North Lantau region.

3.6.2. The absence of young calves in the past three consecutive quarters was in stark contrast to their regular occurrence in North Lantau waters during the baseline period. This should be of a serious concern, and the occurrence of young calves in North Lantau waters should be closely monitored in the upcoming quarters.

3.7. Activities and associations with fishing boats

3.7.1. Only one of the ten dolphin groups were engaged in socializing activity, while none of them was engaged in feeding, traveling or milling/resting activity during the three-month study period.

3.7.2. The percentage of sightings associated with socializing activities (10.0%) was higher than the one recorded during the baseline period (5.4%). However, it should be noted the sample size on total numbers of dolphin sightings during the present quarter (ten dolphin groups) was much lower than the baseline period (66 dolphin groups).

3.7.3. Distribution of dolphins engaged in various activities during the present impact phase period and the baseline period is shown in Figure 6. The only dolphin group engaged in socializing activity was sighted to the west of Shum Wat near the HKLR09 alignment during the present quarterly period, which was very different from the baseline period when various dolphin activities occurred throughout the North Lantau region (Figure 6).

3.7.4. As consistently recorded in the past monitoring quarters, none of the ten dolphin groups was found to be associated with any operating fishing vessel in North Lantau waters during the present impact phase period.

3.8. Summary of photo-identification works

3.8.1. From June to August 2016, over 1,200 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 15 individuals sighted 15 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.

3.8.3. Notably, three of these 15 individuals (NL104, NL136 and NL302) were also sighted in West Lantau waters during the HKLR09 monitoring surveys from June to August 2016. Moreover, one individual (NL150) was sighted in both NWL and SWL survey areas

during the same quarter, showing extensive individual movement between different survey areas.

3.9. Individual range use

3.9.1. Ranging patterns of the 15 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, four individuals (NL104, NL136, NL150 and NL302) consistently utilized both North Lantau waters in the past have extended their range use to WL and SWL waters during the present quarter. 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, as such shift could possibly be related to the HZMB-related construction works (see Hung 2015, 2016).

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 northern connection sub-sea tunnel section 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.

5. References

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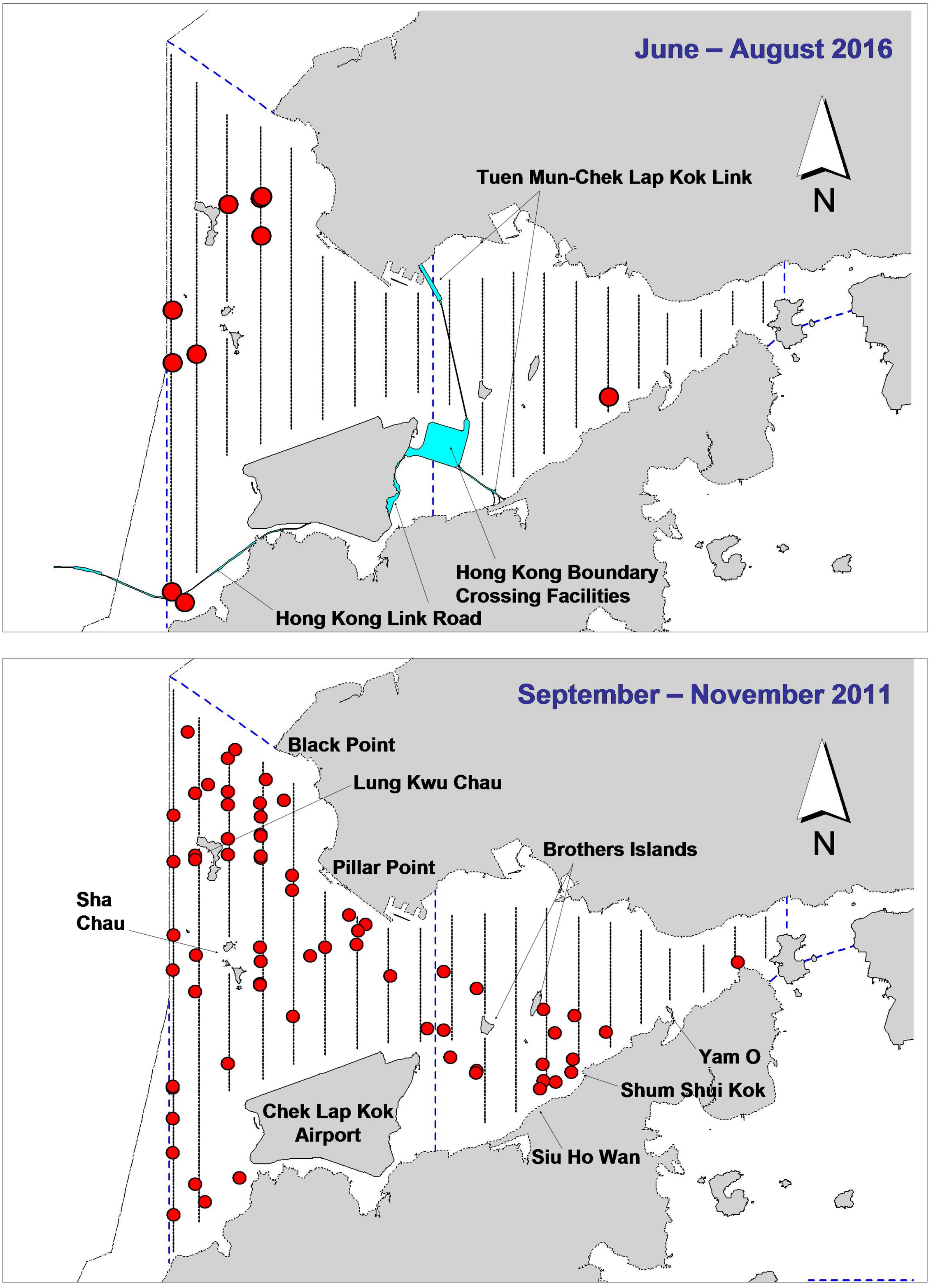


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

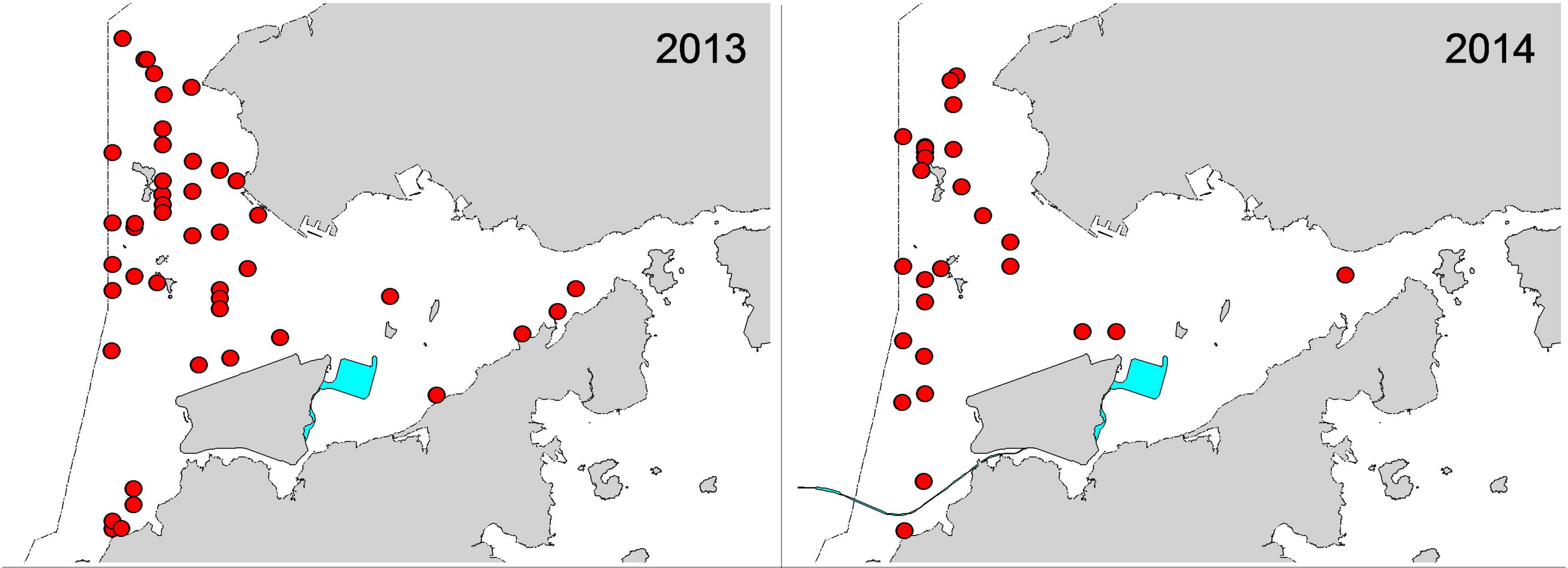


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the same summer quarters (June-August) of HKLR03 impact phase in 2013-16

