

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

*Tenth Quarterly Environmental Monitoring &  
Audit (EM&A) Report*

02 November 2016

**Environmental Resources Management**  
16/F, Berkshire House  
25 Westlands Road  
Quarry Bay, Hong Kong  
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*www.erm.com*



Ref.: HYDHZMBEEM00\_0\_4760L.16

15 November 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  
10th Quarterly EM&A Summary Report (March 2016 to May 2016)**

Reference is made to the 10th Quarterly Environmental Monitoring and Audit (EM&A) Report (March 2016 to May 2016) (ET's ref.: "0215660\_10th Qtr EM&A\_20161102.doc" dated 2 Nov. 2016) certified by the ET Leader and provided to us via e-mail on 2 Nov. 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

Q:\Projects\HYDHZMBEEM00\02\_Proj\_Mgt\02\_Corr\HYDHZMBEEM00\_0\_4760L.16.docx

# Contract No. HY/2012/07





## Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section

**Environmental Resources Management**

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*Tenth Quarterly Environmental Monitoring & Audit (EM&A) Report*

**Document Code:**  
 0215660\_10th Qtr EM&A\_20161102.doc

Client:  Gammon		Project No:  0215660			
Summary:  This document presents the Tenth Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Southern Connection Viaduct Section.		Date: 02 November 2016			
		Approved by:  			
		Mr Craig Reid Partner			
		Certified by:  			
		Mr Jovy Tam ET Leader			
	10 <sup>th</sup> Quarterly EM&A Report	VAR	JT	CAR	02/11/16
Revision	Description	By	Checked	Approved	Date
<p>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.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			

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## **EXECUTIVE SUMMARY**

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*.

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 Tenth Quarterly EM&A Report presenting the EM&A works carried out during the period from 1 March to 31 May 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:

### March 2016

#### **Marine Works**

- 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.

### *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.

### April 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.

### May 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.

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

24-hour TSP monitoring	17 sessions
1-hour TSP monitoring	17 sessions
Noise monitoring	17 sessions
Water quality monitoring	40 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 March and May 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:

#### 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.

##### **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.

## 1.1

## 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*.

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 Tenth 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 March to 31 May 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

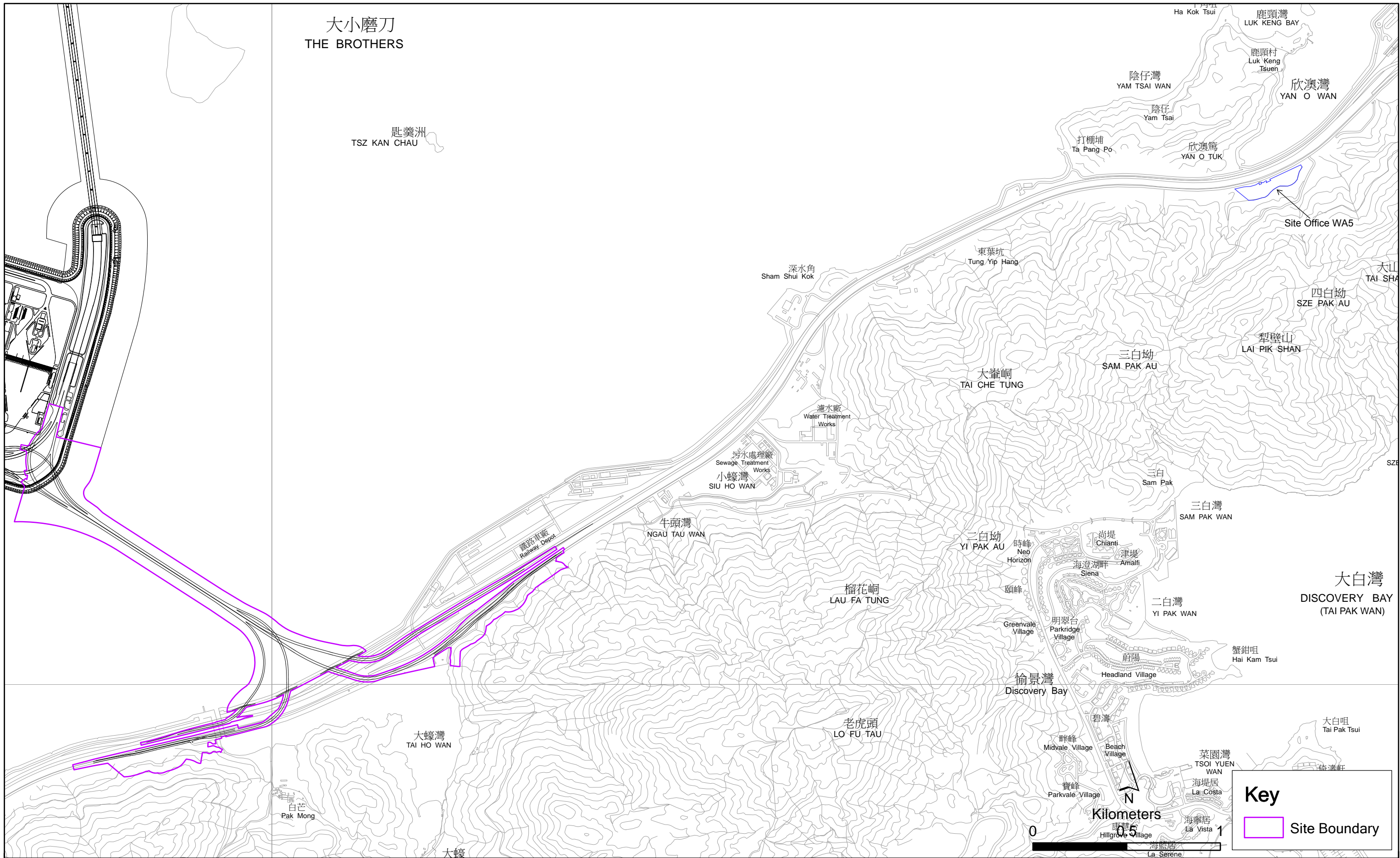
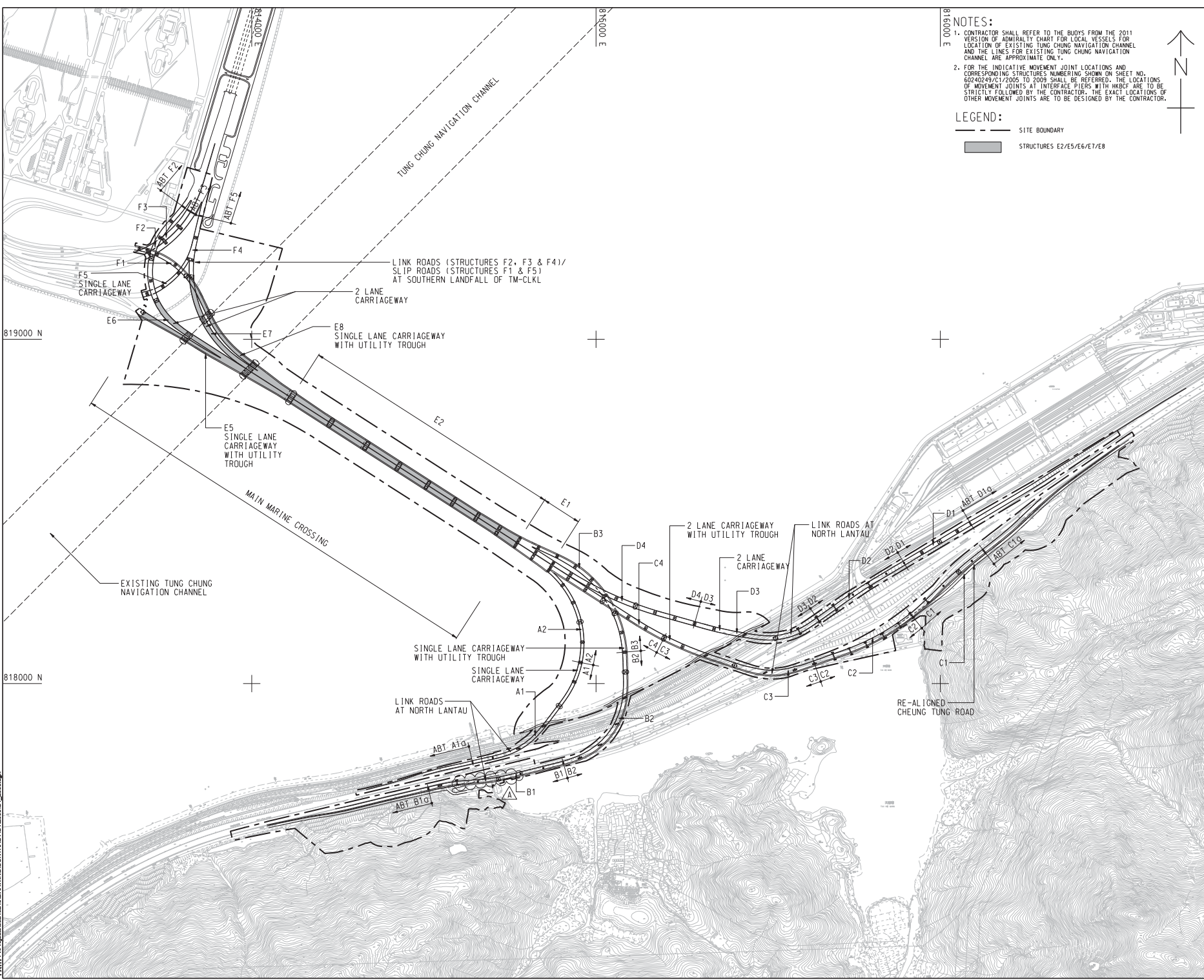


Figure 1.1

General Layout Plan of the Project

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 Designer: LHM/88 Checked: SLYT Approved: CWN  
 Project Management Initials: ISO AT 50mm x 61mm  
 Date: 12/11/2012



**NOTES:**

- 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.
- FOR THE INDICATIVE MOVEMENT JOINT LOCATIONS AND CORRESPONDING STRUCTURES NUMBERING SHOWN ON SHEET NO. 60240249/C1/2000 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

**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  
港務局  
Hong Kong - Zhuhai - Hainan Bridge  
Hong Kong Project Management Office

**CONSULTANT**  
AECOM Asia Company Ltd.  
www.aecom.com

**SUB-CONSULTANTS**

# Figure 1.2a

**ISSUE/REVISION**

NO.	DATE	DESCRIPTION	CHK.

**STATUS**

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A1 : 6000

**DIMENSION UNIT**  
METRES

**KEY PLAN**

**PROJECT NO.**  
60240249

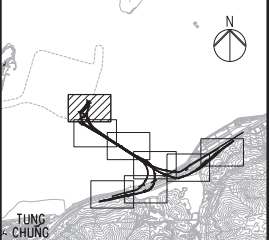
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HY/2012/07

**SHEET TITLE**  
SOUTHERN CONNECTION  
GENERAL LAYOUT PLAN

**SHEET NUMBER**  
60240249/C1/2000A

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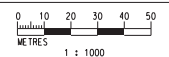


**KEY PLAN**

**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

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



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B	SUBMISSION	RC	07/13				
C	SUBMISSION	RC	09/13				

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Checked	DS	
Approved	DOP	
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Client: **路政署 HIGHWAYS DEPARTMENT**  
 香港特別行政區運輸及房屋局  
 Transport and Planning  
 Hong Kong - Zhuhai - Macao Bridge  
 Hong Kong Project Management Office

Supervising Officer: **AECOM**  
 Contractor: **Gammon**

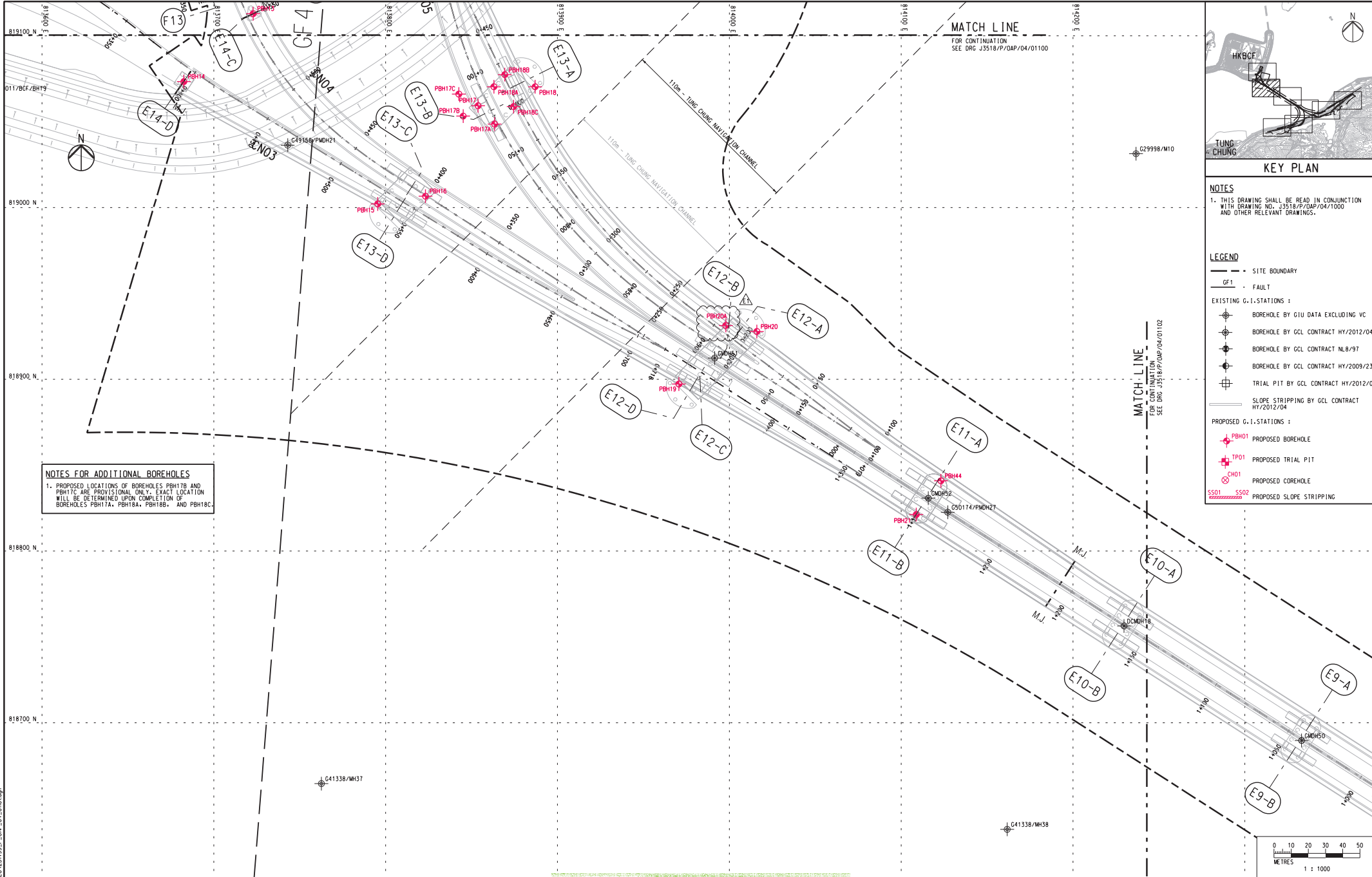
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**Contract No. HY/2012/07**  
**Tuen Mun - Chek Lap Kok Link**  
**Southern Connection Viaduct Section**

Originator: **ARUP**

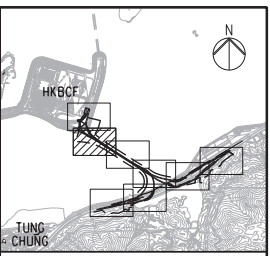
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**Figure 1.2b**

Drawing no. **J3518/P/OAP/04/01100** Rev. **C**

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



**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 NLB/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 :	
	PROPOSED BOREHOLE
	PROPOSED TRIAL PIT
	PROPOSED COREHOLE
	PROPOSED SLOPE STRIPPING

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

Drawn	RL	Date	07/13
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Client: **路政署**  
**HIGHWAYS DEPARTMENT**  
 香港路政署  
 Hong Kong - Zhuhai - Macao Bridge  
 Hong Kong Project Management Office

Supervising Officer: **AECOM**  
 Contractor: **Gammon**

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

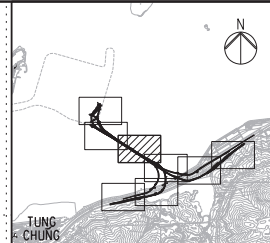
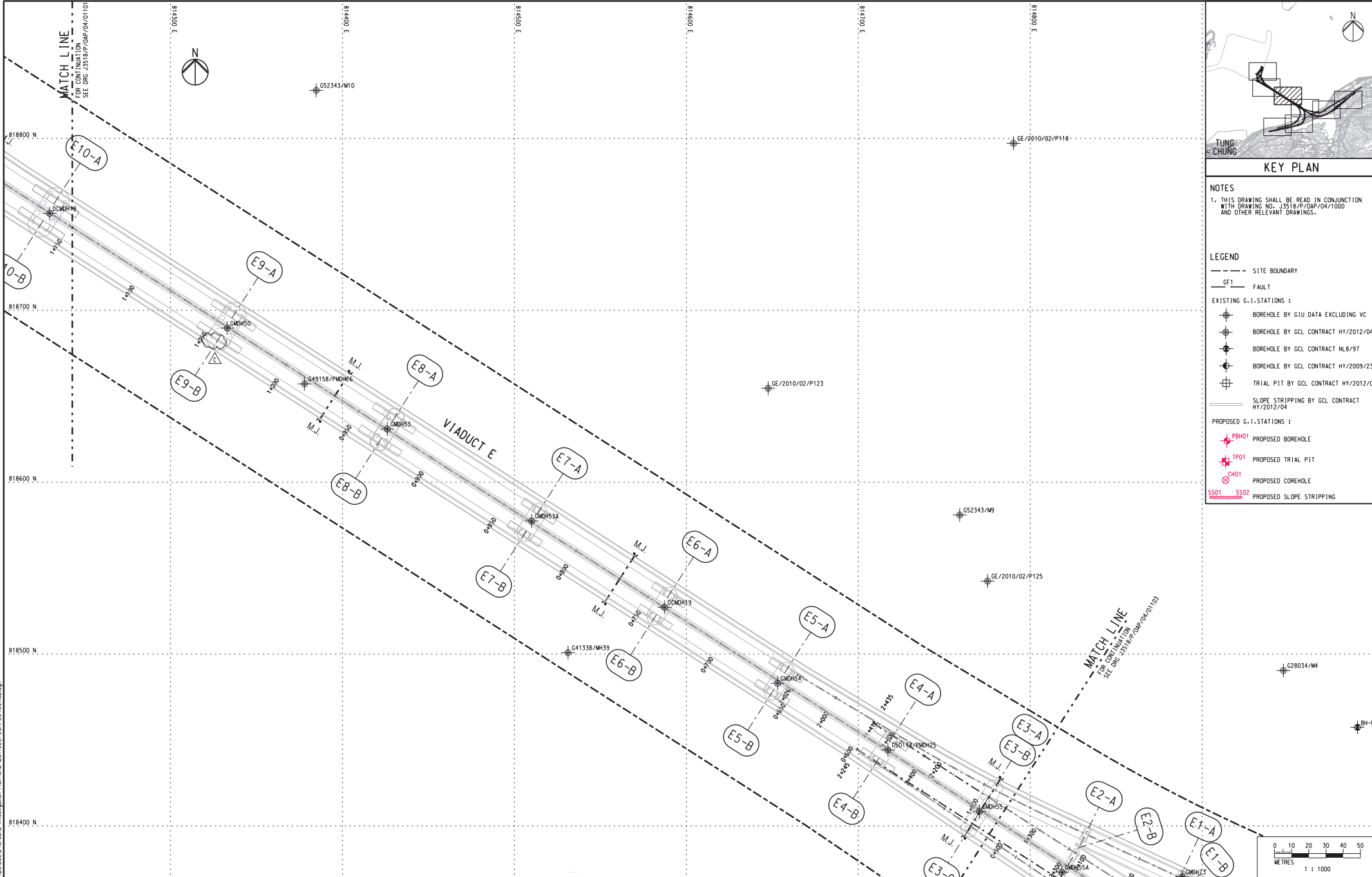
Originator: **ARUP**

Drawing title  
**Figure 1.2c**

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



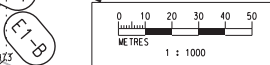
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- LEGEND**
- SITE BOUNDARY
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    - ⊕ BOREHOLE BY GCL CONTRACT HY/2012/04
    - ⊕ BOREHOLE BY GCL CONTRACT NL8/97
    - ⊕ BOREHOLE BY GCL CONTRACT HY/2009/23
    - ⊕ TRIAL PIT BY GCL CONTRACT HY/2012/04
  - 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				

Checked	Approved
DS	DOP

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Client

Supervising Officer

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

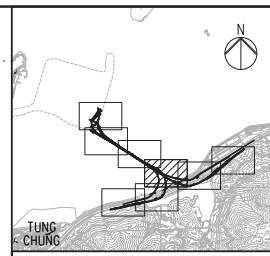
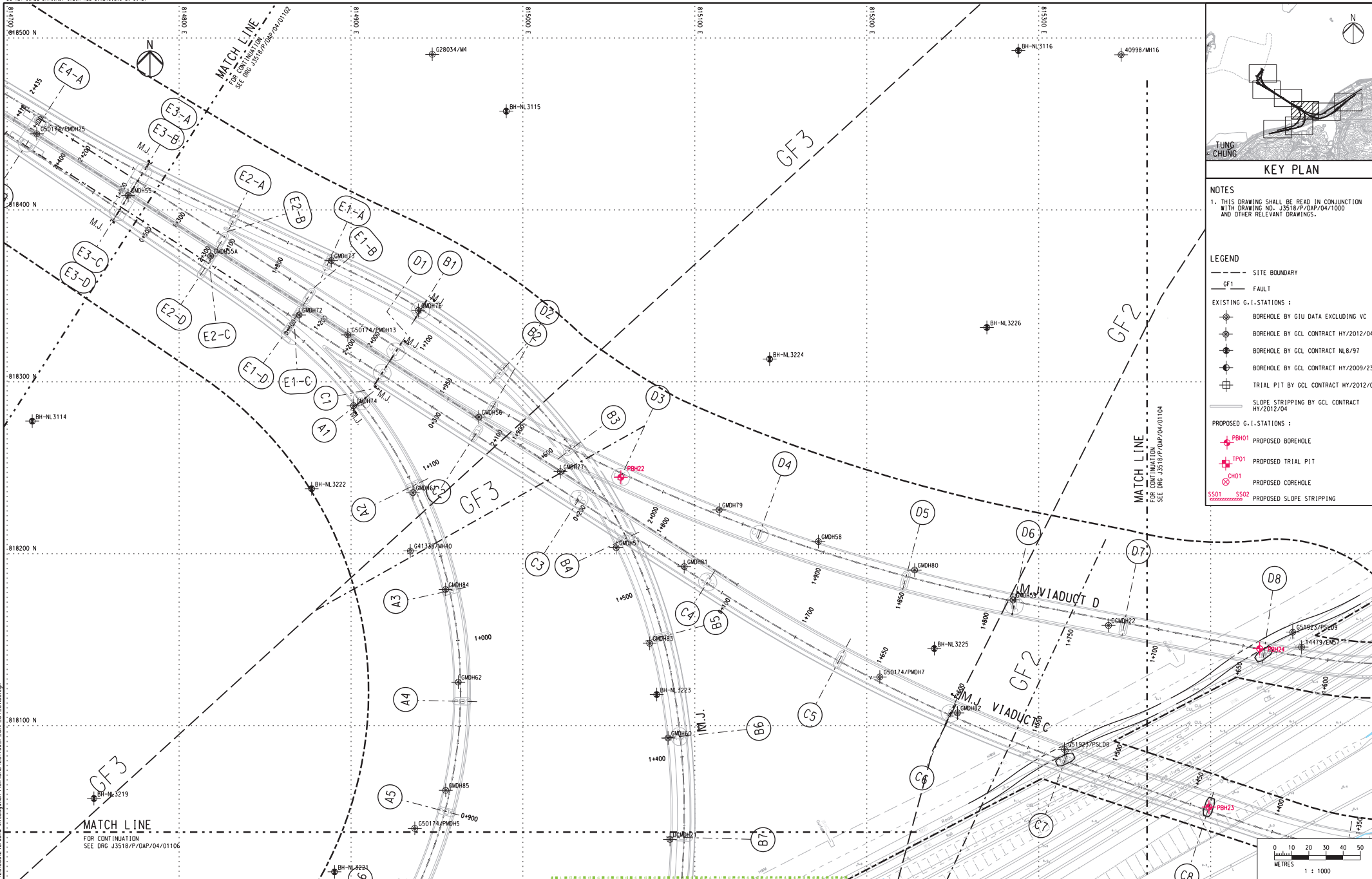
Contractor

Originator

Drawing title  
**Figure 1.2d**

Drawing no. J3518/P/OAP/04/01102 Rev. C

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.



**KEY PLAN**

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

**LEGEND**

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	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
PROPOSED G.I.-STATIONS :	
	PROPOSED BOREHOLE
	PROPOSED TRIAL PIT
	PROPOSED COREHOLE
	PROPOSED SLOPE STRIPPING



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

Checked	Approved
DS	DOP

Scale
1:1000 @ A1 / 1:2000 @ A3

Client  
 路政署  
 HIGHWAYS DEPARTMENT  
 港珠澳大桥香港工程管理局  
 Hong Kong - Zhuhai - Macao Bridge  
 Hong Kong Project Management Office

Supervising Officer  
**AECOM**

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

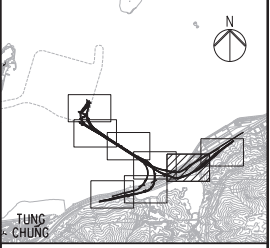
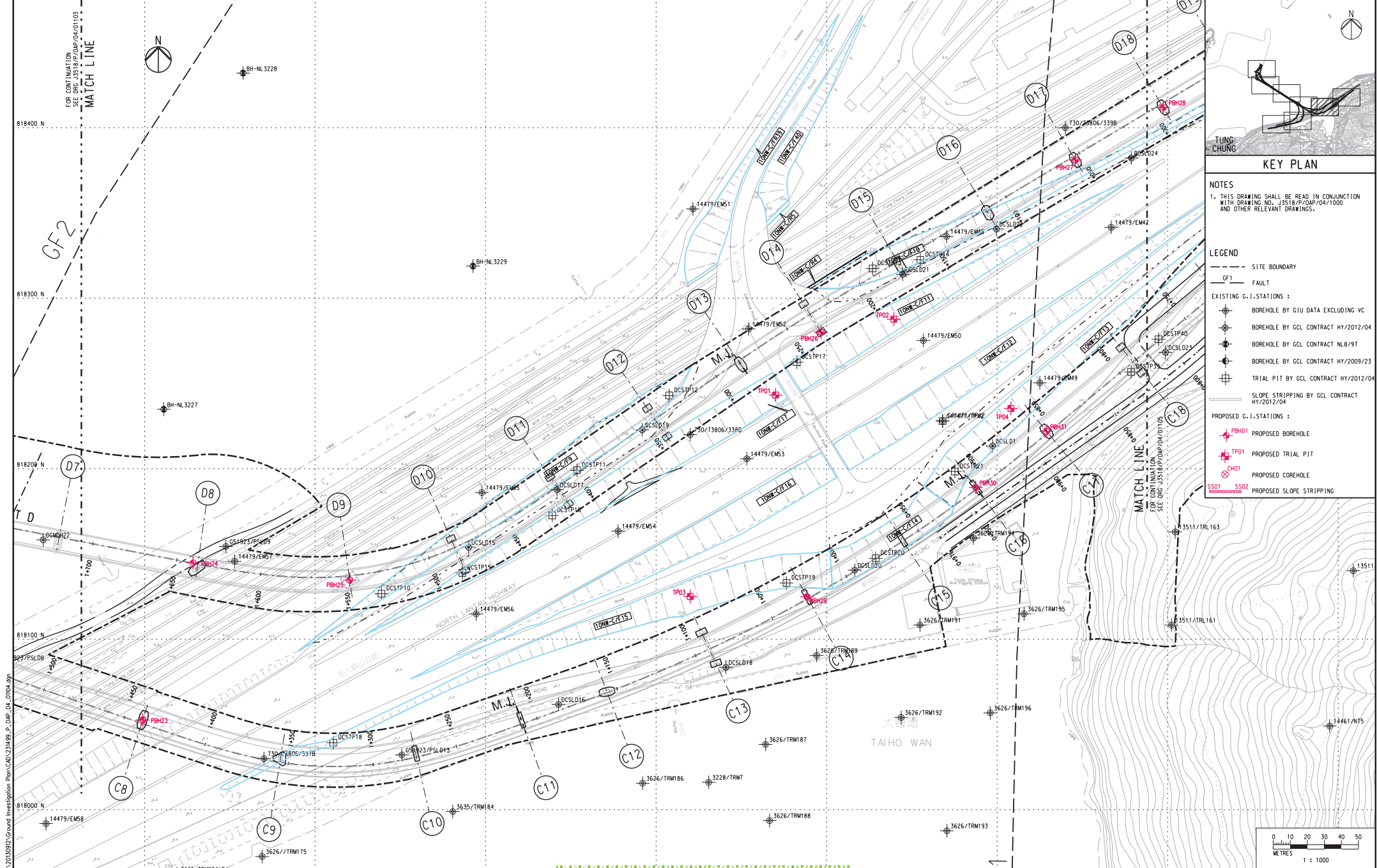
Contractor  
**Gammon**

Originator  
**ARUP**

Drawing title  
**Figure 1.2e**

Drawing no. J3518/P/OAP/04/01103 Rev. c

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**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 NL6/97  
 ● 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	Drawn	Date
A	SUBMISSION	RC	07/13					RL	07/13
B	SUBMISSION	RC	07/13					Checked	Approved
C	SUBMISSION	RC	09/13					DS	DOP
								Scale	1:1000 @ A1 / 1:2000 @ A3

Client

Supervising Officer

Project Title

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

Contractor

Originator

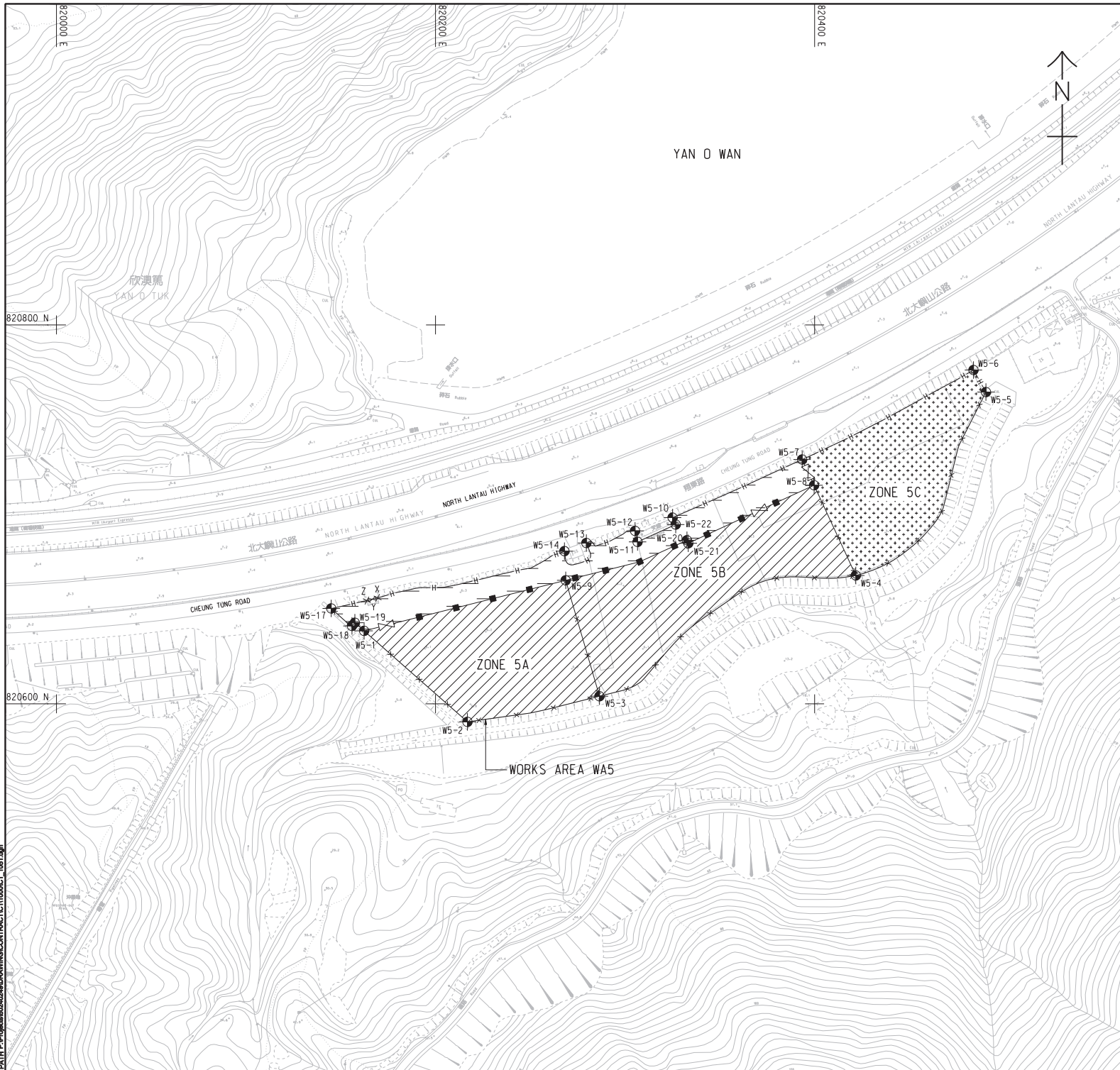
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# Figure 1.2f

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

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**NOTES:**

- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE WORKS AREA KEY PLAN IN SHEET NO. 60240249/C1/1000.
- 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. T15 619. IN CASE OF DISCREPANCY BETWEEN THE BOUNDARY SHOWN ON THIS DRAWING AND THE BOUNDARY INDICATED ON THE ENGINEERING CONDITIONS, THE LATTER SHALL PREVAIL.
- DEMARCATION OF THE WORKS AREA SHALL BE DETERMINED ON SITE.
- REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6110 AND H6111 FOR DETAILS OF HOARDING.
- REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NOS. H6121 AND H6122 FOR DETAILS OF CHAIN LINK FENCE.
- REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NO. H6121 FOR DETAILS OF GATE.
- CHAIN LINK FENCE SHALL BE ERRECTED 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.
- THE LOCATION AND WIDTH OF GATE SHOWN ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE SUPERVISING OFFICER.
- NO STRUCTURES SHALL BE ERRECTED 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.
- THE TENTATIVE OCCUPATION PERIOD SHALL BE REFERRED TO EMPLOYER'S REQUIREMENTS PART 2 AND PART 14 SECTION 1 CLAUSE 1.45A.
- THE WORKS AREAS SHOWN ON THIS DRAWING ARE TO BE SHARE-USED AMONG THE CONTRACTS OF TM-CLK RELATED CONTRACTS. THE AREAS HATCHED WITH ARE TENTATIVELY ALLOCATED FOR THE USE OF THIS CONTRACT.
- 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.
- HOARDING AND GATE (TO BE ERRECTED AND MAINTAINED UNDER THIS CONTRACT)
- CHAIN LINK FENCE AND GATE (TO BE ERRECTED AND MAINTAINED BY OTHERS)
- CHAIN LINK FENCE AND GATE (TO BE ERRECTED AND MAINTAINED UNDER THIS CONTRACT)

**SETTING OUT COORDINATES OF WORKS AREA W5**

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

**ISSUE/REVISION**

NO.	DATE	DESCRIPTION	CHK.
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**STATUS**

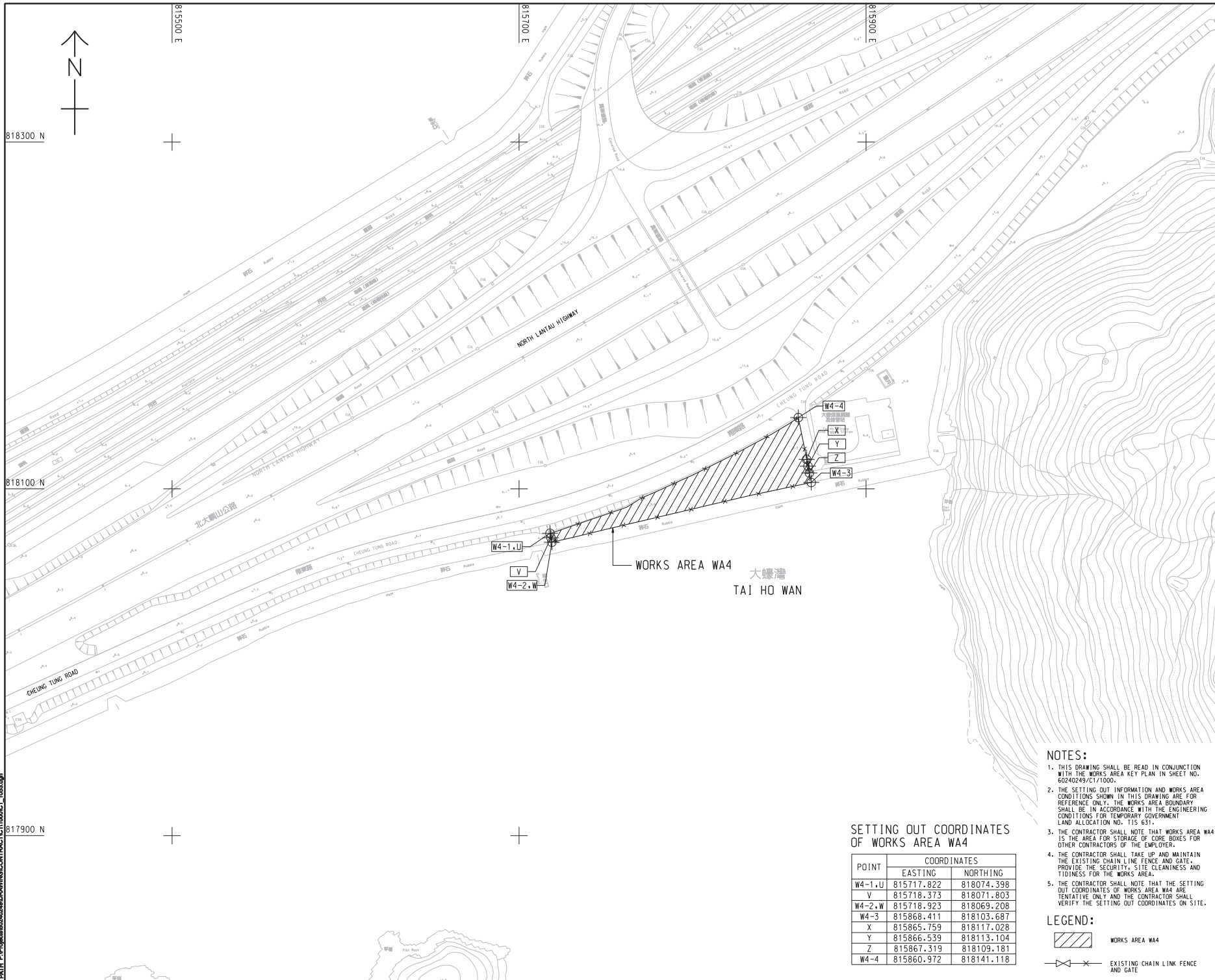
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A1:1000	METRES

**KEY PLAN**

**Figure 1.2h**

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SETTING OUT COORDINATES OF WORKS AREA WA4

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

- NOTES:**
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE WORKS AREA KEY PLAN IN SHEET NO. 60240249/C1/100.
  - 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. T15 631.
  - THE CONTRACTOR SHALL NOTE THAT WORKS AREA WA4 IS THE AREA FOR STORAGE OF CORE BOXES FOR OTHER CONTRACTORS OF THE EMPLOYER.
  - THE CONTRACTOR SHALL TAKE UP AND MAINTAIN THE EXISTING CHAIN LINK FENCE AND GATE. PROVIDE THE SECURITY, SITE CLEANLINESS AND TIDINESS FOR THE WORKS AREA.
  - THE CONTRACTOR SHALL NOTE THAT THE SETTING OUT COORDINATES OF WORKS AREA WA4 ARE TENTATIVE ONLY AND THE CONTRACTOR SHALL VERIFY THE SETTING OUT COORDINATES ON SITE.

**LEGEND:**

WORKS AREA WA4

EXISTING CHAIN LINK FENCE AND GATE

**AECOM**

**PROJECT**  
 TUEN MUN - CHEK LAP KOK LINK

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

**CLIENT**  
 路政署 DEPARTMENT OF HIGHWAYS  
 港務局 港務工程管理局  
 Hong Kong + Zhuhai + Hainan Bridge  
 Hong Kong Project Management Office

**CONSULTANT**  
 AECOM Asia Company Ltd.  
 www.aecom.com

**SUB-CONSULTANTS**  
 2/11/2012/16

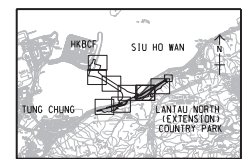
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**ISSUE/REVISION**

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 METRES



**PROJECT NO.**  
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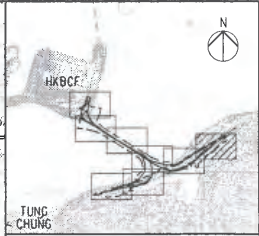
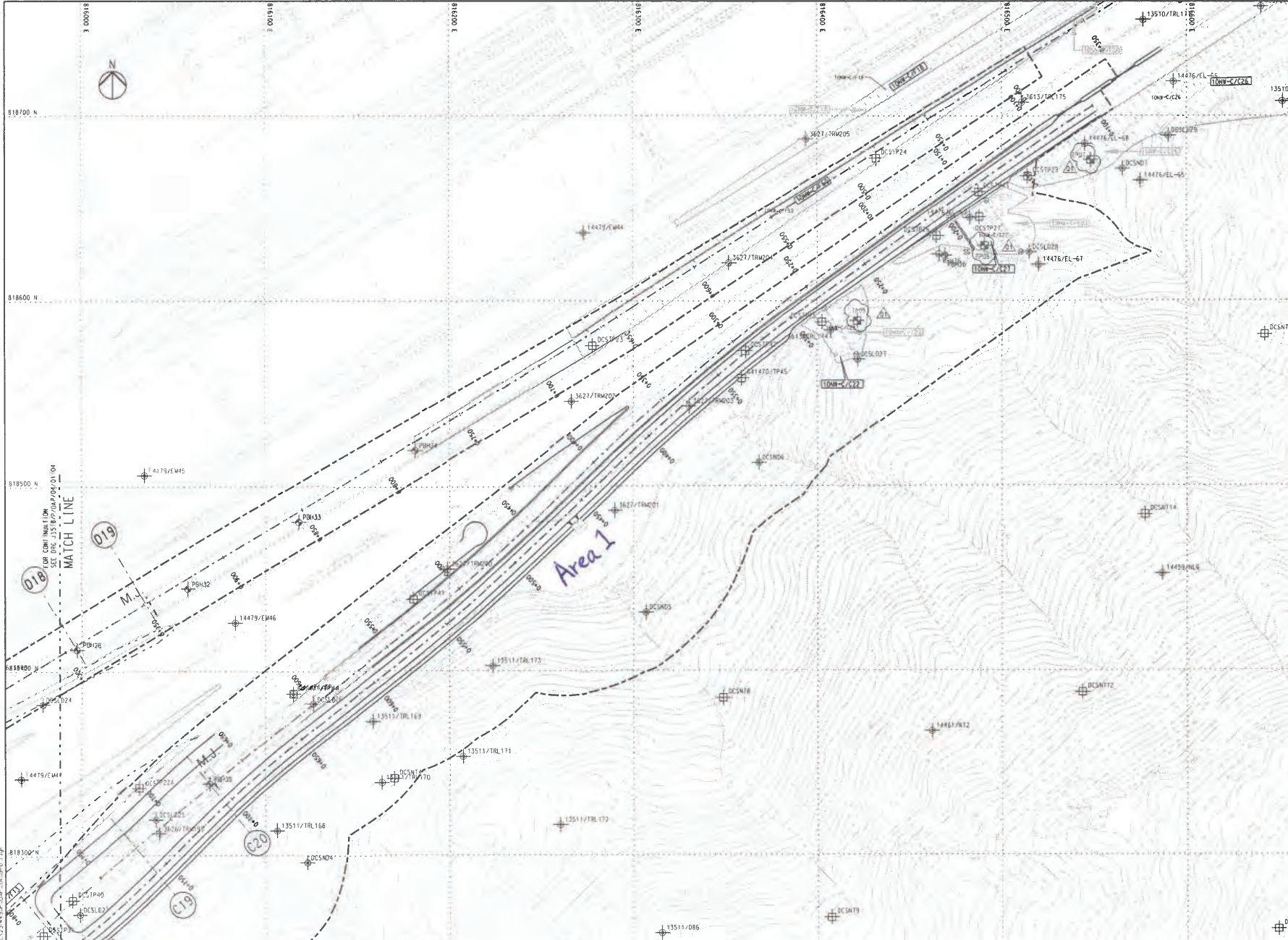
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 HY/2012/07

**SHEET TITLE**  
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**SHEET NUMBER**  
 60240249/C1/1053

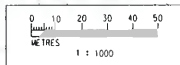
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**NOTES**  
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- LEGEND**
- SITE BOUNDARY
  - GF1 FAULT
- EXISTING G.I. STATIONS :
- ⊕ BOREHOLE BY GIU DATA EXCLUDING VC
  - ⊕ BOREHOLE BY GCL CONTRACT HY/2012/04
  - ⊕ BOREHOLE BY GCL CONTRACT NLB/97
  - ⊕ 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 :
- ⊕ B-0 PROPOSED BOREHOLE
  - ⊕ T-0 PROPOSED TRIAL PIT
  - ⊕ C-01 PROPOSED COREHOLE
  - ⊕ S502 PROPOSED SLOPE STRIPPING



Rev	Description	By	Date	Rev	Description	By	Date
01	ISSUED FOR CONSTRUCTION	RL	31/03				
02	ISSUED FOR CONSTRUCTION	RL	07/13				
03	ISSUED FOR CONSTRUCTION	RL	29/13				
04	ISSUED FOR CONSTRUCTION	RL	19/12				

Drawn	Date	Client
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Checked	Approved	Supervising Officer
DS	DOP	AZCOM
Scale	1:1000 @ A1 / 1:2000 @ A3	

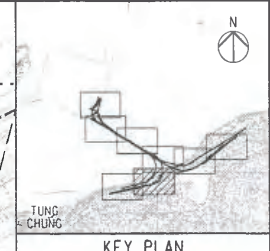
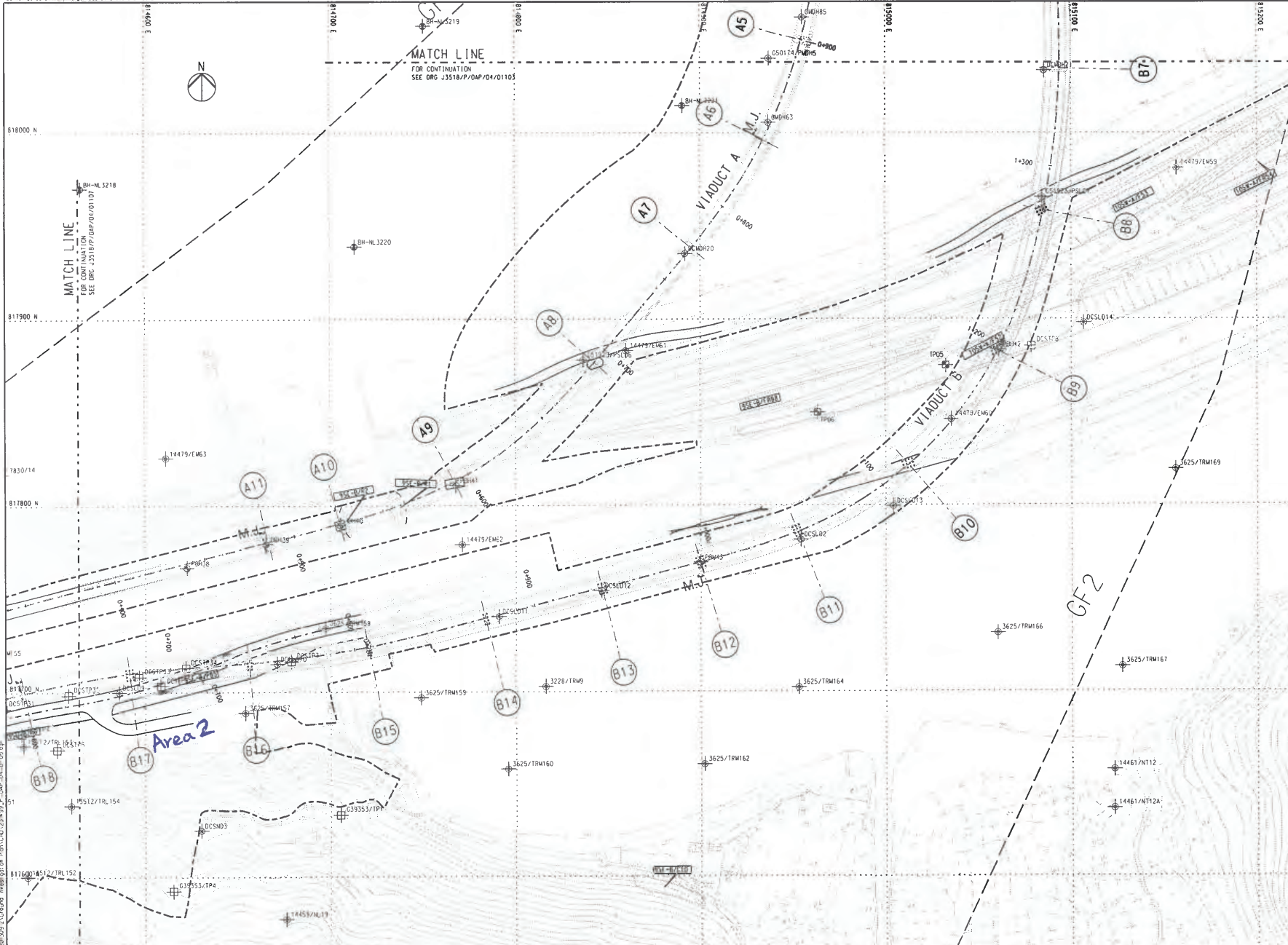
	Client 路政署 HIGHWAYS DEPARTMENT 港珠澳大桥香港工程指挥部 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office	Project Title Contract No. HY/2012/07 Tuen Mun - Chek Lap Kok Link Southern Connection Viaduct Section
	Supervising Officer AZCOM	Contractor Gammon

Drawing title  
**Figure 1.2k**

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

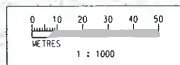


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**NOTES**  
 1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NO. J3518/P/OAP/04/1000 AND OTHER RELEVANT DRAWINGS.

- LEGEND**
- SITE BOUNDARY
  - GF1- FAULT
  - EXISTING G.I. STATIONS :
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    - ⊕ BOREHOLE BY GCL CONTRACT HY/2012/04
    - ⊕ BOREHOLE BY GCL CONTRACT NLR/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 :
    - ⊕ PROPOSED BOREHOLE
    - ⊕ PROPOSED TRIAL PIT
    - ⊕ PROPOSED COREHOLE
    - ⊕ PROPOSED SLOPE STRIPPING



Rev	Description	By	Date	Rev	Description	By	Date
A	SUBMISSION	RL	07/13				
B	SUBMISSION	RL	07/13				
C	SUBMISSION	RL	07/13				

Drawn	Date	Client	路政署 HIGHWAYS DEPARTMENT 港珠澳大橋香港工程管理有限公司 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	Drawing Title	<b>Figure 1.2I</b> Drawing no. J3518/P/OAP/04/01106 Rev c
Checked	Approved	Supervising Officer		Contractor		Originator	
DS	DOP						
Scale	1:1000 @ A1 / 1:2000 @ A3						

The construction phase of the Contract commenced on 31 October 2013. The rolling construction programme for the period of March to May 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:

#### March 2016

##### *Marine Works*

- 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.

##### *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.

#### April 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.

May 2016

***Marine Works***

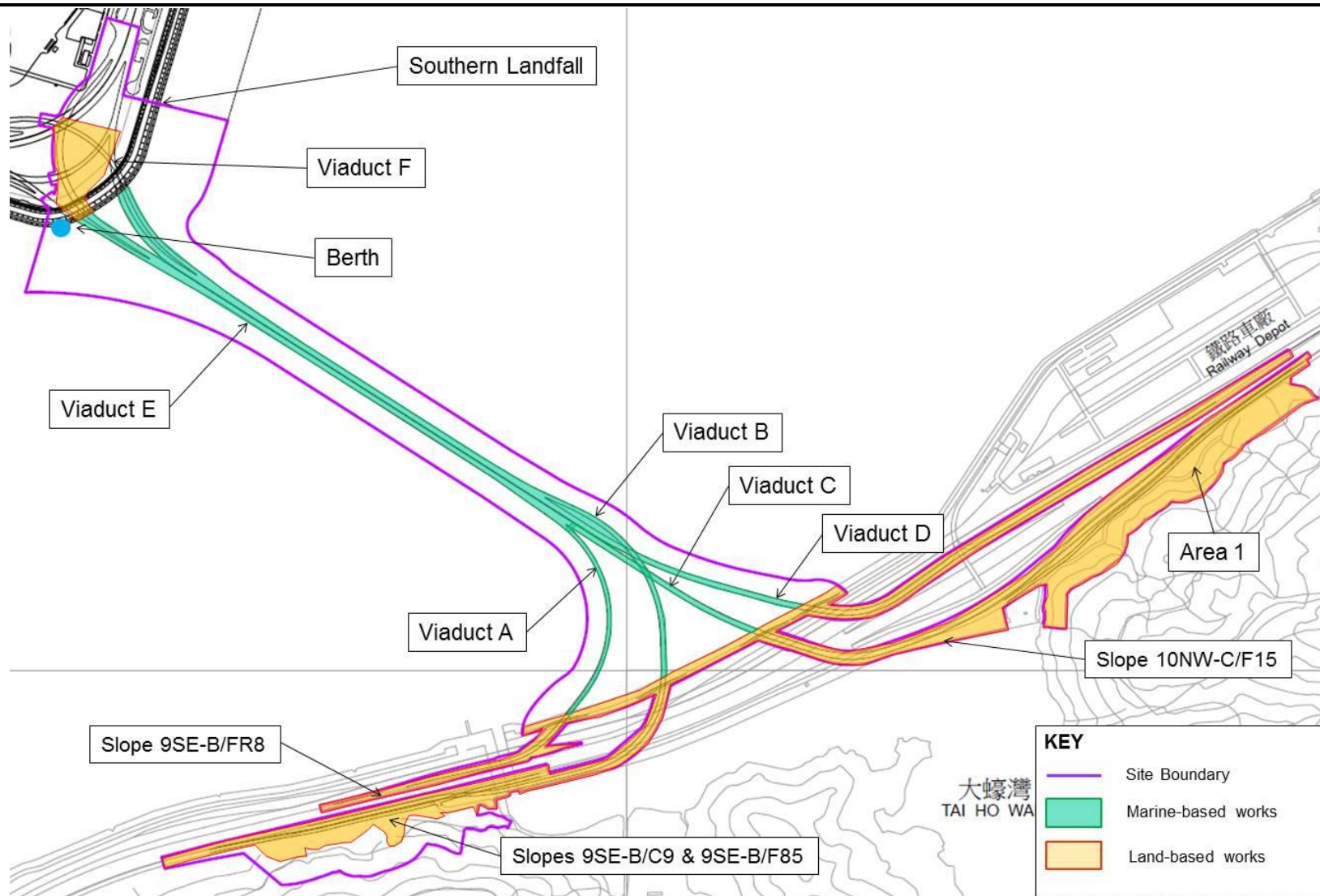
- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Construction of marine section of berth at Southern Landfall;
- Launching gantry operation; and
- Installation of deck segment and pier head segment.

***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.

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



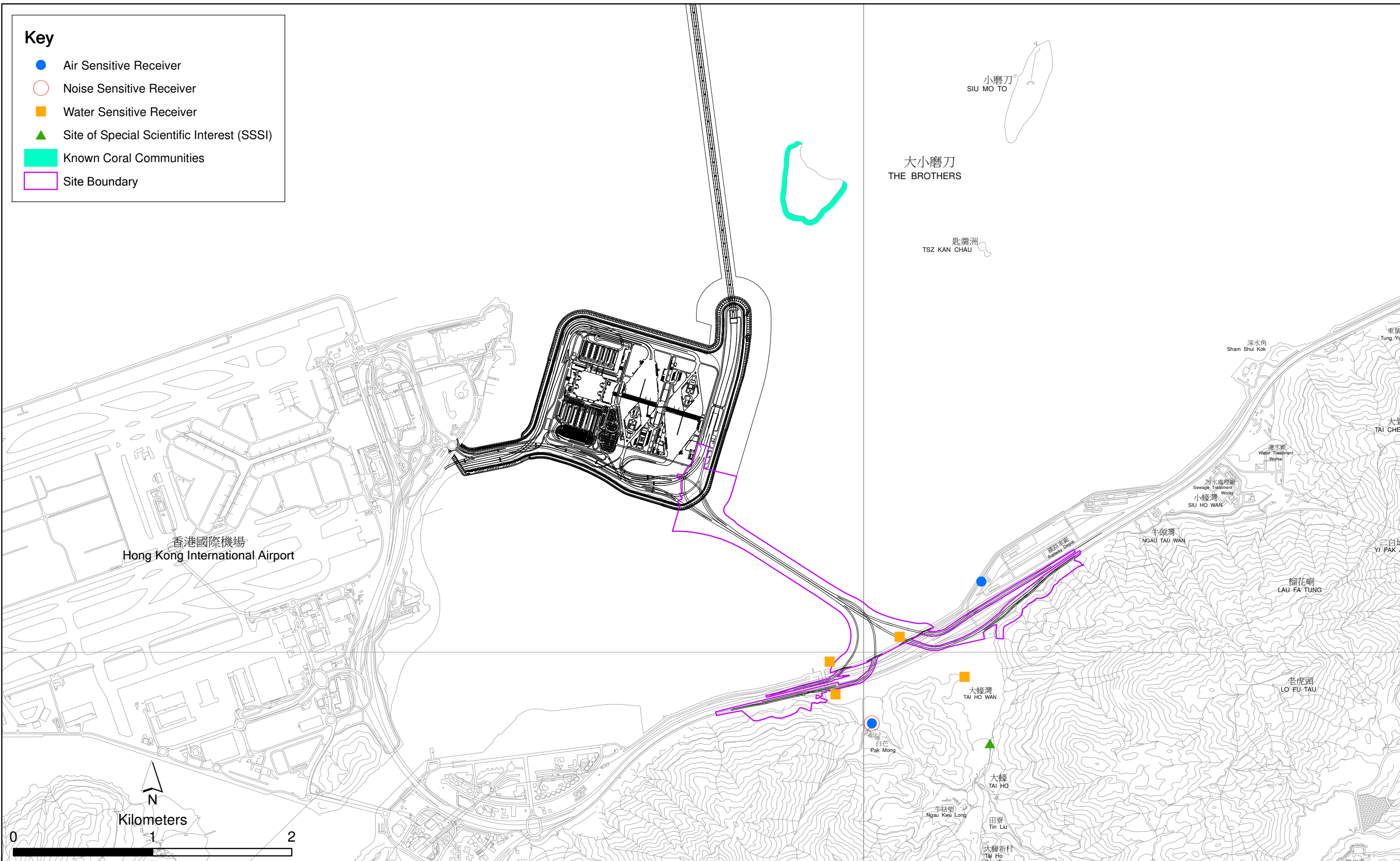


Figure 1.4

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

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.

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 <sup>(1)</sup> 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.

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

Monitoring Station <sup>(1)</sup>	Monitoring Period	Location	Description	Parameters & Frequency
-----------------------------------	-------------------	----------	-------------	------------------------

<sup>(1)</sup> 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.

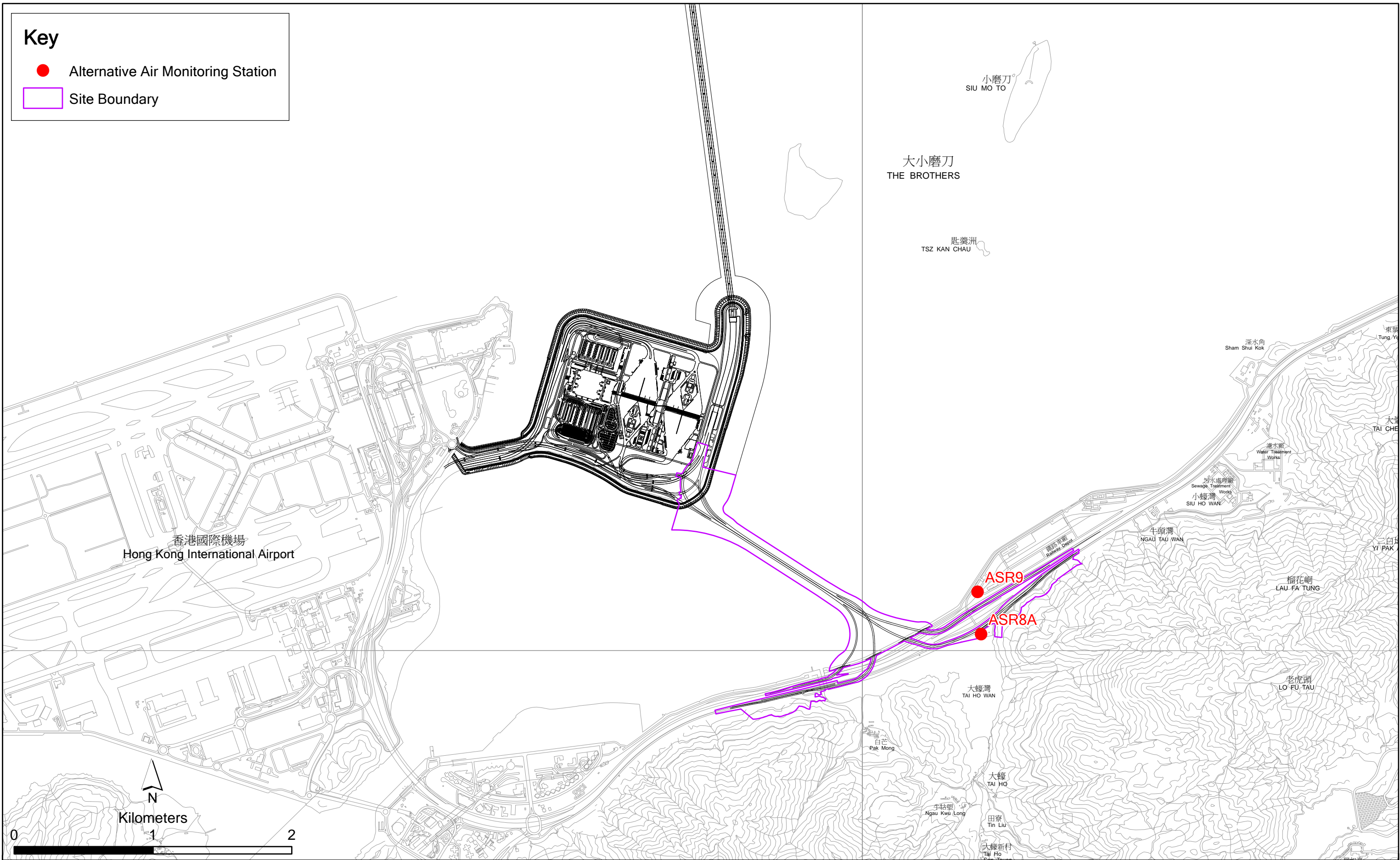


Figure 2.1

Locations of Air Quality Monitoring Stations



Monitoring Station <sup>(1)</sup>	Monitoring Period	Location	Description	Parameters & Frequency
ASR8A	3, 9, 15, 21, 24 and 30 March 2016;	Area 4	On ground at the Area 4	<ul style="list-style-type: none"> <li>1-hour Total Suspended Particulates (1-hour TSP, µg/m<sup>3</sup>), 3 times per day every 6 days</li> <li>24-hour Total Suspended Particulates (24-hour TSP, µg/m<sup>3</sup>), daily for 24-hour every 6 days</li> </ul>
ASR9	5, 11, 14, 20, 26 and 29 April 2016; 5, 11, 17, 23 and 27 May 2016	MTR Depot	On the ground nearby MTR Depot entrance	

Note:

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

**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 *Twenty-ninth to Thirty-first Monthly EM&A Reports*.

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

Month	Station	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
March 2016	ASR 8A	129	58 - 259	394	500
	ASR 9	106	65 - 182	393	500
April 2016	ASR 8A	100	44 - 224	394	500
	ASR 9	86	62 - 129	393	500
May 2016	ASR 8A	82	44 - 187	394	500
	ASR 9	95	62 - 146	393	500

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

Month	Station	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
March 2016	ASR 8A	76	59 - 112	178	260
	ASR 9	73	56 - 111	178	260
April 2016	ASR 8A	57	43 - 81	178	260
	ASR 9	59	51 - 73	178	260
May 2016	ASR 8A	55	44 - 71	178	260
	ASR 9	60	50 - 73	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 17 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* <sup>(1)</sup> 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*.

<sup>(1)</sup> 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.

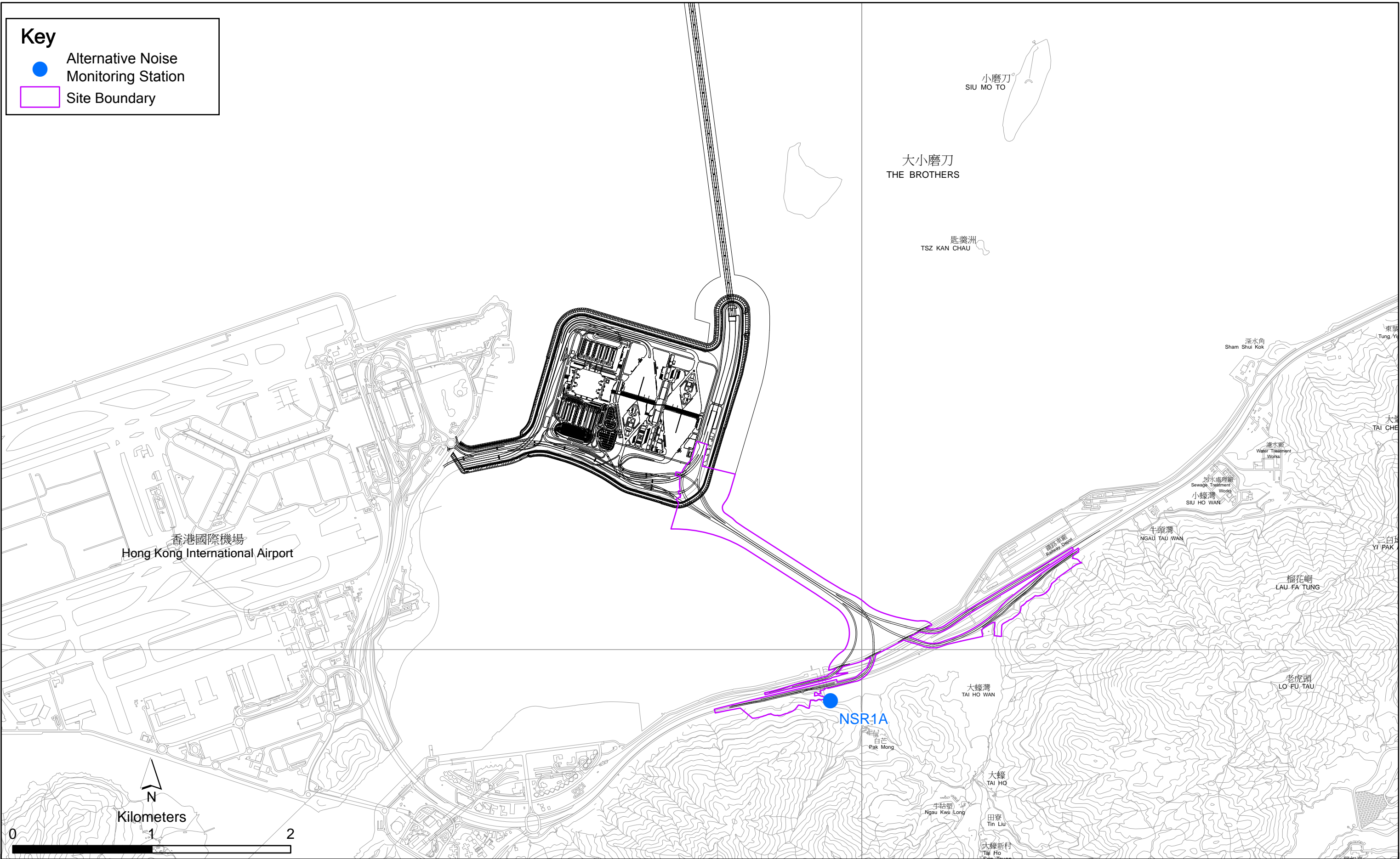


Figure 2.2

Location of Noise Monitoring Station

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

Monitoring Station	Monitoring Period	Location	Parameters & Frequency
NSR1A	3, 9, 15, 21, 24 and 30 March 2016; 5, 11, 14, 20, 26 and 29 April 2016; 5, 11, 17, 23 and 27 May 2016	Pak Mong Village Pavilion	<ul style="list-style-type: none"> <li>30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays (Monday to Saturday). <math>L_{eq}</math>, <math>L_{10}</math> and <math>L_{90}</math> would be recorded.</li> <li>At least once a week</li> </ul>

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 *Twenty-ninth to Thirty-first 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)
March 2016	59	58 - 61	75
April 2016	59	58 - 61	75
May 2016	60	59 - 61	75

A total of 17 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 <sup>(1)</sup> 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).

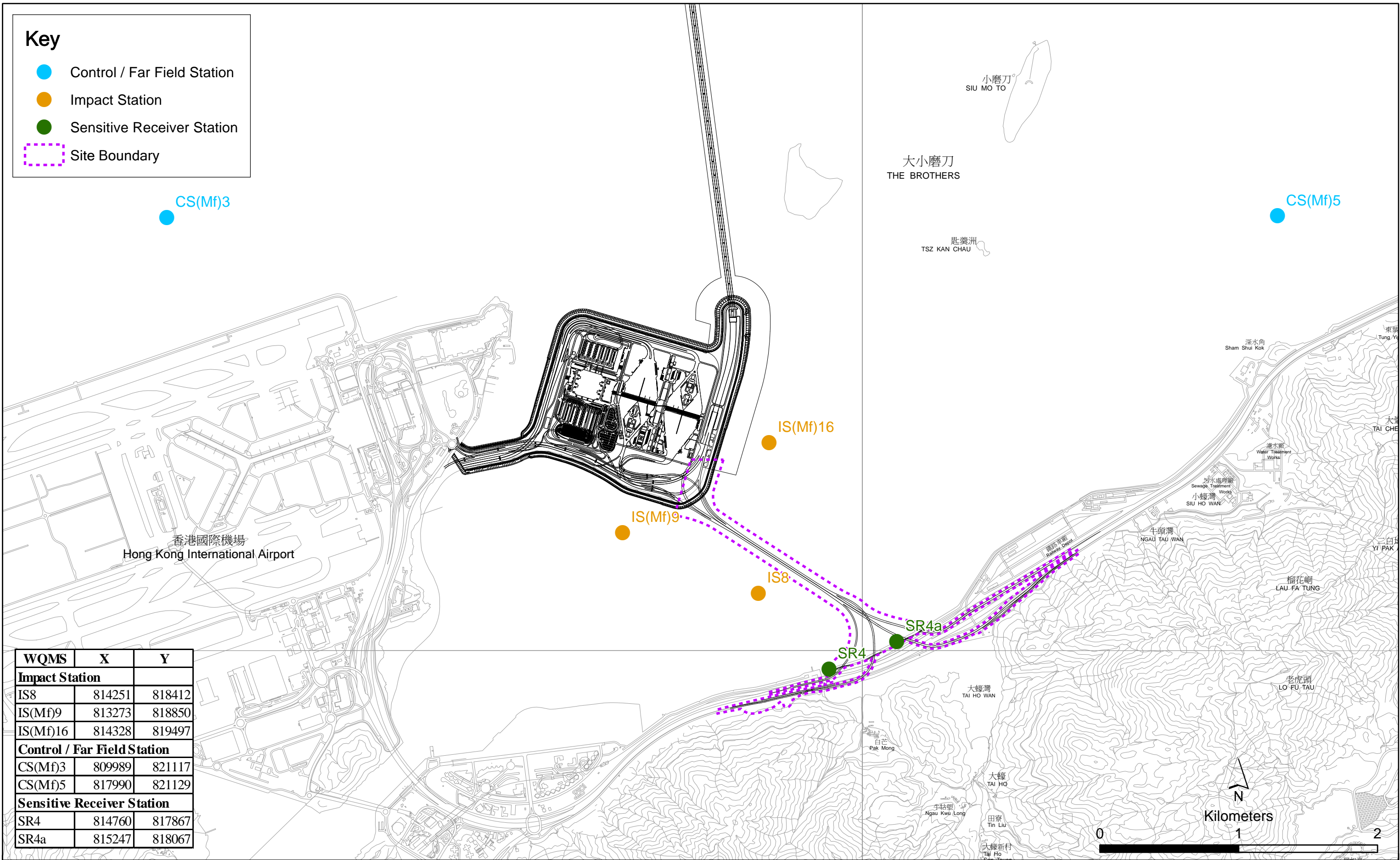
**Table 2.8** *Locations of Water Quality Monitoring Stations and the Corresponding Monitoring Requirements*

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850	<ul style="list-style-type: none"> <li>• Temperature(°C)</li> <li>• pH(pH unit)</li> <li>• Turbidity (NTU)</li> <li>• Water depth (m)</li> <li>• Salinity (ppt)</li> </ul>	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	<ul style="list-style-type: none"> <li>• Dissolved Oxygen (DO) (mg/L and % of saturation)</li> <li>• Suspended Solid (SS) (mg/L)</li> </ul>		
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			

<sup>(1)</sup> 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.

**Key**

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



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

Figure 2.3

Locations of Water Quality Monitoring Stations

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*.

### 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 *Twenty-ninth to Thirty-first Monthly EM&A Reports*.

In this reporting period, a total of 40 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.

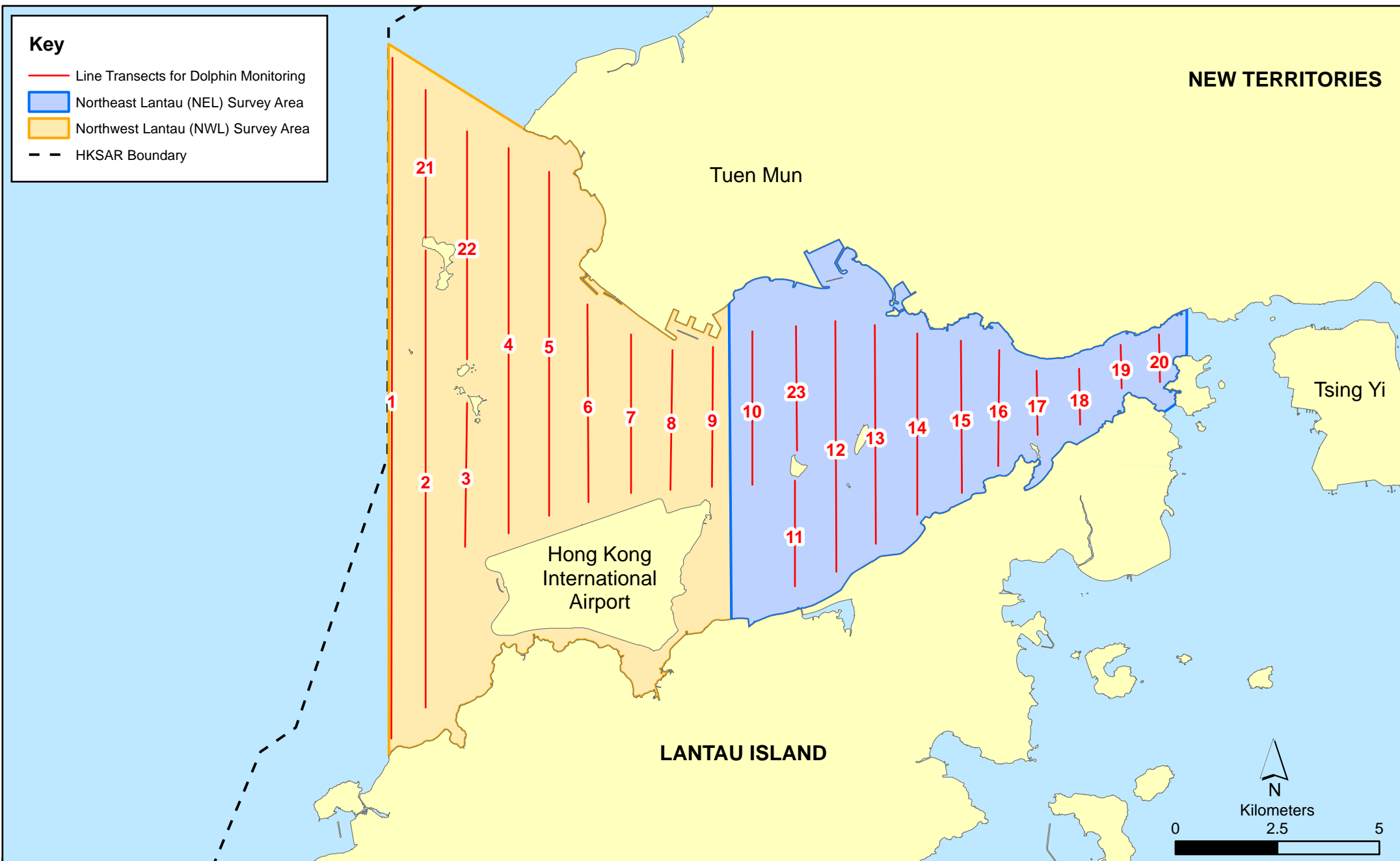


Figure 2.4

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

**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 896.56 km of survey effort was collected, with 90.3% 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,

341.16 km and 555.40 km of survey effort were conducted in NEL and NWL survey areas respectively. The total survey effort conducted on primary lines was 657.94 km, while the effort on secondary lines was 238.62 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 March to May 2016, a total of seven (7) groups of 22 Chinese White Dolphins were sighted. Three (3) dolphin sightings were made on primary lines during on-effort search. In this quarterly period, all dolphin groups were sighted in NWL. 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: 7 <sup>th</sup> / 11 <sup>th</sup> Mar 2016	0.0	0.0
	Set 2: 22 <sup>nd</sup> / 23 <sup>rd</sup> Mar 2016	0.0	0.0
	Set 3: 5 <sup>th</sup> / 12 <sup>th</sup> Apr 2016	0.0	0.0
	Set 4: 15 <sup>th</sup> / 19 <sup>th</sup> Apr 2016	0.0	0.0
	Set 5: 3 <sup>rd</sup> / 12 <sup>th</sup> May 2016	0.0	0.0
	Set 6: 17 <sup>th</sup> / 26 <sup>th</sup> May 2016	0.0	0.0
NWL	Set 1: 7 <sup>th</sup> / 11 <sup>th</sup> Mar 2016	0.0	0.0
	Set 2: 22 <sup>nd</sup> / 23 <sup>rd</sup> Mar 2016	1.6	4.8
	Set 3: 5 <sup>th</sup> / 12 <sup>th</sup> Apr 2016	2.2	17.6
	Set 4: 15 <sup>th</sup> / 19 <sup>th</sup> Apr 2016	2.1	6.3
	Set 5: 3 <sup>rd</sup> / 12 <sup>th</sup> May 2016	0.0	0.0
	Set 6: 17 <sup>th</sup> / 26 <sup>th</sup> May 2016	0.0	0.0

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)	
	March - May 2016	September - November 2011	March - May 2016	September - November 2011
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	0.98 ± 1.10	9.85 ± 5.85	4.78 ± 6.85	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 eight (8) individuals per group in North Lantau region during March to May 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 Size*

	Average Dolphin Group Size	
	March - May 2016	September - November 2011
Overall	3.14 ± 2.27 (n = 7)	3.72 ± 3.13 (n = 66)
Northeast Lantau	N/A	3.18 ± 2.16 (n = 17)
Northwest Lantau	3.14 ± 2.27 (n = 7)	3.92 ± 3.40 (n = 49)

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between March and May 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, 8, 16, 23 and 31 March 2016; 6, 13, 20 and 28 April 2016; and 4, 11, 18 and 26 May 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 March 2016	Area 1 <ul style="list-style-type: none"> <li>A chemical container was not placed in drip tray.</li> <li>Soil stockpile was not covered.</li> <li>Refuse was found in drainage.</li> </ul>	Area 1 <ul style="list-style-type: none"> <li>Chemical containers should be placed in drip tray.</li> <li>Tarpaulin sheet was used to cover the stockpile immediately.</li> <li>Refuse in drainage should be cleaned up regularly.</li> </ul>
8 March 2016	Pier E4 <ul style="list-style-type: none"> <li>Sandbags were insufficient to avoid runoff.</li> <li>Refuse was found on platform.</li> <li>Excessive soil was found in gutter.</li> </ul> Pier E5 <ul style="list-style-type: none"> <li>Chemical containers were not placed in drip tray.</li> <li>Oil stain was found on platform.</li> </ul>	Pier E4 <ul style="list-style-type: none"> <li>More sandbags should be provided to avoid runoff.</li> <li>Refuse on platform should be cleaned up regularly.</li> </ul> Pier E5 <ul style="list-style-type: none"> <li>Excessive soil in gutter should be cleaned up regularly.</li> <li>Chemical containers should be placed in drip tray.</li> <li>Oil stain should be cleaned up.</li> </ul>
16 March 2016	Pier A9 <ul style="list-style-type: none"> <li>Chemical containers were not placed in drip tray.</li> <li>An outdated EP was displayed at the entrance.</li> </ul> Area 2 <ul style="list-style-type: none"> <li>Water was leaking from pipe and accumulated in site area.</li> </ul>	Pier A9 <ul style="list-style-type: none"> <li>Chemical containers should be placed in drip tray.</li> <li>Only the most updated EP should be displayed.</li> </ul> Area 2 <ul style="list-style-type: none"> <li>Water leakage should be avoided for preventing stagnant water runoff.</li> </ul>

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
23 March 2016	Pier E7 <ul style="list-style-type: none"> <li>A generator was not placed on decoupling pad.</li> <li>Oil stain was found on platform.</li> <li>Some chemical containers were not placed in drip tray.</li> <li>An expired dumping permit was displayed.</li> </ul>	Pier E7 <ul style="list-style-type: none"> <li>Generator on marine platform should be placed on decoupling pad.</li> <li>Oil stain was removed immediately.</li> <li>Chemical containers should be placed in drip tray.</li> <li>The expired dumping permit was removed immediately.</li> </ul>
31 March 2016	Area 1 <ul style="list-style-type: none"> <li>Equipment was placed too close to natural habitat.</li> </ul> Pier E7 <ul style="list-style-type: none"> <li>A generator was not well placed on decoupling pad.</li> </ul>	Area 1 <ul style="list-style-type: none"> <li>Construction equipment should be placed away from natural habitat.</li> </ul> Pier E7 <ul style="list-style-type: none"> <li>Generators on marine platform should be well placed on decoupling pad.</li> </ul>
6 April 2016	Area 1 <ul style="list-style-type: none"> <li>Some broken sandbags were placed too close to drainage.</li> <li>Refuse was found in drainage.</li> <li>Construction material was placed too close to natural habitat.</li> </ul> Area 2 <ul style="list-style-type: none"> <li>Soil stockpile was not well covered.</li> </ul>	Area 1 <ul style="list-style-type: none"> <li>Broken sandbags should be removed.</li> <li>Refuse in drainage should be cleaned up.</li> <li>Construction material should be placed away from natural habitat.</li> </ul> Area 2 <ul style="list-style-type: none"> <li>Soil stockpile should be well covered.</li> </ul>
13 April 2016	Seafront <ul style="list-style-type: none"> <li>Oil stain was found on the floor.</li> </ul>	Seafront <ul style="list-style-type: none"> <li>Oil stain should be cleaned up.</li> </ul>
20 April 2016	Abutment D <ul style="list-style-type: none"> <li>Drip tray for generator was not plugged.</li> <li>The road was partially dry.</li> </ul>	Abutment D <ul style="list-style-type: none"> <li>Drip tray should be plugged.</li> <li>Watering should be applied regularly to avoid dust emission.</li> </ul>
28 April 2016	Pier E6 <ul style="list-style-type: none"> <li>Drip tray for generator was not plugged.</li> </ul> Pier E4 <ul style="list-style-type: none"> <li>Waste on platform was not properly stored.</li> </ul>	Pier E6 <ul style="list-style-type: none"> <li>Drip tray should be plugged.</li> </ul> Pier E7 <ul style="list-style-type: none"> <li>Waste should be stored properly.</li> </ul>
4 May 2016	Pier E13AB <ul style="list-style-type: none"> <li>Waste was not properly disposed.</li> </ul> Pier E6 <ul style="list-style-type: none"> <li>Drip tray for generator was not plugged..</li> </ul>	Pier E13AB <ul style="list-style-type: none"> <li>Waste should be properly stored and disposed.</li> </ul> Pier E6 <ul style="list-style-type: none"> <li>Drip tray should be plugged..</li> </ul>
11 May 2016	Area 1 <ul style="list-style-type: none"> <li>Checklist of a wetsep was not displayed.</li> <li>Soil Stockpile was not well covered by tarpaulin sheet.</li> </ul> Area 2 <ul style="list-style-type: none"> <li>The unpaved area was partially dry.</li> </ul>	Area 1 <ul style="list-style-type: none"> <li>Checklist of the wetsep should be displayed.</li> <li>Soil Stockpile should be well covered</li> </ul> Area 2 <ul style="list-style-type: none"> <li>Watering should be applied regularly to avoid dust emission.</li> </ul>
18 May 2016	Pier E13AB <ul style="list-style-type: none"> <li>Waste was improperly stored on marine platform.</li> <li>A chemical container was not placed in drip tray.</li> </ul>	Pier E13AB <ul style="list-style-type: none"> <li>Waste should be properly stored and cleaned up regularly.</li> <li>Chemical containers should be placed in drip tray.</li> </ul>
26 May 2016	Area 2 <ul style="list-style-type: none"> <li>Soil stockpile was not well covered by tarpaulin sheet.</li> </ul> Pier E1 <ul style="list-style-type: none"> <li>Surface runoff control was insufficient.</li> <li>An air compressor was not placed in drip tray.</li> <li>A chemical container was not placed in drip tray.</li> </ul>	Area 2 <ul style="list-style-type: none"> <li>Soil stockpile should be well covered by tarpaulin sheet.</li> </ul> Pier E1 <ul style="list-style-type: none"> <li>Surface runoff control should be provided.</li> <li>Air compressor should be placed in drip tray.</li> <li>Chemical container should be placed in drip tray.</li> </ul>

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 <sup>(a)</sup> (m <sup>3</sup> )	Imported Fill (m <sup>3</sup> )	Inert Construction Waste Re- used (m <sup>3</sup> )	Non-inert Construction Waste <sup>(b)</sup> (kg)	Recyclable Materials <sup>(c)</sup> (kg)	Chemical Wastes (kg)	Marine Sediment (m <sup>3</sup> )	
							Category L	Category M
March 2016	965	0	537	88,360	0	2,000	0	0
April 2016	565	0	789	79,580	8,724	3,000	0	0
May 2016	440	0	581	75,620	0	3,000	0	0
<b>Total</b>	<b>1,970</b>	<b>0</b>	<b>1,907</b>	<b>243,560</b>	<b>8,724</b>	<b>8,000</b>	<b>0</b>	<b>0</b>

**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/I	17-Jul-15	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
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
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 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 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 HY/2012/07 (WA5 adjacent to Cheung Tung Road, Yam O)
Construction Noise Permit for night works and works in general holidays	GW-RS0080-16	01-Feb-16	30-Apr-16	GCL	For Broad Permit
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-RS0279-16	29-Mar-16	30-May-16	GCL	Broad Permit for Segmen. Launching at Land Portion
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-RS1054-15	30-Sep-15	29-Mar-16	GCL	For Load unload at NLH near Viaduct D
Construction Noise Permit for night works and works in general holidays	GW-RW0045-16	27-Jan-16	25-Jul-16	GCL	General works at WA5
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

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Marine Dumping Permit	EP/MD/16-138	10-Dec-15	13-Jun-16	GCL	For dumping Type I sediment
Marine Dumping Permit	EP/MD/16-203	29 Mar 2016	30 Apr 2016	GCL	For dumping Type I (Dedicated Site) and Type II sediment
Marine Dumping Permit	EP/MD/17-028	31-May-16	30-Jun-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, SR4, SR4a during mid-ebb tide and SR4a during mid-flood 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  $\alpha=0.05$ , significant difference was only detected at CS(Mf)3 during mid-ebb tide ( $F_{1,70}=5.56$ ,  $p=0.02$ ), which is the upstream control station. The differences at other stations were insignificant ( $F_{1,72}=3.57$ ,  $p=0.06$  at CS(Mf)5 during mid-ebb tide;  $F_{1,60}=0.01$ ,  $p=0.93$  at SR4 during mid-ebb tide;  $F_{1,51}=0.82$ ,  $p=0.37$  at SR4a during mid-ebb tide; and  $F_{1,51}=0.05$ ,  $p=0.83$  during mid-flood tide). 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 <sup>(a)</sup>		Quarterly Mean (March to May 2016)	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
CS(Mf)3	9.2	12.8	12.0	16.6	14.7	13.9
CS(Mf)5	9.2	11.5	11.9	14.9	14.0	13.5
SR4	10.3	12.3	13.4	16.0	13.5	12.6
SR4a	9.1	9.8	11.9	12.7	13.5	13.1
IS8	11.3	13.5	14.6	17.6	13.6	12.8
IS(Mf)9	10.9	14.3	14.2	18.5	14.0	13.2
IS(Mf)16	11.4	10.3	14.8	13.4	14.0	13.2

**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*.

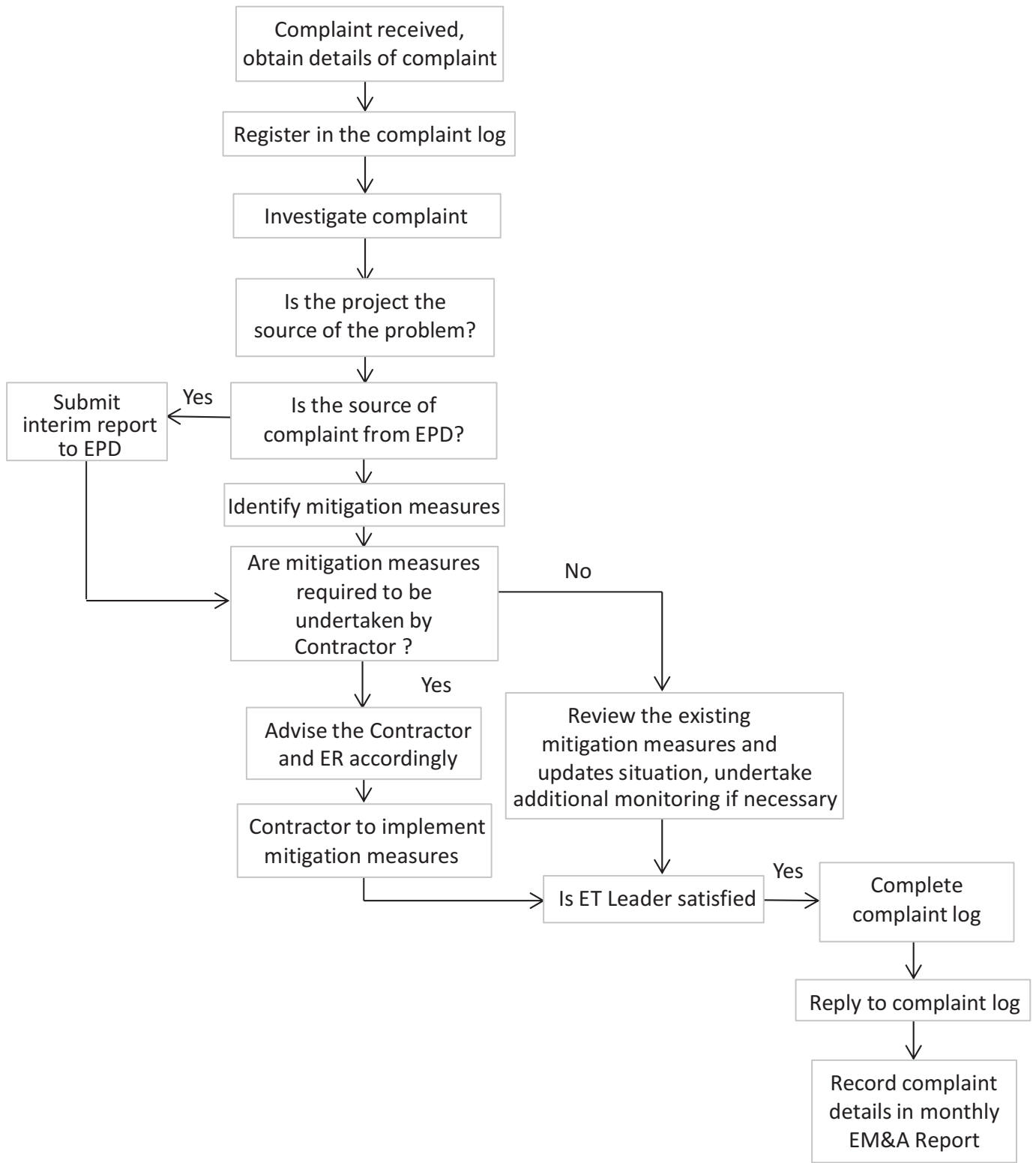


Figure 2.5 Environmental Complaint Handling Procedure

### 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:

##### 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.

**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.

#### 4.1 CONCLUSIONS

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

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

A total of seven (7) groups of twenty-two (22) Chinese White Dolphins were sighted during the six sets of survey from March to May 2016. One (1) Limit Level exceedance was recorded for the quarterly dolphin monitoring data between March and May 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 thirteen (13) times in the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audits.