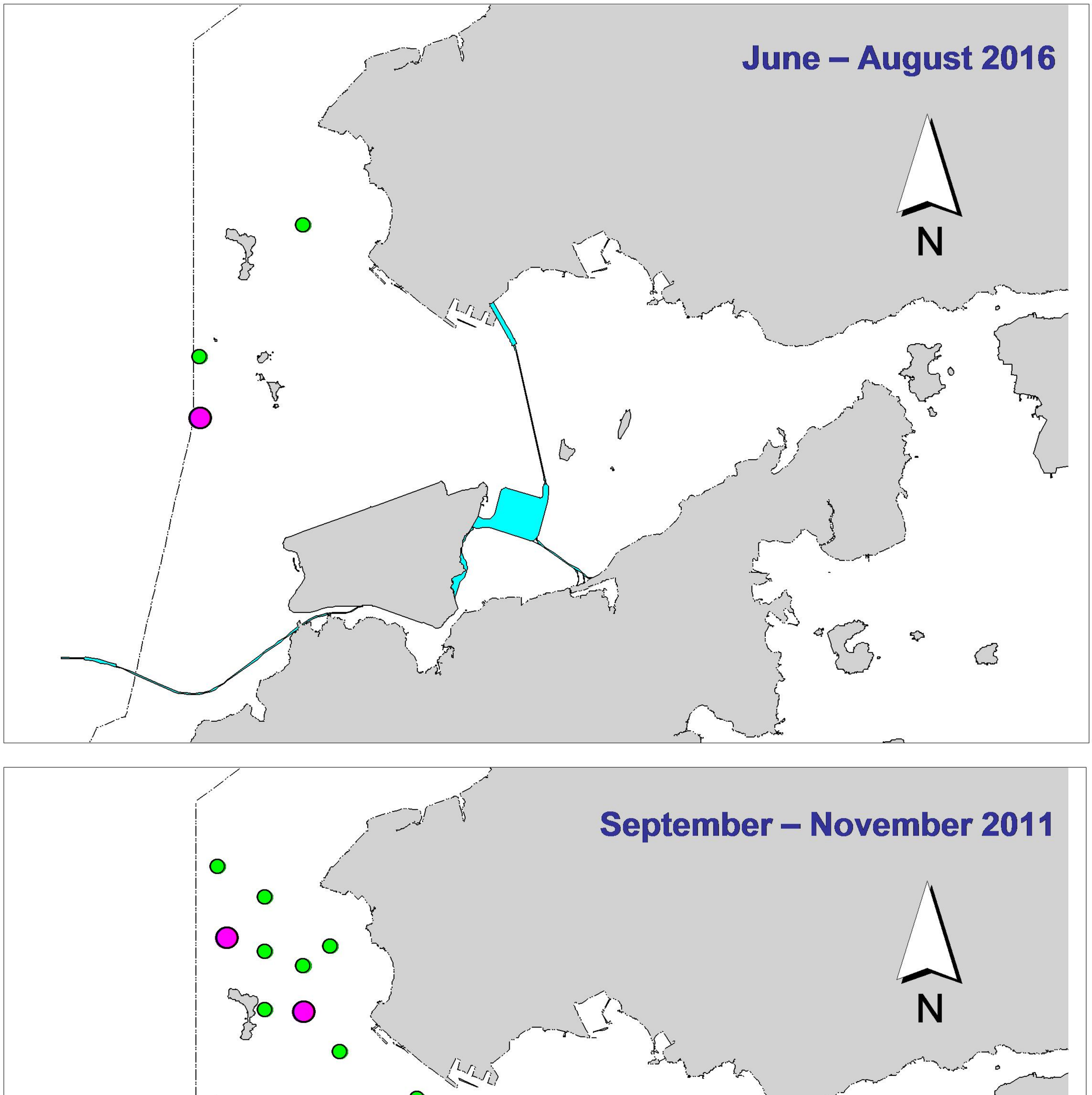


Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR03 impact phase (top) and baseline monitoring surveys (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

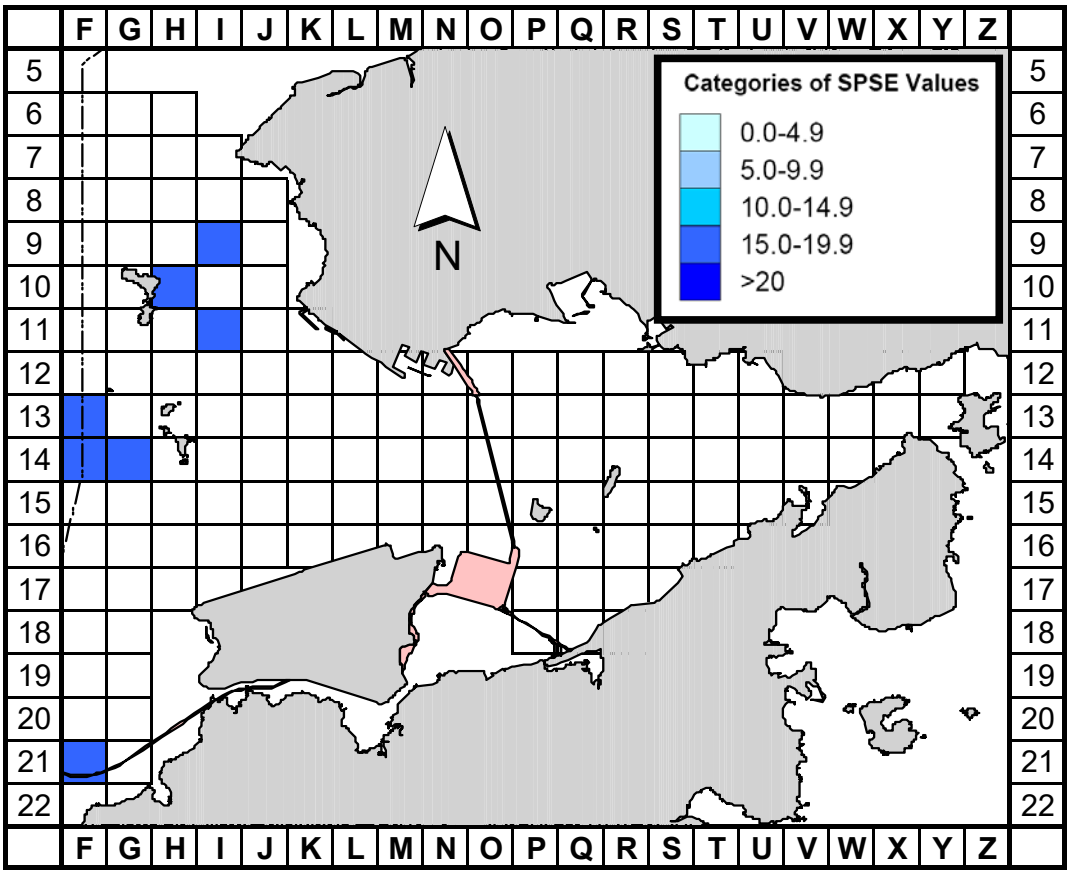


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (June-August 2016) (SPSE = no. of on-effort sightings per 100 units of survey effort)