There was no 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



↔ Line of Communication

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	2016																	
												March			April			May			June								
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20
<b>HY/2012/07 - TM-CLK Link-SC [DWP rF] - Status Update 21-03-2016</b>																													
<b>Contract Key Dates</b>																													
<b>Possession Dates / Access Period</b>																													
POS02-0	Portion A (Commencement of Works+499 days) original	0	21-Mar-16*	0%	0		03-Jun-15		-292	0	0%																		
POS02-1B	Portion A - Area 1B	0	21-Mar-16*	0%	0		14-Sep-15		-188	0	0%																		
POS02-3	Portion A - Area 3	0	21-Mar-16*	0%	0		03-Nov-15		-139	0	0%																		
POS02-6	Portion A - Area 6	0	21-Mar-16*	0%	0		03-Nov-15		-139	0	0%																		
POS03-0	Portion B (Commencement of Works+619 days) original	0	21-Mar-16*	0%	0		02-Oct-15		-171	0	0%																		
<b>Section Completion Dates</b>																													
<b>Vacate Works Area</b>																													
VAC05	Vacate Works Area WA5 (Zone 5C) (Commencement of Works+758 days)	0		0%	0	21-Mar-16*		31-Dec-15	-80	1228	0%																		
<b>General Submissions</b>																													
<b>General Requirements</b>																													
<b>Temporary Works Design</b>																													
PR00130	Unloading Jetty at HKBCF - Working Platform design and approval	90	02-Jun-14 A	95%	5	29-Mar-16	24-Jul-15	29-Jul-15	-196	991	95%																		
<b>Land Works</b>																													
PR00160	Propose/submit a performance review for piled fnds in accordance w/ ETW	101	26-May-14 A	100%	0	21-Mar-16	05-Apr-16	05-Apr-16	10	373	100%																		
<b>Land GI Works</b>																													
PR02204	SQR Sampling & Testing and Approval	110	14-Aug-14 A	95%	6	30-Mar-16	02-Dec-14	08-Dec-14	-383	7	95%																		
PR03110	Trial Pits along Cheung Tung Road	20	21-Oct-13 A	95%	1	21-Mar-16	08-Dec-14	08-Dec-14	-378	11	95%																		
<b>Design Submissions</b>																													
<b>Detailed Design (v18.8 18-08-14)</b>																													
<b>General Submissions</b>																													
ARDD0037-1	Preparation of Seismic Performance Report Viaduct A,B,C,D - AP12.01	50	21-Aug-15 A	80%	10	01-Apr-16	09-Dec-15	22-Dec-15	-73	0	80%																		
ARDD0037-2	IC/SO Approval of Seismic Performance Report Viaduct A,B,C,D - AP12.01	75	04-Apr-16	0%	75	15-Jul-16	23-Dec-15	05-Apr-16	-73	245	0%																		
ARDD0037-5	IC/SO Approval of Seismic Performance Report Viaduct E - AP12.02	75	21-Mar-16	0%	75	01-Jul-16	23-Dec-15	05-Apr-16	-63	255	0%																		
ARDD0037-7	Preparation of Seismic Performance Report Viaduct F - AP12.03	160	21-Aug-15 A	0%	160	28-Oct-16	13-May-15	22-Dec-15	-223	0	0%																		
ARDD0040-1	Preparation of Operation and Maintenance Manual - AP08.00	30	01-Sep-15 A	0%	30	29-Apr-16	11-Nov-15	22-Dec-15	-93	8	0%																		
ARDD0040-2	IC/SO Approval of Operation and Maintenance Manual - AP08.00	75	11-May-16	0%	75	24-Aug-16	23-Dec-15	05-Apr-16	-101	218	0%																		
ARDD0042-2	IC/SO Approval of O&M Facility Provisions DDA - BP11.01	75	14-Jan-15 A	50%	38	11-May-16	30-Oct-15	22-Dec-15	-101	0	50%																		
<b>Viaduct A</b>																													
<b>Viaduct Design</b>																													
ARDD0435-3	Viaduct A - Coordination and Further Issue of Construction Method and Ter	60	01-Jun-15 A	50%	30	29-Apr-16	17-Mar-15	27-Apr-15	-264	18	50%																		
ARDD0435-4	Viaduct A - Preparation of Draft DDA Working Drawing Set	60	01-Jun-15 A	20%	48	25-May-16	19-Feb-15	27-Apr-15	-282	0	20%																		
ARDD0435-6	Viaduct A - Preparation and Coordination of Working Drawing Set	10	26-May-16	0%	10	08-Jun-16	28-Apr-15	11-May-15	-282	0	0%																		
ARDD0435-8	Viaduct A - IC/SO Consent of Supplemental Working Drawings Viaduct A	10	09-Jun-16	0%	10	22-Jun-16	30-Jun-15	13-Jul-15	-247	0	0%																		
<b>Viaduct F1 &amp; F3</b>																													
<b>Viaduct Design</b>																													
ARDD0486-2	Viaduct F1 & F3 - Coordination and Further Issue of Construction Method :	60	02-Mar-15 A	10%	54	02-Jun-16	22-Jun-15	03-Sep-15	-195	0	10%																		
ARDD0486-3	Viaduct F1 & F3 - Preparation of Draft Working Drawing Set	60	02-Mar-15 A	10%	54	02-Jun-16	22-Jun-15	03-Sep-15	-195	0	10%																		
ARDD0486-5	Viaduct F1 & F3 - Preparation and Coordination of DDA/Working Drawing	10	03-Jun-16	0%	10	16-Jun-16	04-Sep-15	17-Sep-15	-195	0	0%																		
ARDD0486-7	Viaduct F1 & F3 - IC/SO Consent of Supplemental Working Drawings Viad	10	17-Jun-16	0%	10	30-Jun-16	18-Sep-15	01-Oct-15	-195	0	0%																		
<b>Viaduct F2, F4 and F5</b>																													
<b>Viaduct Design</b>																													
ARDD0530-2	Viaduct F2, F4 & F5 - GCL/FRE Issue of Construction Method/Temporary	0		0%	0	21-Mar-16		11-May-15	-224	0	0%																		
ARDD0530-3	Viaduct F2, F4 & F5 - Coordination and Further Issue of Construction Mett	60	21-Mar-16	0%	60	10-Jun-16	12-May-15	03-Aug-15	-224	0	0%																		
ARDD0530-4	Viaduct F2, F4 & F5 - Preparation of Draft Working Drawing Set	60	21-Mar-16	0%	60	10-Jun-16	12-May-15	03-Aug-15	-224	0	0%																		
ARDD0530-6	Viaduct F2, F4 & F5 - Preparation and Coordination of DDA/Working Draw	10	13-Jun-16	0%	10	24-Jun-16	04-Aug-15	17-Aug-15	-224	0	0%																		
ARDD0530-E	Viaduct F2, F4 & F5 - IC/SO Consent of Supplemental Drawings of Viaduc	10	21-Mar-16	0%	10	01-Apr-16	18-Sep-15	01-Oct-15	-131	60	0%																		
<b>Associated Construction Milestones</b>																													
ARDD0552	Viaduct F2, F4 & F5 - DDA approval ready for Commencement of Pilecaps	0	21-Mar-16	0%	0		24-Jul-15		-241	151	0%																		
<b>Parapet and Utility Trough</b>																													
ARDD0562-4	IC/SO Approval of DDA -DP30.01	75	31-Jul-14 A	90%	8	30-Mar-16	30-Nov-15	09-Dec-15	-80	0	100%																		
ARDD0562-5	IC/SO Approval of DDA -DP30.01	0		0%	0	30-Mar-16		09-Dec-15	-80	31	0%																		
ARDD0566	IC/SO Approval of DDA -DP31.01	75	24-Oct-14 A	80%	15	08-Apr-16	19-Nov-15	09-Dec-15	-87	0	80%																		
ARDD0566-1	IC/SO Approval of DDA -DP31.01	0		0%	0	08-Apr-16		09-Dec-15	-87	92	0%																		
<b>Slopeworks for Viaduct B: 9SE- B/C8, B/C9, B/F9, B/F85+ 10SW-A/F52, A/F53</b>																													

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWP rE2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 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 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**

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	2016																							
												March				April				May				June											
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20						
ARDD0580-5	Preparation of Slope A/F52 Submission - CP12.03	20	10-Feb-15 A	100%	0	21-Mar-16	31-Jul-19	31-Jul-19	878	878	100%																								
ARDD0580-6	IC/SO Approval of Slope - CP12.03	75	21-Sep-15 A	95%	4	24-Mar-16	07-Sep-15	10-Sep-15	-140	0	95%																								
<b>Slopeworks for Viaduct D: 10NW -C/R4, C/F9, C/F10, C/F11, C/F17, C/F50</b>																																			
ARDD0603	IC/SO Approval of Slope Combined AIP/DDA -CP14.01	75	16-Dec-14 A	95%	4	24-Mar-16	02-Jun-15	05-Jun-15	-209	0	95%																								
ARDD0603-1	IC/SO Approval of Slope Combined AIP/DDA -CP14.01	0		0%	0	24-Mar-16		05-Jun-15	-209	0	0%																								
ARDD0604-2	IC/SO Approval of Slope Combined AIP/DDA -CP14.02	75	18-May-15 A	75%	19	14-Apr-16	15-Sep-15	09-Oct-15	-134	0	75%																								
ARDD0604-3	IC/SO Approval of Revised Slope Combined AIP/DDA -CP14.02	0		0%	0	14-Apr-16		09-Oct-15	-134	75	0%																								
<b>Waterworks, Drainage &amp; Utility Diversions</b>																																			
ARDD0629	IC/SO Approval of Waterworks, Drainage & Utility DDA - BP20.01	75	22-Jul-14 A	95%	4	24-Mar-16	19-Oct-15	22-Oct-15	-110	0	95%																								
ARDD0629-1	IC/SO Approval of Waterworks, Drainage & Utility DDA - BP20.01	0		0%	0	24-Mar-16		22-Oct-15	-110	0	0%																								
ARDD0629-2	Gov't Approval of Submissions for Waterworks, Drainage & Utility Diversior	75	02-Jan-14 A	95%	4	24-Mar-16	19-Oct-15	22-Oct-15	-110	0	95%																								
<b>Viaduct Approach Ramp Retaining Walls</b>																																			
<b>Approach Ramp B</b>																																			
ARDD0664	Approach B - IC/SO Approval of Approach Ramp B DDA -DP21.01	75	14-Oct-14 A	80%	15	08-Apr-16	09-Feb-16	29-Feb-16	-29	0	80%																								
ARDD0664-1	Approach B - IC/SO Approval of Approach Ramp B DDA -DP21.01	0		0%	0	08-Apr-16		29-Feb-16	-29	110	0%																								
<b>Approach A</b>																																			
ARDD0670	Approach A - IC/SO Approval of Approach Ramp A DDA - DP20.01	75	03-Oct-14 A	95%	4	24-Mar-16	24-Dec-15	29-Dec-15	-62	0	95%																								
ARDD0670-1	Approach A - IC/SO Approval of Approach Ramp A DDA - DP20.01	0		0%	0	24-Mar-16		29-Dec-15	-62	0	0%																								
<b>Approach F</b>																																			
ARDD0676	Approach F - IC/SO Approval of Approach Ramp F DDA -DP24.01	75	23-Dec-14 A	70%	23	20-Apr-16	20-Feb-15	24-Mar-15	-281	0	70%																								
ARDD0676-1	Approach F - IC/SO Approval of Approach Ramp F DDA -DP24.01	0		0%	0	20-Apr-16		30-Dec-15	-80	193	0%																								
<b>Landscape</b>																																			
ARDD0701	Water Supply Application to WSD	0		0%	0	21-Mar-16		05-Jan-16	-53	0	0%																								
ARDD0702	Gov't Approval of LVIA	40	21-Mar-16	0%	40	13-May-16	06-Jan-16	01-Mar-16	-53	143	0%																								
<b>Segment Target Geometry And Erection Engineering</b>																																			
<b>Viaduct A</b>																																			
ARDD0716	Viaduct A - Confirmation of Erection Sequence from Freyssinet	0		0%	0	21-Mar-16		31-Jul-19	878	878	0%																								
ARDD0717	Viaduct A - Erection Sequence Analysis	20	21-Jan-16 A	0%	20	15-Apr-16	03-Mar-15	30-Mar-15	-274	0	0%																								
ARDD0718	Viaduct A - Target Geometry Analysis	20	18-Apr-16	0%	20	13-May-16	31-Mar-15	27-Apr-15	-274	0	0%																								
ARDD0719	Viaduct A - Segment Geometry Schedules	10	16-May-16	0%	10	27-May-16	28-Apr-15	11-May-15	-274	8	0%																								
ARDD0719-1	Viaduct A - Issue of Pierhead Segments Bridge A1, A2	0		0%	0	08-Jun-16		13-Jul-15	-237	10	0%																								
ARDD0719-3	Viaduct A - Issue of Casting Data and Segment Catalogue Bridge A2 (Final	0		0%	0	08-Jun-16		13-Jul-15	-237	10	0%																								
ARDD0719-4	Viaduct A - Issue of Casting Data and Segment Catalogue Bridge A1 (Final	0		0%	0	08-Jun-16		11-May-15	-282	0	0%																								
ARDD0719-5	Viaduct A - Issue Erection Manual	40	09-Jun-16	0%	40	03-Aug-16	12-May-15	06-Jul-15	-282	0	0%																								
<b>Viaduct C</b>																																			
ARDD0724-5	Viaduct C - Issue Erection Manual	30	21-Dec-15 A	5%	29	28-Apr-16	02-Oct-15	11-Nov-15	-121	18	5%																								
<b>Viaduct E5 and E6</b>																																			
ARDD0734	Viaduct E5 & E6 - Segment Geometry Schedules	10	05-May-14 A	90%	1	21-Mar-16	18-Jun-15	18-Jun-15	-197	3	90%																								
TGP0570	Viaduct E5 & E6 - Issue of Optimised Casting Data and Segment Catalogue	40	30-Apr-15 A	90%	4	24-Mar-16	15-Jun-15	18-Jun-15	-200	0	90%																								
TGP0590	Viaduct E5 & E6 - Issue Erection Manual	10	25-Mar-16	0%	10	07-Apr-16	19-Jun-15	02-Jul-15	-200	40	0%																								
<b>Viaduct E7 &amp; E8</b>																																			
ARDD0739	Viaduct E7 & E8 - Segment Geometry Schedules	10	05-May-14 A	90%	1	21-Mar-16	18-Jun-15	18-Jun-15	-197	0	90%																								
TGP0760	Viaduct E7 & E8 - Issue of Optimised Casting Data and Segment Catalogue	40	31-Jul-15 A	90%	4	24-Mar-16	02-Aug-16	05-Aug-16	96	283	90%																								
TGP0790	Viaduct E7 & E8 - Issue Erection Manual	10	22-Mar-16	0%	10	04-Apr-16	19-Jun-15	02-Jul-15	-197	43	0%																								
<b>Viaduct E2</b>																																			
TGP0290	Viaduct E2 - Issue of Erection Manual	10	21-Mar-16	0%	10	01-Apr-16	22-Apr-15	05-May-15	-238	28	0%																								
<b>Viaduct F</b>																																			
ARDD0751	Viaduct F - Confirmation of Erection Sequence from Freyssinet	0		0%	0	21-Mar-16		11-May-15	-224	0	0%																								
ARDD0752	Viaduct F - Erection Sequence Analysis	30	21-Mar-16	0%	30	29-Apr-16	12-May-15	22-Jun-15	-224	0	0%																								
ARDD0753	Viaduct F - Target Geometry Analysis	30	02-May-16	0%	30	10-Jun-16	23-Jun-15	03-Aug-15	-224	0	0%																								
ARDD0754	Viaduct F - Segment Geometry Schedules	10	13-Jun-16	0%	10	24-Jun-16	04-Aug-15	17-Aug-15	-224	0	0%																								
<b>Major Procurement</b>																																			
<b>Marine Permanent Navigaion Aids</b>																																			
PR65011	Design & Approvals for Marine Navigation Aids	150	23-Oct-13 A	90%	15	11-Apr-16	02-Sep-15	19-Sep-15	-162	0	90%																								
PR65012	Procure & Deliver Marine Navigation Aids	240	12-Apr-16	0%	240	27-Jan-17	21-Sep-15	15-Jul-16	-162	0	0%																								
<b>Deck Segment Installation Equipment</b>																																			
<b>Lifting Frames</b>																																			
<b>Lifting Frames 3 &amp; 4</b>																																			
PR68017	Lifting Frame 3&4 Fabrication	85	29-Sep-14 A	67%	28	27-Apr-16	16-Mar-15	22-Apr-15	-299	0	67%																								

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWPPrE2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 Filter: TASK filters: 3-Month Lookahead, No CC  
 Milestones, No Level of Effort.

**Tuen Mun - Chek Lap Kok Link - Southern Connection**  
**3-Month Rolling Programme (Page 2 of 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**









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	2016																									
												March					April					May					June										
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20								
<b>Viaduct C</b>																																					
<b>Bridge C4</b>																																					
<b>Pier C4 (C4b)</b>																																					
<b>Pier Head Segments</b>																																					
SC4B0374	C4 (C4b) - Pier Head Segment Diaphragm - Rebar	12	30-Jan-16 A	100%	0	04-Mar-16 A					100%																										
SC4B0376	C4 (C4b) - Pier Head Segment Diaphragm - Formwork & Prep for Concre	8	15-Feb-16 A	100%	0	10-Mar-16 A					100%																										
SC4B0378	C4 (C4b) - Pier Head Segment Diaphragm - Concreting	2	17-Feb-16 A	100%	0	11-Mar-16 A					100%																										
SC4B0380	C4 (C4b) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	18-Feb-16 A	100%	0	15-Mar-16 A					100%																										
<b>Pier C2 (C4d)</b>																																					
<b>Pier Head Segments</b>																																					
SC4D0372	C2 (C4d) - Pier Head Segment Lift & Fix (1 seg)	1	22-Jan-16 A	50%	1	21-Mar-16	31-Jul-19	31-Jul-19	952	952	50%																										
SC4D0374	C2 (C4d) - Pier Head Segment Diaphragm - Rebar	12	11-Feb-16 A	50%	6	30-Mar-16	24-Jul-19	31-Jul-19	946	946	50%																										
SC4D0376	C2 (C4d) - Pier Head Segment Diaphragm - Formwork & Prep for Concre	8	15-Feb-16 A	50%	4	24-Mar-16	27-Jul-19	31-Jul-19	948	948	50%																										
SC4D0378	C2 (C4d) - Pier Head Segment Diaphragm - Concreting	2	16-Feb-16 A	50%	1	21-Mar-16	20-Feb-16	20-Feb-16	-25	57	50%																										
SC4D0380	C2 (C4d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	17-Feb-16 A	50%	3	23-Mar-16	18-Feb-16	20-Feb-16	-27	55	50%																										
<b>Pier C5 (C4a)</b>																																					
<b>Pier Head Segments</b>																																					
SC4A0372	C5 (C4a) - Pier Head Segment Lift & Fix (1 seg)	2	01-Mar-16 A	100%	0	01-Mar-16 A					100%																										
SC4A0374	C5 (C4a) - Pier Head Segment Diaphragm - Rebar	13	08-Mar-16 A	50%	6	31-Mar-16	23-Jul-19	31-Jul-19	946	946	50%																										
SC4A0376	C5 (C4a) - Pier Head Segment Diaphragm - Formwork & Prep for Concre	8	17-Mar-16 A	20%	6	31-Mar-16	27-Feb-16	05-Mar-16	-18	0	20%																										
SC4A0378	C5 (C4a) - Pier Head Segment Diaphragm - Concreting	2	31-Mar-16	0%	2	02-Apr-16	07-Mar-16	08-Mar-16	-18	0	0%																										
SC4A0380	C5 (C4a) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	02-Apr-16	0%	6	11-Apr-16	09-Mar-16	15-Mar-16	-18	64	0%																										
<b>Pier C3 (C4c)</b>																																					
<b>Pier Head Segments</b>																																					
SC4C0370	C3 (C4c) - Pier Head Segment - Temporary Platform	6	10-Mar-16 A	100%	0	18-Mar-16 A					100%																										
SC4C0372	C3 (C4c) - Pier Head Segment Lift & Fix (1 seg)	2	21-Mar-16	0%	2	22-Mar-16	23-Jan-16	25-Jan-16	-46	0	0%																										
SC4C0374	C3 (C4c) - Pier Head Segment Diaphragm - Rebar	12	23-Mar-16	0%	12	09-Apr-16	26-Jan-16	11-Feb-16	-46	0	0%																										
SC4C0376	C3 (C4c) - Pier Head Segment Diaphragm - Formwork & Prep for Concre	8	11-Apr-16	0%	8	21-Apr-16	12-Feb-16	20-Feb-16	-46	0	0%																										
SC4C0378	C3 (C4c) - Pier Head Segment Diaphragm - Concreting	2	22-Apr-16	0%	2	23-Apr-16	22-Feb-16	23-Feb-16	-46	0	0%																										
SC4C0380	C3 (C4c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	25-Apr-16	0%	6	30-Apr-16	24-Feb-16	02-Mar-16	-45	37	0%																										
<b>Pier C6 (C3f)</b>																																					
<b>Pier Works</b>																																					
SC3F0310	C6 (C3f) - Type 4B-MJ Pier Head Rebarwork, Formwork & Prep	8	14-Jan-16 A	100%	0	03-Mar-16 A					100%																										
SC3F0330	C6 (C3f) - Type 4B-MJ Pier Head Concreting	1	04-Mar-16 A	100%	0	04-Mar-16 A					100%																										
SC3F0340	C6 (C3f) - Type 4B-MJ Pier Head Curing/Striking of Forms/Remove Scaff	4	05-Mar-16 A	50%	2	22-Mar-16	03-Mar-16	04-Mar-16	-15	0	50%																										
SC3F0350	C6 (C3f) - Type 4B-Bearing Plinth	6	10-Mar-16 A	100%	0	18-Mar-16 A					100%																										
<b>Pier Head Segments</b>																																					
SC3F0370	C6 (C3f) - Pier Head Segment - Temporary Platform	6	23-Mar-16	0%	6	01-Apr-16	05-Mar-16	11-Mar-16	-15	0	0%																										
SC3F0371	C6 (C3f) - Pier Head Segment Bearings	2	02-Apr-16	0%	2	05-Apr-16	12-Mar-16	14-Mar-16	-15	0	0%																										
SC3F0372	C6 (C3f) - Pier Head Segment Lift & Temp Support (2 seg)	7	06-Apr-16	0%	7	13-Apr-16	15-Mar-16	22-Mar-16	-15	67	0%																										
<b>Bridge C3</b>																																					
<b>Pier C7 (C3e)</b>																																					
<b>Pier Works</b>																																					
SC3E0320	C7 (C3e) - Type 5B Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	27-Jul-19	31-Jul-19	948	948	0%																										
<b>Pier Head Segments</b>																																					
SC3E0374	C7 (C3e) - Pier Head Segment Diaphragm - Rebar	12	29-Feb-16 A	100%	0	08-Mar-16 A					100%																										
SC3E0376	C7 (C3e) - Pier Head Segment Diaphragm - Formwork	8	09-Mar-16 A	100%	0	10-Mar-16 A					100%																										
SC3E0378	C7 (C3e) - Pier Head Segment Diaphragm - Concreting	2	11-Mar-16 A	100%	0	11-Mar-16 A					100%																										
SC3E0380	C7 (C3e) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	12-Mar-16 A	100%	0	12-Mar-16 A					100%																										
<b>Pier C8 (C3d)</b>																																					
<b>Pier Head Segments</b>																																					
SC3D0370	C8 (C3d) - Pier Head Segment - Temporary Platform	6	21-Mar-16	0%	6	30-Mar-16	14-Mar-16	19-Mar-16	-6	0	0%																										
SC3D0372	C8 (C3d) - Pier Head Segment Lift & Fix (1 seg)	2	31-Mar-16	0%	2	01-Apr-16	21-Mar-16	22-Mar-16	-6	0	0%																										
SC3D0374	C8 (C3d) - Pier Head Segment Diaphragm - Rebar	12	02-Apr-16	0%	12	18-Apr-16	23-Mar-16	09-Apr-16	-6	0	0%																										
SC3D0376	C8 (C3d) - Pier Head Segment Diaphragm - Formwork	8	19-Apr-16	0%	8	28-Apr-16	11-Apr-16	21-Apr-16	-6	0	0%																										
SC3D0378	C8 (C3d) - Pier Head Segment Diaphragm - Concreting	2	29-Apr-16	0%	2	30-Apr-16	22-Apr-16	23-Apr-16	-6	0	0%																										
SC3D0380	C8 (C3d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	03-May-16	0%	6	09-May-16	25-Apr-16	30-Apr-16	-6	96	0%																										
<b>Pier C10 (C3b)</b>																																					
<b>Pier Works</b>																																					
SC3B0320	C10 (C3b) - Type 5B Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	23-Jun-16	27-Jun-16	65	31	0%																										
<b>Pier Head Segments</b>																																					
SC3B0370	C10 (C3b) - Pier Head Segment - Temporary Platform	6	15-Mar-16 A	40%	4	24-Mar-16	06-May-16	11-May-16	34	0	40%																										

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWPPrE2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 Filter: TASK filters: 3-Month Lookahead, No CC  
 Milestones, No Level of Effort.

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	2016																												
												March							April							May							June							
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20	27	04	11	18	25	02	09	16	23	30	
SC3B0372	C10 (C3b) - Pier Head Segment Lift & Fix (1 seg)	2	24-Mar-16	0%	2	30-Mar-16	11-May-16	13-May-16	34	0	0%																													
SC3B0374	C10 (C3b) - Pier Head Segment Diaphragm - Rebar	14	30-Mar-16	0%	14	18-Apr-16	13-May-16	01-Jun-16	34	0	0%																													
SC3B0376	C10 (C3b) - Pier Head Segment Diaphragm - Formwork	8	18-Apr-16	0%	8	28-Apr-16	03-Jun-16	14-Jun-16	34	0	0%																													
SC3B0378	C10 (C3b) - Pier Head Segment Diaphragm - Concreting	2	28-Apr-16	0%	2	30-Apr-16	16-Jun-16	18-Jun-16	34	0	0%																													
SC3B0380	C10 (C3b) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	30-Apr-16	0%	6	09-May-16	20-Jun-16	27-Jun-16	34	136	0%																													
<b>Pier C9 (C3c)</b>																																								
<b>Pier Head Segments</b>																																								
SC3C0370	C9 (C3c) - Pier Head Segment - Temporary Platform	6	26-Feb-16 A	100%	0	01-Mar-16 A					100%																													
SC3C0372	C9 (C3c) - Pier Head Segment Lift & Fix (1 seg)	2	04-Mar-16 A	100%	0	05-Apr-16 A					100%																													
SC3C0374	C9 (C3c) - Pier Head Segment Diaphragm - Rebar	12	21-Mar-16	0%	12	07-Apr-16	22-Apr-16	06-May-16	22	0	0%																													
SC3C0376	C9 (C3c) - Pier Head Segment Diaphragm - Formwork	8	08-Apr-16	0%	8	18-Apr-16	07-May-16	18-May-16	22	0	0%																													
SC3C0378	C9 (C3c) - Pier Head Segment Diaphragm - Concreting	2	19-Apr-16	0%	2	21-Apr-16	19-May-16	20-May-16	22	0	0%																													
SC3C0380	C9 (C3c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	22-Apr-16	0%	6	28-Apr-16	21-May-16	28-May-16	22	0	0%																													
<b>Pier C11 (C3a)</b>																																								
<b>Pier Works</b>																																								
SC3A0360	C11 (C3a) - Type 5B-MJ Pier Backfilling Works	4	05-Mar-16 A	100%	0	09-Mar-16 A					100%																													
<b>Pier Head Segments</b>																																								
SC3A0370	C11 (C3a) - Pier Head Segment - Temporary Platform	6	10-Mar-16 A	100%	0	16-Mar-16 A					100%																													
SC3A0371	C11 (C3a) - Pier Head Segment Bearings	2	31-Mar-16	0%	2	01-Apr-16	24-Jun-16	25-Jun-16	60	0	0%																													
SC3A0372	C11 (C3a) - Pier Head Segment Lift & Temp Support (2 seg)	7	02-Apr-16	0%	7	11-Apr-16	27-Jun-16	06-Jul-16	60	162	0%																													
<b>Bridge C2</b>																																								
<b>Pier C13 (C2e) Portal</b>																																								
<b>Portal</b>																																								
SC2ER290	C13 (C2e) - Portal Beam Soffit Formwork	12	15-Jan-16 A	100%	0	27-Feb-16 A					100%																													
SC2ER300	C13 (C2e) - Portal Beam Rebarwork & Inserts	16	29-Feb-16 A	100%	0	11-Mar-16 A					100%																													
SC2ER302	C13 (C2e) - Portal Beam Side Formwork & Prep for Concreting	16	12-Mar-16 A	100%	0	16-Mar-16 A					100%																													
SC2ER310	C13 (C2e) - Portal Beam Concreting	1	17-Mar-16 A	100%	0	17-Mar-16 A					100%																													
SC2ER320	C13 (C2e) - Pier Head Curing/Striking of Forms/Remove Scaffolding	14	18-Mar-16 A	0%	14	09-Apr-16	10-Nov-15	25-Nov-15	-107	0	0%																													
SC2ER325	C13 (C2e) - Pier Backfilling Works	4	07-Apr-16	0%	4	11-Apr-16	25-Aug-16	29-Aug-16	104	13	0%																													
<b>Pier C14 (C2d)</b>																																								
<b>Pier Works</b>																																								
SC2D0280	C14 (C2d) - Type 5B Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	05-Dec-15	09-Dec-15	-85	0	0%																													
<b>Pier Head Segments</b>																																								
SC2D0374	C14 (C2d) - Pier Head Segment Diaphragm - Rebar	12	09-Mar-16 A	50%	6	30-Mar-16	24-Jul-19	31-Jul-19	946	946	50%																													
SC2D0376	C14 (C2d) - Pier Head Segment Diaphragm - Formwork & Prep for Concr	8	15-Mar-16 A	50%	4	24-Mar-16	27-Jul-19	31-Jul-19	948	948	50%																													
SC2D0378	C14 (C2d) - Pier Head Segment Diaphragm - Concreting	2	16-Mar-16 A	50%	1	21-Mar-16	09-Dec-15	09-Dec-15	-82	69	50%																													
SC2D0380	C14 (C2d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	17-Mar-16 A	50%	3	24-Mar-16	07-Dec-15	09-Dec-15	-85	24	50%																													
<b>Pier C15 (C2c)</b>																																								
<b>Pier Works</b>																																								
SC2C0280	C15 (C2c) - Type 5B Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	19-Dec-15	23-Dec-15	-73	26	0%																													
<b>Pier Head Segments</b>																																								
SC2C0370	C15 (C2c) - Pier Head Segment - Temporary Platform	6	10-Mar-16 A	100%	0	11-Mar-16 A					100%																													
SC2C0372	C15 (C2c) - Pier Head Segment Lift & Fix (1 seg)	2	21-Mar-16	0%	2	22-Mar-16	19-Nov-15	20-Nov-15	-99	0	0%																													
SC2C0374	C15 (C2c) - Pier Head Segment Diaphragm - Rebar	12	23-Mar-16	0%	12	09-Apr-16	21-Nov-15	04-Dec-15	-99	0	0%																													
SC2C0376	C15 (C2c) - Pier Head Segment Diaphragm - Formwork & Prep for Concr	8	11-Apr-16	0%	8	21-Apr-16	05-Dec-15	14-Dec-15	-99	0	0%																													
SC2C0378	C15 (C2c) - Pier Head Segment Diaphragm - Concreting	2	22-Apr-16	0%	2	23-Apr-16	15-Dec-15	16-Dec-15	-99	0	0%																													
SC2C0380	C15 (C2c) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	25-Apr-16	0%	6	30-Apr-16	17-Dec-15	23-Dec-15	-99	45	0%																													
<b>Pier C12 (C2f)</b>																																								
<b>Pier Works</b>																																								
SC2F0275	C12 (C2f) - Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	07-Nov-15	11-Nov-15	-109	12	0%																													
<b>Pier Head Segments</b>																																								
SC2F0372	C12 (C2f) - Pier Head Segment Lift & Fix (1 seg)	2	24-Feb-16 A	100%	0	25-Feb-16 A					100%																													
SC2F0374	C12 (C2f) - Pier Head Segment Diaphragm - Rebar	12	29-Feb-16 A	100%	0	09-Mar-16 A					100%																													
SC2F0376	C12 (C2f) - Pier Head Segment Diaphragm - Formwork	8	21-Mar-16	0%	8	01-Apr-16	23-Oct-15	02-Nov-15	-121	0	0%																													
SC2F0378	C12 (C2f) - Pier Head Segment Diaphragm - Concreting	2	02-Apr-16	0%	2	05-Apr-16	03-Nov-15	04-Nov-15	-121	0	0%																													
SC2F0380	C12 (C2f) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	06-Apr-16	0%	6	12-Apr-16	05-Nov-15	11-Nov-15	-121	30	0%																													
<b>Pier C16 (C2b)</b>																																								
<b>Pier Works</b>																																								
SC2B0360	C16 (C2b) - Type 5B-MJ Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	27-Jul-19	31-Jul-19	948	948	0%																													
<b>Pier Head Segments</b>																																								
SC2B0370	C16 (C2b) - Pier Head Segment - Temporary Platform	6	05-Apr-16 A	100%	0	09-Apr-16 A					100%																													
SC2B0371	C16 (C2b) - Pier Head Segment Bearings	2	11-Apr-16 A	100%	0	12-Apr-16 A					100%																													
SC2B0372	C16 (C2b) - Pier Head Segment Lift & Temp Support (2 seg)	7	15-Apr-16 A	100%	0	23-Apr-16 A					100%																													

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWP-E2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 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 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**

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	2016											
												March			April			May			June		
												22	29	07	14	21	28	04	11	18	25	02	09
<b>Bridge C1</b>																							
<b>Pier C17 (C2a)</b>																							
<b>Pier Works</b>																							
SC2A0275	C17 (C2a) - Type 5B Pier Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	15-Jan-16	19-Jan-16	-53	0	0%												
<b>Pier Head Segments</b>																							
SC2A0370	C17 (C2a) - Pier Head Segment - Temporary Platform	6	29-Mar-16	0%	6	05-Apr-16	20-Jan-16	26-Jan-16	-53	0	0%												
SC2A0372	C17 (C2a) - Pier Head Segment Lift & Fix (1 seg)	2	06-Apr-16	0%	2	07-Apr-16	27-Jan-16	29-Jan-16	-52	0	0%												
SC2A0374	C17 (C2a) - Pier Head Segment Diaphragm - Rebar	13	08-Apr-16	0%	13	25-Apr-16	30-Jan-16	17-Feb-16	-52	0	0%												
SC2A0376	C17 (C2a) - Pier Head Segment Diaphragm - Formwork	8	26-Apr-16	0%	8	05-May-16	18-Feb-16	27-Feb-16	-51	0	0%												
SC2A0378	C17 (C2a) - Pier Head Segment Diaphragm - Concreting	2	06-May-16	0%	2	07-May-16	29-Feb-16	01-Mar-16	-51	0	0%												
SC2A0380	C17 (C2a) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	09-May-16	0%	6	16-May-16	02-Mar-16	08-Mar-16	-51	97	0%												
<b>Pier C19 (C1d)</b>																							
<b>Pier Works</b>																							
SC1D0195	C19 (C1d) - Type 5B-B Pier/Pier Head Backfilling Works	4	21-Mar-16	0%	4	24-Mar-16	27-Jul-19	31-Jul-19	948	948	0%												
<b>Pier Head Segments</b>																							
SC1D0374	C19 (C1d) - Pier Head Segment Diaphragm - Rebar	13	21-Mar-16	0%	13	08-Apr-16	12-Sep-15	29-Sep-15	-151	0	0%												
SC1D0376	C19 (C1d) - Pier Head Segment Diaphragm - Formwork	8	09-Apr-16	0%	8	19-Apr-16	30-Sep-15	09-Oct-15	-151	0	0%												
SC1D0378	C19 (C1d) - Pier Head Segment Diaphragm - Concreting	2	21-Apr-16	0%	2	22-Apr-16	10-Oct-15	12-Oct-15	-151	0	0%												
SC1D0380	C19 (C1d) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	23-Apr-16	0%	6	29-Apr-16	13-Oct-15	20-Oct-15	-151	0	0%												
<b>Pier C18 (C3d) Portal</b>																							
<b>Portal</b>																							
SC1ER280	C18 (C1e) - Portal Beam Scaffolding	12	21-Mar-16	0%	12	07-Apr-16	12-Oct-15	27-Oct-15	-129	0	0%												
SC1ER290	C18 (C1e) - Portal Beam Soffit Formwork	12	08-Apr-16	0%	12	23-Apr-16	28-Oct-15	11-Nov-15	-129	0	0%												
SC1ER300	C18 (C1e) - Portal Beam Rebarwork & Inserts	16	25-Apr-16	0%	16	13-May-16	12-Nov-15	30-Nov-15	-129	0	0%												
SC1ER302	C18 (C1e) - Portal Beam Side Formwork & Prep for Concreting	16	16-May-16	0%	16	06-Jun-16	01-Dec-15	19-Dec-15	-128	0	0%												
SC1ER310	C18 (C1e) - Portal Beam Concreting	1	08-Jun-16	0%	1	08-Jun-16	21-Dec-15	21-Dec-15	-128	0	0%												
SC1ER320	C18 (C1e) - Pier Head Curing/Striking of Forms/Remove Scaffolding	14	10-Jun-16	0%	14	30-Jun-16	22-Dec-15	09-Jan-16	-128	0	0%												
<b>Abutment &amp; Approach Ramp C</b>																							
SC1C0200	Abutment C - Walls & Staircase	48	21-Mar-16	0%	48	25-May-16	14-Mar-16	18-May-16	-6	19	0%												
SC1C0250	AR-C - RE Walls - Erect fencing, Excavation/formation/ drainage filter & bo	12	22-Apr-15 A	90%	1	22-Mar-16	13-Feb-16	15-Feb-16	-31	0	90%												
SC1C0251	AR-C - RE Walls - Upper layers with backfill in stages	48	22-Mar-16	0%	48	28-Mar-16	15-Feb-16	16-Apr-16	-31	0	0%												
SC1C0252	AR-C - RC Walls - Base Slabs	49	08-Apr-15 A	50%	25	28-May-16	14-Mar-16	16-Apr-16	-31	0	50%												
SC1C0253	AR-C - RC Walls - Side Walls	48	18-Apr-16	0%	48	25-Jun-16	14-Mar-16	18-May-16	-25	0	0%												
<b>Viaduct D</b>																							
<b>Bridge D3</b>																							
<b>Pier D5 (D4b)</b>																							
<b>Pier Head Segments</b>																							
SD4B0372	D5 (D4b) - Pier Head Segment Lift & Fix (1 seg)	2	27-Feb-16 A	100%	0	27-Feb-16 A					100%												
SD4B0374	D5 (D4b) - Pier Head Segment Diaphragm - Rebar	12	21-Mar-16	0%	12	07-Apr-16	24-Oct-15	07-Nov-15	-120	0	0%												
SD4B0376	D5 (D4b) - Pier Head Segment Diaphragm - Formwork & Prep for Concre	8	08-Apr-16	0%	8	18-Apr-16	09-Nov-15	17-Nov-15	-120	0	0%												
SD4B0378	D5 (D4b) - Pier Head Segment Diaphragm - Concreting	2	19-Apr-16	0%	2	21-Apr-16	18-Nov-15	19-Nov-15	-120	0	0%												
SD4B0380	D5 (D4b) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	22-Apr-16	0%	6	28-Apr-16	20-Nov-15	26-Nov-15	-120	0	0%												
<b>Pier D1 (D4f)</b>																							
<b>Pier Head Segments</b>																							
SD4F0370	D1 (D4f) - Pier Head Segment - Temporary Platform	6	03-Mar-16 A	100%	0	12-Mar-16 A					100%												
SD4F0371	D1 (D4f) - Pier Head Segment Bearings	2	14-Mar-16 A	100%	0	18-Mar-16 A					100%												
SD4F0372	D1 (D4f) - Pier Head Segment Lift & Temp Support (2 seg)	7	21-Mar-16	0%	7	31-Mar-16	28-Nov-15	05-Dec-15	-91	45	0%												
<b>Pier D6 (D4a)</b>																							
<b>Pier Head Segments</b>																							
SD4A0370	D6 (D4a) - Pier Head Segment - Temporary Platform	6	21-Mar-16	0%	6	30-Mar-16	28-Nov-15	04-Dec-15	-91	32	0%												
SD4A0371	D6 (D4a) - Pier Head Segment Bearings	2	12-May-16	0%	2	13-May-16	05-Dec-15	07-Dec-15	-123	0	0%												
SD4A0372	D6 (D4a) - Pier Head Segment Lift & Temp Support (2 seg)	7	16-May-16	0%	7	24-May-16	08-Dec-15	15-Dec-15	-123	13	0%												
<b>Bridge D2</b>																							
<b>Pier D8 (D3d)</b>																							
<b>Pier Works</b>																							
SD3D0240	D8 (D3d) - Type 5B Pier Rebarwork (3rd Lift)	3	19-Nov-15 A	100%	0	21-Mar-16	31-Jul-19	31-Jul-19	952	952	100%												
<b>Pier Head Segments</b>																							
SD3D0370	D8 (D3d) - Pier Head Segment - Temporary Platform	6	21-Mar-16	0%	6	30-Mar-16	10-Nov-15	16-Nov-15	-107	0	0%												
SD3D0372	D8 (D3d) - Pier Head Segment Lift & Fix (1 seg)	2	31-Mar-16	0%	2	01-Apr-16	17-Nov-15	18-Nov-15	-107	0	0%												
SD3D0374	D8 (D3d) - Pier Head Segment Diaphragm - Rebar	13	02-Apr-16	0%	13	19-Apr-16	19-Nov-15	03-Dec-15	-107	0	0%												
SD3D0376	D8 (D3d) - Pier Head Segment Diaphragm - Formwork	8	21-Apr-16	0%	8	29-Apr-16	04-Dec-15	12-Dec-15	-107	0	0%												
SD3D0378	D8 (D3d) - Pier Head Segment Diaphragm - Concreting	2	30-Apr-16	0%	2	03-May-16	14-Dec-15	15-Dec-15	-107	0	0%												

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWPPrE2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 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 8 of 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**