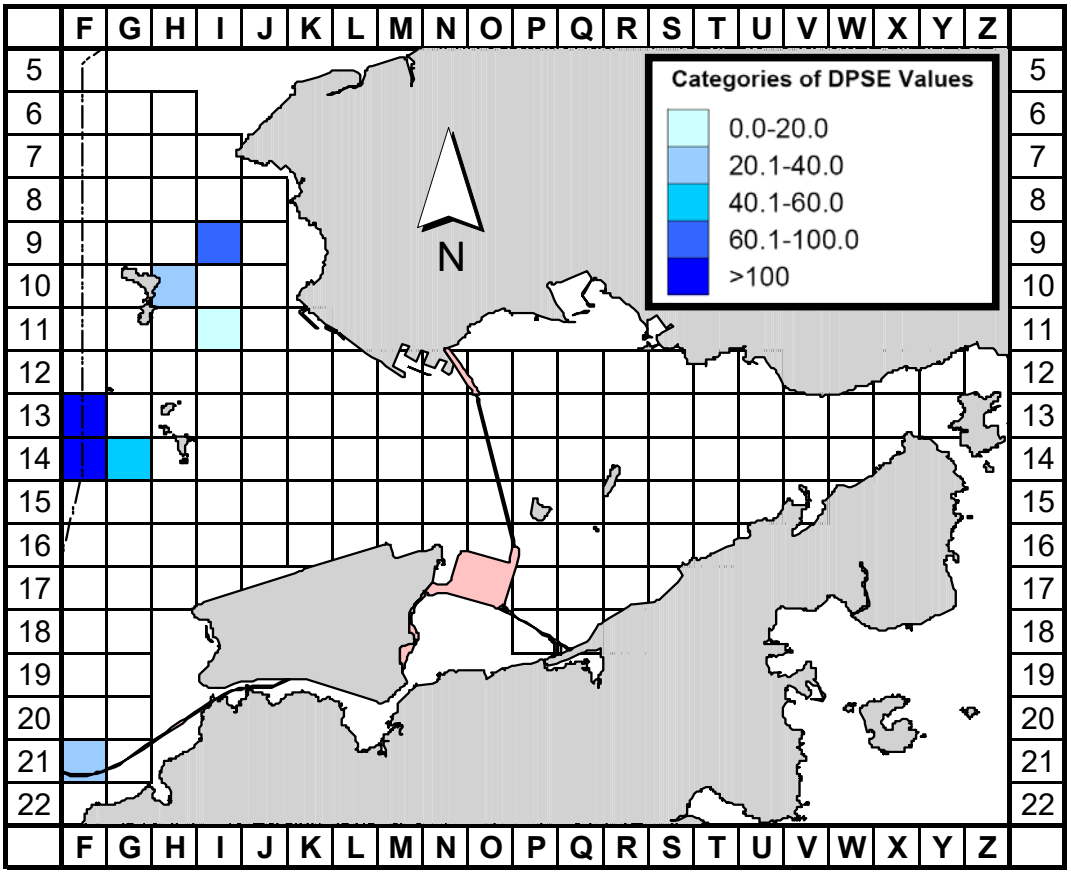


Figure 4b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (June-August 2016) (DPSE = no. of dolphins per 100 units of survey effort)

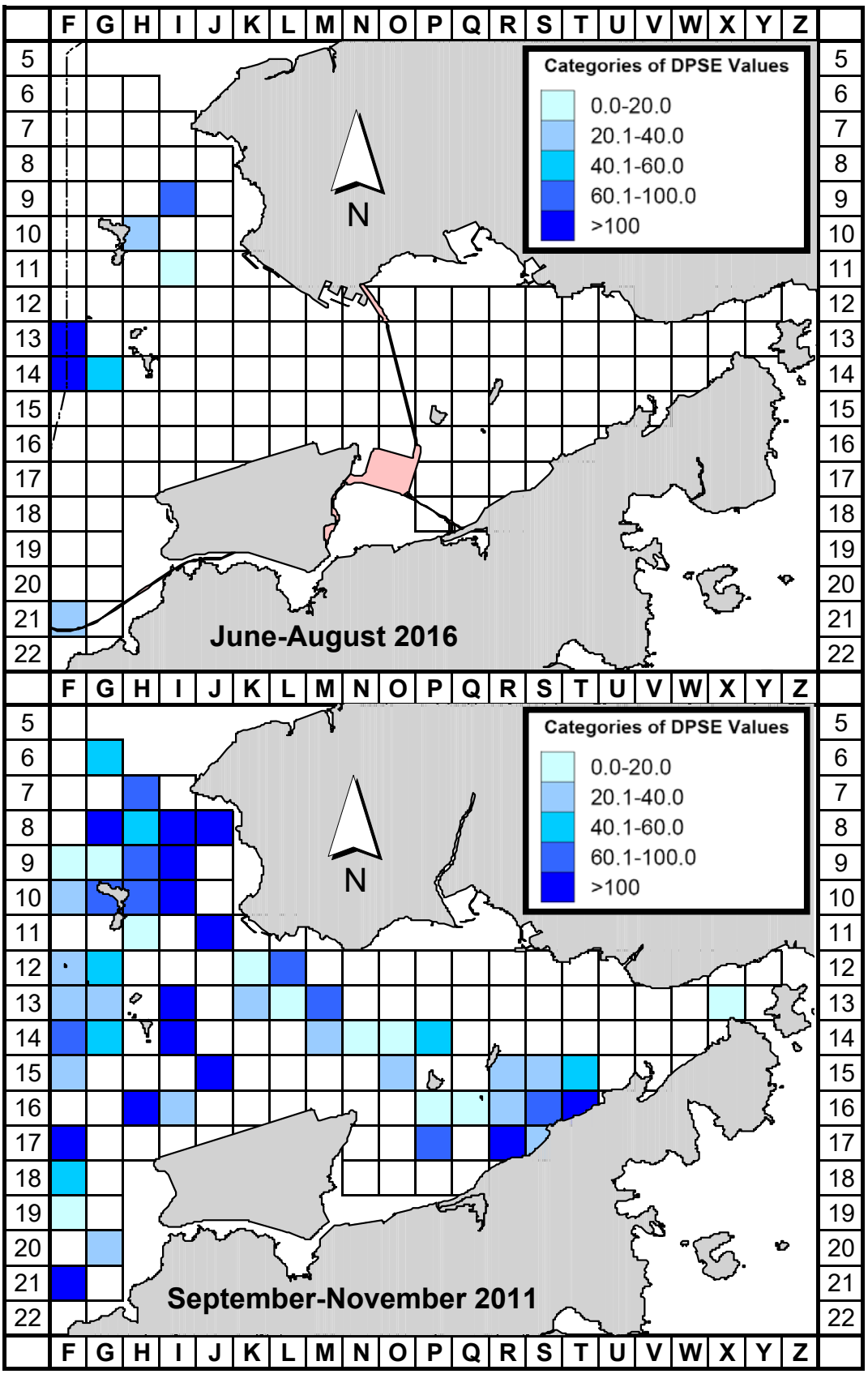


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between the impact monitoring period (June-August 2016) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)