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	2016																																							
												March				April				May				June																											
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20																						
<b>Pier Head Segments</b>																																																			
SD2A0374	D16 (D2a) - Pier Head Segment Diaphragm - Rebar	13	19-Feb-16 A	100%	0	16-Mar-16 A					100%																																								
SD2A0376	D16 (D2a) - Pier Head Segment Diaphragm - Formwork	8	17-Mar-16 A	10%	7	01-Apr-16	21-Sep-15	30-Sep-15	-144	0	10%																																								
SD2A0378	D16 (D2a) - Pier Head Segment Diaphragm - Concreting	2	01-Apr-16	0%	2	05-Apr-16	02-Oct-15	03-Oct-15	-144	0	0%																																								
SD2A0380	D16 (D2a) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	05-Apr-16	0%	6	12-Apr-16	05-Oct-15	10-Oct-15	-144	77	0%																																								
<b>Abutment &amp; Approach Ramp D</b>																																																			
SD1B0200	Abutment D - Walls & Staircase	48	21-Mar-16	0%	48	25-May-16	17-Oct-15	14-Dec-15	-125	0	0%																																								
SD1B0250	AR-D - RE Walls - Erect MTR boundary fence, Excavation/formation/drain:	24	15-Dec-15 A	90%	2	23-Mar-16	29-Feb-16	02-Mar-16	-17	0	90%																																								
SD1B0260	AR-D - RE Walls - Upper layers with backfill in stages	48	23-Mar-16	0%	48	30-May-16	24-May-19	31-Jul-19	902	902	0%																																								
SD1B0280	AR-D - RC Walls - Side Walls	48	27-Jul-15 A	90%	5	29-Mar-16	25-Nov-15	30-Nov-15	-94	31	90%																																								
SD1B0290	AR-D - RC Walls - Backfill	12	10-May-16	0%	12	25-May-16	01-Dec-15	14-Dec-15	-125	0	0%																																								
SD1B0300	AR-D - RC Walls - Concrete parapets	19	27-May-16	0%	19	24-Jun-16	11-Jan-16	01-Feb-16	-105	0	0%																																								
SD1B0400	AR-D - Drainage	39	27-May-16	0%	39	22-Jul-16	15-Dec-15	01-Feb-16	-125	0	0%																																								
<b>Viaduct E</b>																																																			
<b>Viaduct E1</b>																																																			
<b>Bridge E1 - Piling &amp; Substructure</b>																																																			
<b>E1A, E1B, E1C &amp; E1D (E1a1-2-3-4)</b>																																																			
<b>Pier Head Segments - E1A, E1B, E1C &amp; E1D</b>																																																			
<b>Pier Head Segments - E1D (E1a1)</b>																																																			
SE1A1372	E1D (E1a1) - Pier Head Segment Lift & Fix (1 seg)	2	21-Mar-16	0%	2	22-Mar-16	19-May-16	21-May-16	42	0	0%																																								
SE1A1374	E1D (E1a1) - Pier Head Segment Diaphragm - Rebar	15	23-Mar-16	0%	15	13-Apr-16	21-May-16	11-Jun-16	42	0	0%																																								
SE1A1376	E1D (E1a1) - Pier Head Segment Diaphragm - Formwork & Prep for Conc	8	13-Apr-16	0%	8	25-Apr-16	13-Jun-16	24-Jun-16	42	0	0%																																								
SE1A1378	E1D (E1a1) - Pier Head Segment Diaphragm - Concreting	2	25-Apr-16	0%	2	27-Apr-16	25-Jun-16	27-Jun-16	42	0	0%																																								
SE1A1380	E1D (E1a1) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	27-Apr-16	0%	6	05-May-16	28-Jun-16	06-Jul-16	42	178	0%																																								
<b>E2A, E2B, E2C &amp; E2D (E1b1-2-3-4)</b>																																																			
<b>Pier Head Segments - E2A, E2B, E2C &amp; E2D</b>																																																			
<b>Pier Head Segments - E2D (E1b1)</b>																																																			
SE1B1372	E2D (E1b1) - Pier Head Segment Lift & Fix (1 seg)	2	21-Mar-16	0%	2	22-Mar-16	10-May-16	12-May-16	37	0	0%																																								
SE1B1374	E2D (E1b1) - Pier Head Segment Diaphragm - Rebar	12	23-Mar-16	0%	12	09-Apr-16	13-May-16	30-May-16	37	0	0%																																								
SE1B1376	E2D (E1b1) - Pier Head Segment Diaphragm - Formwork & Prep for Conc	8	11-Apr-16	0%	8	21-Apr-16	31-May-16	11-Jun-16	37	0	0%																																								
SE1B1378	E2D (E1b1) - Pier Head Segment Diaphragm - Concreting	2	22-Apr-16	0%	2	23-Apr-16	13-Jun-16	14-Jun-16	37	0	0%																																								
SE1B1380	E2D (E1b1) - Pier Head Segment Diaphragm - Curing & Striking of Forms	6	25-Apr-16	0%	6	30-Apr-16	16-Jun-16	24-Jun-16	37	173	0%																																								
<b>Viaduct E2</b>																																																			
<b>Bridge E2 - Piling &amp; Substructure</b>																																																			
<b>E3A, E3B, E3C &amp; E3D (E2a - 1/2/3/4)</b>																																																			
<b>Pier Head Segments - E3A, E3B, E3C &amp; E3D</b>																																																			
<b>Pier Head Segment - E3C (E2a2)</b>																																																			
SE2A2372	E3C (E2a2) - Pier Head Segment Lift & Temp Support (2 seg)	7	21-Mar-16	0%	7	31-Mar-16	05-Jan-16	15-Jan-16	-59	23	0%																																								
<b>Pier Head Segment - E3D (E2a1)</b>																																																			
SE2A1372	E3D (E2a1) - Pier Head Segment Lift & Temp Support (2 seg)	7	21-Mar-16	0%	7	31-Mar-16	19-Apr-16	28-Apr-16	21	157	0%																																								
<b>E4A &amp; E4B (E2b - 1/2)</b>																																																			
<b>Pier Works - E4A &amp; E4B</b>																																																			
<b>Pier Works - E4A (E2b2)</b>																																																			
SE2B2340	E4A (E2b2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour	6	19-Feb-16 A	100%	0	08-Mar-16 A					100%																																								
<b>Pier Works - E4B (E2b1)</b>																																																			
SE2B1240	E4B (E2b1) - Seagull Pier Falsework & Scaffolding (3rd pour, arm)	6	21-Dec-15 A	100%	0	12-Mar-16 A					100%																																								
SE2B1260	E4B (E2b1) - Seagull Pier Rebar Fixing, Formwork & Prep (3rd pour, arm)	28	08-Mar-16 A	25%	21	19-Apr-16	02-Mar-15	25-Mar-15	-294	0	25%																																								
SE2B1280	E4B (E2b1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (3rd pour	5	21-Apr-16	0%	5	26-Apr-16	26-Mar-15	31-Mar-15	-294	0	0%																																								
SE2B1300	E4B (E2b1) - Seagull Pier Falsework & Scaffolding (4th pour, upper diaphr:	6	28-Apr-16	0%	6	05-May-16	02-Apr-15	13-Apr-15	-294	0	0%																																								
SE2B1320	E4B (E2b1) - Seagull Pier Rebar Fixing, Formwork & Prep (4th pour, uppe	12	06-May-16	0%	12	21-May-16	14-Apr-15	29-Apr-15	-294	0	0%																																								
SE2B1340	E4B (E2b1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour	4	23-May-16	0%	4	27-May-16	30-Apr-15	05-May-15	-294	0	0%																																								
<b>Pier Head Segments - E4A &amp; E4B</b>																																																			
<b>Pier head Segment - E4A (E2b2)</b>																																																			
SE2B2262	E4A (E2b2) - Pier Head Segment - Temporary Platform	2	12-Mar-16 A	60%	1	21-Mar-16	05-Mar-15	05-Mar-15	-291																																										





Activity ID	Activity Name	Orig. Durr.	Act. Start / FC Early Start	Duration % Complete	Rem. Durr.	Act. Finish / FC Early Finish	Late Start	Late Finish	Total Float	Free Float	Physical % Complete	2016														
												March			April			May			June					
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30
SE2E1300	E7B (E2e1) - Seagull Pier Falsework & Scaffolding (6th pour, uppder Diapt	2	18-May-16	0%	2	20-May-16	30-Apr-16	03-May-16	-12	0	0%															
SE2E1320	E7B (E2e1) - Seagull Pier Rebar Fixing, Formwork & Prep (6th pour, uppd	6	20-May-16	0%	6	28-May-16	04-May-16	10-May-16	-12	0	0%															
SE2E1340	E7B (E2e1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (6th pour	4	28-May-16	0%	4	03-Jun-16	11-May-16	16-May-16	-12	0	0%															
<b>Pier head Segment - E7A &amp; E7B</b>																										
<b>Pier head Segment - E7A (E2e2)</b>																										
SE2E2262	E7A (E2e2) - Pier Head Segment - Temporary Platform	2	27-May-16	0%	2	30-May-16	10-Jun-16	11-Jun-16	9	0	0%															
SE2E2264	E7A (E2e2) - Pier Head Segment Lift & Fix (4 seg)	4	30-May-16	0%	4	04-Jun-16	13-Jun-16	18-Jun-16	9	0	0%															
SE2E2266	E7A (E2e2) - Pier Head Segment Diaphragm Works	30	04-Jun-16	0%	30	19-Jul-16	20-Jun-16	29-Jul-16	9	0	0%															
<b>Pier head Segment - E7B (E2e1)</b>																										
SE2E1162	E7B (E2e1) - Pier Head Segment - Temporary Platform	2	03-Jun-16	0%	2	06-Jun-16	18-May-16	19-May-16	-12	0	0%															
SE2E1164	E7B (E2e1) - Pier Head Segment Lift & Fix (4 seg)	4	06-Jun-16	0%	4	13-Jun-16	20-May-16	24-May-16	-12	0	0%															
SE2E1166	E7B (E2e1) - Pier Head Segment Diaphragm Works	30	13-Jun-16	0%	30	26-Jul-16	25-May-16	08-Jul-16	-12	0	0%															
<b>E8A &amp; E8B (E2f - 1/2)</b>																										
<b>Pier Works - E8A &amp; E8B</b>																										
<b>Pier Works - E8A (E2f2)</b>																										
SE2F2050	E8A (E2f2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (1st pour,	3	22-Feb-16 A	100%	0	26-Feb-16 A					100%															
SE2F2070	E8A (E2f2) - Seagull Pier Falsework & Scaffolding (2nd pour, Lower Diaphi	2	27-Feb-16 A	100%	0	04-Mar-16 A					100%															
SE2F2080	E8A (E2f2) - Seagull Pier Combine Shell Installation, Rebar Fixing, Formw	7	05-Mar-16 A	100%	0	09-Mar-16 A					100%															
SE2F2100	E8A (E2f2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (2nd pour	3	09-Mar-16 A	100%	0	12-Mar-16 A					100%															
SE2F2120	E8A (E2f2) - Seagull Pier Falsework & Scaffolding (3rd pour, Lower Arm)	4	21-Mar-16	0%	4	24-Mar-16	04-Mar-16	08-Mar-16	-14	0	0%															
SE2F2140	E8A (E2f2) - Seagull Pier Rebar Fixing, Formwork & Prep (3rd pour, Lowe	7	29-Mar-16	0%	7	06-Apr-16	09-Mar-16	16-Mar-16	-14	0	0%															
SE2F2160	E8A (E2f2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (3rd pour,	3	07-Apr-16	0%	3	09-Apr-16	17-Mar-16	19-Mar-16	-14	0	0%															
SE2F2180	E8A (E2f2) - Seagull Pier Falsework & Scaffolding (4th pour, Interface laye	2	11-Apr-16	0%	2	12-Apr-16	21-Mar-16	22-Mar-16	-14	0	0%															
SE2F2200	E8A (E2f2) - Seagull Pier Combine Shell Installation, Rebar Fixing, Formw	7	13-Apr-16	0%	7	22-Apr-16	23-Mar-16	02-Apr-16	-14	0	0%															
SE2F2220	E8A (E2f2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour,	3	23-Apr-16	0%	3	26-Apr-16	05-Apr-16	07-Apr-16	-14	0	0%															
SE2F2240	E8A (E2f2) - Seagull Pier Falsework & Scaffolding (5th pour, Upper Arm)	2	25-Apr-16	0%	2	26-Apr-16	06-Apr-16	07-Apr-16	-14	0	0%															
SE2F2260	E8A (E2f2) - Seagull Pier Rebar Fixing, Formwork & Prep (5th pour, Uppe	6	27-Apr-16	0%	6	04-May-16	08-Apr-16	15-Apr-16	-14	0	0%															
SE2F2280	E8A (E2f2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (5th pour,	4	05-May-16	0%	4	09-May-16	16-Apr-16	21-Apr-16	-14	0	0%															
SE2F2300	E8A (E2f2) - Seagull Pier Falsework & Scaffolding (6th pour, Upper Diaphr	2	06-May-16	0%	2	07-May-16	18-Apr-16	19-Apr-16	-14	0	0%															
SE2F2320	E8A (E2f2) - Seagull Pier Rebar Fixing, Formwork & Prep (6th pour, Uppe	6	09-May-16	0%	6	16-May-16	21-Apr-16	27-Apr-16	-14	0	0%															
SE2F2340	E8A (E2f2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (6th pour,	4	18-May-16	0%	4	21-May-16	28-Apr-16	03-May-16	-14	35	0%															
<b>Pier Works - E8B (E2f1)</b>																										
SE2F1030	E8B (E2f1) - Seagull Pier Combine Shell Installation, Rebar Fixing, Formw	7	17-Feb-16 A	100%	0	03-Mar-16 A					100%															
SE2F1050	E8B (E2f1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (1st pour,	3	04-Mar-16 A	100%	0	10-Mar-16 A					100%															
SE2F1070	E8B (E2f1) - Seagull Pier Falsework & Scaffolding (2nd pour, Lower Diaphi	2	08-Mar-16 A	100%	0	09-Mar-16 A					100%															
SE2F1080	E8B (E2f1) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Pre	7	11-Mar-16 A	50%	4	24-Mar-16	20-Jan-16	23-Jan-16	-49	0	50%															
SE2F1100	E8B (E2f1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (2nd pour	3	24-Mar-16	0%	3	31-Mar-16	25-Jan-16	27-Jan-16	-49	0	0%															
SE2F1120	E8B (E2f1) - Seagull Pier Falsework & Scaffolding (3rd pour, Lower Arm)	4	31-Mar-16	0%	4	06-Apr-16	28-Jan-16	01-Feb-16	-49	0	0%															
SE2F1140	E8B (E2f1) - Seagull Pier Rebar Fixing, Formwork & Prep (3rd pour, Lowe	7	06-Apr-16	0%	7	15-Apr-16	02-Feb-16	12-Feb-16	-49	0	0%															
SE2F1160	E8B (E2f1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (3rd pour,	3	15-Apr-16	0%	3	19-Apr-16	13-Feb-16	16-Feb-16	-49	0	0%															
SE2F1180	E8B (E2f1) - Seagull Pier Falsework & Scaffolding (4th pour, Interface laye	2	19-Apr-16	0%	2	22-Apr-16	17-Feb-16	18-Feb-16	-49	0	0%															
SE2F1200	E8B (E2f1) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Pre	7	22-Apr-16	0%	7	30-Apr-16	19-Feb-16	26-Feb-16	-49	0	0%															
SE2F1220	E8B (E2f1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour,	3	30-Apr-16	0%	3	05-May-16	27-Feb-16	01-Mar-16	-49	0	0%															
SE2F1240	E8B (E2f1) - Seagull Pier Falsework & Scaffolding (5th pour, Upper Arm)	2	03-May-16	0%	2	05-May-16	29-Feb-16	01-Mar-16	-49	0	0%															
SE2F1260	E8B (E2f1) - Seagull Pier Rebar Fixing, Formwork & Prep (5th pour, Uppe	6	05-May-16	0%	6	12-May-16	02-Mar-16	08-Mar-16	-49	0	0%															
SE2F1280	E8B (E2f1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (5th pour,	4	12-May-16	0%	4	19-May-16	09-Mar-16	12-Mar-16	-49	0	0%															
SE2F1300	E8B (E2f1) - Seagull Pier Falsework & Scaffolding (6th pour, Upper Diaphr	2	13-May-16	0%	2	18-May-16	10-Mar-16	11-Mar-16	-49	0	0%															
SE2F1320	E8B (E2f1) - Seagull Pier Rebar Fixing, Formwork & Prep (6th pour, Uppe	6	18-May-16	0%	6	25-May-16	12-Mar-16	18-Mar-16	-49	0	0%															
SE2F1340	E8B (E2f1) - Seagull Pier Concreting, Curing & Striking, CJ Prep (6th pour,	4	25-May-16	0%	4	31-May-16	19-Mar-16	23-Mar-16	-49	0	0%															
<b>Pier head Segment - E8A &amp; E8B</b>																										
<b>Pier head Segment - E8B (E2f1)</b>																										
SE2F1162	E8B (E2f1) - Pier Head Segment - Temporary Platform	2	31-May-16	0%	2	03-Jun-16	24-Mar-16	29-Mar-16	-49	0	0%															
SE2F1164	E8B (E2f1) - Pier Head Segment Lift & Fix (4 seg)	4	03-Jun-16	0%	4	10-Jun-16	30-Mar-16	02-Apr-16	-49	0	0%															
SE2F1166	E8B (E2f1) - Pier Head Segment Diaphragm Works	30	10-Jun-16	0%	30	23-Jul-16	05-Apr-16	12-May-16	-49	0	0%															
<b>E9A &amp; E9B (E2g - 1/2)</b>																										
<b>Pier Works - E9A &amp; E9B</b>																										
<b>Pier Works - E9A (E2g2)</b>																										
SE2G221	E9A (E2g2) - Seagull Pier Rebar Fixing, Formwork & Prep (4th pour, Lowe	7	24-Feb-16 A	40%	4	29-Mar-16	24-Dec-15	31-Dec-15	-68	0	40%															
SE2G222	E9A (E2g2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour	3	29-Mar-16	0%	3	01-Apr-16	02-Jan-16	05-Jan-16	-68	0	0%															
SE2G222	E9A (E2g2) - Seagull Pier Falsework & Scaffolding (5th pour, Interface laye	2	01-Apr-16	0%	2	05-Apr-16	06-Jan-16	07-Jan-16	-68	0	0%															
SE2G221	E9A (E2g2) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Pre	7	05-Apr-16	0%	7	13-Apr-16	08-Jan-16	15-Jan-16	-68	0	0%															
SE2G221	E9A (E2g2) - Seagull Pier Concreting, Curing & Striking, CJ Prep (5th pour	3	13-Apr-16	0%	3	18-Apr-16	16-Jan-16	19-Jan-16	-68	0	0%															
SE2G221	E9A (E2g2) - Seagull Pier Falsework & Scaffolding (6th pour, Upper Arm)	2	15-Apr-16	0%	2	18-Apr-16	18-Jan-16	19-Jan-16	-68	0	0%															

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWP-E2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 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 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**









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	2016																								
												March				April				May				June												
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20							
SE8CD090	E13A (E8c) Dolphin - Marine Pile Cap - Inst.Access & make Watertight	6	24-Oct-15 A	0%	6	30-Mar-16	24-Jul-19	31-Jul-19	922	922	0%	[Gantt Bar]																								
SE8CD100	E13A (E8c) Dolphin - Marine Pile Cap - Weld Fin Plates / Plug Rebar & Co	1	06-Nov-15 A	0%	1	21-Mar-16	31-Jul-19	31-Jul-19	927	927	0%	[Gantt Bar]																								
SE8CD120	E13A (E8c) Dolphin - Marine Pile Cap - Dewater precast shell / Remove Lit	1	19-Nov-15 A	0%	1	21-Mar-16	21-Nov-16	21-Nov-16	181	0	0%	[Gantt Bar]																								
SE8CD130	E13A (E8c) Dolphin - Marine Pile Cap - Pile cut down 3nr	3	22-Mar-16	0%	3	24-Mar-16	22-Nov-16	24-Nov-16	181	0	0%	[Gantt Bar]																								
SE8CD140	E13A (E8c) Dolphin - Marine Pile Cap - Rebar fixing, inst.inserts	4	29-Mar-16	0%	4	01-Apr-16	25-Nov-16	29-Nov-16	181	0	0%	[Gantt Bar]																								
SE8CD150	E13A (E8c) Dolphin - Marine Pile Cap - Concreting	1	02-Apr-16	0%	1	02-Apr-16	30-Nov-16	30-Nov-16	181	97	0%	[Gantt Bar]																								
<b>Pile Cap Works</b>																																				
SE7C0160	E13A/B (E8c/E7c) - Marine Pile Cap - Rebar fixing (final pour)	6	16-Feb-16 A	100%	0	26-Feb-16 A					100%	[Gantt Bar]																								
SE7C0162	E13A/B (E8c/E7c) - Marine Pile Cap - Concreting (Final pour)	1	27-Feb-16 A	100%	0	27-Feb-16 A					100%	[Gantt Bar]																								
SE7C0164	E13A/B (E8c/E7c) - Marine Pile Cap - Curing incl. CJ preparation	6	28-Feb-16 A	100%	0	04-Mar-16 A					100%	[Gantt Bar]																								
<b>Pile Cap Works - E13C &amp; E13D</b>																																				
<b>Pile Cap Works</b>																																				
SE5C0100	E13C/D (E6c/E5c) - Marine Pile Cap - Weld Fin Plates / Plug Rebar & Con	2	17-Feb-16 A	100%	0	23-Feb-16 A					100%	[Gantt Bar]																								
SE5C0110	E13C/D (E6c/E5c) - Marine Pile Cap - Dewater precast shell / Remove Lift	2	24-Feb-16 A	100%	0	29-Feb-16 A					100%	[Gantt Bar]																								
SE5C0120	E13C/D (E6c/E5c) - Marine Pile Cap - Pile cut down 8nr	9	01-Mar-16 A	50%	5	29-Mar-16	29-Apr-15	05-May-15	-250	0	50%	[Gantt Bar]																								
SE5C0130	E13C/D (E6c/E5c) - Marine Pile Cap - Rebar fixing (1st pour)	8	29-Mar-16	0%	8	08-Apr-16	06-May-15	15-May-15	-250	0	0%	[Gantt Bar]																								
SE5C0140	E13C/D (E6c/E5c) - Marine Pile Cap - Concreting (1st pour)	1	08-Apr-16	0%	1	09-Apr-16	16-May-15	16-May-15	-250	0	0%	[Gantt Bar]																								
SE5C0150	E13C/D (E6c/E5c) - Marine Pile Cap - CJ preparation	3	09-Apr-16	0%	3	13-Apr-16	18-May-15	20-May-15	-250	0	0%	[Gantt Bar]																								
SE5C0160	E13C/D (E6c/E5c) - Marine Pile Cap - Rebar fixing (Final pour)	6	13-Apr-16	0%	6	20-Apr-16	22-May-15	29-May-15	-250	0	0%	[Gantt Bar]																								
SE5C0162	E13C/D (E6c/E5c) - Marine Pile Cap - Concreting (Final pour)	1	20-Apr-16	0%	1	21-Apr-16	30-May-15	30-May-15	-250	0	0%	[Gantt Bar]																								
SE5C0164	E13C/D (E6c/E5c) - Marine Pile Cap - Curing incl. CJ preparation	6	21-Apr-16	0%	6	28-Apr-16	01-Jun-15	08-Jun-15	-250	65	0%	[Gantt Bar]																								
<b>Bridge E8 - Pier E13A (E8c)</b>																																				
<b>Pier Works - E13A</b>																																				
<b>Pier Works</b>																																				
SE8C102	E13A (E8c) - Seagull Pier Falsework & Scaffolding (1st pour, Lower Stem)	4	05-Mar-16 A	100%	0	08-Mar-16 A					100%	[Gantt Bar]																								
SE8C103	E13A (E8c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	09-Mar-16 A	50%	4	24-Mar-16	14-Dec-18	18-Dec-18	782	0	50%	[Gantt Bar]																								
SE8C104	E13A (E8c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (1st pour)	3	24-Mar-16	0%	3	31-Mar-16	19-Dec-18	21-Dec-18	782	0	0%	[Gantt Bar]																								
SE8C107	E13A (E8c) - Seagull Pier Falsework & Scaffolding (2nd pour, Upper Stem)	3	31-Mar-16	0%	3	05-Apr-16	22-Dec-18	27-Dec-18	782	0	0%	[Gantt Bar]																								
SE8C108	E13A (E8c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	05-Apr-16	0%	7	13-Apr-16	28-Dec-18	05-Jan-19	782	0	0%	[Gantt Bar]																								
SE8C110	E13A (E8c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (2nd pour)	3	13-Apr-16	0%	3	18-Apr-16	07-Jan-19	09-Jan-19	782	0	0%	[Gantt Bar]																								
SE8C112	E13A (E8c) - Seagull Pier Falsework & Scaffolding (3rd pour, Lower Diaphragm)	3	18-Apr-16	0%	3	22-Apr-16	10-Jan-19	12-Jan-19	782	0	0%	[Gantt Bar]																								
SE8C114	E13A (E8c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	22-Apr-16	0%	7	30-Apr-16	14-Jan-19	21-Jan-19	782	0	0%	[Gantt Bar]																								
SE8C116	E13A (E8c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (3rd pour)	3	30-Apr-16	0%	3	05-May-16	22-Jan-19	24-Jan-19	782	0	0%	[Gantt Bar]																								
SE8C118	E13A (E8c) - Seagull Pier Falsework & Scaffolding (4th pour, Lower Arm)	4	05-May-16	0%	4	10-May-16	25-Jan-19	29-Jan-19	782	0	0%	[Gantt Bar]																								
SE8C120	E13A (E8c) - Seagull Pier Rebar Fixing, Formwork & Prep (4th pour, Lower Arm)	7	10-May-16	0%	7	20-May-16	30-Jan-19	09-Feb-19	782	0	0%	[Gantt Bar]																								
SE8C122	E13A (E8c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour)	3	20-May-16	0%	3	24-May-16	11-Feb-19	13-Feb-19	782	0	0%	[Gantt Bar]																								
SE8C124	E13A (E8c) - Seagull Pier Falsework & Scaffolding (5th pour, Interface layer)	3	24-May-16	0%	3	28-May-16	14-Feb-19	16-Feb-19	782	0	0%	[Gantt Bar]																								
SE8C126	E13A (E8c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	28-May-16	0%	7	08-Jun-16	18-Feb-19	25-Feb-19	782	0	0%	[Gantt Bar]																								
SE8C128	E13A (E8c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (5th pour)	3	08-Jun-16	0%	3	13-Jun-16	26-Feb-19	28-Feb-19	782	0	0%	[Gantt Bar]																								
SE8C129	E13A (E8c) - Seagull Pier Falsework & Scaffolding (6th pour, Upper Arm)	3	10-Jun-16	0%	3	14-Jun-16	27-Feb-19	01-Mar-19	782	0	0%	[Gantt Bar]																								
SE8C129	E13A (E8c) - Seagull Pier Rebar Fixing, Formwork & Prep (6th pour, Upper Arm)	6	14-Jun-16	0%	6	24-Jun-16	02-Mar-19	08-Mar-19	782	0	0%	[Gantt Bar]																								
<b>Bridge E7 - Pier E13B (E7c)</b>																																				
<b>Pier Works - E13B</b>																																				
<b>Pier Works</b>																																				
SE7C102	E13B (E7c) - Seagull Pier Falsework & Scaffolding (1st pour, Lower Stem)	4	05-Mar-16 A	100%	0	15-Mar-16 A					100%	[Gantt Bar]																								
SE7C103	E13B (E7c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	18-Mar-16 A	10%	6	31-Mar-16	11-May-15	19-May-15	-240	0	10%	[Gantt Bar]																								
SE7C104	E13B (E7c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (1st pour)	3	31-Mar-16	0%	3	05-Apr-16	20-May-15	23-May-15	-240	0	0%	[Gantt Bar]																								
SE7C107	E13B (E7c) - Seagull Pier Falsework & Scaffolding (2nd pour, Lower Diaphragm)	3	05-Apr-16	0%	3	08-Apr-16	26-May-15	28-May-15	-240	0	0%	[Gantt Bar]																								
SE7C108	E13B (E7c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	08-Apr-16	0%	7	18-Apr-16	29-May-15	06-Jun-15	-240	0	0%	[Gantt Bar]																								
SE7C110	E13B (E7c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (2nd pour)	3	18-Apr-16	0%	3	22-Apr-16	08-Jun-15	12-Jun-15	-240	0	0%	[Gantt Bar]																								
SE7C112	E13B (E7c) - Seagull Pier Falsework & Scaffolding (3rd pour, Lower Arm)	4	22-Apr-16	0%	4	27-Apr-16	13-Jun-15	18-Jun-15	-240	0	0%	[Gantt Bar]																								
SE7C114	E13B (E7c) - Seagull Pier Rebar Fixing, Formwork & Prep (3rd pour, Lower Arm)	7	27-Apr-16	0%	7	06-May-16	19-Jun-15	30-Jun-15	-240	0	0%	[Gantt Bar]																								
SE7C116	E13B (E7c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (3rd pour)	3	06-May-16	0%	3	10-May-16	02-Jul-15	04-Jul-15	-240	0	0%	[Gantt Bar]																								
SE7C118	E13B (E7c) - Seagull Pier Falsework & Scaffolding (4th pour, Interface layer)	3	10-May-16	0%	3	13-May-16	06-Jul-15	08-Jul-15	-240	0	0%	[Gantt Bar]																								
SE7C120	E13B (E7c) - Seagull Pier Shell Installation, Rebar Fixing, Formwork & Prep	7	13-May-16	0%	7	24-May-16	09-Jul-15	17-Jul-15	-240	0	0%	[Gantt Bar]																								
SE7C122	E13B (E7c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (4th pour)	3	24-May-16	0%	3	28-May-16	18-Jul-15	21-Jul-15	-240	0	0%	[Gantt Bar]																								
SE7C124	E13B (E7c) - Seagull Pier Falsework & Scaffolding (5th pour, Upper Arm)	3	28-May-16	0%	3	01-Jun-16	22-Jul-15	24-Jul-15	-240	0	0%	[Gantt Bar]																								
SE7C126	E13B (E7c) - Seagull Pier Rebar Fixing, Formwork & Prep (5th pour, Upper Arm)	6	01-Jun-16	0%	6	11-Jun-16	25-Jul-15	01-Aug-15	-240	0	0%	[Gantt Bar]																								
SE7C128	E13B (E7c) - Seagull Pier Concreting, Curing & Striking, CJ Prep (5th pour)	3	11-Jun-16	0%	3	16-Jun-16	03-Aug-15	05-Aug-15	-240	0	0%	[Gantt Bar]																								
SE7C130	E13B (E7c) - Seagull Pier Falsework & Scaffolding (6th pour, Upper Diaphragm)	3	13-Jun-16	0%	3	18-Jun-16	04-Aug-15	06-Aug-15	-240	0	0%	[Gantt Bar]																								
SE7C132	E13B (E7c) - Seagull Pier Rebar Fixing, Formwork & Prep (6th pour, Upper Diaphragm)	6	18-Jun-16	0%	6	27-Jun-16	07-Aug-15	14-Aug-15	-240	0	0%	[Gantt Bar]																								
<b>E14A, E14B, E14C &amp; E14D (E8d/E7d/E6d/E5d)</b>																																				
<b>Foundation Works - E14</b>																																				

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWP-E2-M34  
 Layout: J3518-DWP-3MRP Submission - M34  
 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 17 of 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**

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	2016																	
												March			April			May			June								
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20
GFXX545	Mobilization & Assembling Bored Pile Plant & Equipment for Viaducts in HKI	12	21-Mar-16	0%	12	07-Apr-16	25-Nov-14	08-Dec-14	-389	0	0%																		
<b>Foundation Works - E14A (E8d)</b>																													
GFXX544	E14A (E8d) - Confirm Rockhead levels	8	21-Mar-16	0%	8	01-Apr-16	04-Jun-15	15-Jun-15	-224	90	0%																		
<b>Foundation Works - E14B (E7d)</b>																													
GFXX544	E14B (E7d) - Confirm Rockhead levels	8	21-Mar-16	0%	8	01-Apr-16	25-Apr-15	05-May-15	-253	90	0%																		
<b>Foundation Works - E14C (E6d)</b>																													
GFXX544	E14C (E6d) - Confirm Rockhead levels	8	21-Mar-16	0%	8	01-Apr-16	09-May-15	19-May-15	-242	104	0%																		
<b>Foundation Works - E14D (E5d)</b>																													
GFXX544	E14D (E5d) - Confirm Rockhead levels	8	21-Mar-16	0%	8	01-Apr-16	16-Dec-14	24-Dec-14	-353	4	0%																		
GFXX546	E14D (E5d) - Bored Piles (2.20m dia. x 4 nos)	112	08-Apr-16*	0%	112	20-Aug-16	27-Dec-14	20-May-15	-357	0	0%																		
<b>Viaduct F</b>																													
<b>Viaduct F1</b>																													
<b>F2 (F1c)</b>																													
<b>Foundation Works</b>																													
GFXX556	F2 (F1c) - Bored Piles (1.80m dia. x 3 nos)	98	08-Apr-16	0%	98	04-Aug-16	09-Dec-14	13-Apr-15	-389	0	0%																		
<b>F3 (F1d)</b>																													
<b>Foundation Works</b>																													
GFXX557	F3 (F1d) - Bored Piles (1.80m dia. x 3 nos)	98	08-Apr-16	0%	98	04-Aug-16	11-Feb-15	15-Jun-15	-337	0	0%																		
<b>Viaduct F2</b>																													
<b>F6 (F2d)</b>																													
<b>Foundation Works</b>																													
GFXX565	F6 (F2d) - Bored Piles (1.80m dia. x 3 nos)	105	08-Apr-16	0%	105	12-Aug-16	24-Dec-14	07-May-15	-376	0	0%																		
<b>F5 (F2c)</b>																													
<b>Foundation Works</b>																													
GFXX564	F5 (F2c) - Bored Piles (1.80m dia. x 3 nos)	98	08-Apr-16	0%	98	04-Aug-16	02-Jan-15	05-May-15	-371	0	0%																		
<b>Viaduct F3</b>																													
<b>F9 (F3d-1/F3d-2)</b>																													
<b>Foundation Works - F9 (F3d-1/F3d-2)</b>																													
<b>Foundation Works</b>																													
GFXX575	F9 (F3d) - Bored Piles (1.80m dia. x 4 nos)	112	08-Apr-16	0%	112	20-Aug-16	30-Dec-14	19-May-15	-373	0	0%																		
<b>F10 (F3c-1/F3c-2)</b>																													
<b>Foundation Works - Pier F10</b>																													
<b>Foundation Works</b>																													
GFXX574	F10 (F3c) - Bored Piles (1.80m dia. x 4 nos)	84	08-Apr-16	0%	84	19-Jul-16	13-Mar-15	27-Jun-15	-314	0	0%																		
<b>Viaduct F4</b>																													
<b>F18 (F4c) &amp; Abutment</b>																													
<b>Foundation Works</b>																													
GFXX579-3	F18 (F4c) - Pre-drilling for Piles (2 nos)	24	05-Jan-16 A	100%	0	25-Mar-16 A					100%																		
<b>Approach Ramp F</b>																													
<b>Approach Ramp Land Foundation - HKBCF</b>																													
<b>Approach Ramp F Piling</b>																													
GFXX593	AR-F - Pre-drilling for Piles (25 nos)	24	21-Mar-16	0%	24	21-Apr-16	12-Feb-15	14-Mar-15	-324	0	0%																		
GFXX594	AR-F - Confirm Rockhead Levels	8	22-Apr-16	0%	8	30-Apr-16	16-Mar-15	24-Mar-15	-324	0	0%																		
GFXX595	AR-F - Bored Piles (25 nos.)	301	03-May-16	0%	301	08-May-17	25-Mar-15	02-Apr-16	-324	0	0%																		
<b>SUPERSTRUCTURE</b>																													
<b>Assembling, relocation and dismantle of lifting equipment</b>																													
<b>Launching Gantry 2</b>																													
FR100023	Viaduct E1 - Learning Curve - LG2	2	21-Mar-16	0%	2	22-Mar-16	27-Jul-19	29-Jul-19	948	0	0%																		
FR100023A	Viaduct B3 - Complete segments at Pier B3 (B3d) (2 seg) - LG2	2	23-Mar-16	0%	2	24-Mar-16	30-Jul-19	31-Jul-19	948	948	0%																		
<b>Adjustable Lifting Frame 1&amp;2</b>																													
FR000157	Viaduct B3 - Pier B4 - Assemble / Load Test Lifting Frame ALF 1/2	64	20-Jul-15 A	70.31%	19	16-Apr-16	08-Jul-19	31-Jul-19	933	0	0%																		
FR100024	Viaduct B3 - other tests & Learning Curve Lifting Frame ALF 1/2	12	01-Apr-16	0%	12	16-Apr-16	16-Jul-19	31-Jul-19	909	909	0%																		
<b>Narrow Lifting Frame 5&amp;6</b>																													
FR10030	Viaduct F2 - Dismantle NLF 5/6 at Pier F7	6	21-Mar-16	0%	6	30-Mar-16	29-Mar-17	04-Apr-17	304	454	0%																		
<b>Wide Lifting Frame 3&amp;4</b>																													
FR000662	Viaduct E2 - Pier E4A - Assemble / Load Test Lifting Frame WLF 3/4	20	18-Jun-16	0%	20	13-Jul-16	30-May-15	23-Jun-15	-312	0	0%																		
<b>Launching Gantry 1</b>																													
FR000008-T	Viaduct B2 - Launching LG1 B8 to B7	1	21-Mar-16	0%	1	21-Mar-16	31-Jul-19	31-Jul-19	945	945	0%																		
FR000010-T	Viaduct B2 - Launching LG1 B6 to B9	3	21-Mar-16	0%	3	23-Mar-16	23-Oct-15	26-Oct-15	-121	0	0%																		
FR000011-T	Viaduct B2 - Launching LG1 B7 to B6	1	21-Mar-16	0%	1	21-Mar-16	31-Jul-19	31-Jul-19	945	945	0%																		

	Actual Work
	Planned Bar
	Critical Bar
	Milestone

Project ID: J3518DWP-E2-M34  
Layout: J3518-DWP-3MRP Submission - M34  
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 18 of 21 Pages)**  
**(Progress as of 21-Mar-16)**

Date	Revision	Checked	Approved
30-Jan-16		PKN	KWY
02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**



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	2016																							
												March				April				May				June											
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06	13	20						
<b>Bridge E1 Superstructure</b>																																			
<b>Deck Installation</b>																																			
FR000026	Viaduct E1 - End Span at Pier B1 (B3f) (dwn) (7 seg) - LG2 (2 shifts)	4	09-Mar-16 A	100%	0	10-Mar-16 A					100%																								
FR000026A	Viaduct E1 - Launching LG2 B1 to E3A	2	15-Apr-16	0%	2	16-Apr-16	26-Oct-15	27-Oct-15	-136	0	0%																								
FR000030	Viaduct E1 - Cantilever at Pier E1-A (E1a4) (14 seg) - LG2 (2 shifts)	4	02-Apr-16	0%	4	07-Apr-16	13-Oct-15	17-Oct-15	-136	0	0%																								
FR000032	Viaduct E1 - Cantilever at Pier E2-A (E1b4) (16 seg) - LG2	8	21-Mar-16	0%	8	01-Apr-16	03-Oct-15	12-Oct-15	-136	0	0%																								
FR000033	Viaduct E1 - End Span at Pier E3-A (E2a4) (dwn) (6 seg) - LG2 (2 shifts)	4	18-Apr-16	0%	4	22-Apr-16	28-Oct-15	02-Nov-15	-136	0	0%																								
FR000035	Viaduct E1 - Cantilever at Pier E1-B (E1a3) (14 seg) - LG2 (2 shifts)	4	10-May-16	0%	4	13-May-16	18-Nov-15	21-Nov-15	-136	0	0%																								
FR000037	Viaduct E1 - Cantilever at Pier E2-B (E1b3) (16 seg) - LG2 (2 shifts)	4	26-Apr-16	0%	4	29-Apr-16	05-Nov-15	09-Nov-15	-136	0	0%																								
FR000038	Viaduct E1 - End Span at Pier E3-B (E2a3) (dwn) (6 seg) - LG2 (2 shifts)	4	30-Apr-16	0%	4	05-May-16	10-Nov-15	13-Nov-15	-136	0	0%																								
FR000039	Viaduct E1 - Cantilever at Pier E1-C (E1a2) (13 seg) - LG1 (2 shifts)	4	28-May-16	0%	4	01-Jun-16	11-Feb-16	15-Feb-16	-82	0	0%																								
FR000040	Viaduct E1 - Cantilever at Pier E2-C (E1b2) (16 seg) - LG1 (2 shifts)	6	10-May-16	0%	6	18-May-16	23-Jan-16	29-Jan-16	-82	0	0%																								
FR000041	Viaduct E1 - End Span at Pier E3-C (E2a2) (dwn) (6 seg) - LG1 (2 shifts)	5	19-May-16	0%	5	24-May-16	30-Jan-16	04-Feb-16	-82	0	0%																								
FR000041A	Viaduct E1 - Launching LG1 E3C to E1C	2	25-May-16	0%	2	27-May-16	05-Feb-16	06-Feb-16	-82	0	0%																								
FR000049	Viaduct E1 - End Span at Pier C1 (C4e) (down) (8 seg) - LG1	4	18-Jun-16	0%	4	23-Jun-16	26-Feb-16	01-Mar-16	-82	0	0%																								
FR000123	Viaduct E1 - End Span at Pier D1 (D4f) (dwn) (7 seg) - LG2 (2 shifts)	4	16-May-16	0%	4	20-May-16	23-Nov-15	26-Nov-15	-136	0	0%																								
FR000123A	Viaduct D3 - Launching LG2 D1 to D5	4	21-May-16	0%	4	25-May-16	27-Nov-15	01-Dec-15	-136	0	0%																								
<b>At-Grade Roadworks &amp; Other Works along NLH</b>																																			
<b>Viaduct A Slope Works</b>																																			
<b>Slope 9SE-B/FR8</b>																																			
GFXX485	9SE-B/FR8 - Protective Fencing	46	21-Mar-16	0%	46	23-May-16	12-Sep-15	11-Nov-15	-151	0	0%																								
GFXX490	9SE-B/FR8 - Mobilization for Mini Pile	3	24-May-16	0%	3	27-May-16	12-Nov-15	14-Nov-15	-151	0	0%																								
GFXX491	9SE-B/FR8 - Installation of Mini Pile (118 No.)	148	28-May-16	0%	148	08-Dec-16	16-Nov-15	23-May-16	-151	0	0%																								
<b>Viaduct B Slope Works</b>																																			
<b>Slope 10SW-A/F52</b>																																			
GFXX483	10SW-A/F52 - Mobilization for soldier piling	3	24-Mar-16	0%	3	31-Mar-16	11-Sep-15	14-Sep-15	-156	0	0%																								
GFXX484	10SW-A/F52 - Installation of Soldier Pile (260nos., 2rigs)	126	31-Mar-16	0%	126	19-Sep-16	15-Sep-15	22-Feb-16	-156	0	0%																								
<b>At-Grade Roadworks along NLH Westbound</b>																																			
RW10005	NLH W/B (Viaduct C) - Implement TTM - Verge for Gantry Footings (GT3:)	2	21-Mar-16	0%	2	22-Mar-16	17-Nov-15	18-Nov-15	-101	0	0%																								
RW10007	NLH W/B (Viaduct C) - Gantry Footing (GT324, GT325) - Verge (KD3)	35	23-Mar-16	0%	35	07-May-16	19-Nov-15	31-Dec-15	-101	0	0%																								
RW10009B	NLH W/B (Viaduct C) - Implement TTM - Median for Gantry Footings (GT:)	2	09-May-16	0%	2	10-May-16	02-Jan-16	04-Jan-16	-101	0	0%																								
RW10009C	NLH W/B (Viaduct C) -Gantry Footing (GT324, GT325) - Median (KD3)	48	11-May-16	0%	48	08-Jul-16	05-Jan-16	03-Mar-16	-101	0	0%																								
<b>At-Grade Roadworks along NLH Eastbound</b>																																			
RW20011	NLH E/B (Viaduct D) - Implement TTM for tie-in works	2	27-May-16	0%	2	28-May-16	03-Feb-16	04-Feb-16	-85	22	0%																								
RW21000	NLH E/B (Viaduct A) - Implement TTM - Verge for Slope Works & Gantry F	2	24-May-16	0%	2	25-May-16	14-Mar-16	15-Mar-16	-52	0	0%																								
RW21001	NLH E/B (Viaduct A) - Gantry Footing (GT319, GT320) - Verge (KD5)	36	27-May-16	0%	36	18-Jul-16	16-Mar-16	04-May-16	-52	0	0%																								
<b>At-Grade Roadworks and Other Works along Cheung Tung Road</b>																																			
<b>Re-alignment of Cheung Tung Road adjacent to Viaduct B</b>																																			
RP00051	Ch300-620: watermain (DN1000+DN450)	101	15-Apr-15 A	30%	71	18-Jun-16	14-Jul-15	07-Oct-15	-205	923	30%																								
RP00052	Ch300-620: road drainage	102	04-May-15 A	49%	52	27-May-16	29-May-19	31-Jul-19	942	942	49%																								
RP00053	Ch300-620: towngas(DN250+DN400)	70	21-Mar-16	0%	70	17-Jun-16	14-Jul-15	06-Oct-15	-205	0	0%																								
RP00054	Ch300-620: duct laying 11KV	15	24-May-16	0%	15	10-Jun-16	10-Sep-15	26-Sep-15	-205	0	0%																								
RP00055	Ch300-650: telecom cables	15	11-Jun-16	0%	15	28-Jun-16	29-Sep-15	16-Oct-15	-205	0	0%																								
RP00063	Ch620-750: backfilling for roadwork	29	06-May-15 A	20%	23	23-Apr-16	17-Oct-15	16-Nov-15	-124	0	20%																								
RP00064	Ch620-750: telecom, 11KV & 132KV ducting	20	01-Apr-16	0%	20	26-Apr-16	28-Oct-15	19-Nov-15	-125	27	0%																								
RP00065	Ch620-750: cross road duct for WM, 11KV, telecom & lighting	16	05-May-15 A	80%	3	24-Mar-16	16-Nov-15	19-Nov-15	-101	51	80%																								
RP00066	Ch620-750: Towngas(DN250+DN400)	14	21-Mar-16	0%	14	09-Apr-16	19-Sep-15	07-Oct-15	-148	0	0%																								
RP00067	Ch620-750: road drainage	18	09-Apr-16	0%	18	04-May-16	08-Oct-15	31-Oct-15	-146	0	0%																								
RP00068	Ch620-750 Pak Mong temp road	8	04-May-16	0%	8	13-May-16	02-Nov-15	10-Nov-15	-146	0	0%																								
RP00069	Ch620-750: cross road duct for 11KV, telecom & street light cable	14	16-May-16	0%	14	31-May-16	11-Nov-15	26-Nov-15	-148	4	0%																								
RP00070	Ch620-750: roadwork for new CTR	27	10-May-16	0%	27	20-Jun-16	10-Nov-15	10-Dec-15	-144	50	0%																								
RP00073	Ch100-300: trench excavation on footpath	13	21-Mar-16	0%	13	08-Apr-16	08-Aug-15	25-Aug-15	-177	0	0%																								
RP00075	Ch100-300: duct laying for 11KV	14	09-Apr-16	0%	14	25-Apr-16	26-Aug-15	11-Sep-15	-181	0	0%																								
RP00076	Ch100-300: lay telecom cable	10	26-Apr-16	0%	10	07-May-16	12-Sep-15	23-Sep-15	-181	0	0%																								
RP00077	Ch100-300: street lighting & draw pit	13	07-May-16	0%	13	25-May-16	24-Sep-15	10-Oct-15	-177	0	0%																								
RP00078	Ch100-300: relocation of vent pipe	19	26-May-16	0%	19	17-Jun-16	28-Oct-15	18-Nov-15	-169	10	0%																								
RP00079	Ch100-300: watermain(DN450+DN1000)	142	29-Apr-15 A	84%	23	20-Apr-16	13-Aug-15	09-Sep-15	-179	0	84%																								
RP00080	Ch100-300: towngas(DN250)	30	20-Apr-16	0%	30	27-May-16	10-Sep-15	16-Oct-15	-179	0	0%																								
RP00081	Ch100-300: towngas(DN400)	27	27-May-16	0%	27	29-Jun-16	17-Oct-15	18-Nov-15	-179	0	0%																								
RP00083	Ch100-300: roadwork for new CTR	52	21-May-16	0%	52	03-Aug-16	08-Oct-15	10-Dec-15	-177	17	0%																								

<ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Actual Work</li> <li><span style="color: green;">■</span> Planned Bar</li> <li><span style="color: red;">■</span> Critical Bar</li> <li>◆ Milestone</li> </ul>	Project ID: J3518DWPRe2-M34 Layout: J3518-DWP-3MRP Submission - M34 Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.	<b>Tuen Mun - Chek Lap Kok Link - Southern Connection</b> <b>3-Month Rolling Programme (Page 20 of 21 Pages)</b> <b>(Progress as of 21-Mar-16)</b>	<table border="1" style="width: 100%;"> <tr> <th>Date</th> <th>Revision</th> <th>Checked</th> <th>Approved</th> </tr> <tr> <td>30-Jan-16</td> <td></td> <td>PKN</td> <td>KWY</td> </tr> <tr> <td>02-Mar-16</td> <td></td> <td>PKN</td> <td>KWY</td> </tr> <tr> <td>29-Mar-16</td> <td></td> <td>PKN</td> <td>HF</td> </tr> </table>	Date	Revision	Checked	Approved	30-Jan-16		PKN	KWY	02-Mar-16		PKN	KWY	29-Mar-16		PKN	HF	<b>DWG. No.:</b> <b>J3518/GCL/PGM/3MRP-M34</b>
Date	Revision	Checked	Approved																	
30-Jan-16		PKN	KWY																	
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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	2016															
												March				April				May				June			
												22	29	07	14	21	28	04	11	18	25	02	09	16	23	30	06
<b>West Portion</b>																											
RW61000	Realign CTR (West of Abut. C) - Site Clearance	42	03-Sep-14 A	100%	0	21-Mar-16 A					100%																
RW61010	Realign CTR (West of Abut. C) - Road drainage works	60	15-Jan-15 A	80%	12	10-May-16	08-May-19	22-May-19	878	0	80%																
RW61020	Realign CTR (West of Abut. C) - Utility diversion	90	24-Mar-15 A	70%	27	08-Jul-16	25-Jun-19	31-Jul-19	878	878	70%																
RW61030	Realign CTR (West of Abut. C) - Sub-base work	48	15-Dec-15 A	50%	24	21-Apr-16	23-Dec-15	22-Jan-16	-70	0	50%																
RW61050	Realign CTR (West of Abut. C) - Street Light Poles & street furniture	24	22-Apr-16	0%	24	21-May-16	23-Jan-16	23-Feb-16	-70	0	0%																
RW61060	Realign CTR (West of Abut. C) - E&M works & Testing/Commissioning	40	23-May-16	0%	40	09-Jul-16	24-Feb-16	14-Apr-16	-70	0	0%																
RW61082	Realign CTR (West of Abut. C) - Road formation	48	20-Nov-14 A	70%	14	11-Apr-16	29-Mar-19	17-Apr-19	878	0	70%																
<b>East Portion</b>																											
RW60005	Realign CTR (East of Abut. C) - Road formation	66	02-Oct-15 A	60%	26	25-Apr-16	21-Nov-15	22-Dec-15	-96	0	60%																
RW60010	Realign CTR (East of Abut. C) - Road drainage works	60	02-Oct-15 A	60%	24	25-May-16	23-Dec-15	22-Jan-16	-96	0	60%																
RW60020	Realign CTR (East of Abut. C) - Utility diversion	70	02-Jan-16 A	20%	56	08-Jul-16	30-Dec-15	08-Mar-16	-96	0	20%																
<b>Viaduct C Slope Works</b>																											
<b>Slope 10NW-C/F15</b>																											
SWVC6000	10NW-C/F15 - Slope works	24	29-Apr-16	0%	24	31-May-16	30-Aug-16	29-Sep-16	89	0	0%																
SWVC6005	10NW-C/F15 - Install Geo. Instru. & Baseline Monitoring	30	01-Jun-16	0%	30	15-Jul-16	30-Sep-16	08-Nov-16	89	310	0%																
<b>At grade Roadworks and Other Works at Southern Landfall</b>																											
RW30005	South Landfall - Initial record survey	12	21-Mar-16	0%	12	07-Apr-16	20-Nov-15	03-Dec-15	-98	21	0%																
RW30010	South Landfall - Mobilisation for Portion B Works	24	05-May-16	0%	24	08-Jun-16	04-Dec-15	04-Jan-16	-119	0	0%																
RW30014	South Landfall - DN300 Fresh water main works installation & connection (I	60	08-Jun-16	0%	60	29-Aug-16	31-Mar-16	23-Jun-16	-51	0	0%																
<b>Watermains &amp; All Assoc Works from Tung Chung to Southern Landfall</b>																											
WM00120	Lay DN450 Fresh Water Main along re-aligned CTR (app. 500 m at 12m/c	48	22-Apr-15 A	80%	10	05-Apr-16	19-Jul-19	31-Jul-19	936	936	80%																
WM00160	Lay DN450 watermain from Tung Chung to realigned CTR (2nd 500m - 2 v	50	28-Dec-15 A	55%	23	22-Apr-16	31-Oct-16	25-Nov-16	164	0	55%																
WM00170	Lay DN450 watermain from Tung Chung to realigned CTR (3rd 500m - 2 v	50	22-Apr-16	0%	50	04-Jul-16	26-Nov-16	26-Jan-17	164	0	0%																
<b>Pressure Testing</b>																											
TC00010	Pressure Test DN450 Fresh Water Main along re-aligned CTR (app. 520 m	12	18-Sep-15 A	80%	2	23-Mar-16	29-Mar-17	31-Mar-17	286	646	80%																

■ Actual Work  
■ Planned Bar  
■ Critical Bar  
◆ Milestone

Project ID: J3518DWPRe2-M34  
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**Tuen Mun - Chek Lap Kok Link - Southern Connection**  
**3-Month Rolling Programme (Page 21 of 21 Pages)**  
**(Progress as of 21-Mar-16)**

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02-Mar-16		PKN	KWY
29-Mar-16		PKN	HF

**DWG. No.:**  
**J3518/GCL/PGM/3MRP-M34**



## 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-Chek Lap  
Kok Link - Investigation. Updated EM&A Manual for  
Tuen Mun-Chek Lap Kok Link)

*Contract No. HY/2012/07  
Tuen Mun – Chek Lap Kok Link  
Southern Connection Viaduct Section  
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
<b>AIR QUALITY</b>									
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		✓
<b>NOISE</b>									
5.11	Section 4	Noise monitoring	All existing representative sensitive receivers / during North Lantau Viaduct construction	Contractor	EM&A Manual		Y		✓
<b>WATER QUALITY</b>									
<i>General Marine Works</i>									
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		✓
<i>Temporary Staging work</i>									
	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						
<i>Land Works</i>									
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		✓
<i>Water Quality Monitoring</i>									
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	✓
<b>ECOLOGY</b>									
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		✓
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 <sup>2</sup> 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 (donor 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		✓
7.13	6.5	Undertaken gabion wall works in Stream NL1 in the dry season	North Lantau slope works/dry	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	
			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		✓
<b>LANDSCAPE AND VISUAL</b>									
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		✓ Implemented as the 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		✓
10.9	7.6	Recycle/Reuse all felled trees and vegetation, e.g.	All areas/detailed	Design	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	
		mulching (CM9)	design/ during construction	Consultant/ Contractor					
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		n/a
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 (OM4)	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	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and	All areas/detailed design/ during	Design Consultant/	TMEIA	Y	Y	Y	n/a. To be

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status
						D	C	O	
		finishes	construction / during operation	Contractor					implemented by HyD
<b>WASTE</b>									
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 where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	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	
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 materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The Contractor should recycle as many C&D	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	
		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.	construction period						
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: <ul style="list-style-type: none"> <li>- suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed;</li> <li>- Having a capacity of &lt;450L unless the specifications have been approved by the EPD; and</li> <li>- 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;</li> <li>- Enclosed with at least 3 sides;</li> <li>- 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;</li> <li>- Adequate ventilation;</li> <li>- Sufficiently covered to prevent rainfall entering</li> </ul>	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	
		(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 hardstanding;	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 paper if such volume is sufficiently large to warrant collection. Participation in a local	Site Offices/ 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	
		collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.							
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		✓
<b>CULTURAL HERITAGE</b>									
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*

<b>Parameters</b>	<b>Action</b>	<b>Limit</b>
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR9A/ ASR8A = 178 ASR9C/ ASR8/ ASR9 = 178	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR9A/ ASR8A = 394 ASR9C/ ASR8/ ASR9 = 393	500

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

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

**Table D3** *Action and Limit Levels for Water Quality*

<b>Parameter</b>	<b>Action Level#</b>	<b>Limit Level#</b>
DO in $\text{mg}/\text{L}$ (a)	<u>Surface and Middle</u> <b>5.0 mg/L</b>	<u>Surface and Middle</u> <b>4.2 mg/L</b>
	<u>Bottom</u> <b>4.7 mg/L</b>	<u>Bottom</u> <b>3.6 mg/L</b>
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., <b>27.5 NTU</b>	130% of upstream control station at the same tide of the same day and 99%-ile of baseline data, i.e., <b>47.0 NTU</b>
SS in $\text{mg}/\text{L}$ (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., <b>23.5 mg/L</b>	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., <b>34.4 mg/L</b>

**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	
<b>Notes:</b>		
1.	STG means quarterly encounter rate of number of dolphin sightings, which is <b>6.00 in NEL</b> and <b>9.85 in NWL</b> during the baseline monitoring period	
2.	ANI means quarterly encounter rate of total number of dolphins, which is <b>22.19 in NEL</b> and <b>44.66 in NWL</b> 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 31 March 2016)**

Alternative Noise Monitoring at Pak Mong Village Entrance

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

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

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01-Mar	02-Mar	03-Mar	04-Mar	05-Mar
				1-hr TSP Monitoring 24-hr TSP Monitoring		
06-Mar	07-Mar	08-Mar	09-Mar	10-Mar	11-Mar	12-Mar
			1-hr TSP Monitoring 24-hr TSP Monitoring			
13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar
		1-hr TSP Monitoring 24-hr TSP Monitoring				
20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar
	1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring		
27-Mar	28-Mar	29-Mar	30-Mar	31-Mar		
			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 30 Apr 2016)**

Alternative Noise Monitoring at Pak Mong Village Entrance

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

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

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-Apr	02-Apr
03-Apr	04-Apr	05-Apr	06-Apr	07-Apr	08-Apr	09-Apr
		1-hr TSP Monitoring 24-hr TSP Monitoring				
10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr
	1-hr TSP Monitoring 24-hr TSP Monitoring			1-hr TSP Monitoring 24-hr TSP Monitoring		
17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr
			1-hr TSP Monitoring 24-hr TSP Monitoring			
24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr
		1-hr TSP Monitoring 24-hr TSP Monitoring			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 May 2016)**

Alternative Noise Monitoring at Pak Mong Village Entrance

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

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

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

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

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01-Mar	02-Mar	03-Mar	04-Mar	05-Mar
		<b>WQM</b> Mid-Flood 11:07 (09:22 - 12:52) Mid-Ebb 17:59 (16:14 - 19:44)		<b>WQM</b> Mid-Ebb 8:07 (06:22 - 09:00) Mid-Flood 12:50 (11:05 - 14:35)		<b>WQM</b> Mid-Ebb 10:45 (09:00 - 12:30) Mid-Flood 15:42 (13:57 - 17:27)
06-Mar	07-Mar	08-Mar	09-Mar	10-Mar	11-Mar	12-Mar
		<b>WQM</b> Mid-Ebb 12:46 (11:01 - 14:31) Mid-Flood 18:23 (16:38 - 20:08)		<b>WQM</b> Mid-Flood 8:02 (06:17 - 09:47) Mid-Ebb 14:00 (12:15 - 15:45)		<b>WQM</b> Mid-Flood 9:06 (07:21 - 10:51) Mid-Ebb 15:23 (13:38 - 17:08)
13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar
		<b>WQM</b> Mid-Flood 11:04 (09:19 - 12:49) Mid-Ebb 18:10 (16:25 - 19:55)		<b>WQM</b> Mid-Ebb 8:48 (07:40 - 10:00) Mid-Flood 13:44 (11:59 - 15:29)		<b>WQM</b> Mid-Ebb 11:12 (09:27 - 12:57) Mid-Flood 16:25 (14:40 - 18:10)
20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar
		<b>WQM</b> Mid-Ebb 12:43 (10:58 - 14:28) Mid-Flood 18:37 (16:52 - 20:22)		<b>WQM</b> Mid-Flood 7:40 (05:55 - 09:25) Mid-Ebb 13:36 (11:51 - 15:21)		<b>WQM</b> Mid-Flood 8:25 (06:40 - 10:10) Mid-Ebb 14:35 (12:50 - 16:20)
27-Mar	28-Mar	29-Mar	30-Mar	31-Mar		
		<b>WQM</b> Mid-Flood 9:44 (07:59 - 11:29) Mid-Ebb 16:25 (14:40 - 18:10)		<b>WQM</b> Mid-Flood 10:52 (09:07 - 12:37) Mid-Ebb 18:17 (16:32 - 20:02)		



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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-Apr	02-Apr
						<b>WQM</b> Mid-Ebb 9:27 (08:00 - 11:00) Mid-Flood 14:04 (12:19 - 15:49)
03-Apr	04-Apr	05-Apr	06-Apr	07-Apr	08-Apr	09-Apr
		<b>WQM</b> Mid-Ebb 11:44 (09:59 - 13:29) Mid-Flood 17:22 (15:37 - 19:07)		<b>WQM</b> Mid-Ebb 12:58 (11:13 - 14:43) Mid-Flood 19:07 (17:22 - 20:52)		<b>WQM</b> Mid-Flood 7:55 (06:10 - 09:40) Mid-Ebb 14:20 (12:35 - 16:05)
10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr
		<b>WQM</b> Mid-Flood 9:46 (08:01 - 11:31) Mid-Ebb 16:44 (14:59 - 18:29)		<b>WQM</b> Mid-Flood 11:31 (09:46 - 13:16) Mid-Ebb 18:55 (17:10 - 20:40)		<b>WQM</b> Mid-Ebb 10:03 (08:18 - 11:48) Mid-Flood 15:06 (13:21 - 16:51)
17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr
		<b>WQM</b> Mid-Ebb 11:50 (10:05 - 13:35) Mid-Flood 17:47 (16:02 - 19:32)		<b>WQM</b> Mid-Ebb 12:45 (11:00 - 14:30) Mid-Flood 19:06 (17:21 - 20:51)		<b>WQM</b> Mid-Flood 7:50 (06:05 - 09:35) Mid-Ebb 13:43 (11:58 - 15:28)
24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr
		<b>WQM</b> Mid-Flood 8:41 (06:56 - 10:26) Mid-Ebb 15:21 (13:36 - 17:06)		<b>WQM</b> Mid-Flood 9:47 (08:02 - 11:32) Mid-Ebb 16:50 (15:05 - 18:35)		<b>WQM</b> Mid-Flood 11:49 (10:04 - 13:34) Mid-Ebb 18:53 (17:08 - 20:38)

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01-May	02-May	03-May	04-May	05-May	06-May	07-May
		<b>WQM</b> Mid-Ebb 10:37 (08:52 - 12:22) Mid-Flood 16:11 (14:26 - 17:56)		<b>WQM</b> Mid-Ebb 11:56 (10:11 - 13:41) Mid-Flood 18:07 (16:22 - 19:52)		<b>WQM</b> Mid-Ebb 13:20 (11:35 - 15:05) Mid-Flood 20:01 (18:16 - 21:46)
08-May	09-May	10-May	11-May	12-May	13-May	14-May
		<b>WQM</b> Mid-Flood 8:41 (06:56 - 10:26) Mid-Ebb 15:37 (13:52 - 17:22)		<b>WQM</b> Mid-Flood 10:08 (08:23 - 11:53) Mid-Ebb 17:18 (15:33 - 19:03)		<b>WQM</b> Mid-Flood 12:51 (11:06 - 14:36) Mid-Ebb 19:35 (17:50 - 21:20)
15-May	16-May	17-May	18-May	19-May	20-May	21-May
		<b>WQM</b> Mid-Ebb 10:46 (09:01 - 12:31) Mid-Flood 16:42 (14:57 - 18:27)		<b>WQM</b> Mid-Ebb 11:50 (10:05 - 13:35) Mid-Flood 18:15 (16:30 - 20:00)		<b>WQM</b> Mid-Ebb 12:51 (11:06 - 14:36) Mid-Flood 19:36 (17:51 - 21:21)
22-May	23-May	24-May	25-May	26-May	27-May	28-May
		<b>WQM</b> Mid-Flood 7:44 (05:59 - 09:29) Mid-Ebb 14:29 (12:44 - 16:14)		<b>WQM</b> Mid-Flood 8:54 (07:09 - 10:39) Mid-Ebb 15:47 (14:02 - 17:32)		<b>WQM</b> Mid-Flood 10:27 (08:42 - 12:12) Mid-Ebb 17:24 (15:39 - 19:09)
29-May	30-May	31-May				
		<b>WQM</b> Mid-Ebb 9:15 (07:30 - 11:00) Mid-Flood 14:43 (12:58 - 16:28)				

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

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

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

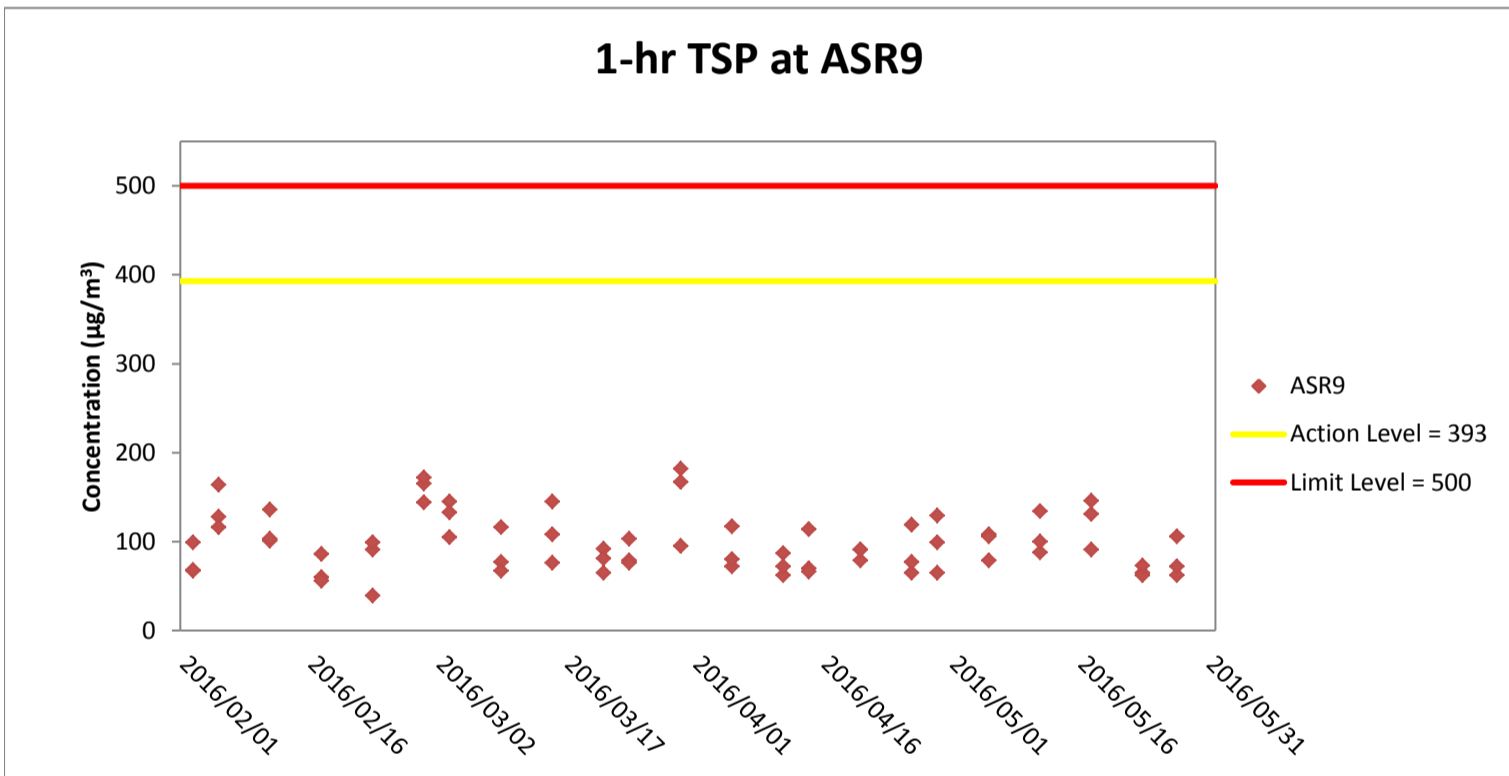
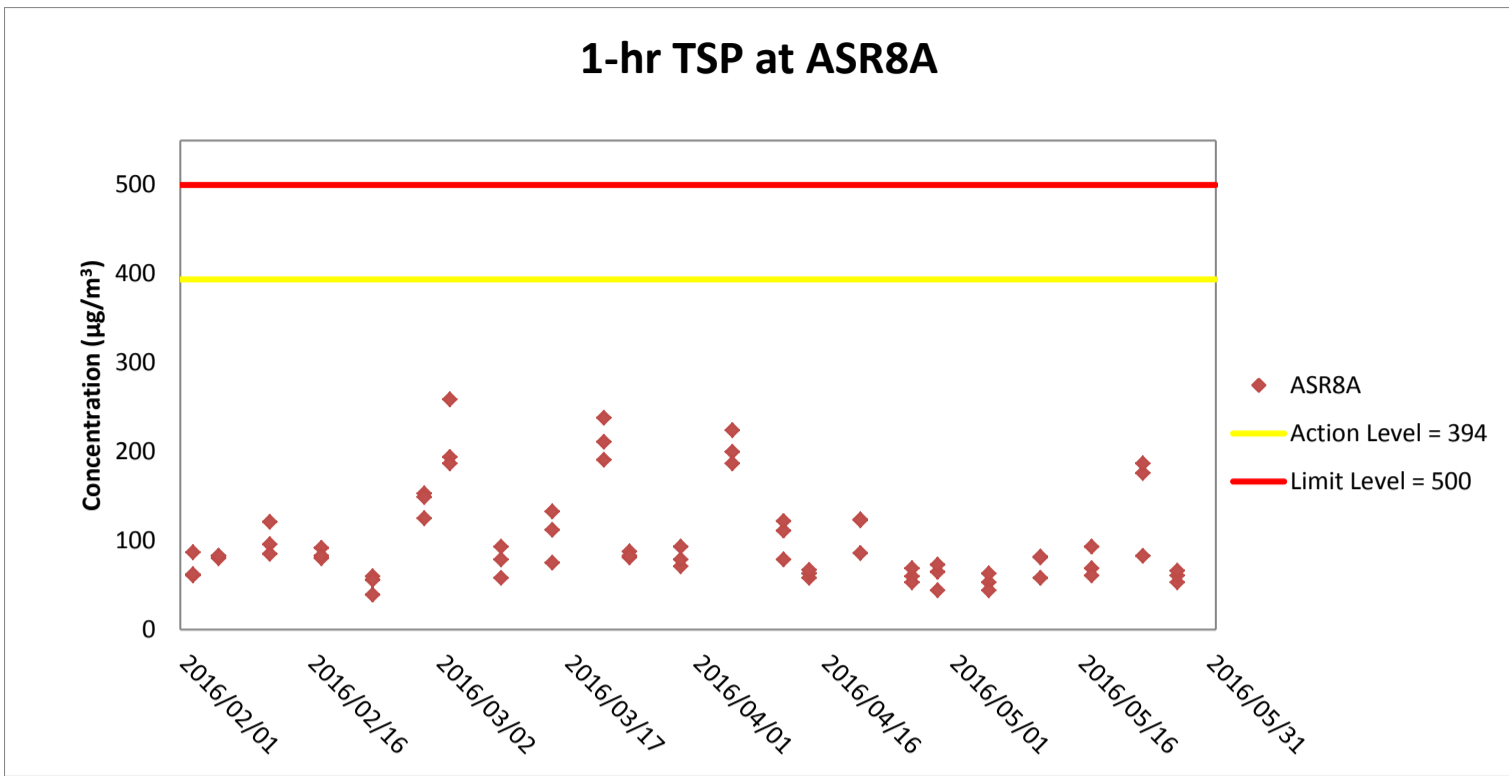
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01-Apr	02-Apr
03-Apr	04-Apr	05-Apr	06-Apr	07-Apr	08-Apr	09-Apr
		Impact Dolphin Monitoring				
10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr
		Impact Dolphin Monitoring			Impact Dolphin Monitoring	
17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr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

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

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

Appendix F

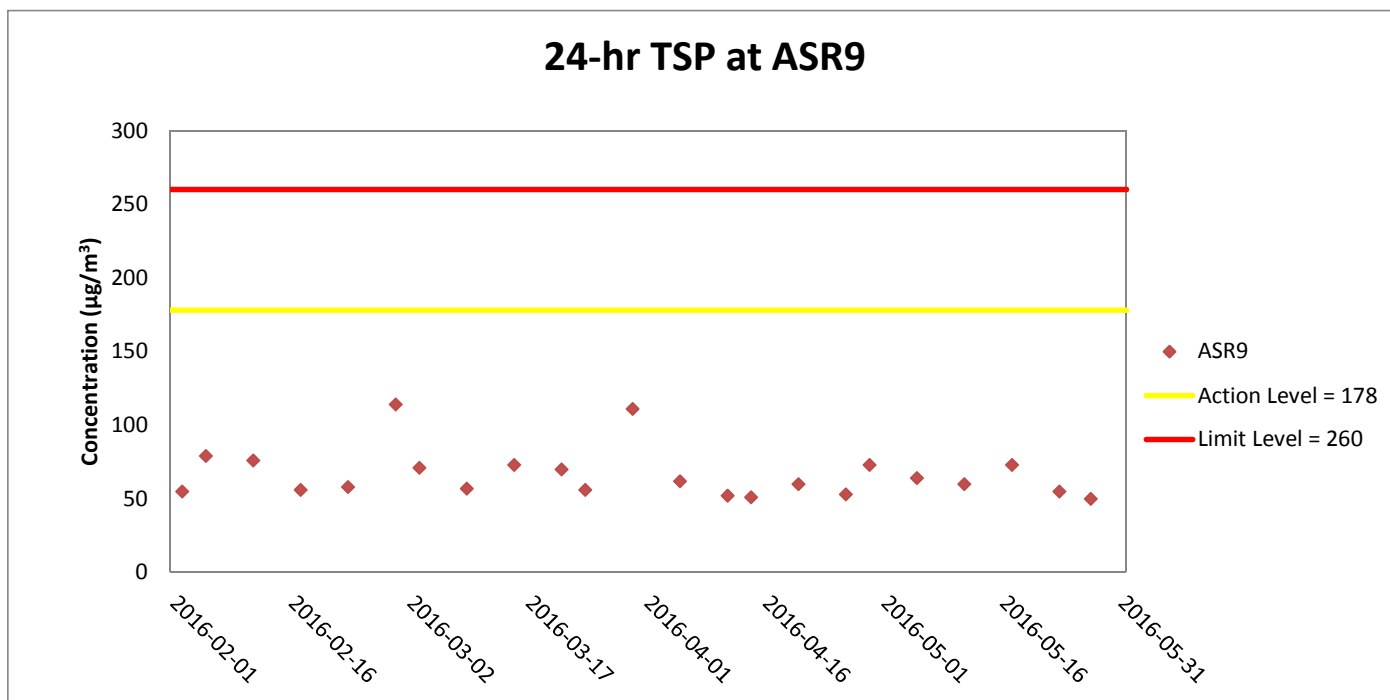
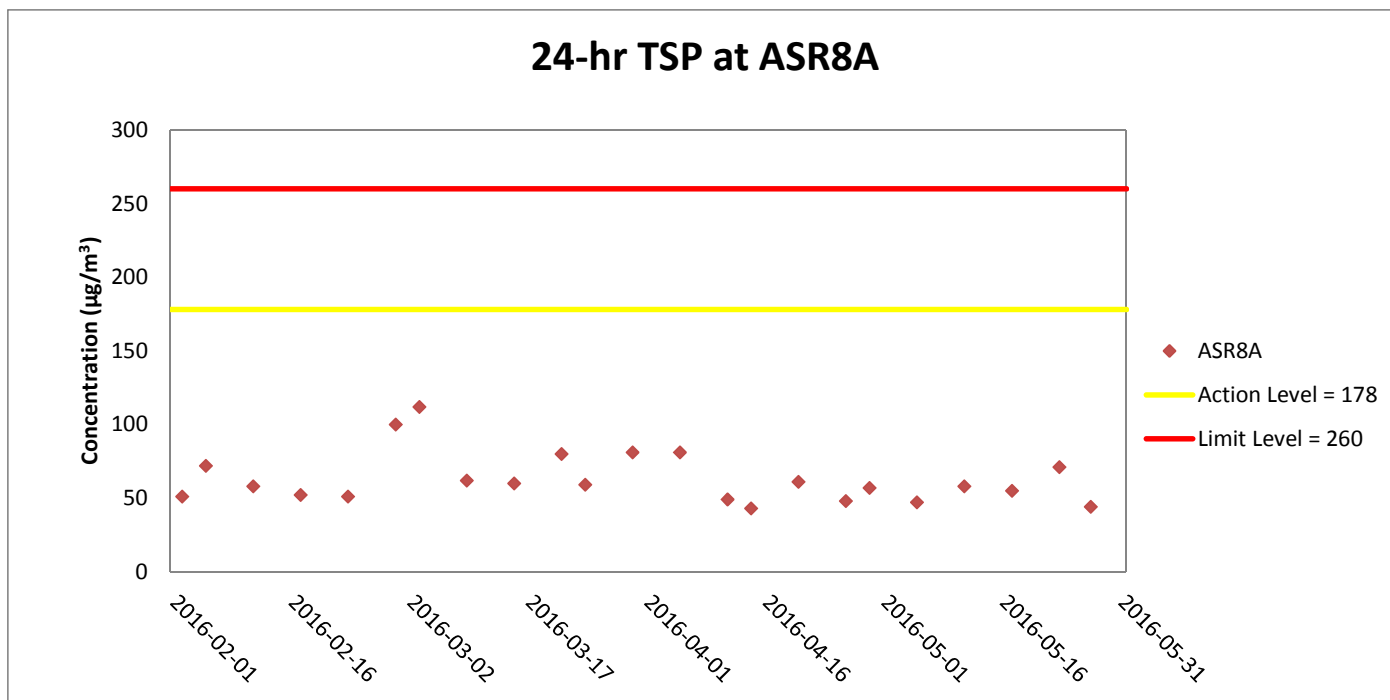
Impact Air Quality  
Monitoring Graphical  
Presentation



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; Construction of marine section of berth at Southern Landfall; 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.

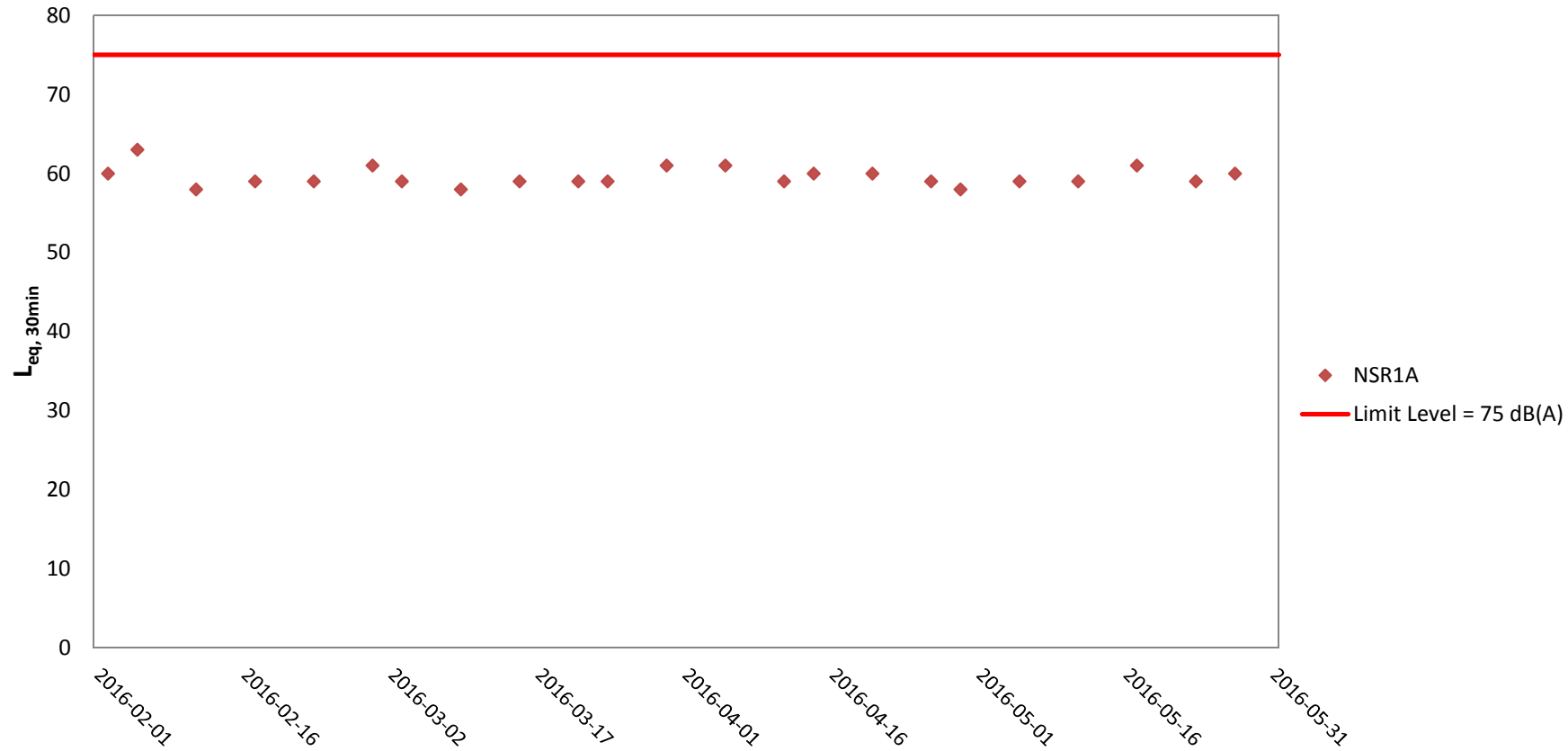
Marine works within the reporting period include Construction and installation of pile caps; Uninstallation of marine piling platform; Pier construction; Construction of marine section of berth at Southern Landfall; Launching gantry operation; and Installation of deck segment and pier head segment.



Appendix G

## Impact Noise Monitoring Graphical Presentation

## Noise Monitoring Results at NSR 1A ( $L_{eq, 30min}$ )



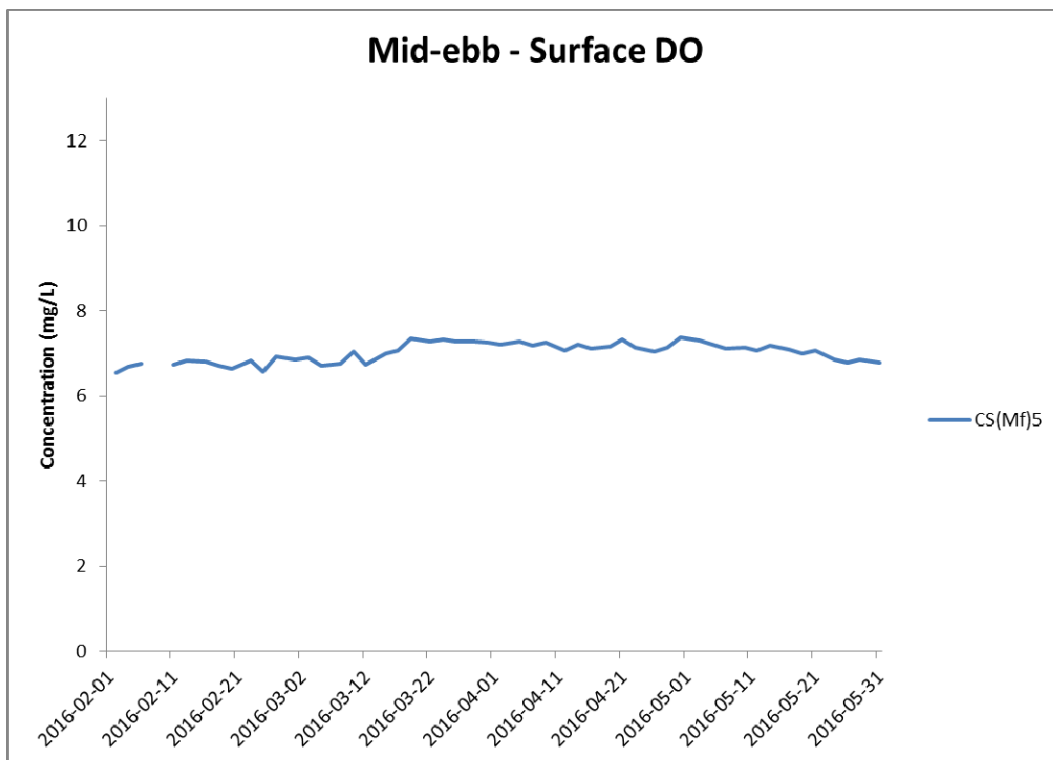
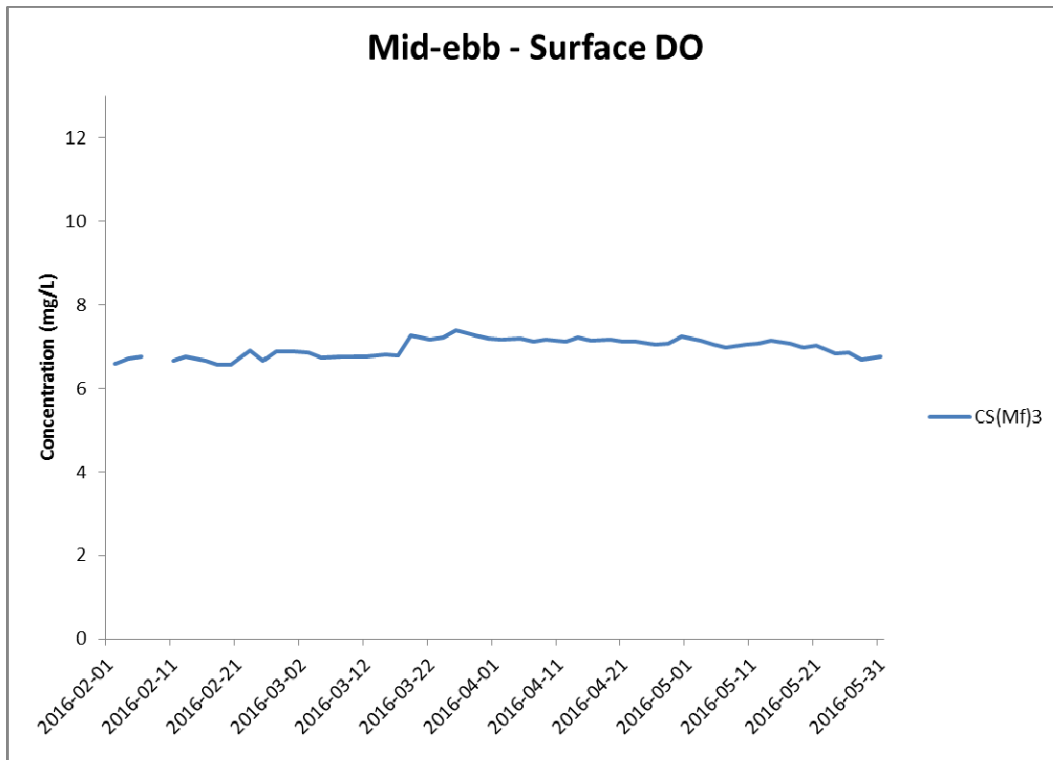
*Weather condition within the reporting period varied between sunny to rainy.*

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

Appendix H

# Impact Water Quality Monitoring Graphical Presentation

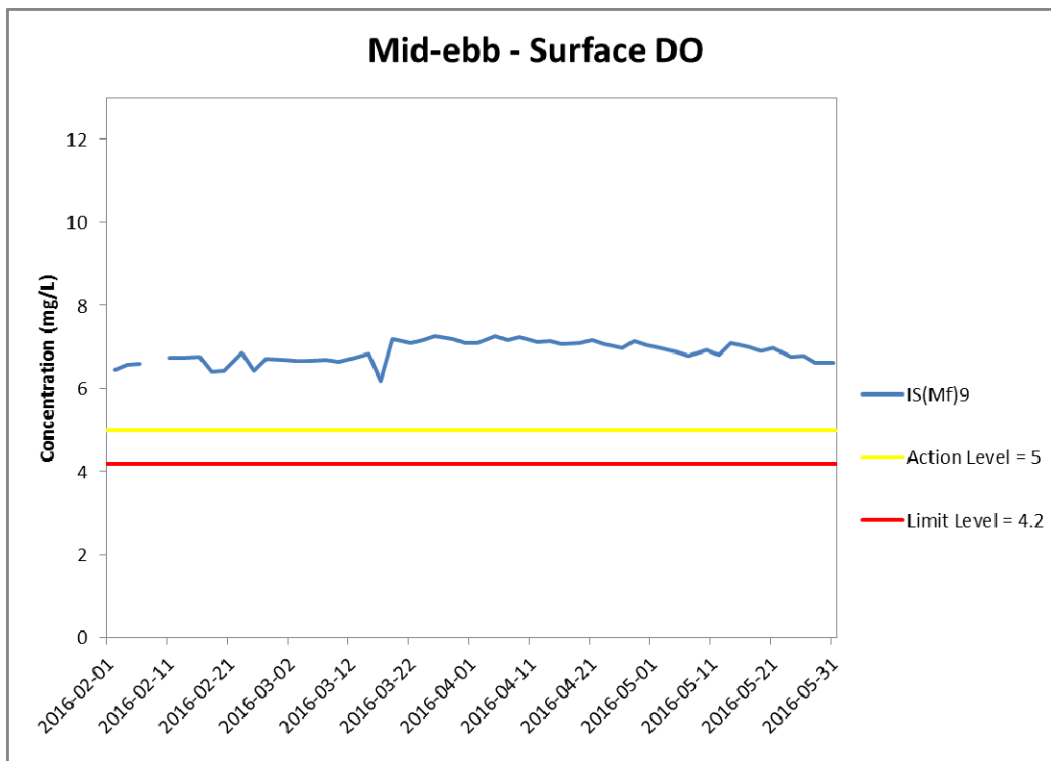
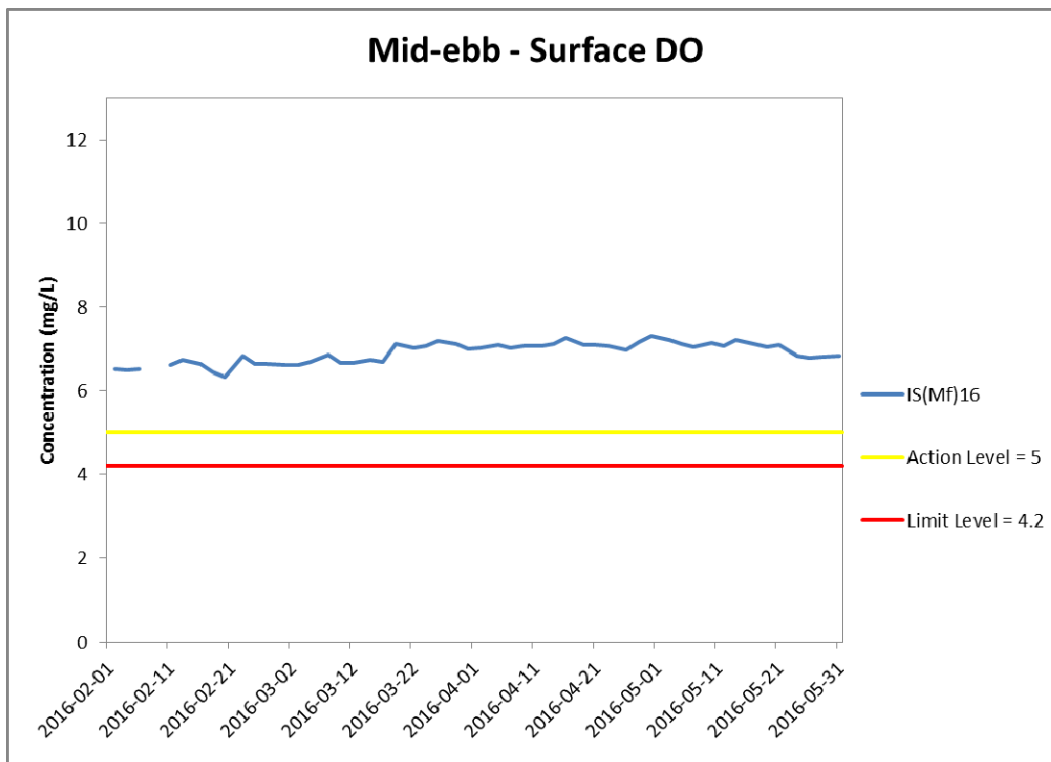