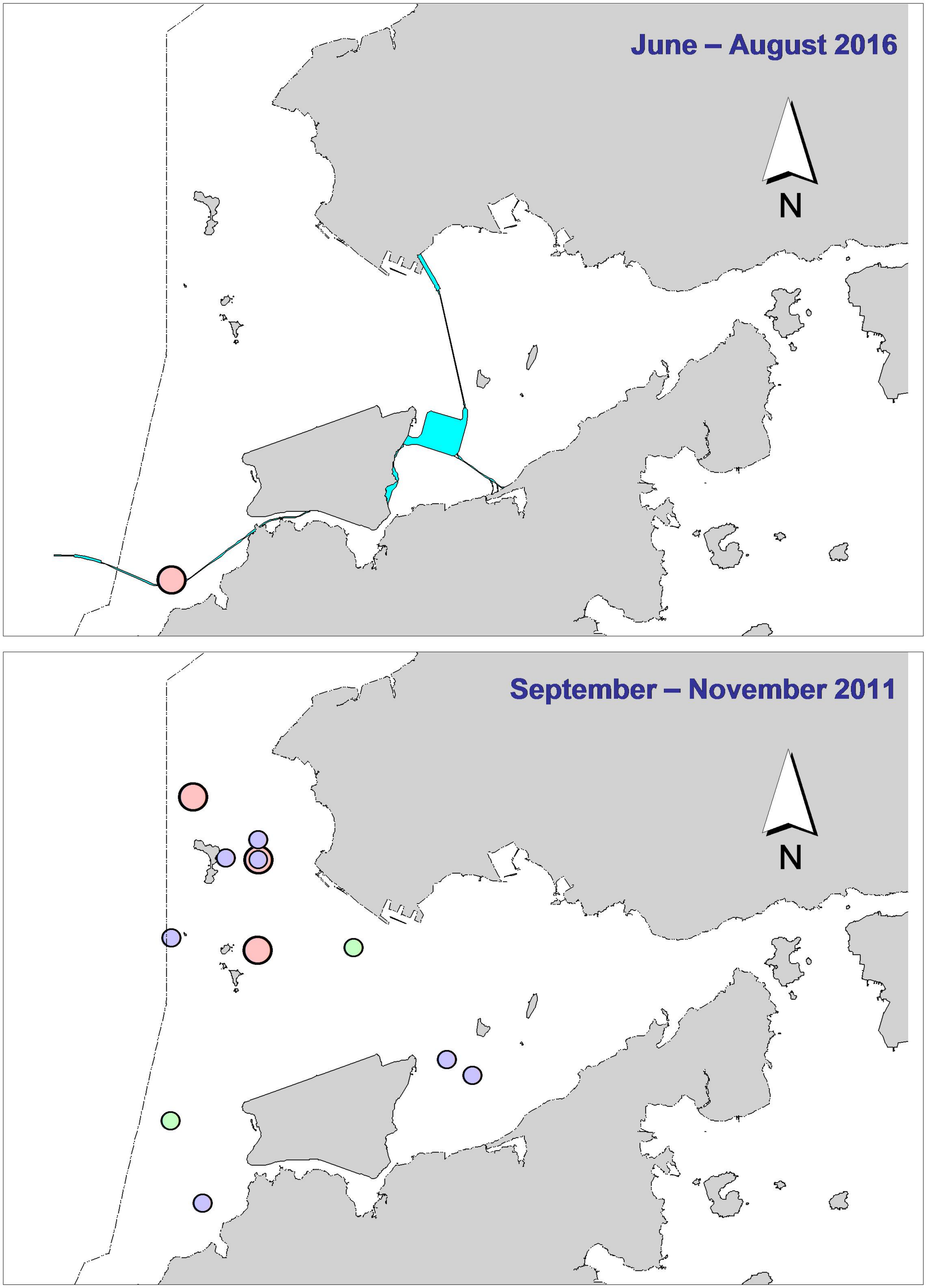


Figure 6. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

Appendix I. HKLR03 Survey Effort Database (June-August 2016)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
1-Jun-16	NW LANTAU	3	5.57	SUMMER	STANDARD31516	HKLR	P
1-Jun-16	NW LANTAU	4	24.03	SUMMER	STANDARD31516	HKLR	P
1-Jun-16	NW LANTAU	5	1.80	SUMMER	STANDARD31516	HKLR	P
1-Jun-16	NW LANTAU	3	2.80	SUMMER	STANDARD31516	HKLR	S
1-Jun-16	NW LANTAU	4	5.30	SUMMER	STANDARD31516	HKLR	S
1-Jun-16	NE LANTAU	2	6.91	SUMMER	STANDARD31516	HKLR	P
1-Jun-16	NE LANTAU	3	12.82	SUMMER	STANDARD31516	HKLR	P
1-Jun-16	NE LANTAU	2	8.05	SUMMER	STANDARD31516	HKLR	S
1-Jun-16	NE LANTAU	3	2.52	SUMMER	STANDARD31516	HKLR	S
6-Jun-16	NW LANTAU	1	4.44	SUMMER	STANDARD31516	HKLR	P
6-Jun-16	NW LANTAU	2	30.16	SUMMER	STANDARD31516	HKLR	P
6-Jun-16	NW LANTAU	3	5.59	SUMMER	STANDARD31516	HKLR	P
6-Jun-16	NW LANTAU	2	13.61	SUMMER	STANDARD31516	HKLR	S
6-Jun-16	NE LANTAU	2	15.55	SUMMER	STANDARD31516	HKLR	P
6-Jun-16	NE LANTAU	3	0.80	SUMMER	STANDARD31516	HKLR	P
6-Jun-16	NE LANTAU	2	10.94	SUMMER	STANDARD31516	HKLR	S
13-Jun-16	NW LANTAU	3	28.50	SUMMER	STANDARD31516	HKLR	P
13-Jun-16	NW LANTAU	4	5.40	SUMMER	STANDARD31516	HKLR	P
13-Jun-16	NW LANTAU	3	4.90	SUMMER	STANDARD31516	HKLR	S
13-Jun-16	NW LANTAU	4	4.90	SUMMER	STANDARD31516	HKLR	S
13-Jun-16	NE LANTAU	2	14.58	SUMMER	STANDARD31516	HKLR	P
13-Jun-16	NE LANTAU	3	5.31	SUMMER	STANDARD31516	HKLR	P
13-Jun-16	NE LANTAU	2	6.03	SUMMER	STANDARD31516	HKLR	S
13-Jun-16	NE LANTAU	3	5.18	SUMMER	STANDARD31516	HKLR	S
17-Jun-16	NW LANTAU	2	20.32	SUMMER	STANDARD31516	HKLR	P
17-Jun-16	NW LANTAU	3	18.28	SUMMER	STANDARD31516	HKLR	P
17-Jun-16	NW LANTAU	2	3.00	SUMMER	STANDARD31516	HKLR	S
17-Jun-16	NW LANTAU	3	5.50	SUMMER	STANDARD31516	HKLR	S
17-Jun-16	NE LANTAU	2	11.80	SUMMER	STANDARD31516	HKLR	P
17-Jun-16	NE LANTAU	3	5.68	SUMMER	STANDARD31516	HKLR	P
17-Jun-16	NE LANTAU	2	3.32	SUMMER	STANDARD31516	HKLR	S
17-Jun-16	NE LANTAU	3	2.90	SUMMER	STANDARD31516	HKLR	S
5-Jul-16	NW LANTAU	2	4.50	SUMMER	STANDARD31516	HKLR	P
5-Jul-16	NW LANTAU	3	29.29	SUMMER	STANDARD31516	HKLR	P
5-Jul-16	NW LANTAU	4	6.90	SUMMER	STANDARD31516	HKLR	P
5-Jul-16	NW LANTAU	2	2.10	SUMMER	STANDARD31516	HKLR	S
5-Jul-16	NW LANTAU	3	7.30	SUMMER	STANDARD31516	HKLR	S
5-Jul-16	NW LANTAU	4	3.70	SUMMER	STANDARD31516	HKLR	S
5-Jul-16	NE LANTAU	2	2.30	SUMMER	STANDARD31516	HKLR	P
5-Jul-16	NE LANTAU	3	13.62	SUMMER	STANDARD31516	HKLR	P
5-Jul-16	NE LANTAU	4	0.81	SUMMER	STANDARD31516	HKLR	P
5-Jul-16	NE LANTAU	2	4.30	SUMMER	STANDARD31516	HKLR	S
5-Jul-16	NE LANTAU	3	5.77	SUMMER	STANDARD31516	HKLR	S
12-Jul-16	NW LANTAU	1	4.04	SUMMER	STANDARD31516	HKLR	P
12-Jul-16	NW LANTAU	2	27.40	SUMMER	STANDARD31516	HKLR	P
12-Jul-16	NW LANTAU	1	2.10	SUMMER	STANDARD31516	HKLR	S
12-Jul-16	NW LANTAU	2	6.27	SUMMER	STANDARD31516	HKLR	S
12-Jul-16	NE LANTAU	2	19.99	SUMMER	STANDARD31516	HKLR	P
12-Jul-16	NE LANTAU	2	11.81	SUMMER	STANDARD31516	HKLR	S
18-Jul-16	NW LANTAU	2	4.34	SUMMER	STANDARD31516	HKLR	P
18-Jul-16	NW LANTAU	3	29.06	SUMMER	STANDARD31516	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
18-Jul-16	NW LANTAU	4	7.70	SUMMER	STANDARD31516	HKLR	P
18-Jul-16	NW LANTAU	2	2.00	SUMMER	STANDARD31516	HKLR	S
18-Jul-16	NW LANTAU	3	7.60	SUMMER	STANDARD31516	HKLR	S
18-Jul-16	NW LANTAU	4	3.00	SUMMER	STANDARD31516	HKLR	S
18-Jul-16	NE LANTAU	2	15.66	SUMMER	STANDARD31516	HKLR	P
18-Jul-16	NE LANTAU	3	1.06	SUMMER	STANDARD31516	HKLR	P
18-Jul-16	NE LANTAU	2	9.89	SUMMER	STANDARD31516	HKLR	S
27-Jul-16	NE LANTAU	2	18.79	SUMMER	STANDARD31516	HKLR	P
27-Jul-16	NE LANTAU	3	0.70	SUMMER	STANDARD31516	HKLR	P
27-Jul-16	NE LANTAU	2	10.91	SUMMER	STANDARD31516	HKLR	S
27-Jul-16	NW LANTAU	2	19.61	SUMMER	STANDARD31516	HKLR	P
27-Jul-16	NW LANTAU	3	11.30	SUMMER	STANDARD31516	HKLR	P
27-Jul-16	NW LANTAU	4	0.60	SUMMER	STANDARD31516	HKLR	P
27-Jul-16	NW LANTAU	2	6.89	SUMMER	STANDARD31516	HKLR	S
27-Jul-16	NW LANTAU	3	1.20	SUMMER	STANDARD31516	HKLR	S
5-Aug-16	NW LANTAU	1	0.88	SUMMER	STANDARD31516	HKLR	P
5-Aug-16	NW LANTAU	2	39.05	SUMMER	STANDARD31516	HKLR	P
5-Aug-16	NW LANTAU	2	11.73	SUMMER	STANDARD31516	HKLR	S
5-Aug-16	NW LANTAU	3	1.70	SUMMER	STANDARD31516	HKLR	S
5-Aug-16	NE LANTAU	2	16.76	SUMMER	STANDARD31516	HKLR	P
5-Aug-16	NE LANTAU	2	9.74	SUMMER	STANDARD31516	HKLR	S
9-Aug-16	NW LANTAU	1	23.75	SUMMER	STANDARD36826	HKLR	P
9-Aug-16	NW LANTAU	2	7.05	SUMMER	STANDARD36826	HKLR	P
9-Aug-16	NW LANTAU	1	6.40	SUMMER	STANDARD36826	HKLR	S
9-Aug-16	NW LANTAU	2	1.70	SUMMER	STANDARD36826	HKLR	S
9-Aug-16	NE LANTAU	1	1.61	SUMMER	STANDARD36826	HKLR	P
9-Aug-16	NE LANTAU	2	9.89	SUMMER	STANDARD36826	HKLR	P
9-Aug-16	NE LANTAU	3	7.85	SUMMER	STANDARD36826	HKLR	P
9-Aug-16	NE LANTAU	2	8.65	SUMMER	STANDARD36826	HKLR	S
9-Aug-16	NE LANTAU	3	2.10	SUMMER	STANDARD36826	HKLR	S
17-Aug-16	NE LANTAU	2	13.69	SUMMER	STANDARD36826	HKLR	P
17-Aug-16	NE LANTAU	3	6.29	SUMMER	STANDARD36826	HKLR	P
17-Aug-16	NE LANTAU	2	10.92	SUMMER	STANDARD36826	HKLR	S
17-Aug-16	NW LANTAU	2	23.13	SUMMER	STANDARD36826	HKLR	P
17-Aug-16	NW LANTAU	3	4.78	SUMMER	STANDARD36826	HKLR	P
17-Aug-16	NW LANTAU	4	2.58	SUMMER	STANDARD36826	HKLR	P
17-Aug-16	NW LANTAU	2	5.31	SUMMER	STANDARD36826	HKLR	S
17-Aug-16	NW LANTAU	3	2.44	SUMMER	STANDARD36826	HKLR	S
17-Aug-16	NW LANTAU	4	0.56	SUMMER	STANDARD36826	HKLR	S
23-Aug-16	NW LANTAU	1	0.94	SUMMER	STANDARD31516	HKLR	P
23-Aug-16	NW LANTAU	2	38.76	SUMMER	STANDARD31516	HKLR	P
23-Aug-16	NW LANTAU	2	13.50	SUMMER	STANDARD31516	HKLR	S
23-Aug-16	NE LANTAU	1	1.00	SUMMER	STANDARD31516	HKLR	P
23-Aug-16	NE LANTAU	2	15.48	SUMMER	STANDARD31516	HKLR	P
23-Aug-16	NE LANTAU	2	9.82	SUMMER	STANDARD31516	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (June-August 2016)