**Figure H1 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



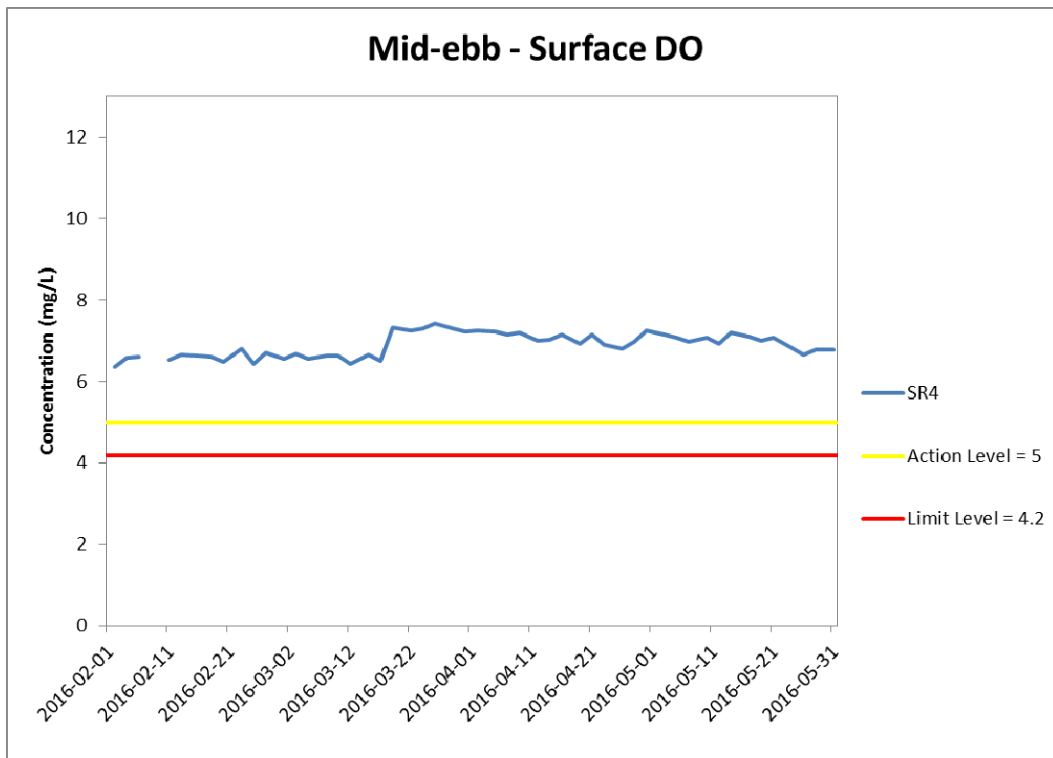
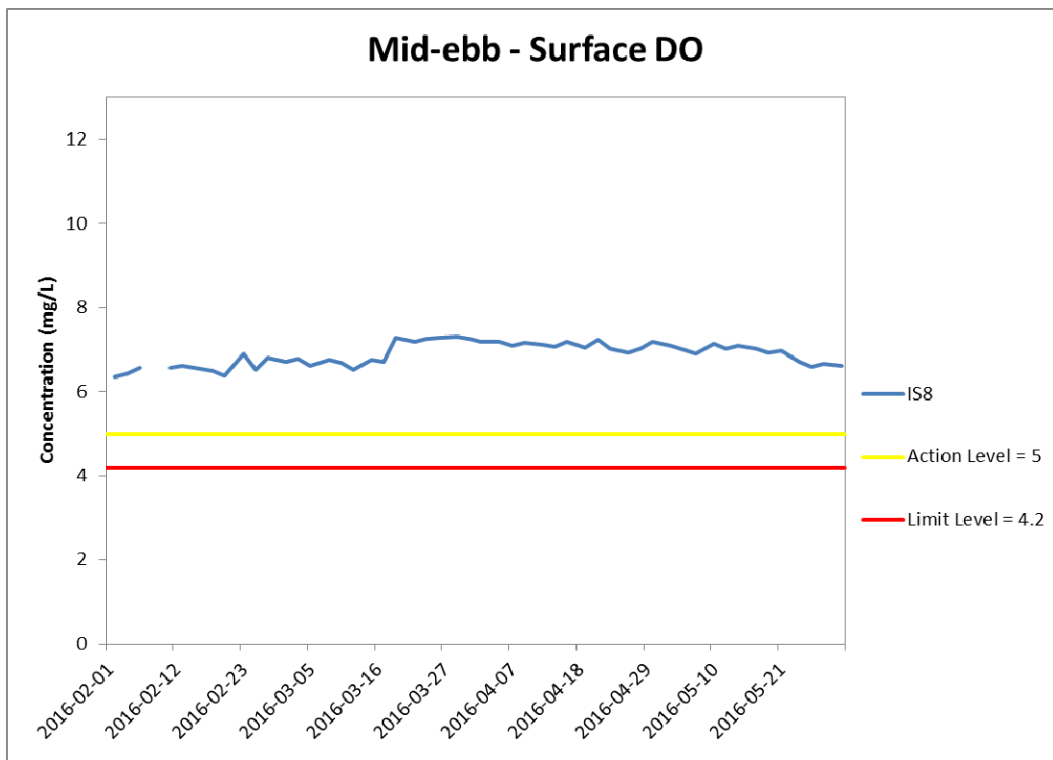


**Figure H2 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



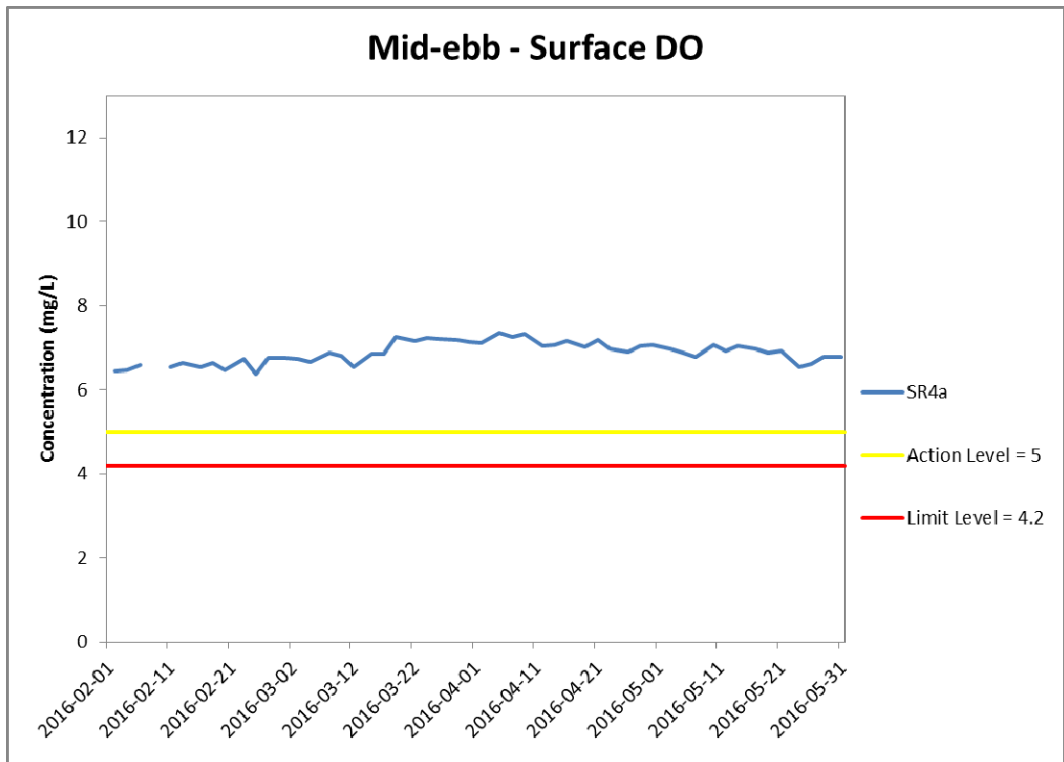


**Figure H3 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 February and 31 May 2016 at IS8 and SR4.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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*

**Environmental  
Resources  
Management**



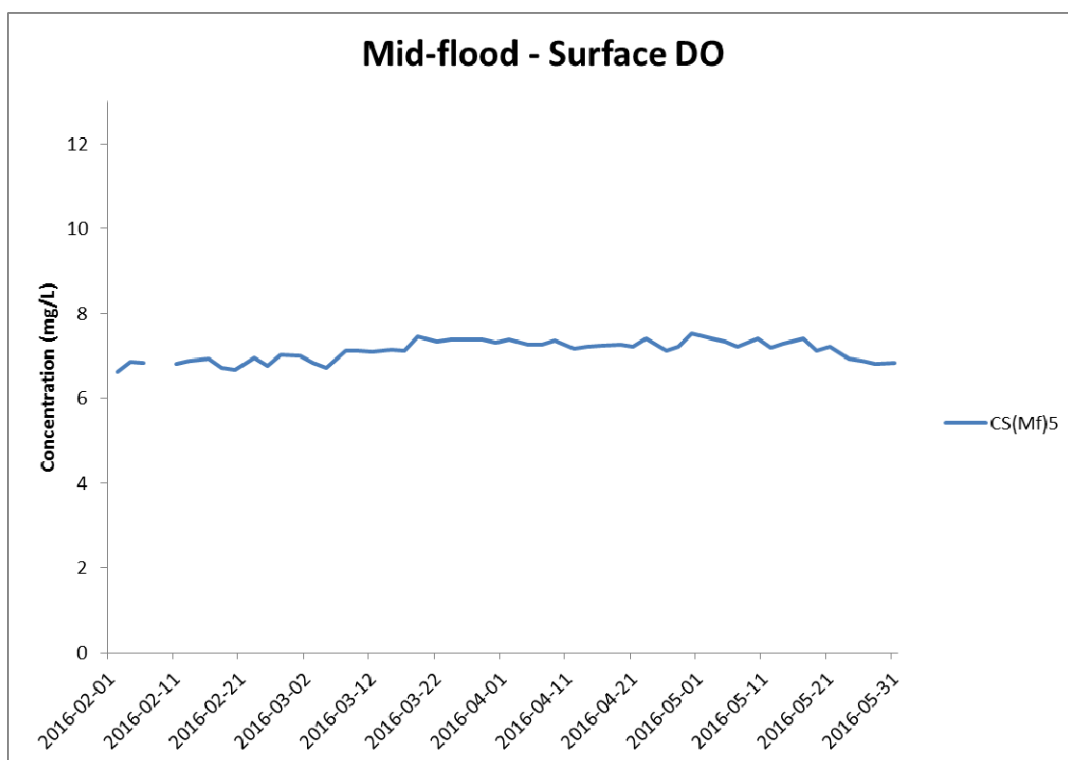
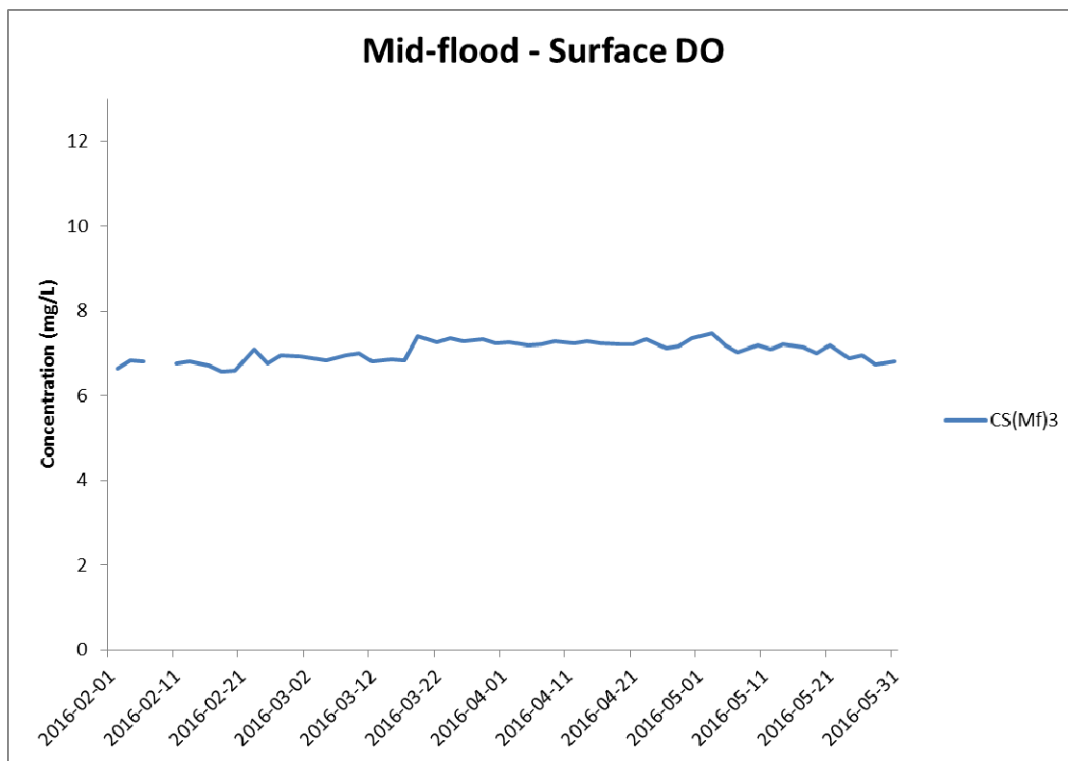


**Figure H4 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**





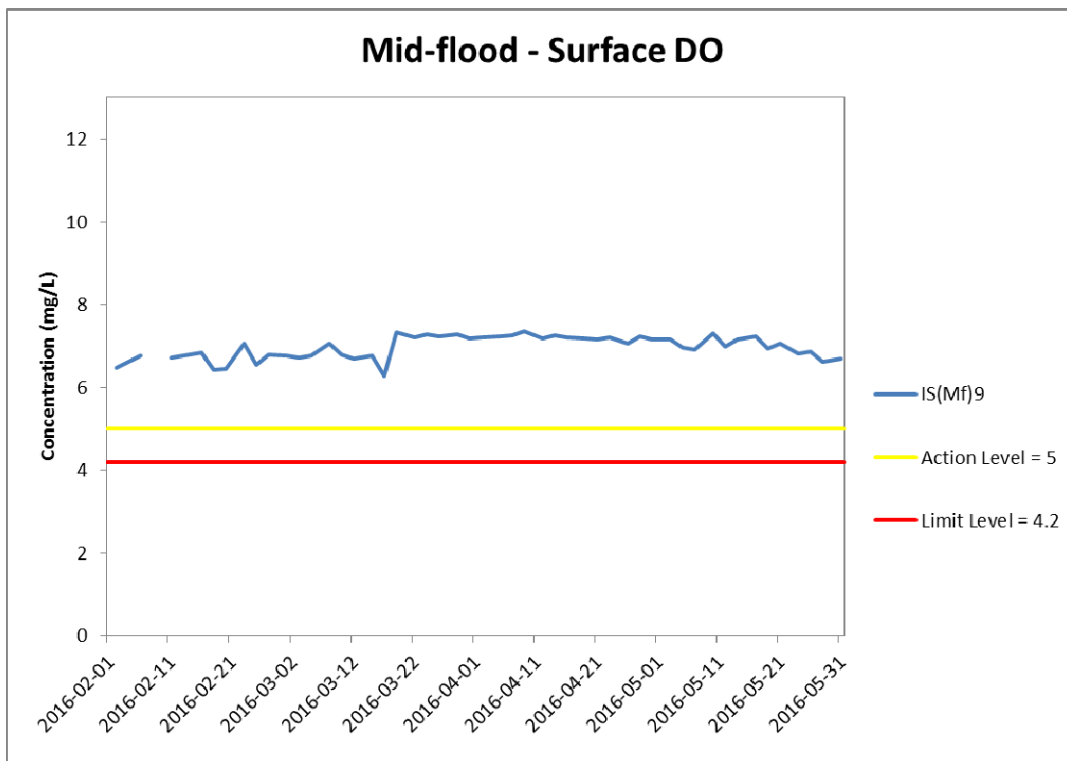
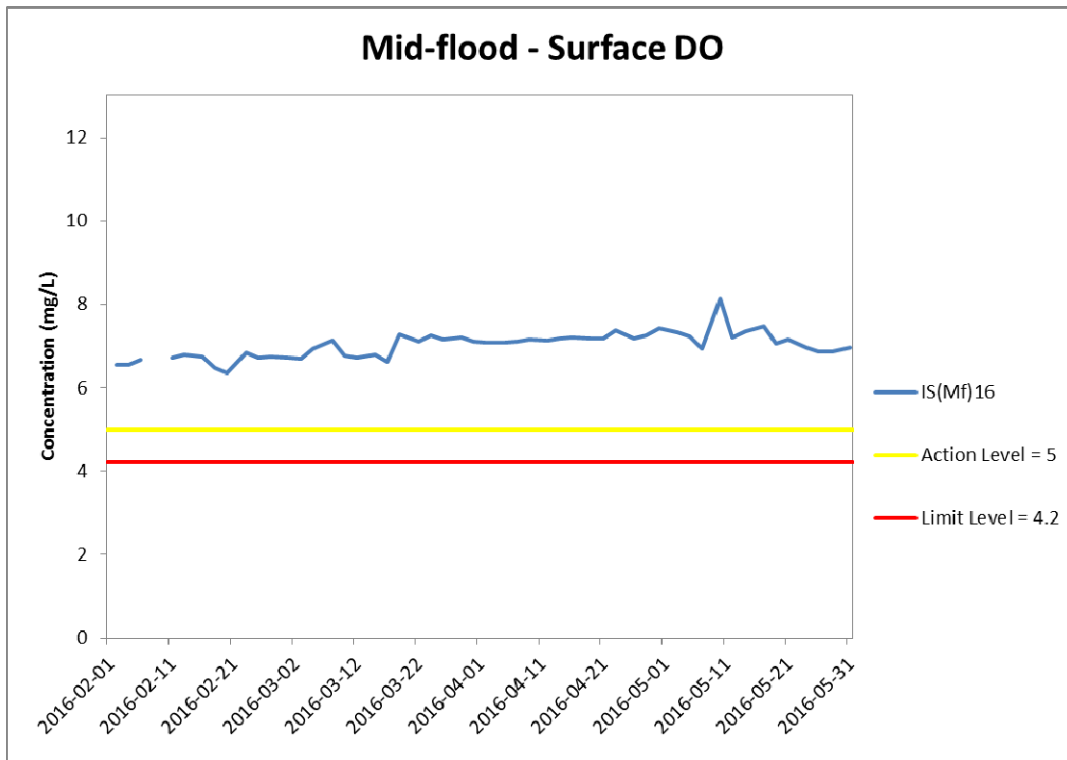
**Figure H5 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**





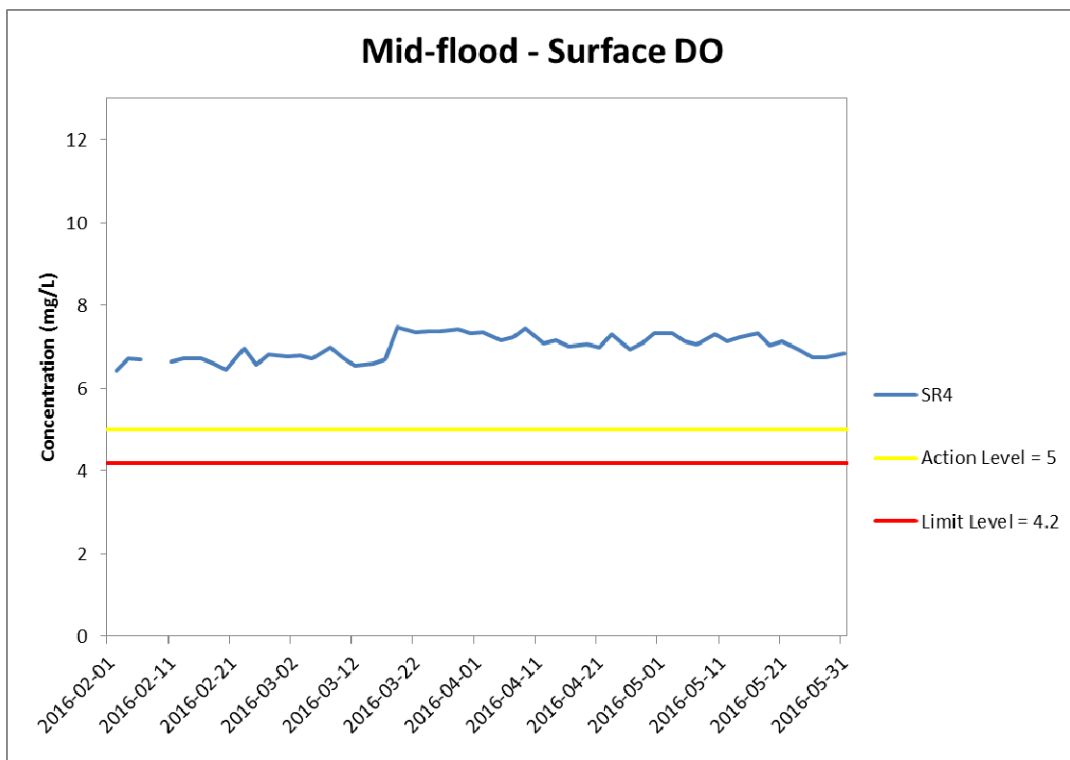
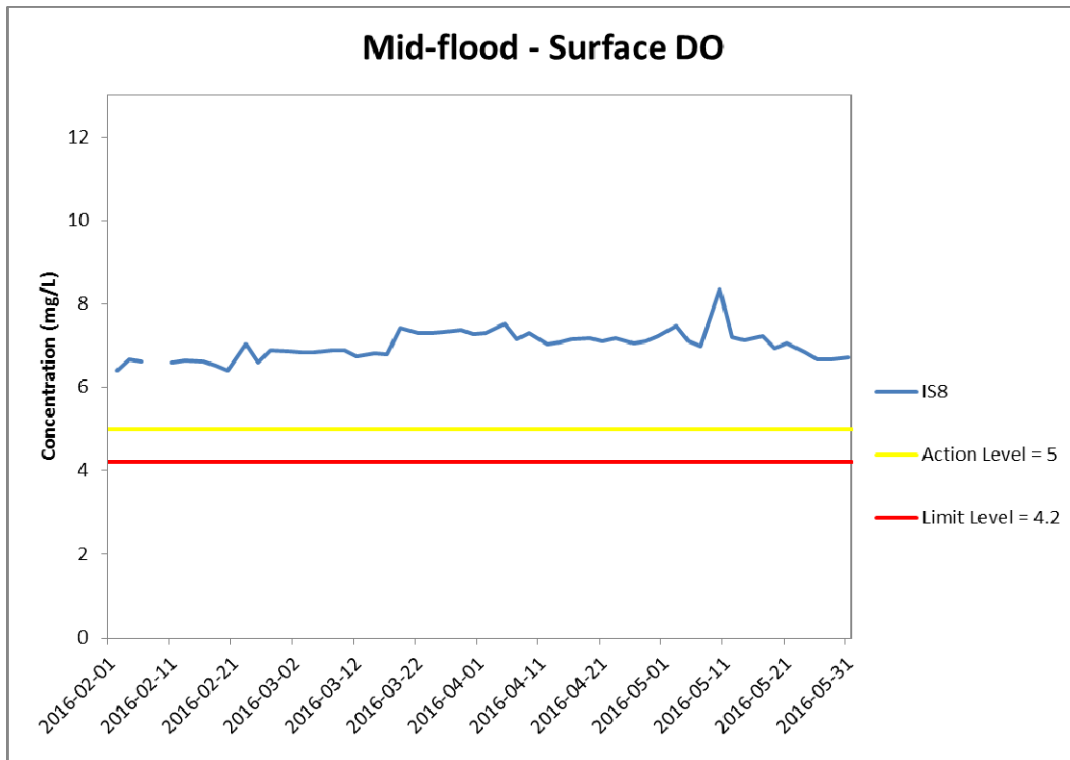


**Figure H6 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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*

**Environmental  
Resources  
Management**



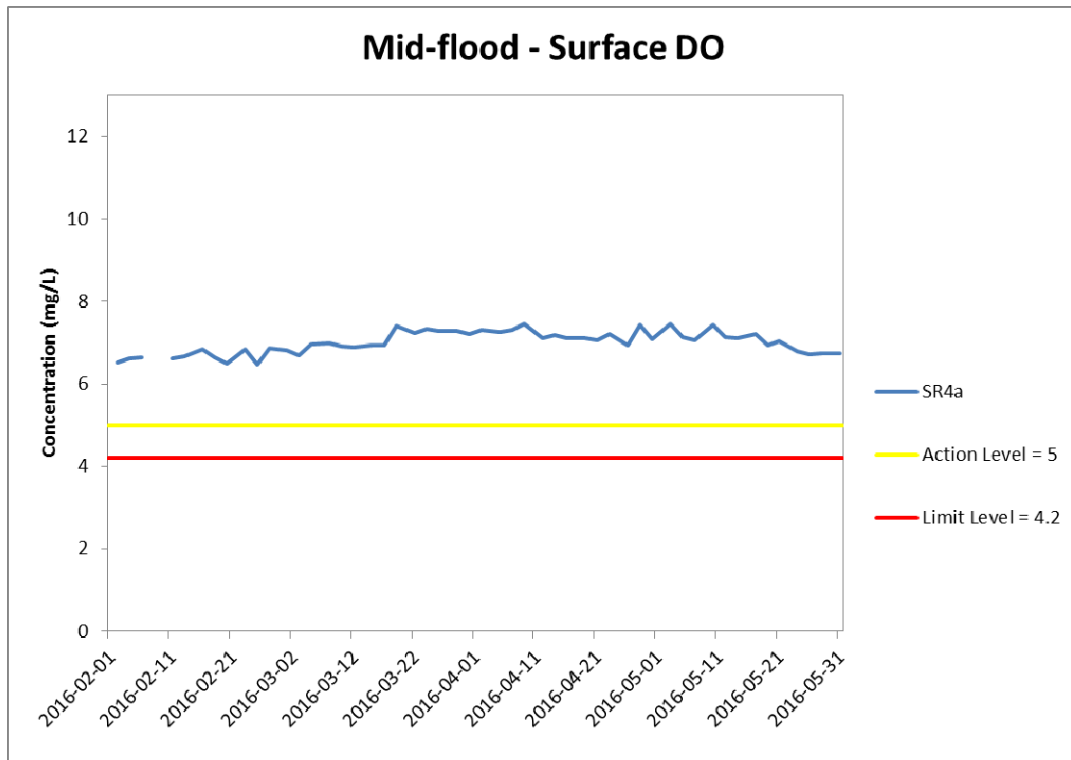


**Figure H7 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 February and 31 May 2016 at IS8 and SR4.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



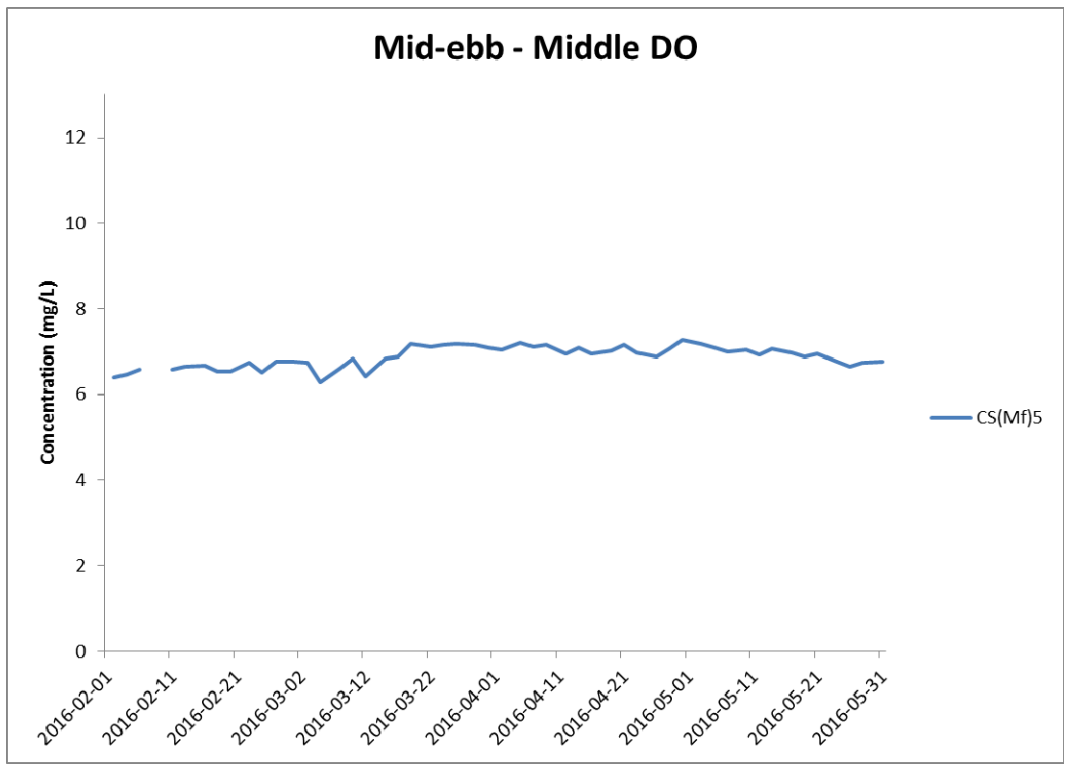
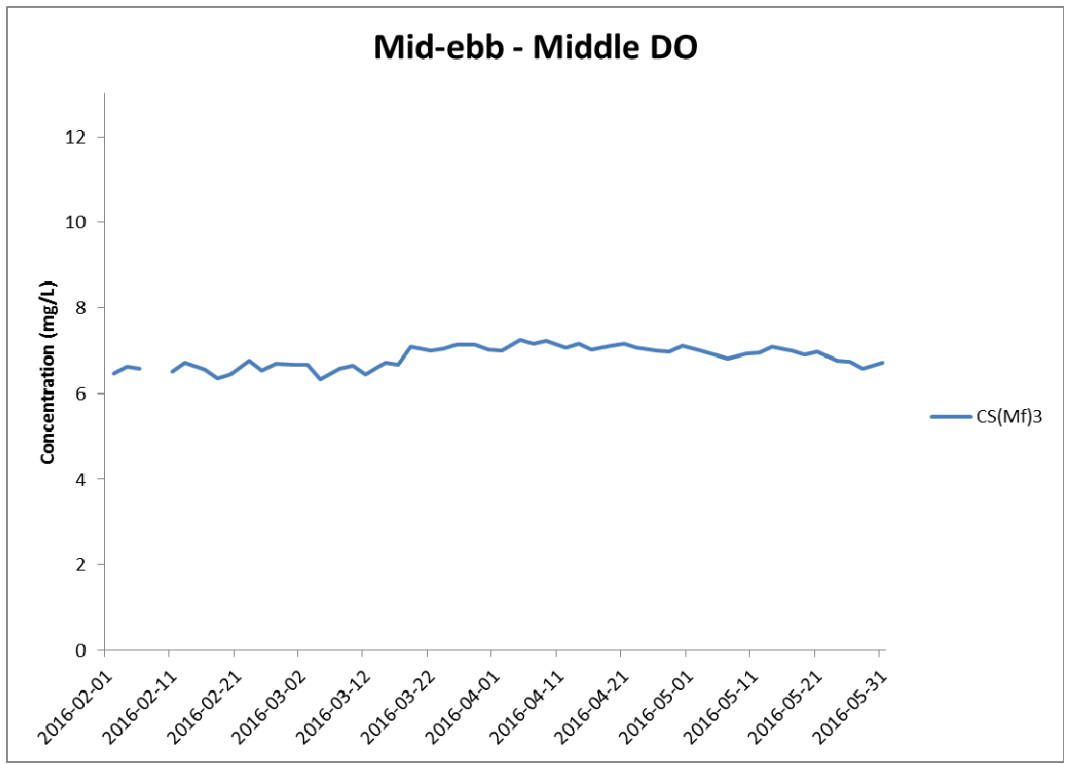


**Figure H8 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



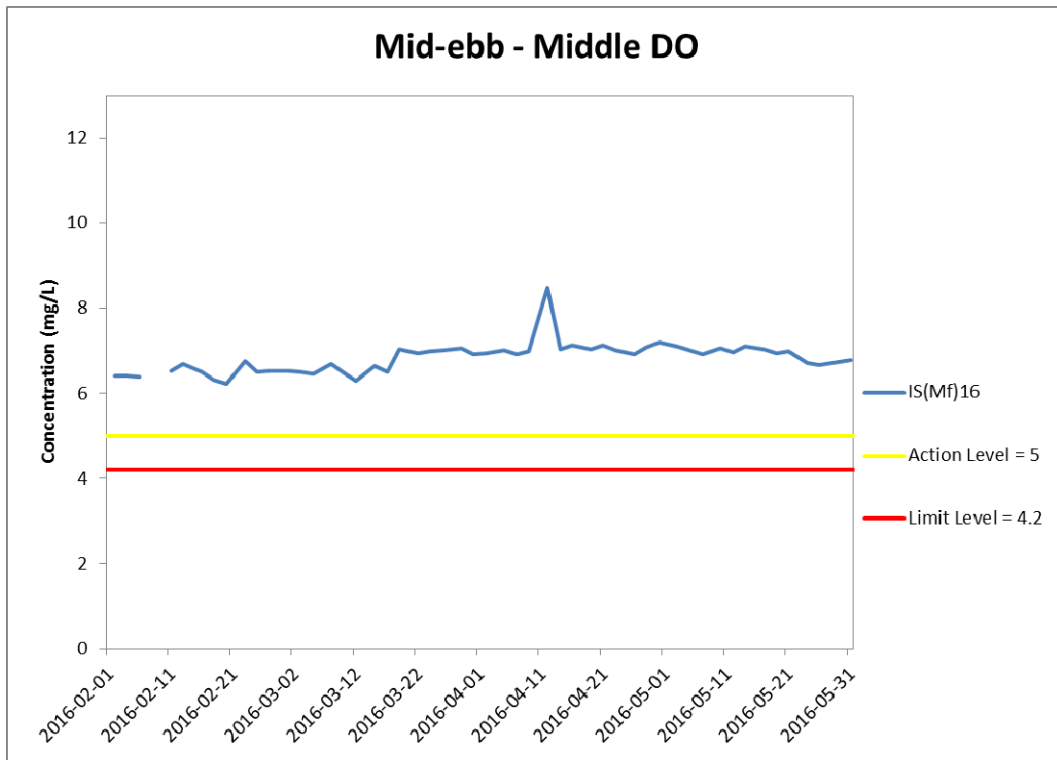


**Figure H9 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



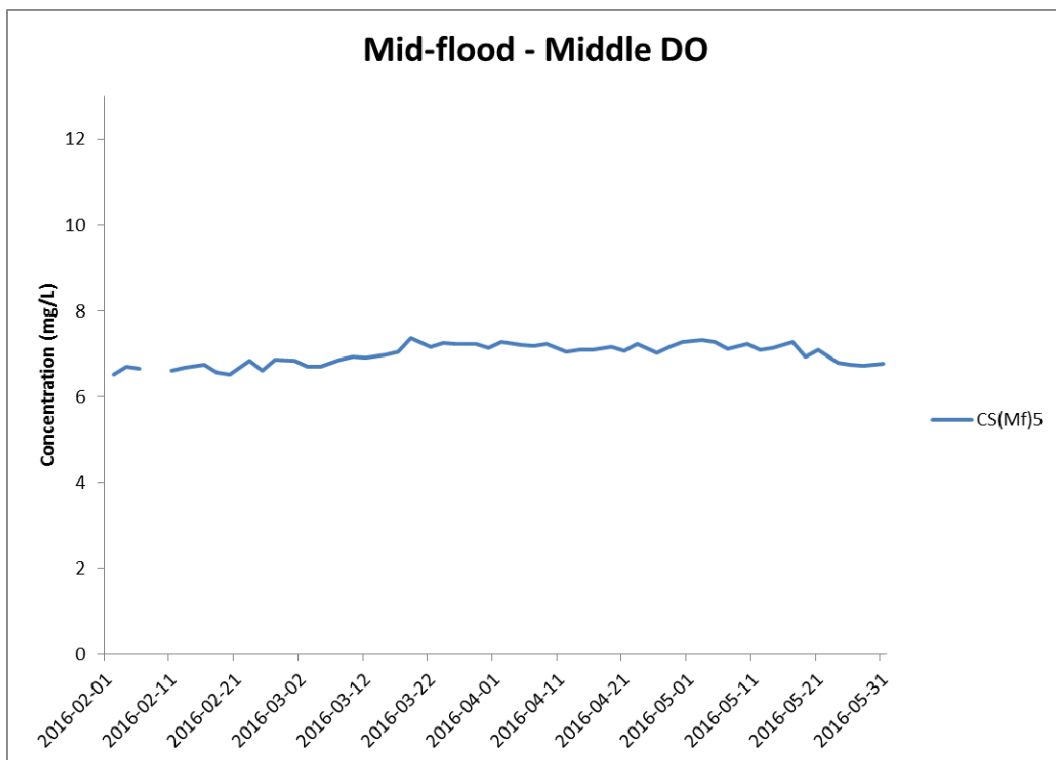
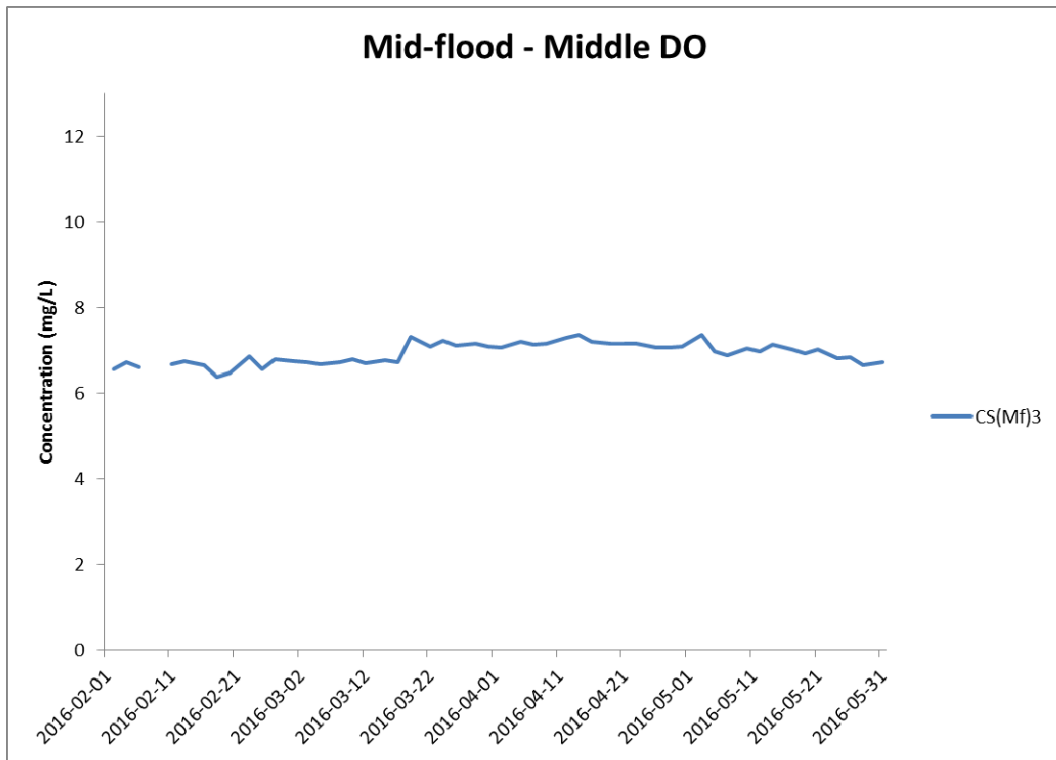


**Figure H10 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 February and 31 May 2016 at IS(Mf)16.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



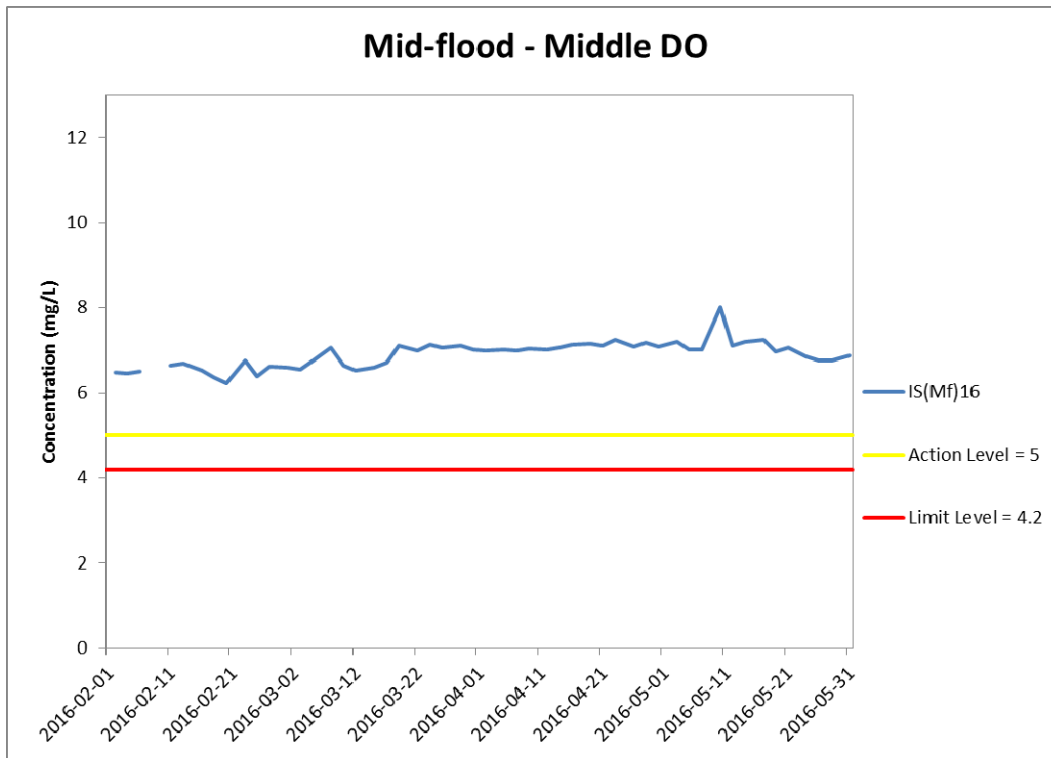


**Figure H11 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



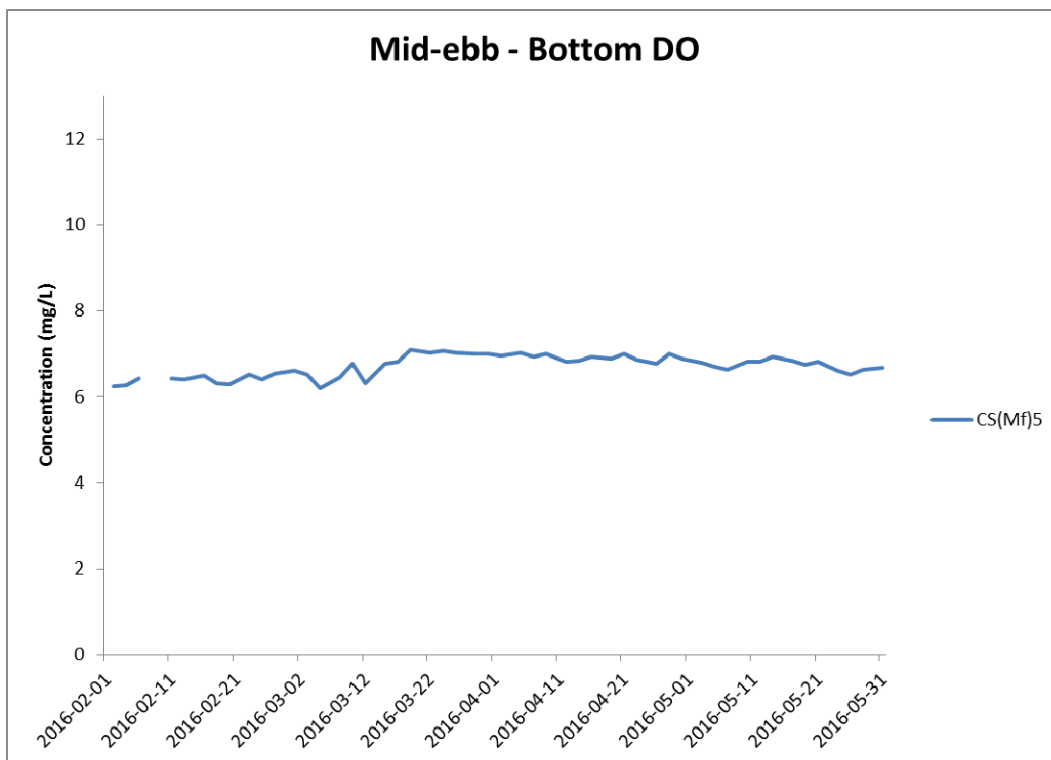
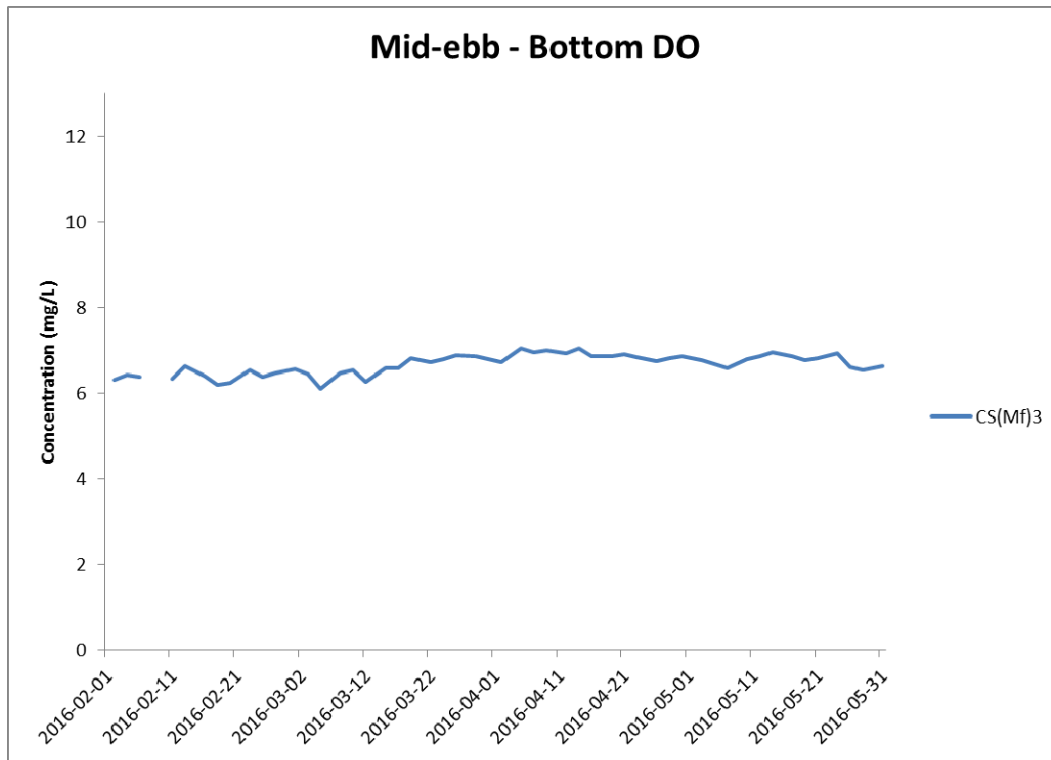