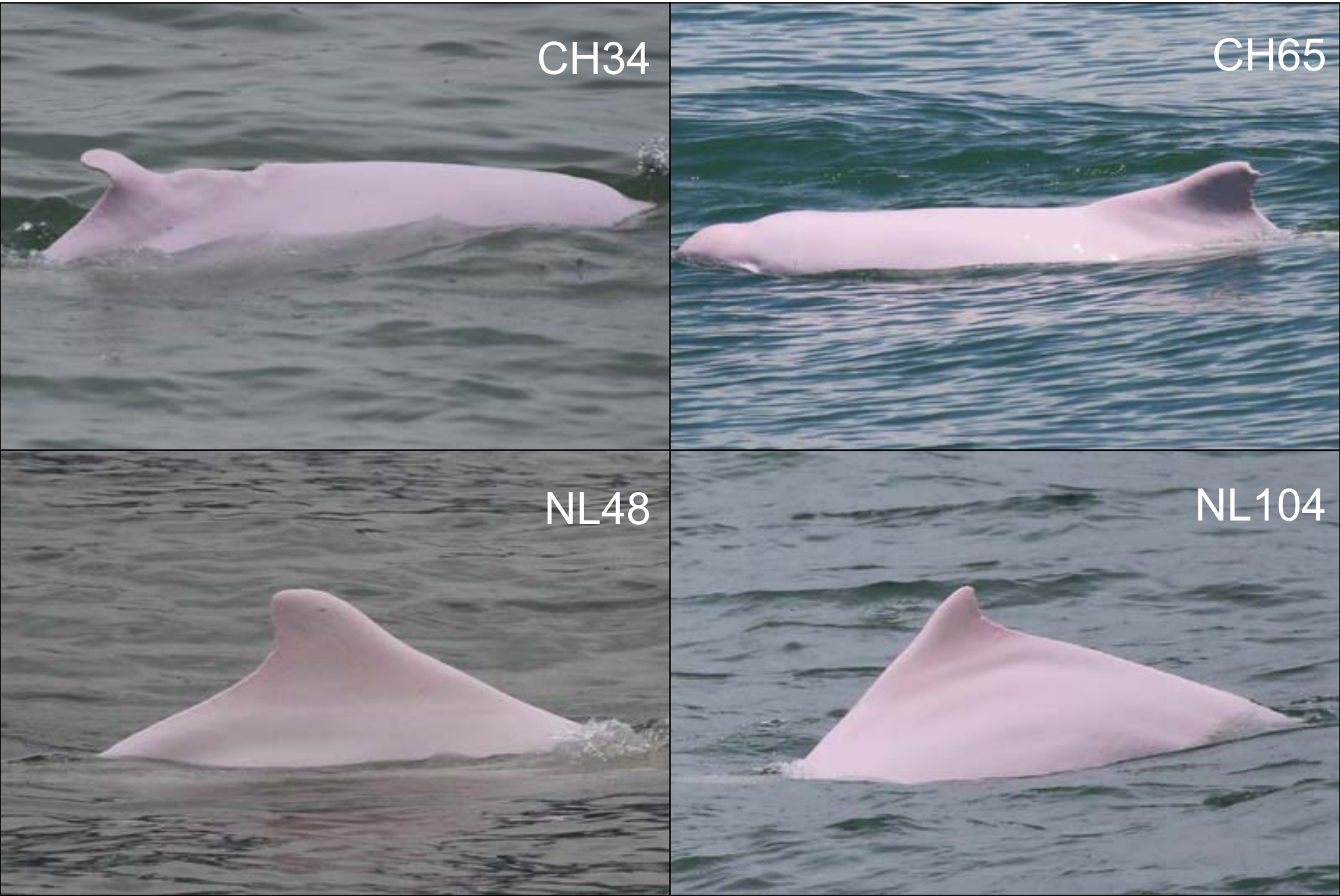
(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
6-Jun-16	1	1556	1	NE LANTAU	2	ND	OFF	HKLR	821150	818561	SUMMER	NONE	
5-Jul-16	1	1016	2	NW LANTAU	2	434	ON	HKLR	815337	804661	SUMMER	NONE	P
12-Jul-16	1	1335	1	NW LANTAU	2	531	ON	HKLR	825962	807516	SUMMER	NONE	P
12-Jul-16	2	1446	3	NW LANTAU	2	165	ON	HKLR	822433	805459	SUMMER	NONE	P
18-Jul-16	1	1014	1	NW LANTAU	3	ND	OFF	HKLR	815004	805073	SUMMER	NONE	
5-Aug-16	1	1049	11	NW LANTAU	2	95	ON	HKLR	822169	804686	SUMMER	NONE	P
5-Aug-16	2	1130	7	NW LANTAU	2	415	ON	HKLR	823742	804689	SUMMER	NONE	P
5-Aug-16	3	1228	2	NW LANTAU	2	119	ON	HKLR	826905	806457	SUMMER	NONE	P
17-Aug-16	1	1353	5	NW LANTAU	2	107	ON	HKLR	827091	807487	SUMMER	NONE	P
17-Aug-16	2	1422	1	NW LANTAU	2	ND	OFF	HKLR	827147	807528	SUMMER	NONE	

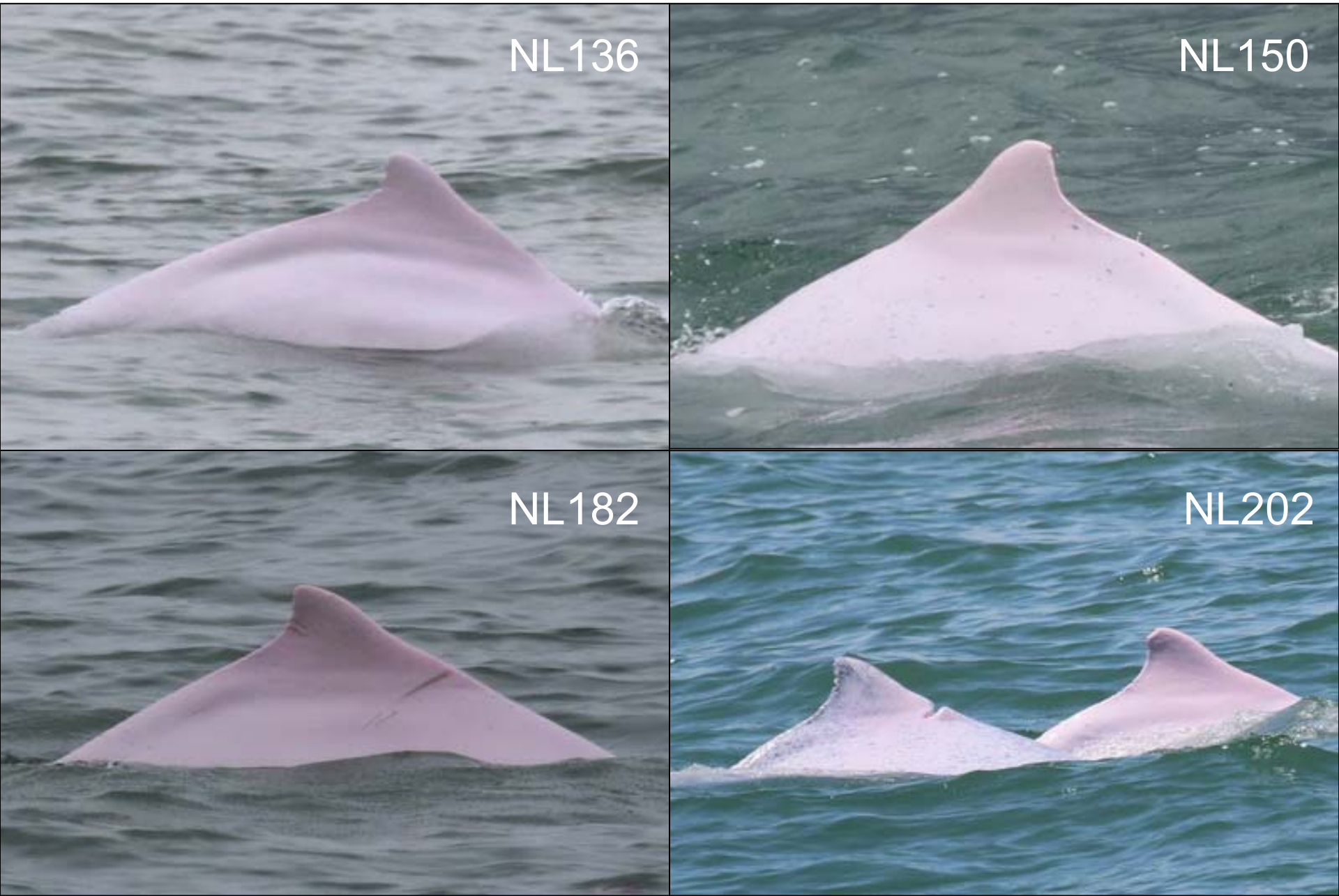
Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in June-August 2016

ID#	DATE	STG#	AREA
CH34	12/07/16	2	NW LANTAU
CH65	05/08/16	1	NW LANTAU
NL48	12/07/16	1	NW LANTAU
NL104	17/08/16	1	NW LANTAU
NL136	12/07/16	2	NW LANTAU
NL150	17/08/16	1	NW LANTAU
NL182	12/07/16	2	NW LANTAU
NL202	05/08/16	3	NW LANTAU
NL255	05/08/16	1	NW LANTAU
NL280	17/08/16	1	NW LANTAU
NL281	05/08/16	1	NW LANTAU
NL286	05/08/16	3	NW LANTAU
NL293	18/07/16	1	NW LANTAU
NL302	05/07/16	1	NW LANTAU
NL307	05/07/16	1	NW LANTAU

Appendix IV. Fifteen individual dolphins that were identified during June-August 2016 under HKLR03 impact phase monitoring surveys