**Figure H12 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 February and 31 May 2016 at IS(Mf)16.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**





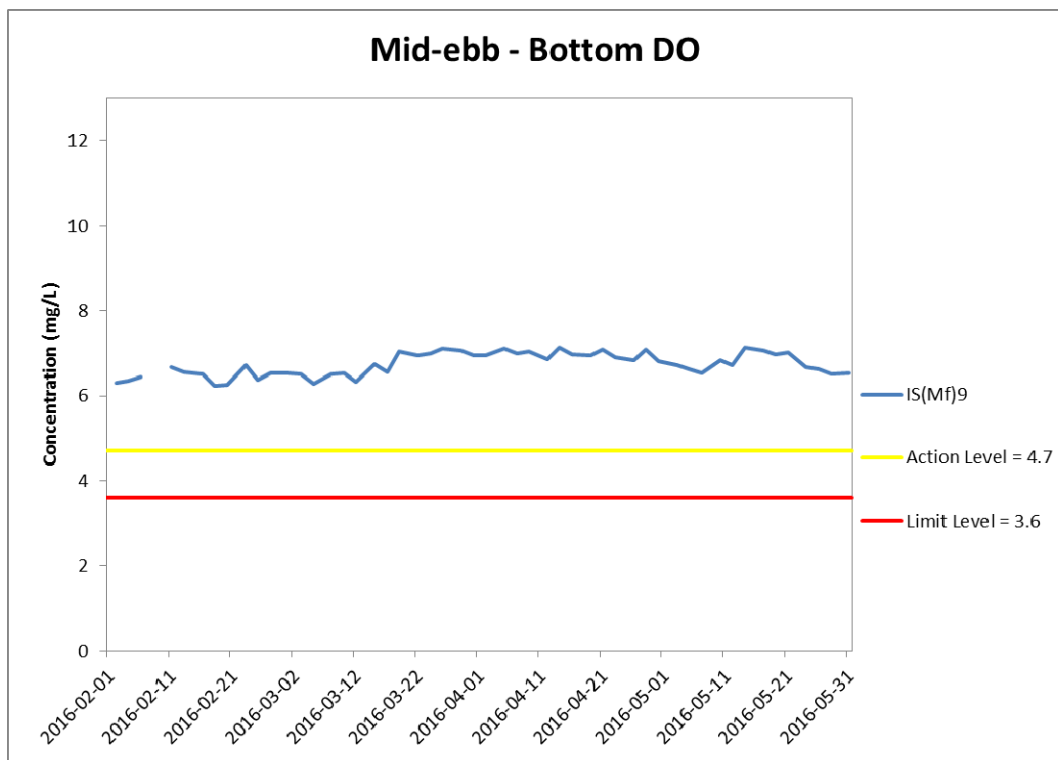
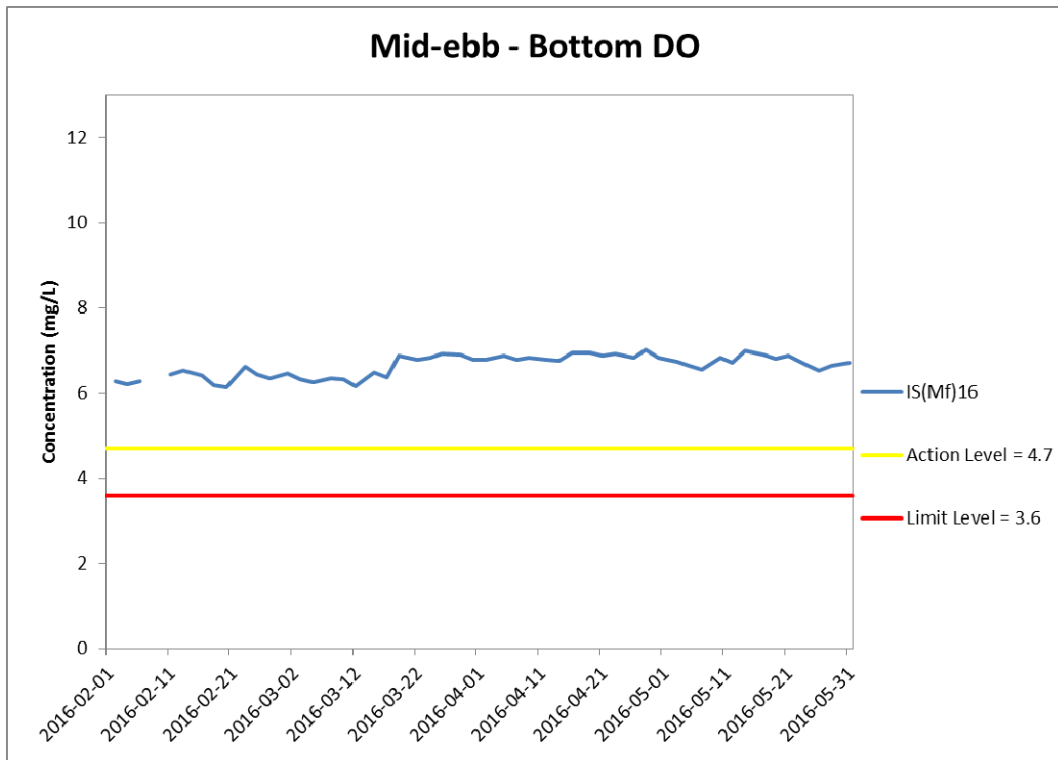
**Figure H13 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**





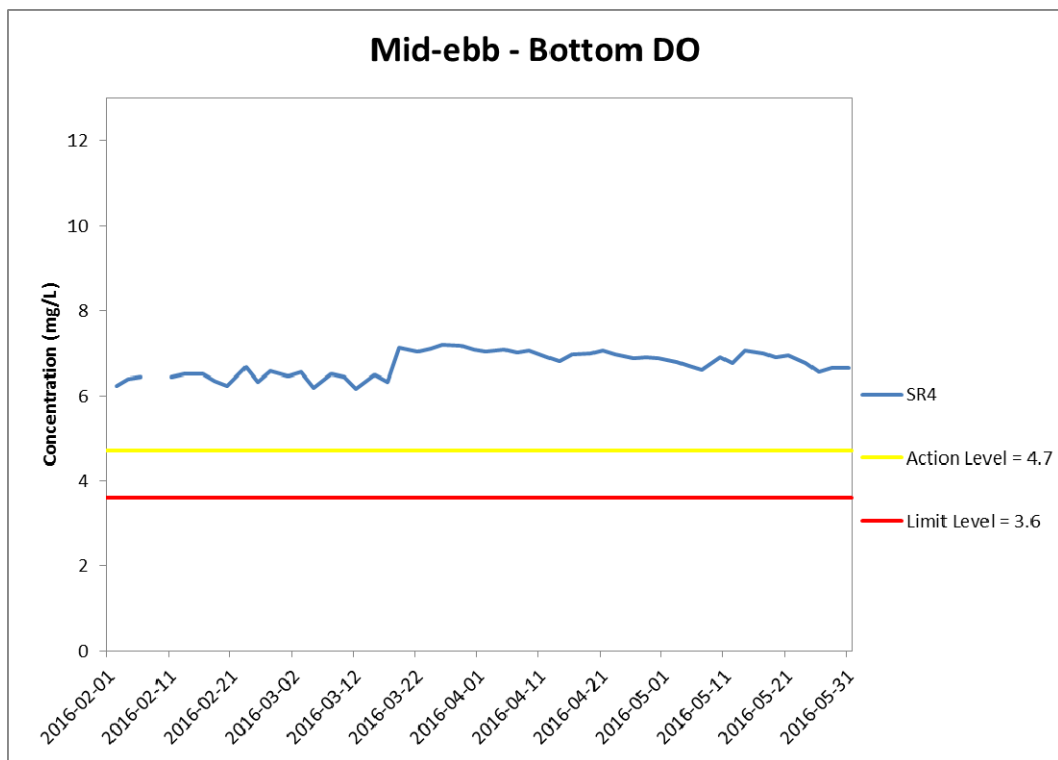
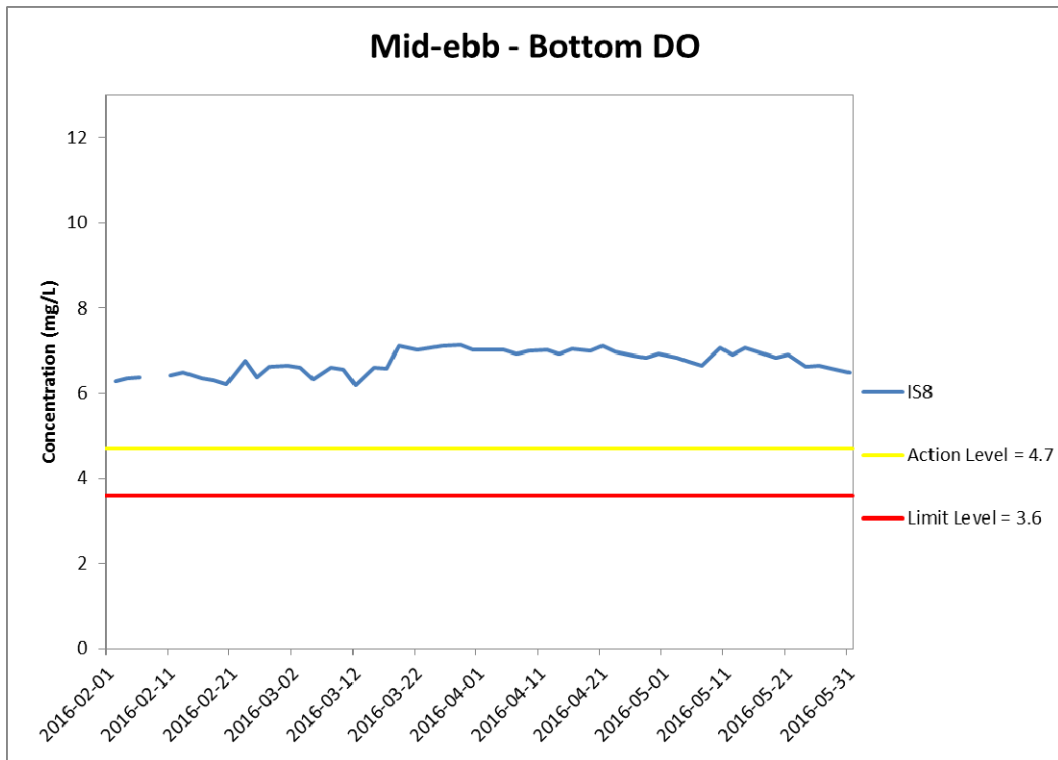


**Figure H14 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



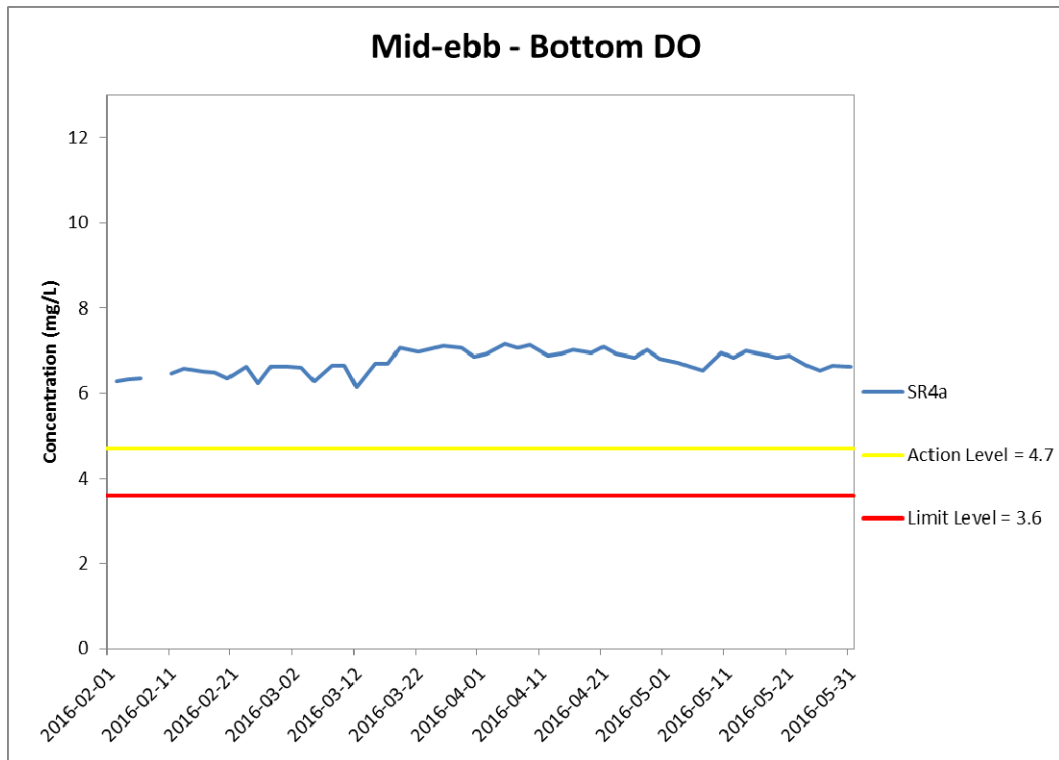


**Figure H15 Impact Monitoring - Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 February and 31 May 2016 at IS8 and SR4.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



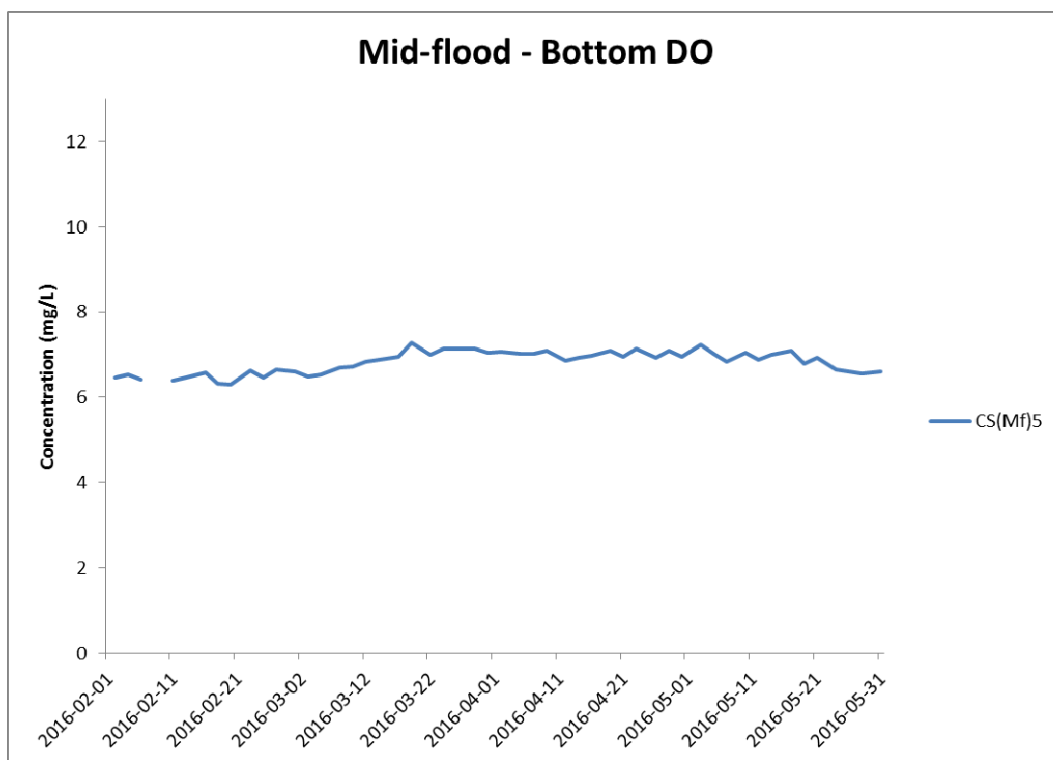
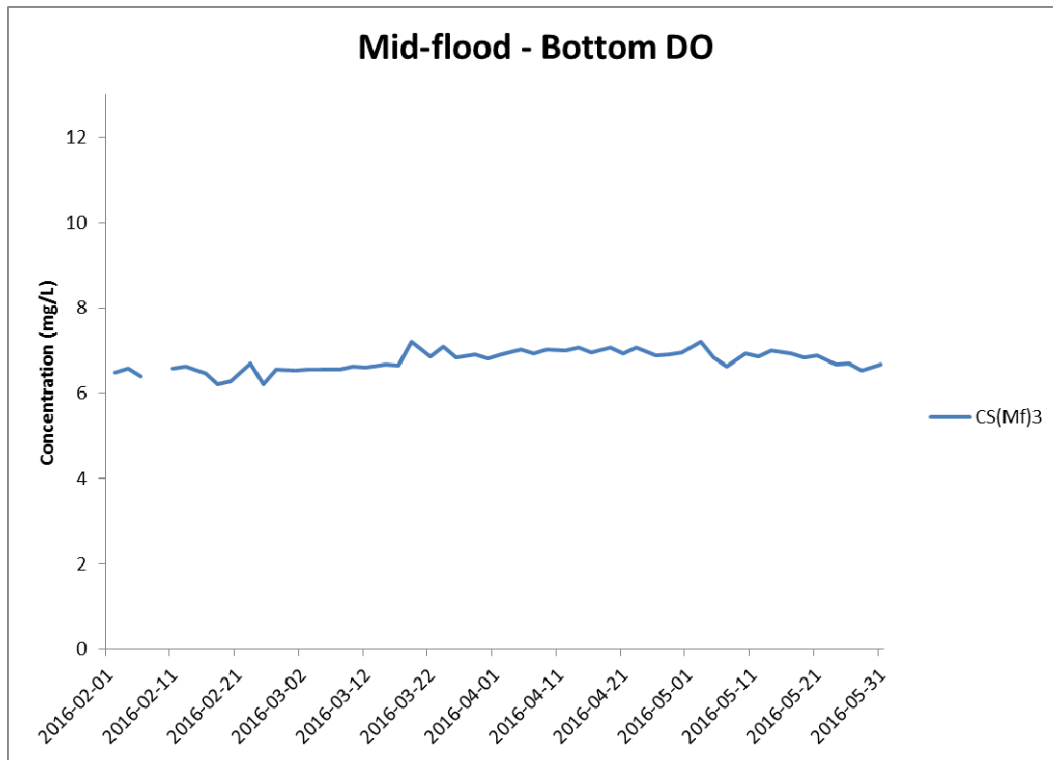


**Figure H16 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



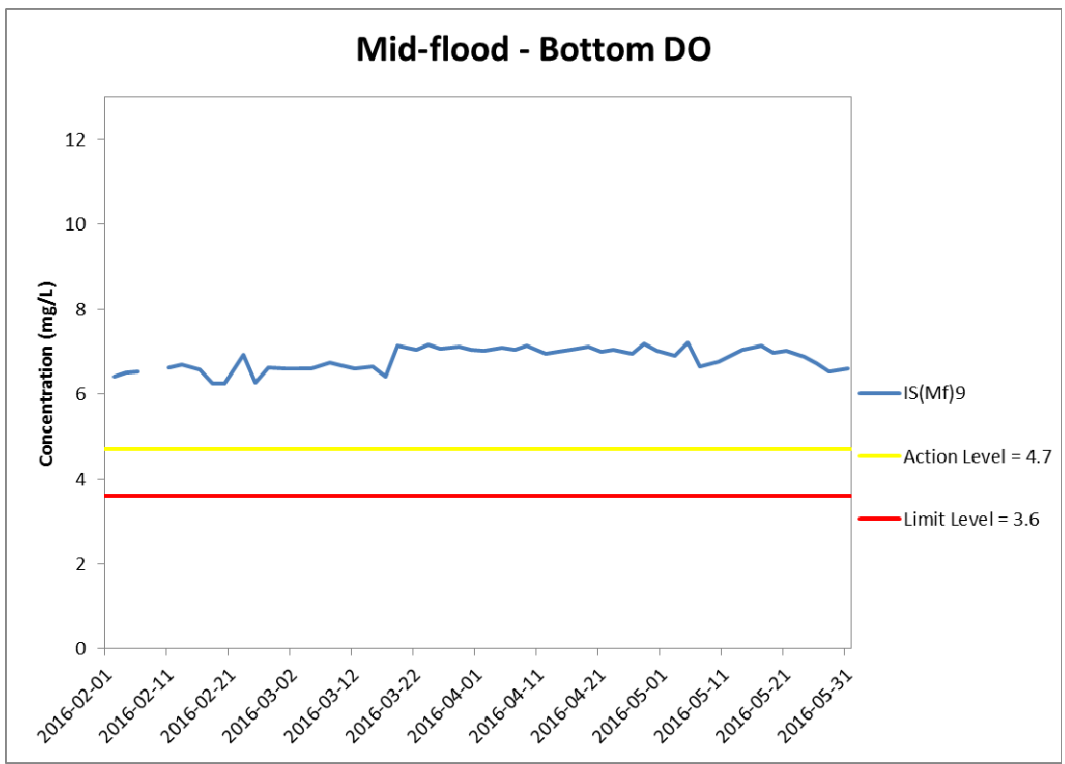
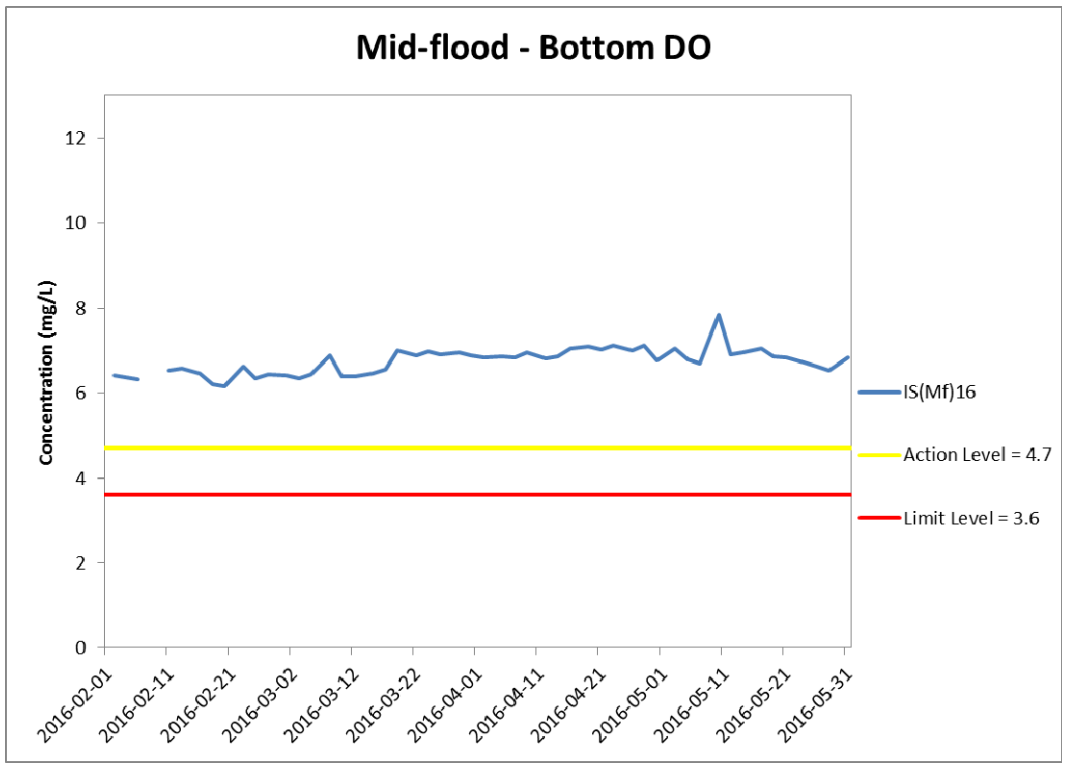


**Figure H17 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**



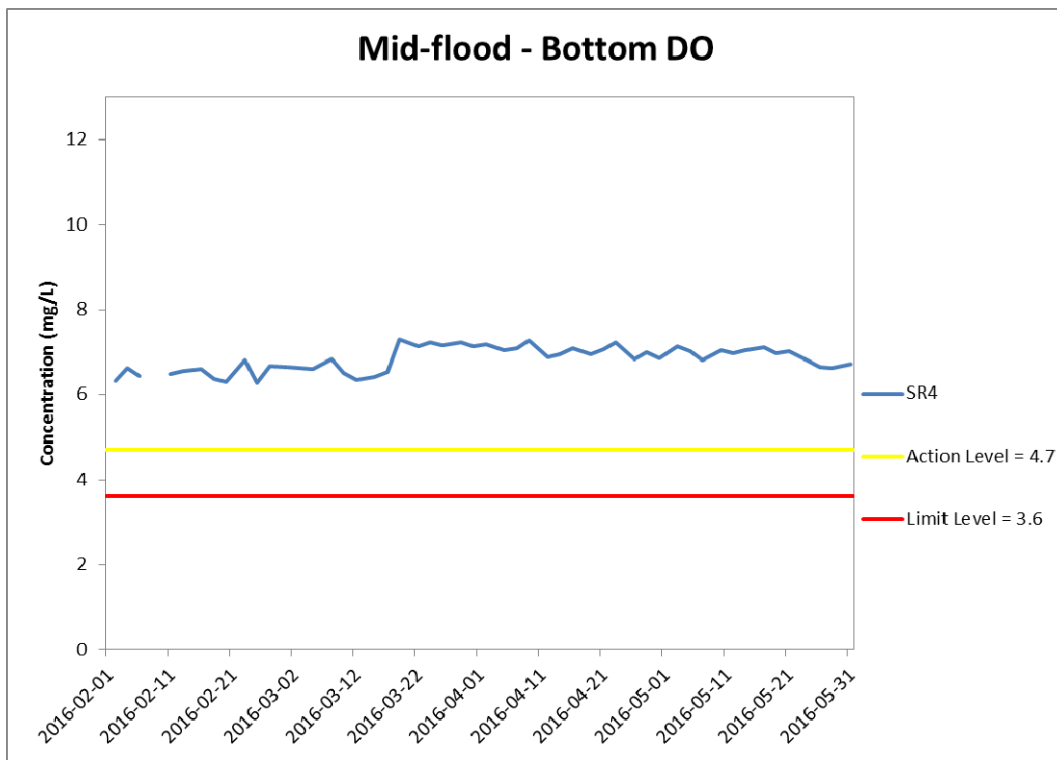
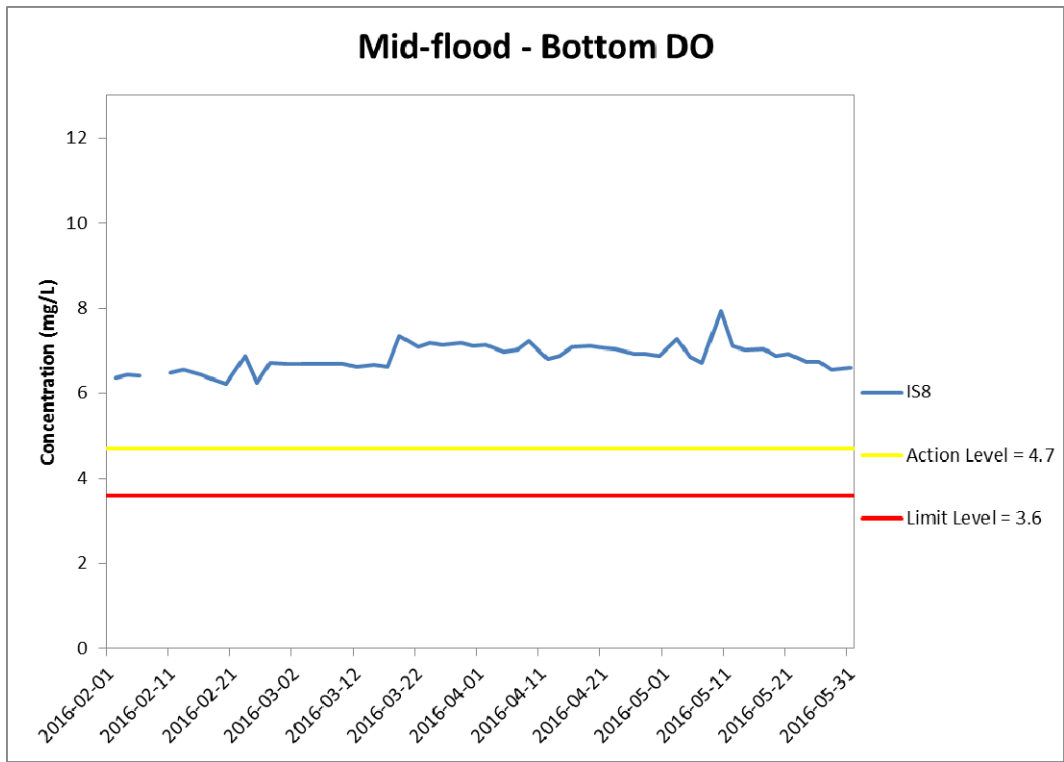


**Figure H18 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental Resources Management**



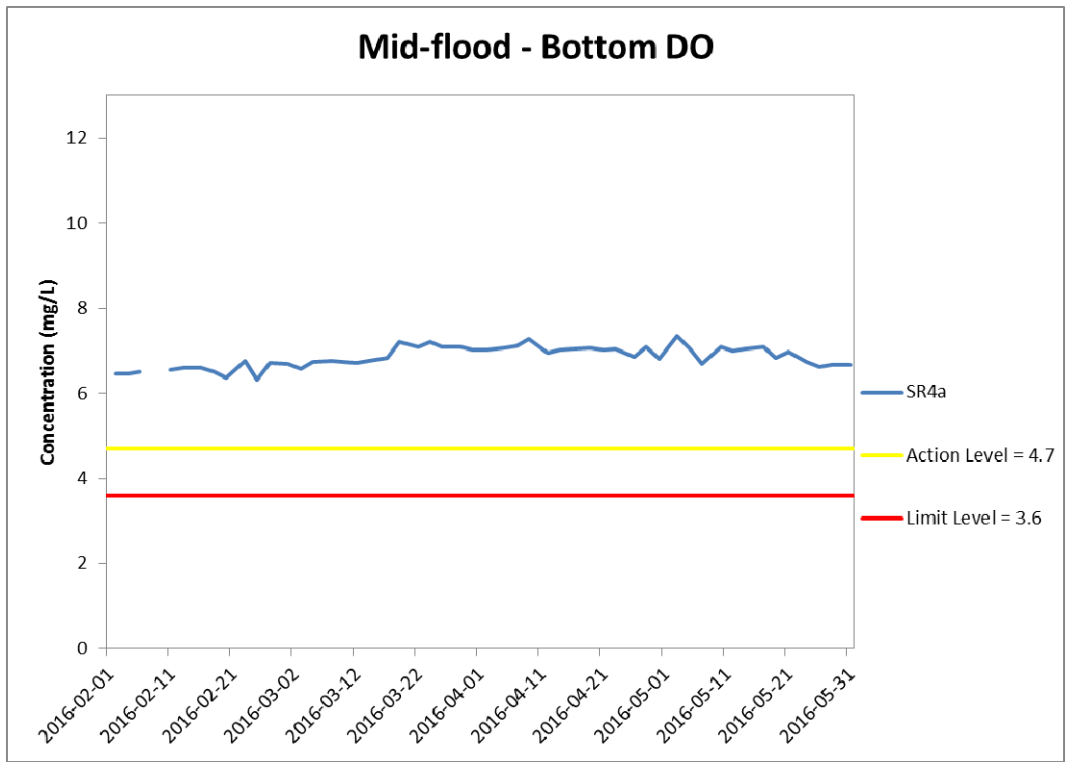


**Figure H19 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 February and 31 May 2016 at IS8 and SR4.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**



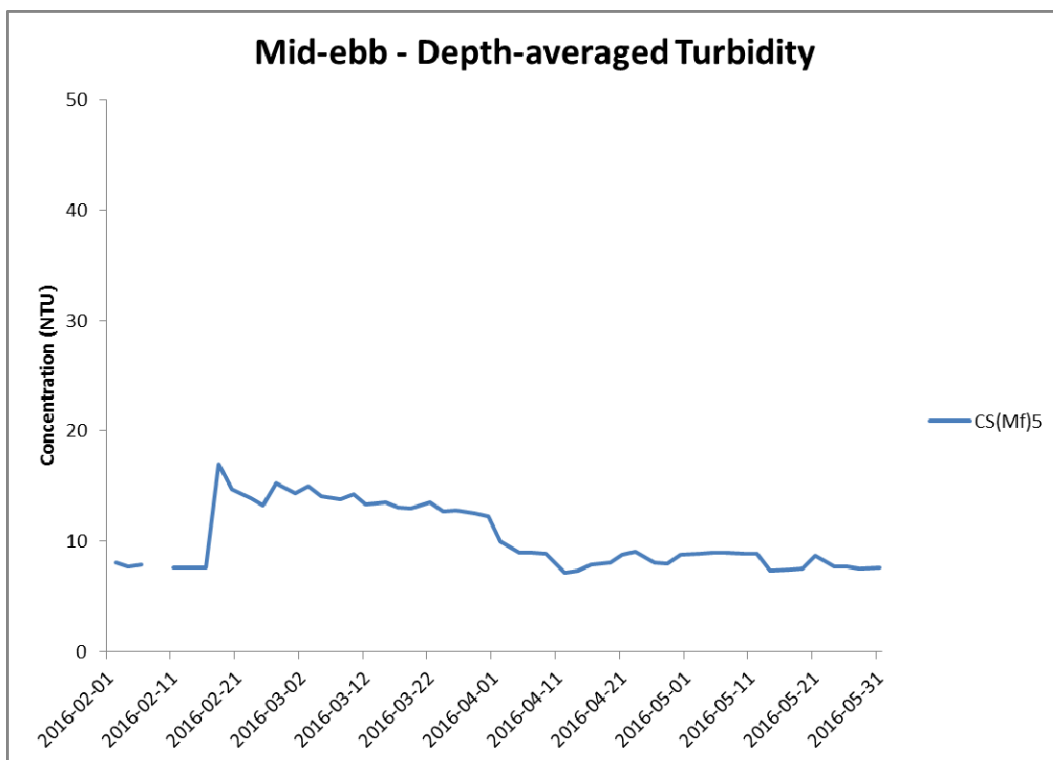
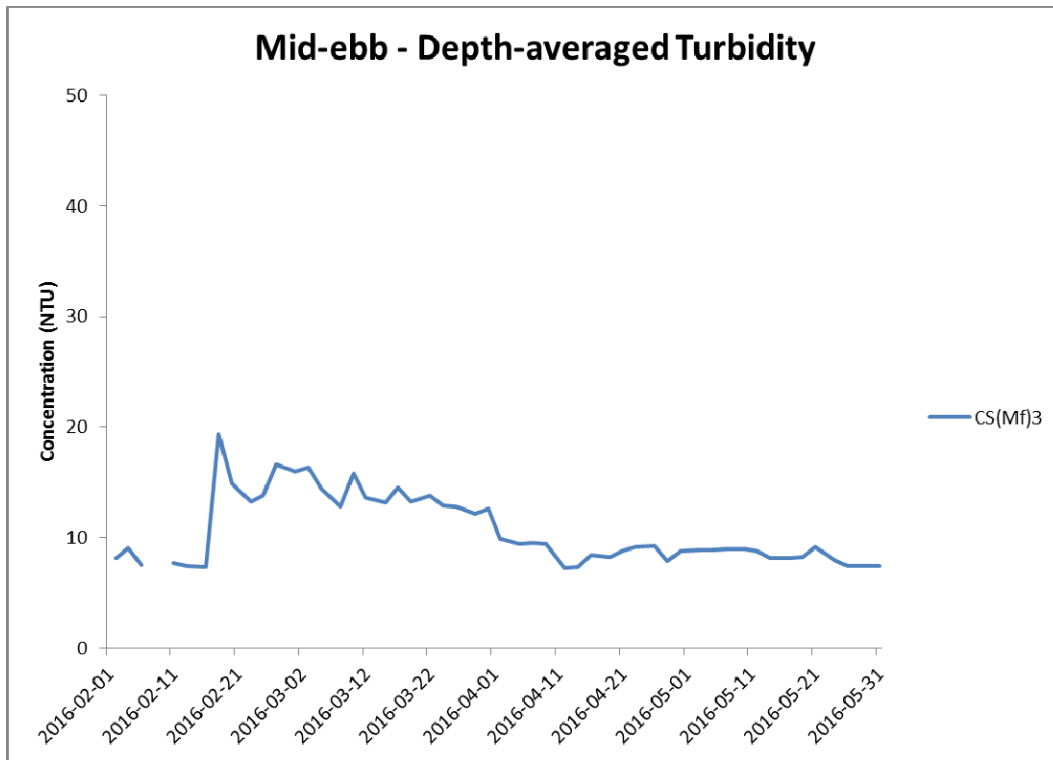


**Figure H20 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**





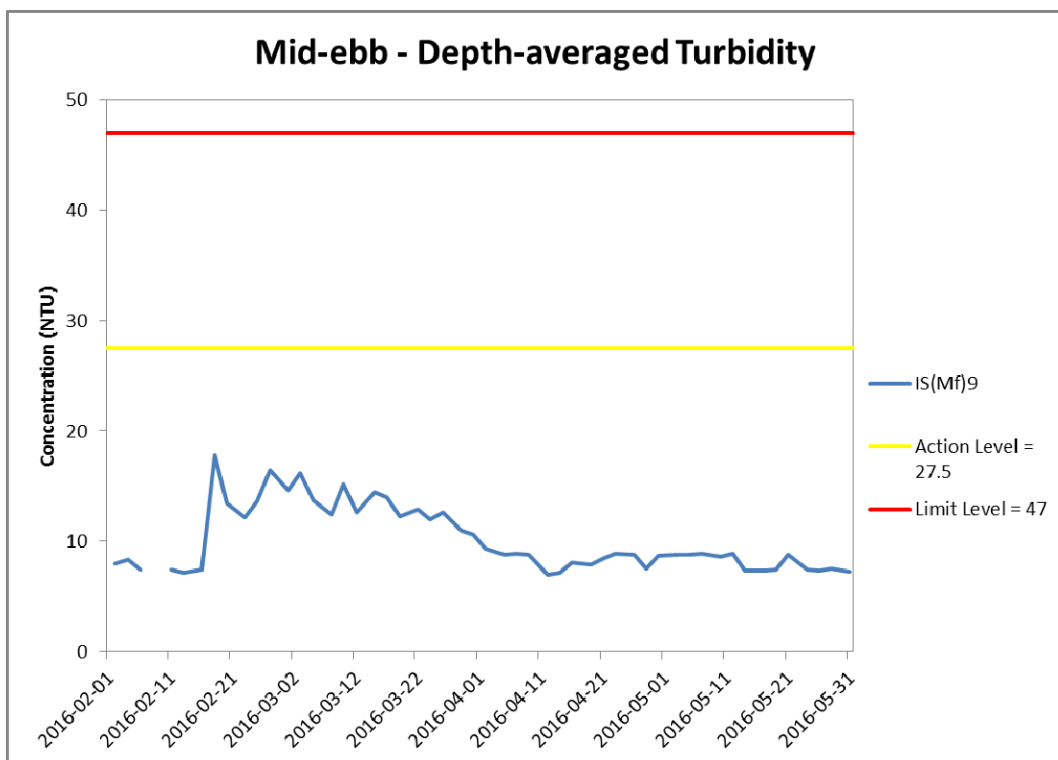
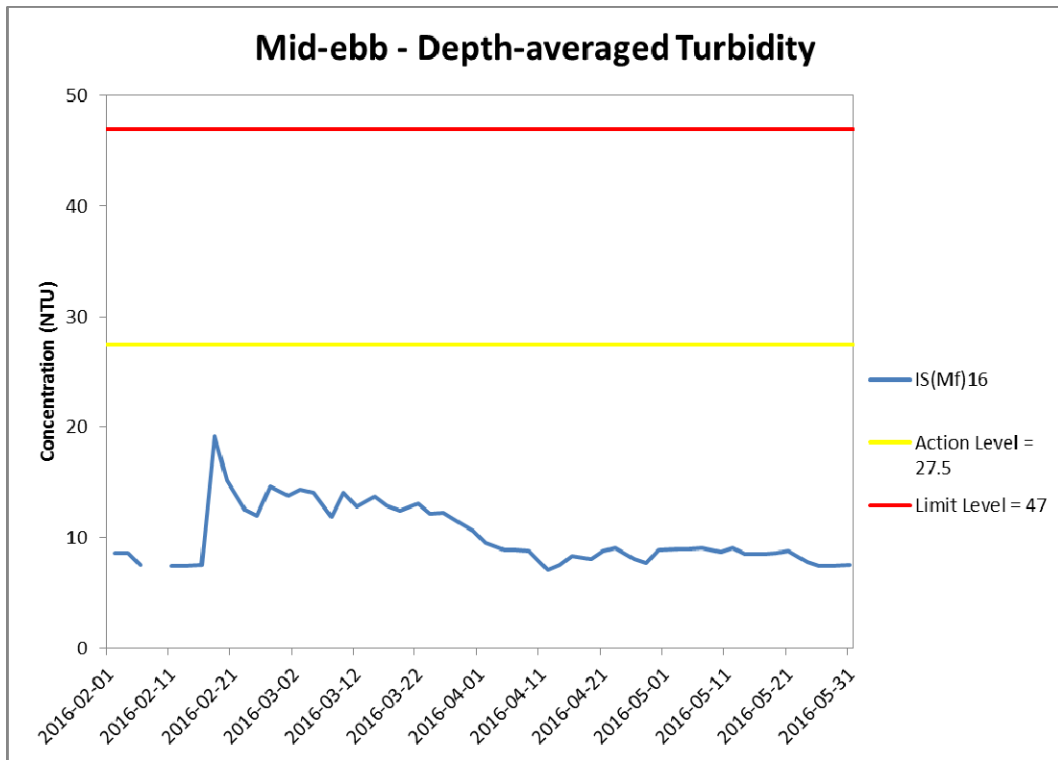
**Figure H21 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**





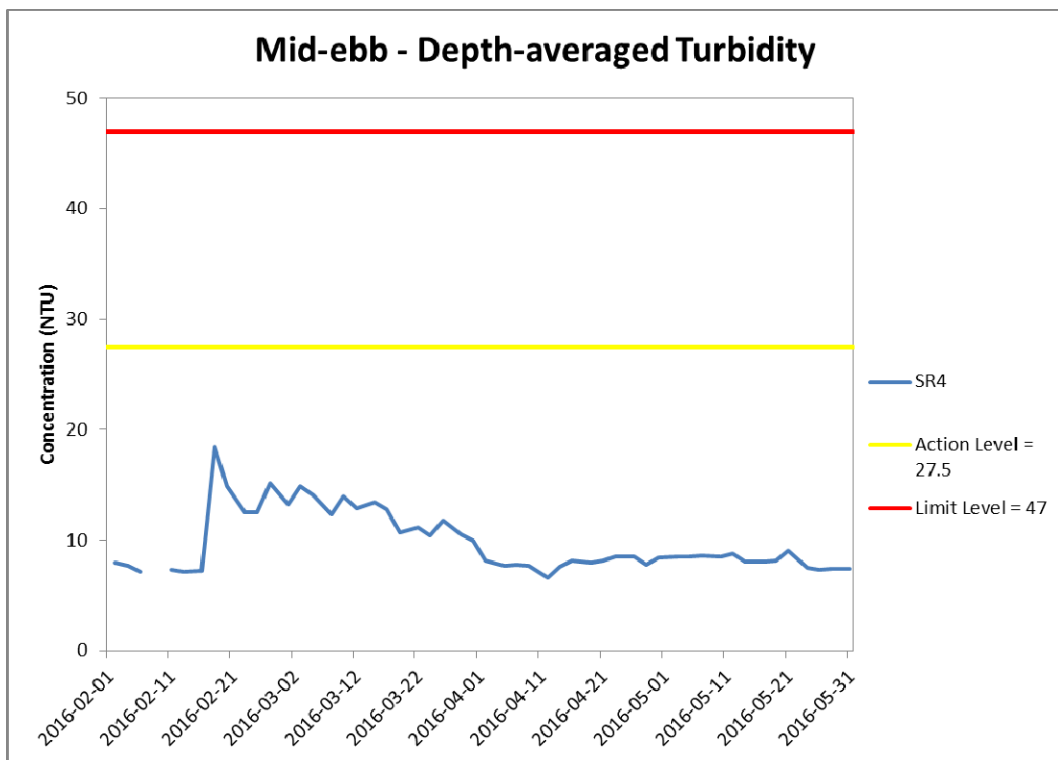
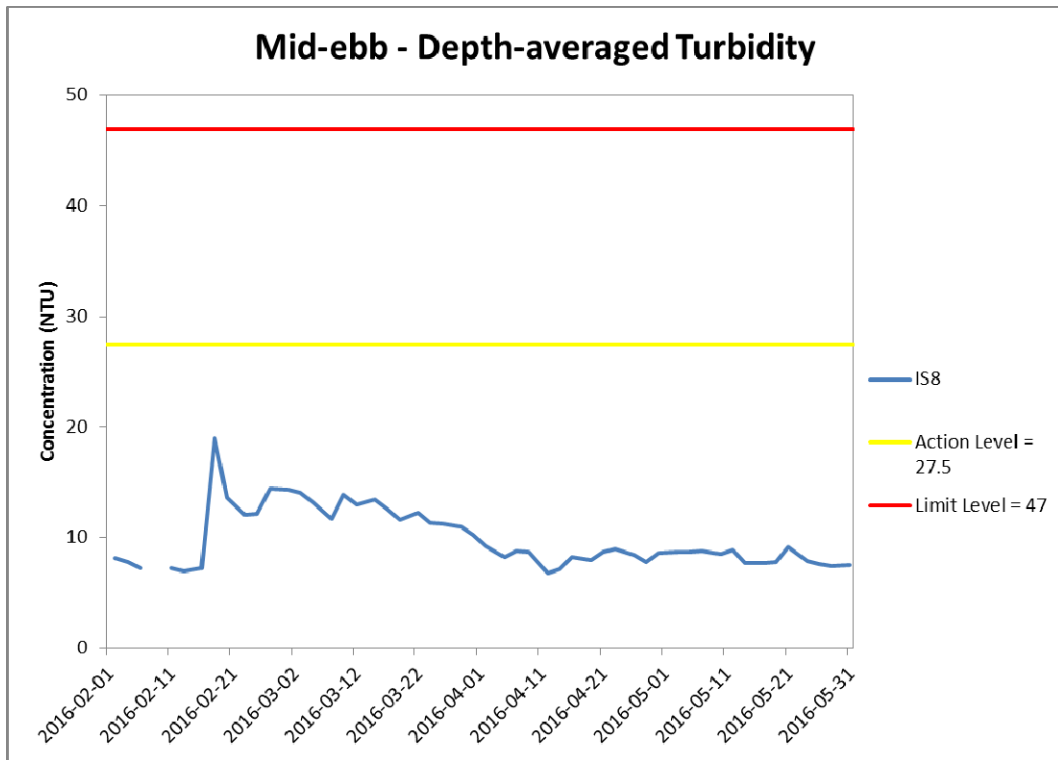