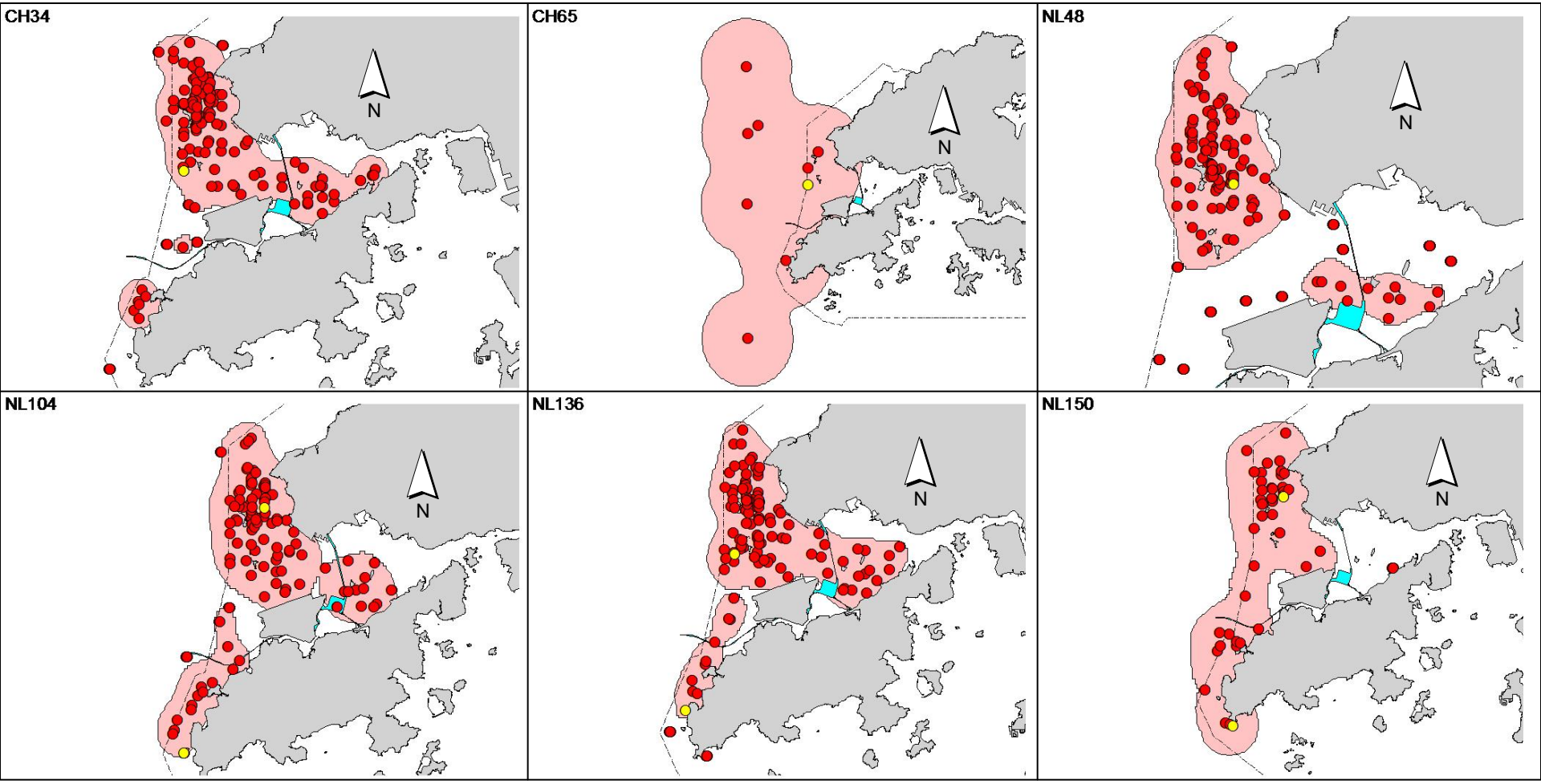
Appendix IV. (cont'd)



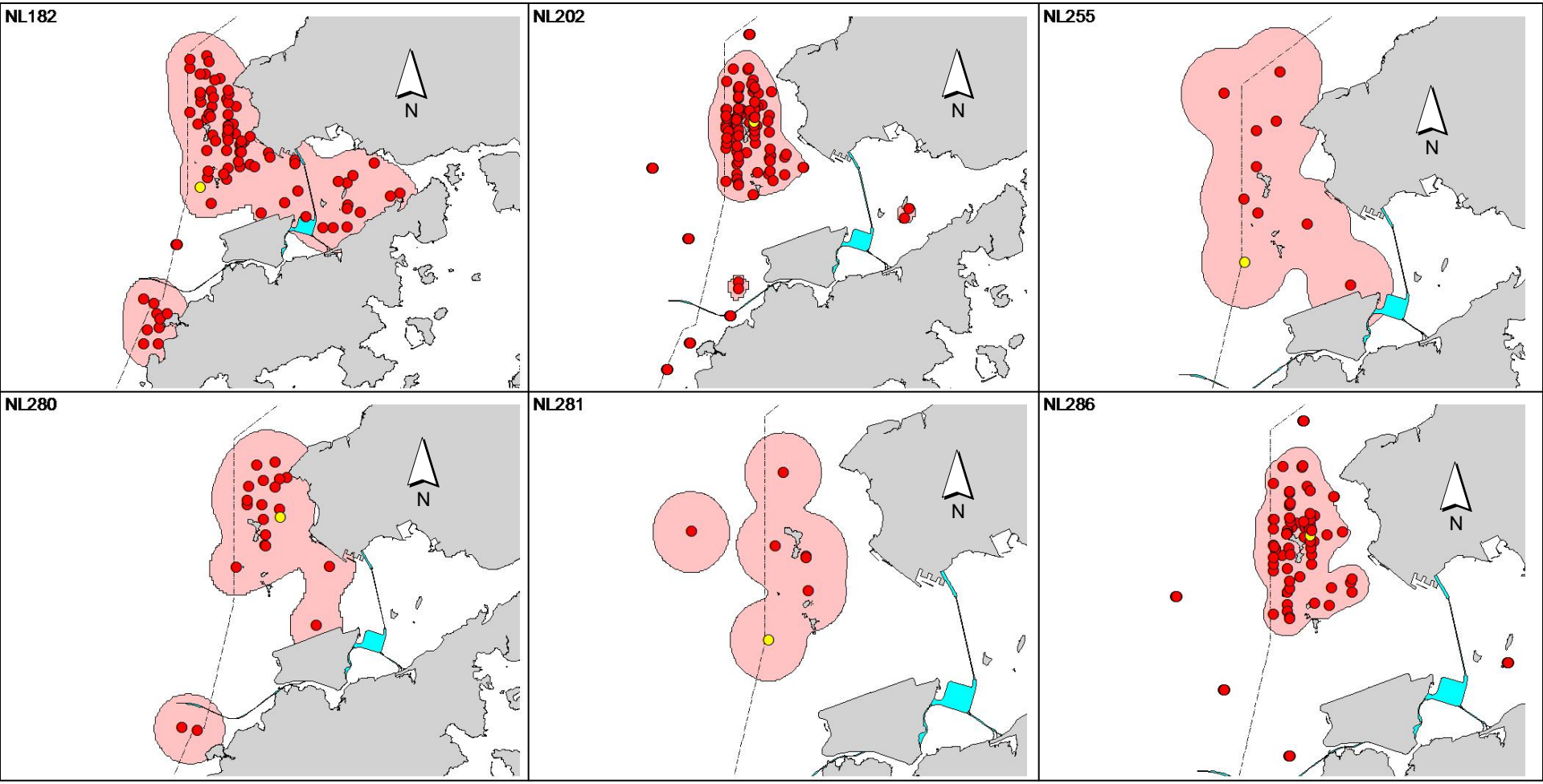
Appendix IV. (cont'd)

Appendix IV. (cont'd)

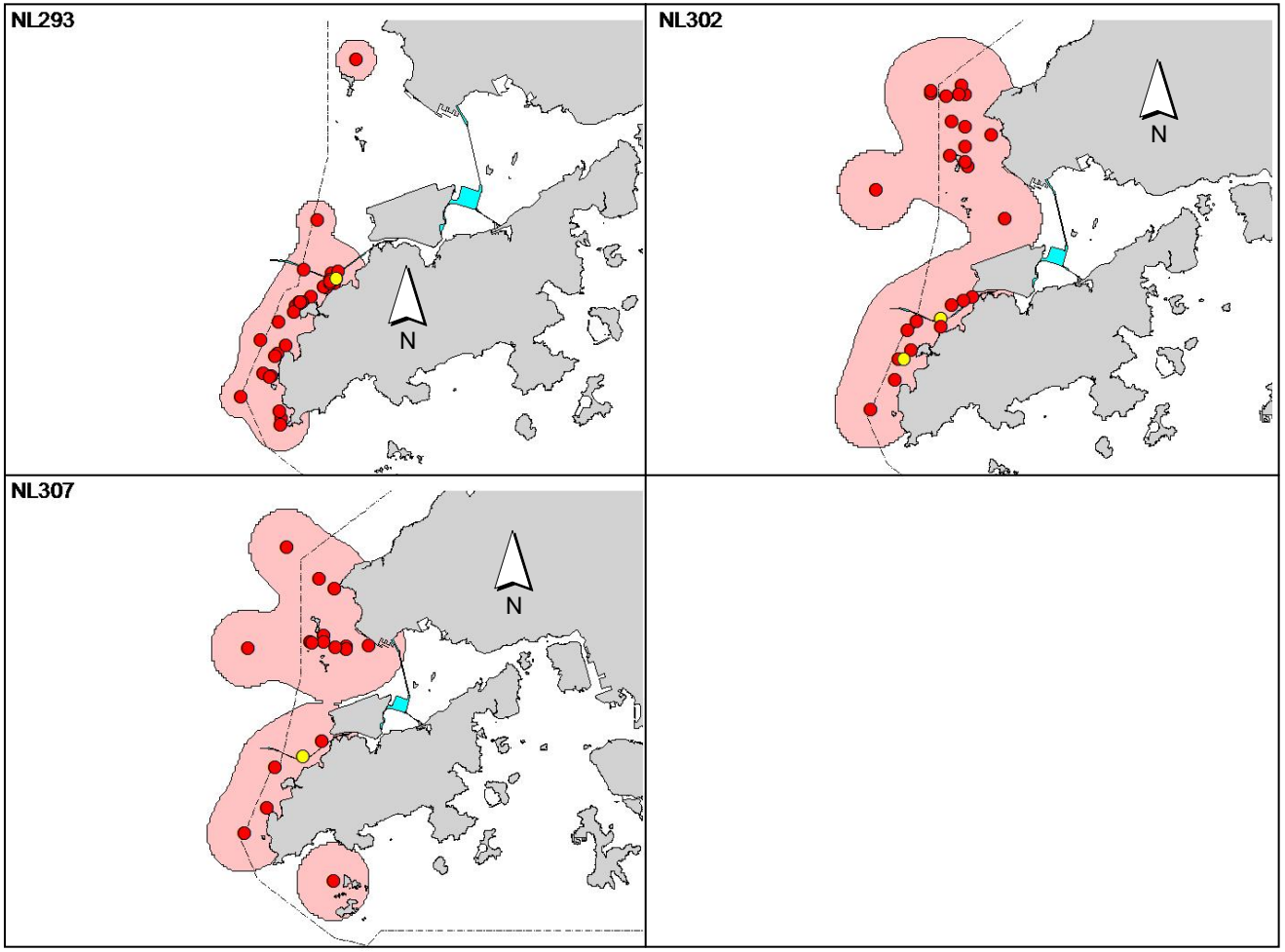
Appendix V. Ranging patterns (95% kernel ranges) of 15 individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicates sightings made in June-August 2016 during HZMB-related monitoring surveys)



Appendix V. (cont'd)



Appendix V. (cont'd)



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 2016 (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	1.941	0.263	0.606	-	1.334	-	-	-	-	-	-	69.400	-	-	0.105	-
Feb	0.783	0.185	0.092	-	0.692	-	-	-	-	-	-	85.890	-	-	0.112	-
Mar	1.502	0.429	0.537	-	0.965	-	-	-	-	-	2.000	88.360	-	-	-	-
Apr	1.354	0.402	0.789	-	0.565	-	-	-	-	-	3.000	79.580	-	8.640	0.084	-
May	1.057	0.192	0.617	-	0.440	-	-	-	-	-	3.000	75.620	-	-	-	-
Jun	0.499	0.277	0.116	-	0.383	-	-	-	-	-	-	103.270	-	-	0.105	-
SUB-TOTAL	**7.136**	**1.747**	**2.757**	**-**	**4.379**	**0.000**	**-**	**-**	**-**	**-**	**8.000**	**502.120**	**-**	**8.640**	**0.406**	**-**
Jul	0.507	0.211	0.230	-	0.277	-	-	-	-	-	2.200	94.760	-	1.540	0.350	-
Aug	1.294	0.144	0.684	-	0.610	-	-	-	-	-	-	116.990	-	9.790	0.098	-
Sep				-		-	-	-	-	-			-			-
Oct				-		-	-	-	-	-			-			-
Nov				-		-	-	-	-	-			-			-
Dec				-		-	-	-	-	-			-			-
TOTAL	**8.936**	**2.102**	**3.671**	**-**	**5.265**	**-**	**-**	**-**	**-**	**-**	**10.200**	**713.870**	**-**	**19.970**	**0.854**	**-**

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 project commencement**
1-Hr TSP	Action	0	0
	Limit	0	0
24-Hr TSP	Action	0	2
	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Water Quality	Action	0	2
	Limit	0	0
Impact Dolphin Monitoring	Action	0	9
	Limit	1	6

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 project commencement	4	0	0

Email message

Environmental Resources Management

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To	Ramboll Environ - 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	28 November 2016

Dear Sir or Madam,

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

0215660_Jun2016/Aug2016_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 2016.

Regards,

Mr Jovy Tam
Environmental Team Leader

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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_Jun2016/Aug2016_dolphin_STG&ANI_NEL&NWL** **[Total No. of Exceedance = 1]**	
Date	June to August 2016 (monitored) 25 November 2016 (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 = 1.72 & ANI = 7.48
	One Limit Level Exceedance was recorded in the quarterly impact dolphin monitoring at NEL and NWL between June and August 2016. The exceedance was reported in the approved *Thirty-Fourth Monthly EM&A Report* dated 13 September 2016.	
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 2016) 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 ($p = 0.0031$) and ANI ($p = 0.0227$) 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 2016) 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 $\alpha = 0.00005$ as the significance level in the statistical tests, significant difference in STG ($p = 0.000009$) and in ANI ($p = 0.000001$) between Cumulative Period and Location 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 2016 and August 2016, the major marine works under *Contract No. HY/2012/07* included: • Construction and installation of pile caps; • Uninstallation of marine piling platform; • Pier construction; • Construction of marine section of berth at Southern Landfall; • Launching gantry operation; and • Installation of deck segment and pier head segment.	

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 (2015 – 16)* (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 a major factor 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 (2015-2016)* also reported that CWD decline were likely influenced by reclamation works, bored piling and intensive marine traffic from construction activities. Based on these possible reasons, the corresponding marine works and 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. Thus, underwater noise emission from this Contract had been substantially reduced in this reporting period when comparing to the previous quarters. 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 2016 and August 2016, there was no exceedance on WQM. Although impact mean levels of depth-averaged SS at SR4a during mid-ebb tide (SR4a during mid-ebb: 12.8 mg/L) were higher than the corresponding ambient levels (SR4a during mid-ebb: 11.9 mg/L), the statistical analyses suggest there were no significant difference. Overall, the WQM results imply that no unacceptable impact on water quality was associated with the marine works under this Contract, and thus no indirect impacts on marine habitat quality due to change in water quality is observed in this Contract. 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 (2016). Prepared for AFCD. Available at: https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/files/Final_Report_2015_16.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; 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 and proposed marine park boundaries; 5. Vessels speed limited at 5 knots and 10 knots within existing and proposed 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. The ET will monitor for future trends in exceedance(s). A joint team meeting was held on 14 October 2016 for discussion on CWD trend, with attendance of ENPO, HyD, Representatives of Resident Site Staff (RSS), Representatives of Environmental Team (ET) for Contract No. HY/2010/02, HY2011/03, HY/2012/07 and HY/2012/08. The discussion/recommendation as recorded in the minutes of the meeting, which might be relevant to this Contract are summarized below. 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. ENPO presented the interim CWD survey results in mainland waters obtained from Hong Kong-Zhuhai-Macao Bridge Authority that some CWDs that previously more often sighted in Hong Kong waters have expanded their ranges into mainland waters, and some with reduced usage in Hong Kong waters, while they are partially accounted for the local decline. It was reminded that the ETs shall keep reviewing the implementation status of the dolphin related mitigation measures and remind the contractor to ensure the relevant measures are fully implemented. The ETs were also reminded to update the BMP boundary in the Regular Marine Travel Route Plan. The participants were requested by ENPO to collect and report the marine traffic statistics. 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. It was also suggested that the protection measures (e.g., speed limit control) for the proposed Brothers Marine Park (BMP) shall be brought forward as soon as possible before its establishment so as to provide a better habitat for dolphin recovery.
Remarks	The results of impact water quality and impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved *Thirty Second* to *Thirty Fourtht Monthly EM&A Reports*. Comparison on water quality between impact and baseline periods is elaborated in the *11th Quarterly EM&A Report*.