**Figure H22 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**



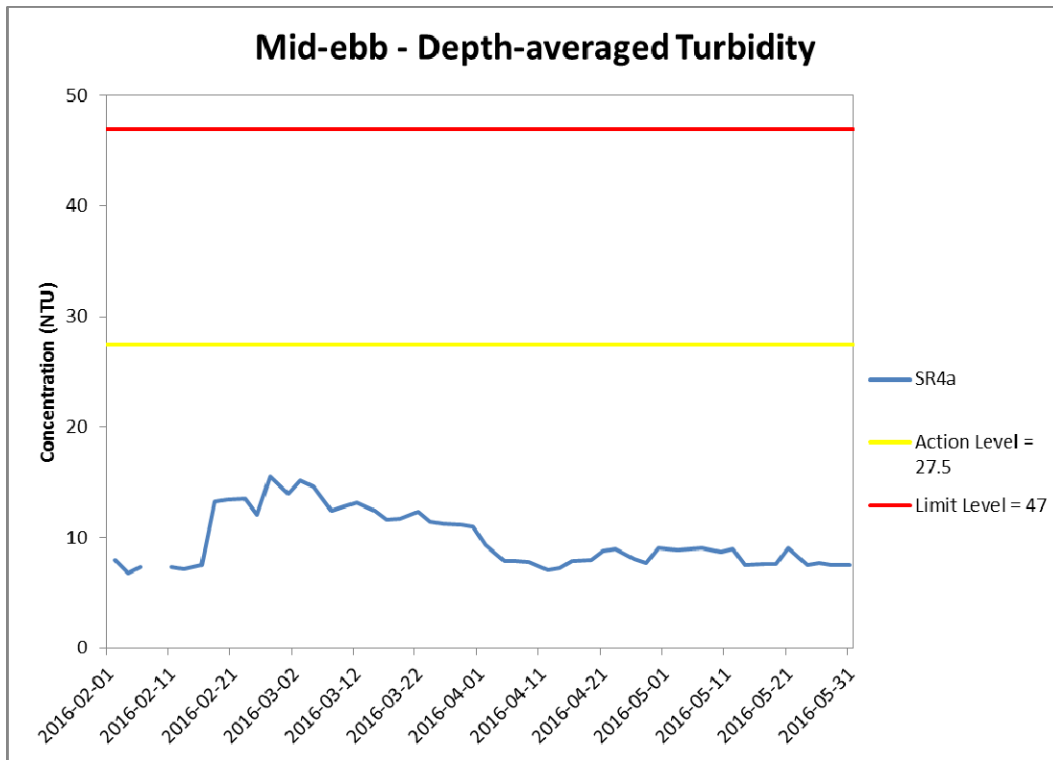


**Figure H23 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 February and 31 May 2016 at IS8 and SR4.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**



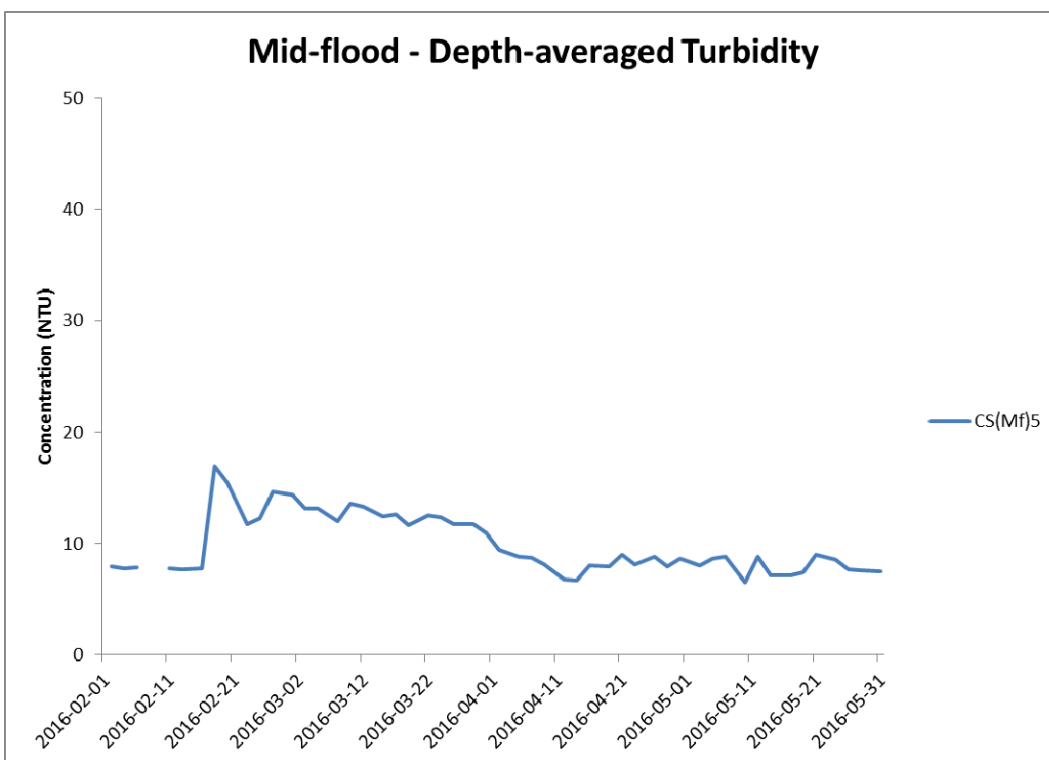
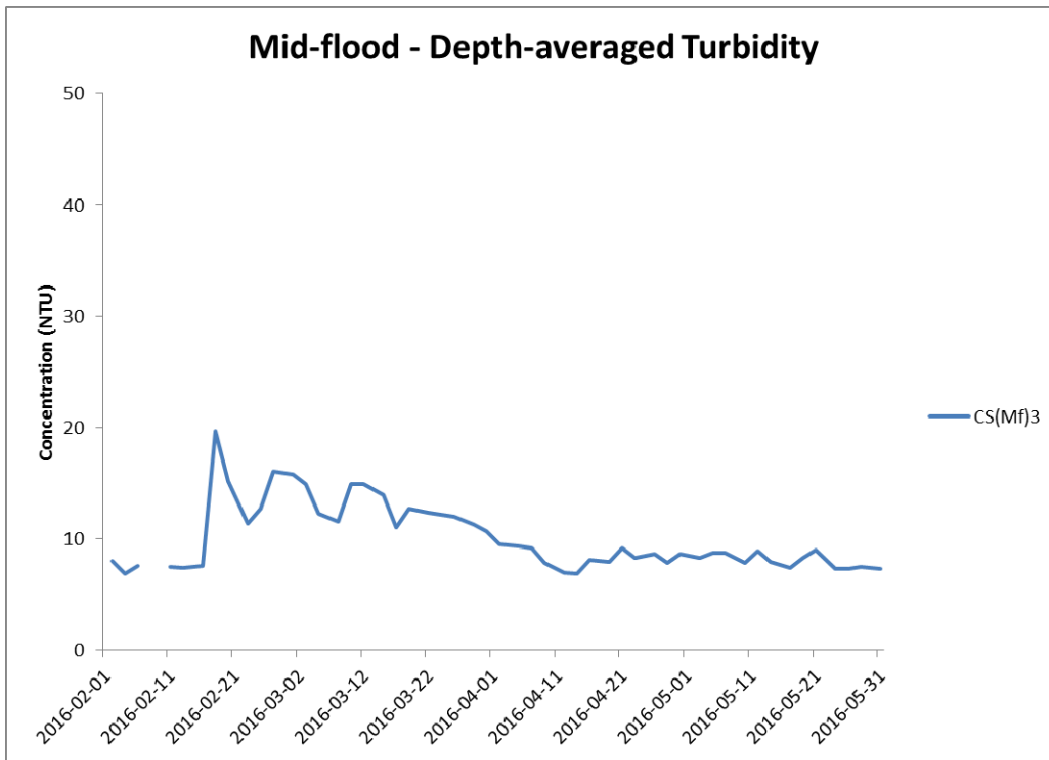


**Figure H24 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



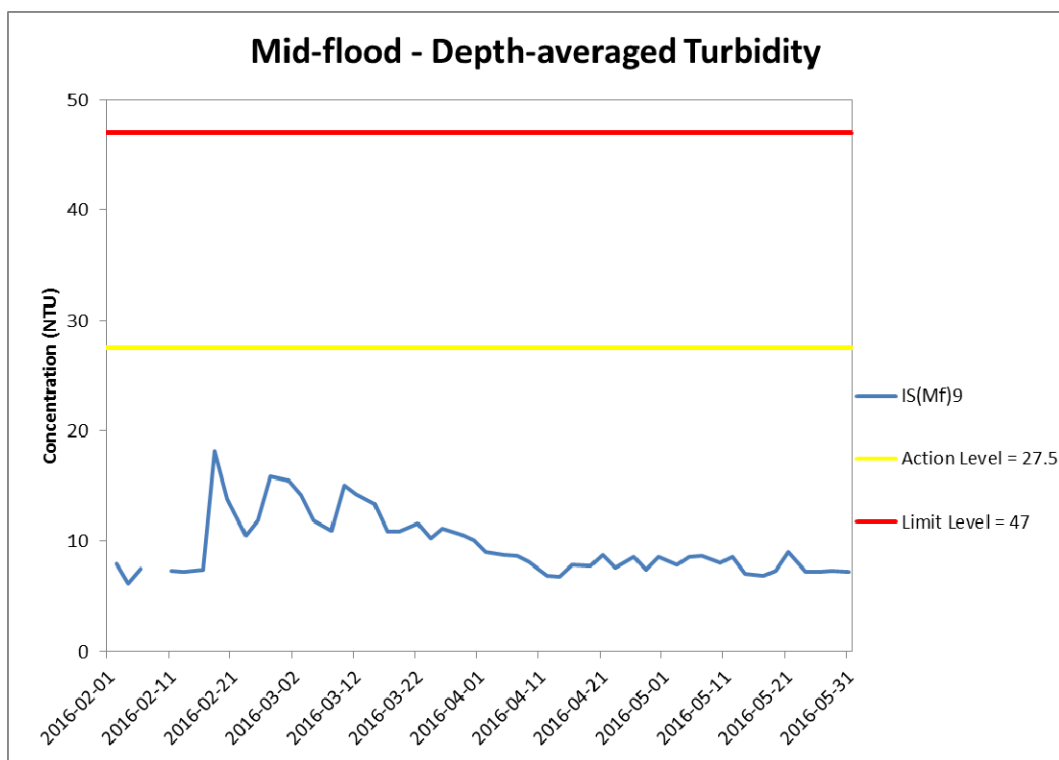
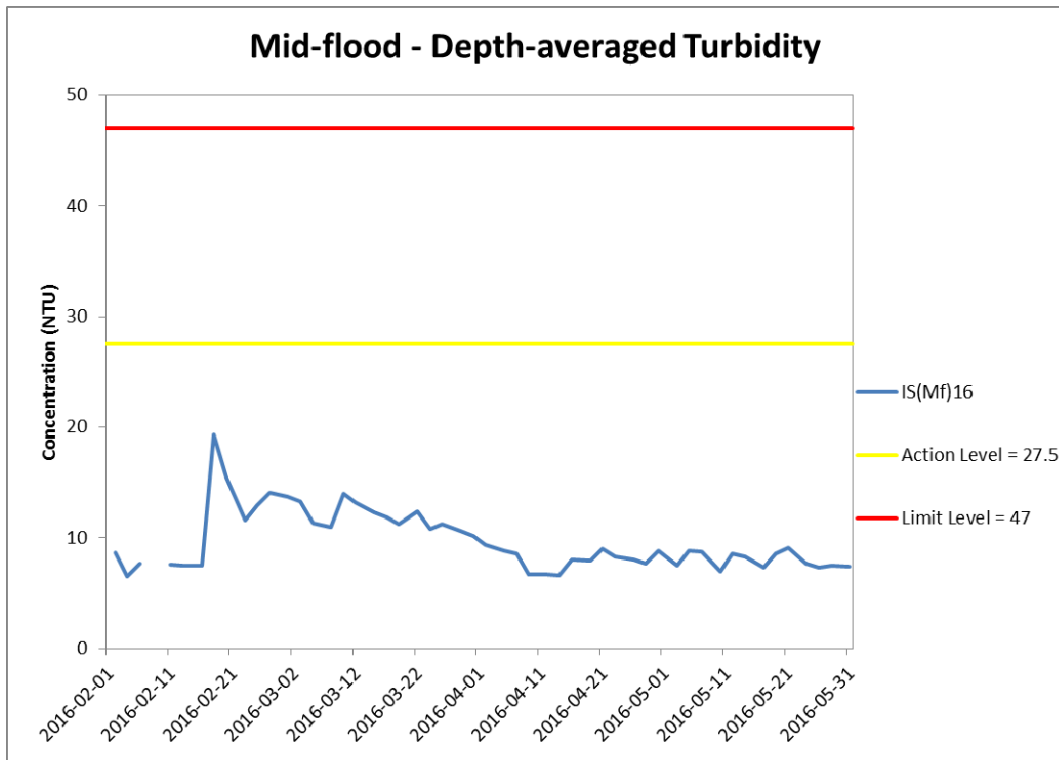


**Figure H25 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(MF)5.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



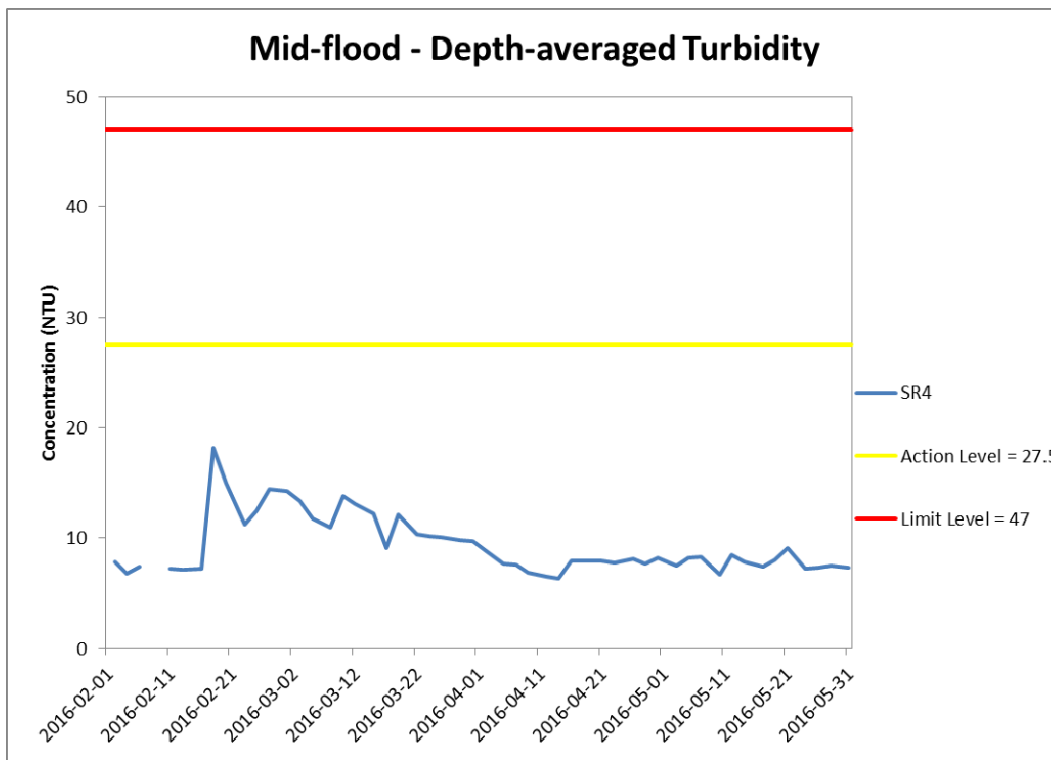
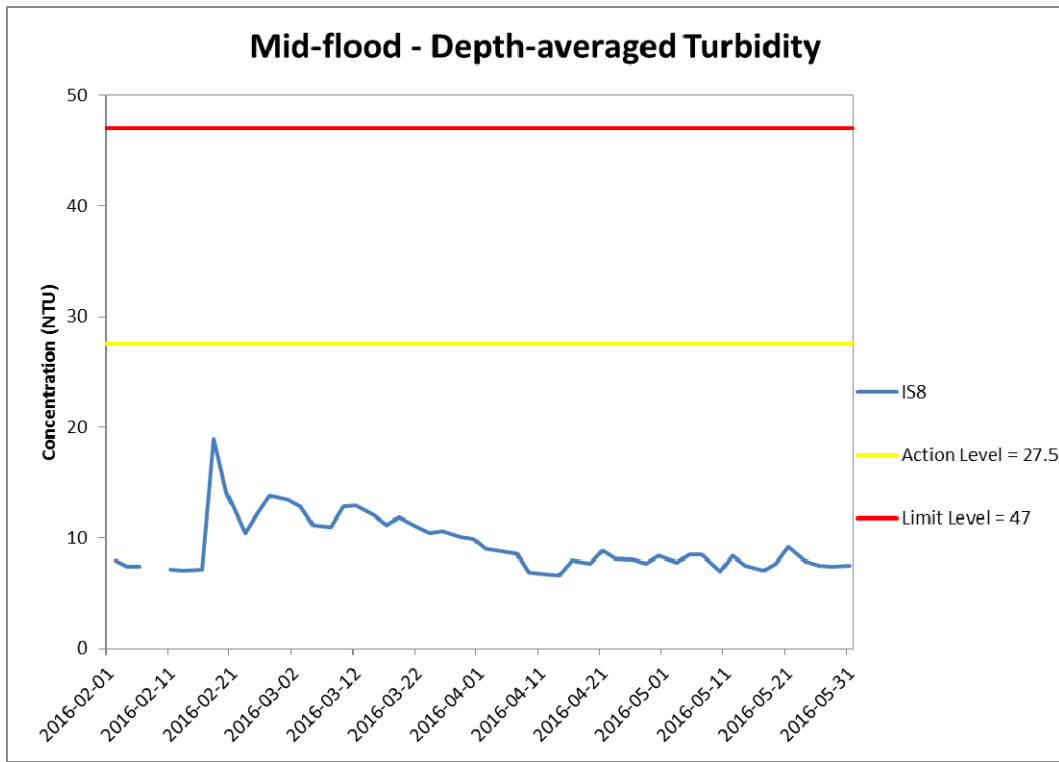


**Figure H26 Impact Monitoring - Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



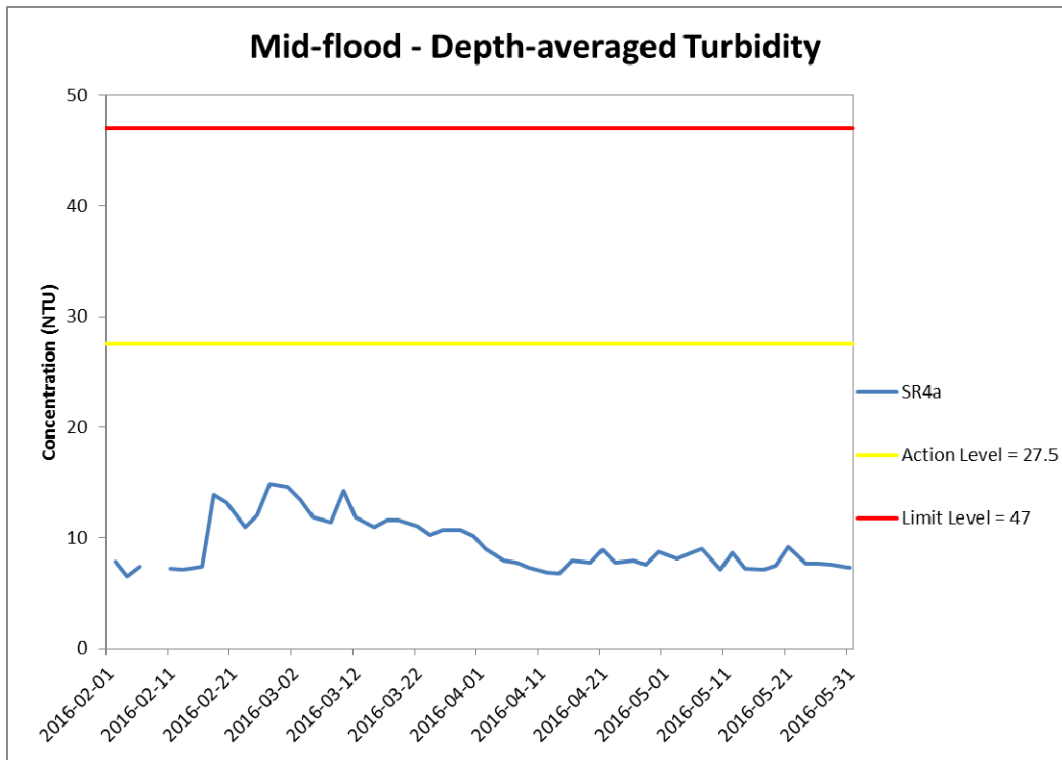


**Figure H27 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 February and 31 May 2016 at IS8 and SR4.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**



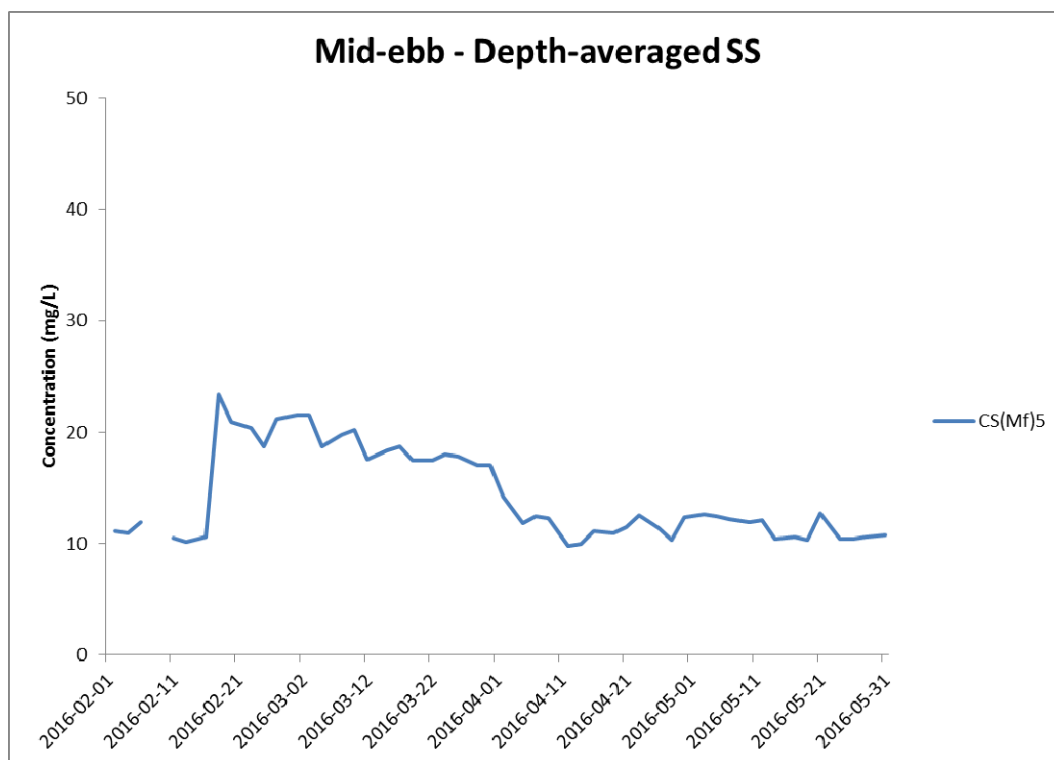
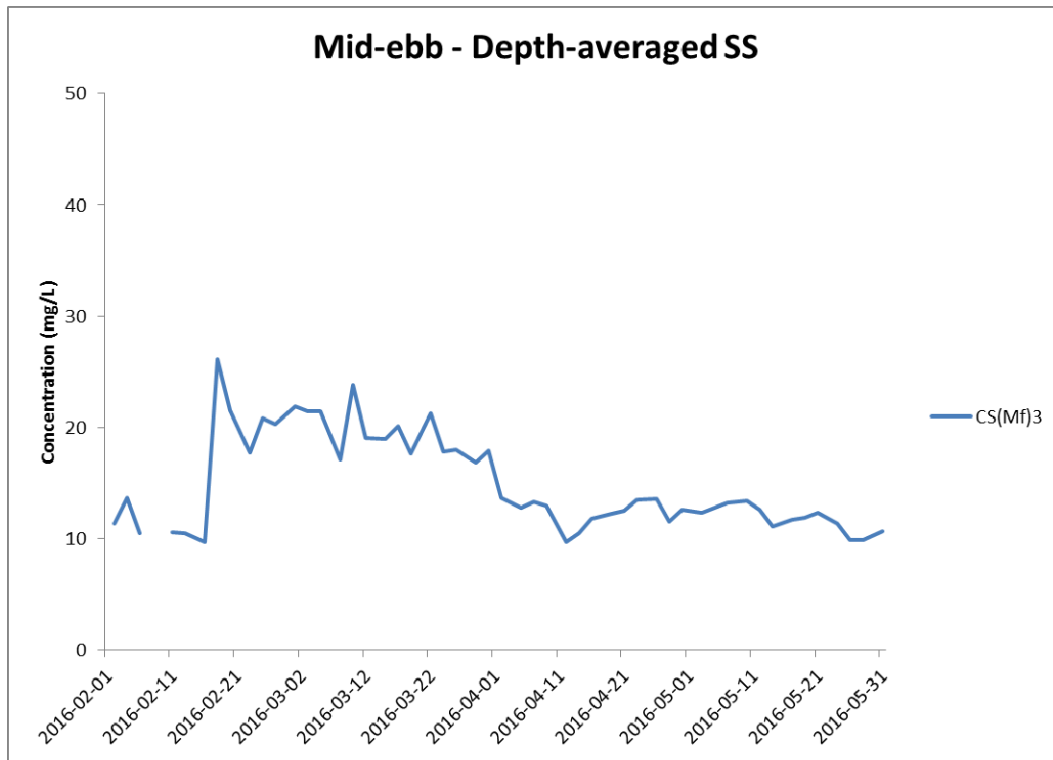


**Figure H28 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**





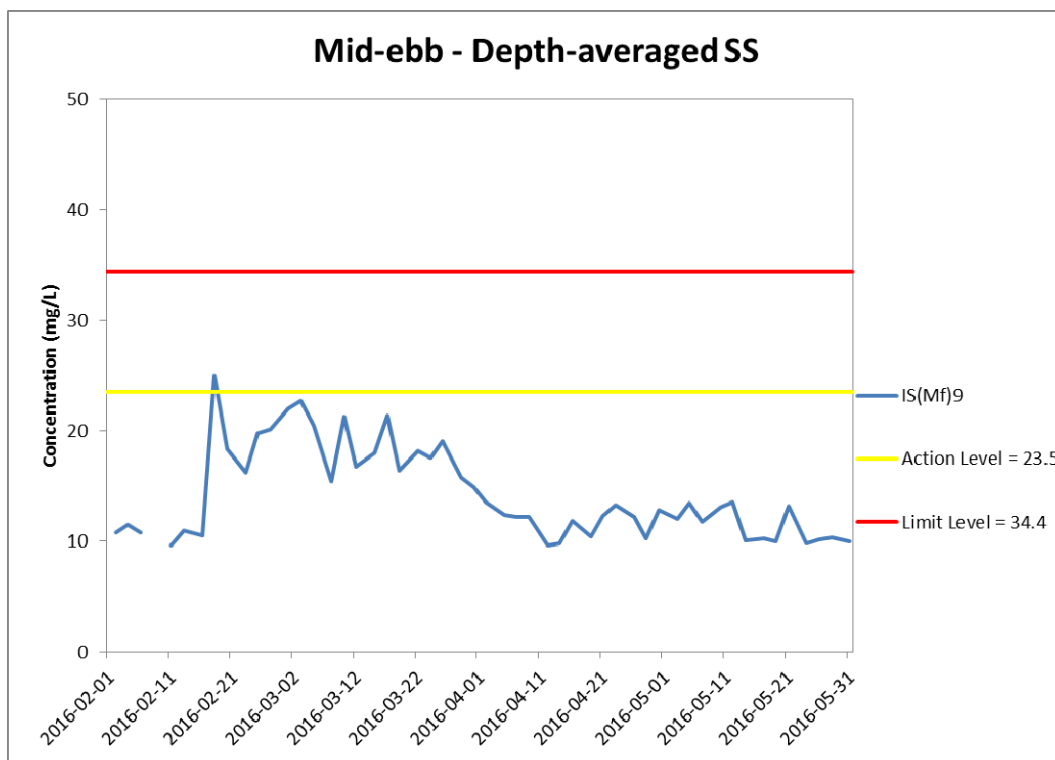
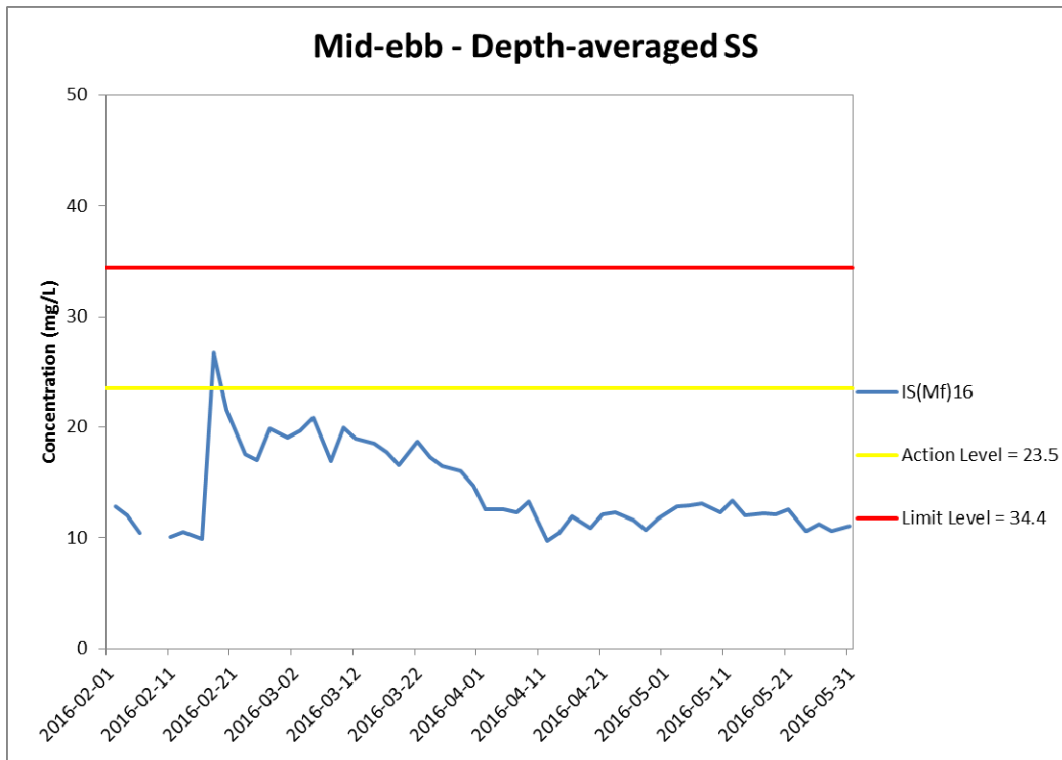
**Figure H29 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**







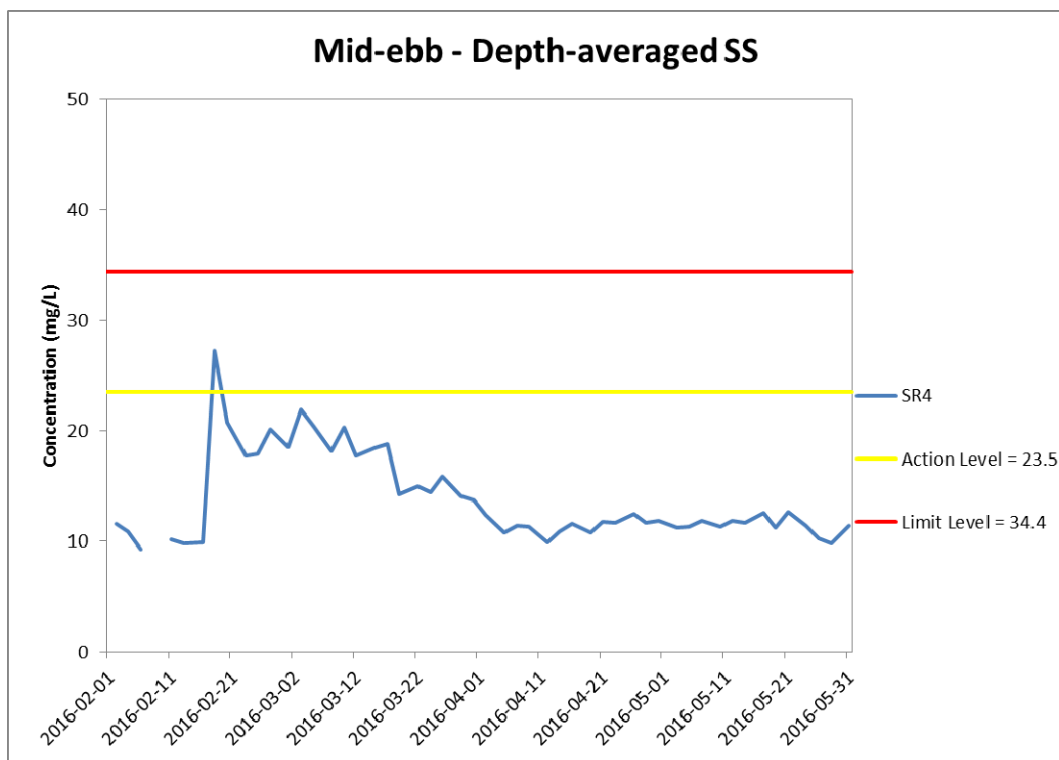
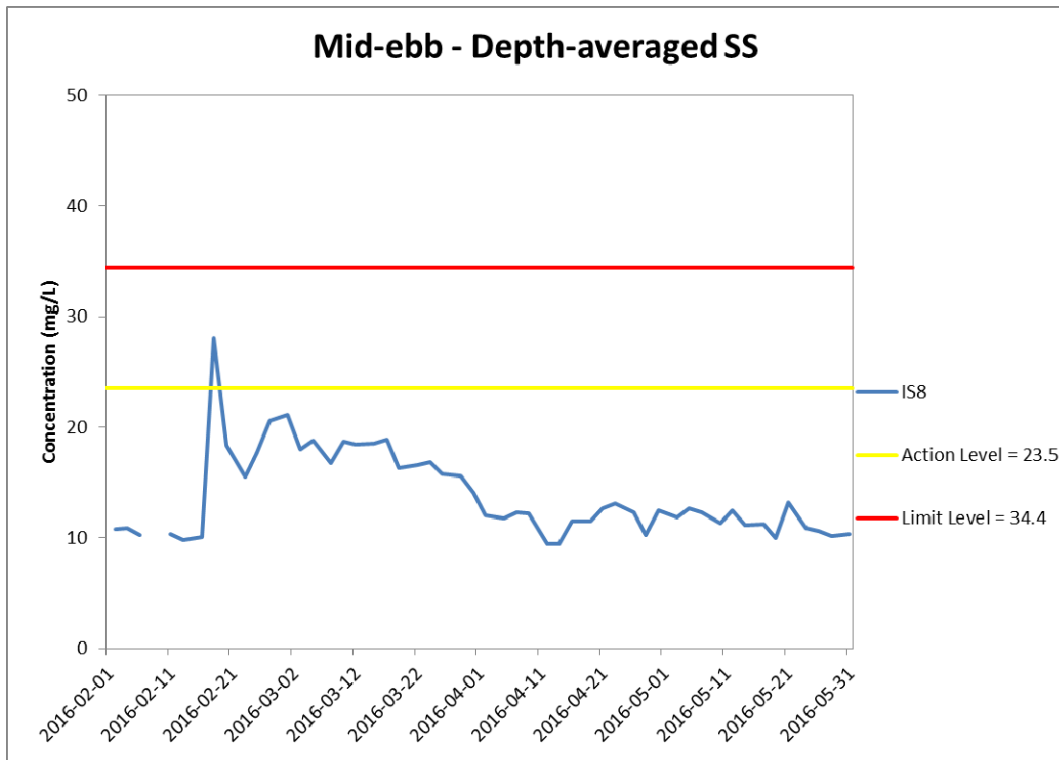
**Figure H30 Impact Monitoring - Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. Results higher than Action Level but lower than 120% of upstream control station at the same tide on the same day are not regarded as exceedance. (Weather condition varied between sunny to rainy within the reporting period.)*

*Marine works within the reporting period include 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.*

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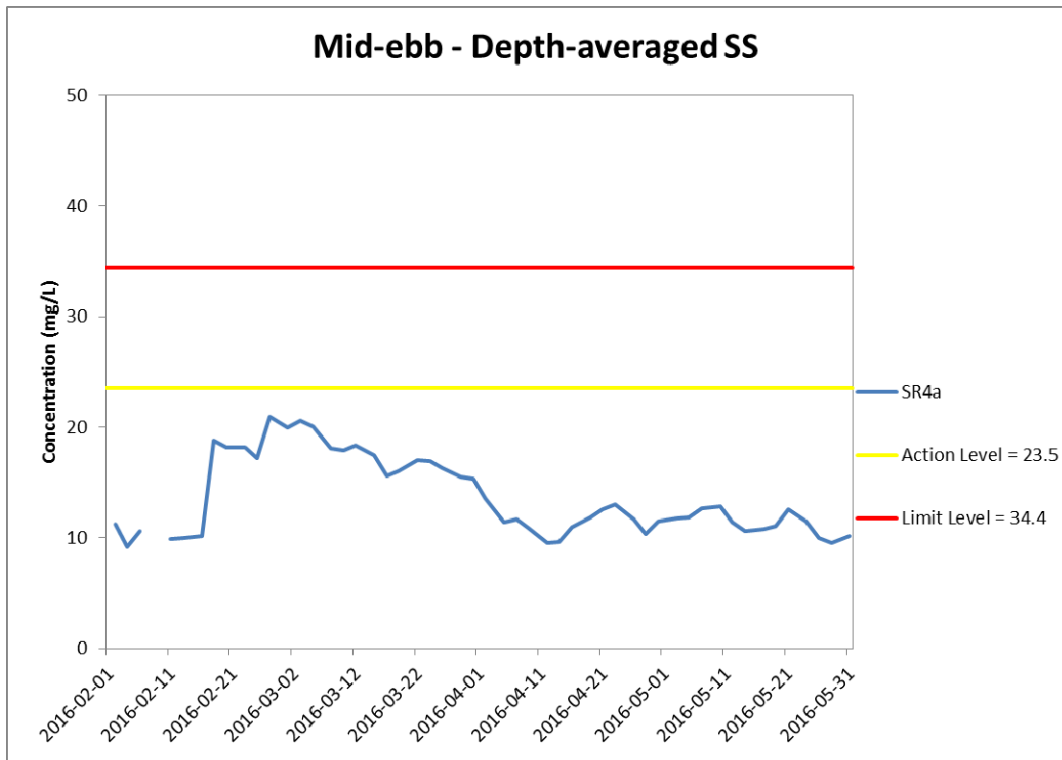
**Figure H31 Impact Monitoring - Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 February and 31 May 2016 at IS8 and SR4.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. Results higher than Action Level but lower than 120% of upstream control station at the same tide on the same day are not regarded as exceedance. (Weather condition varied between sunny to rainy within the reporting period.)*

*Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



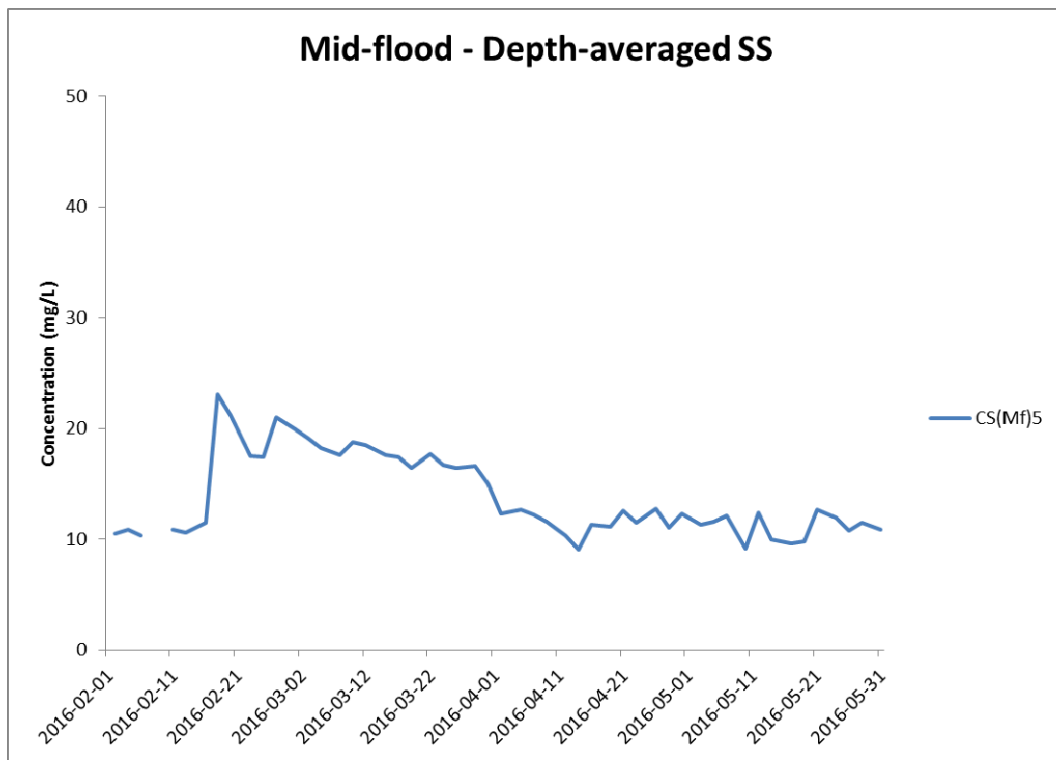
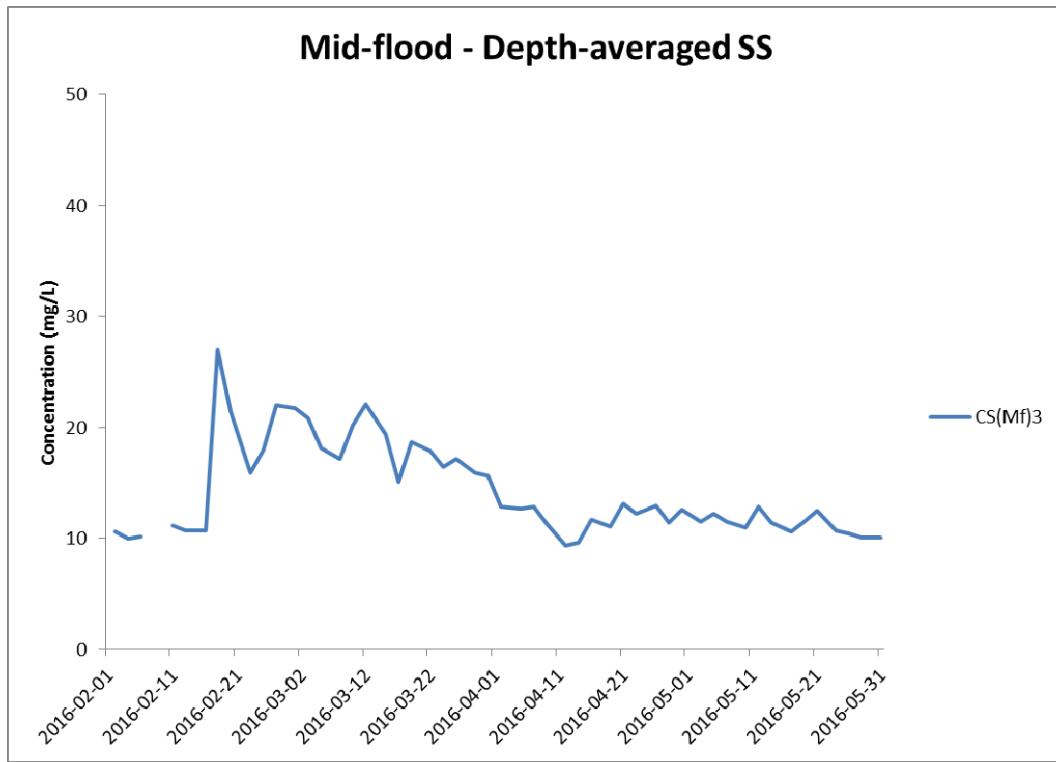


**Figure H32 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 February and 31 May 2016 at SR4a.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**



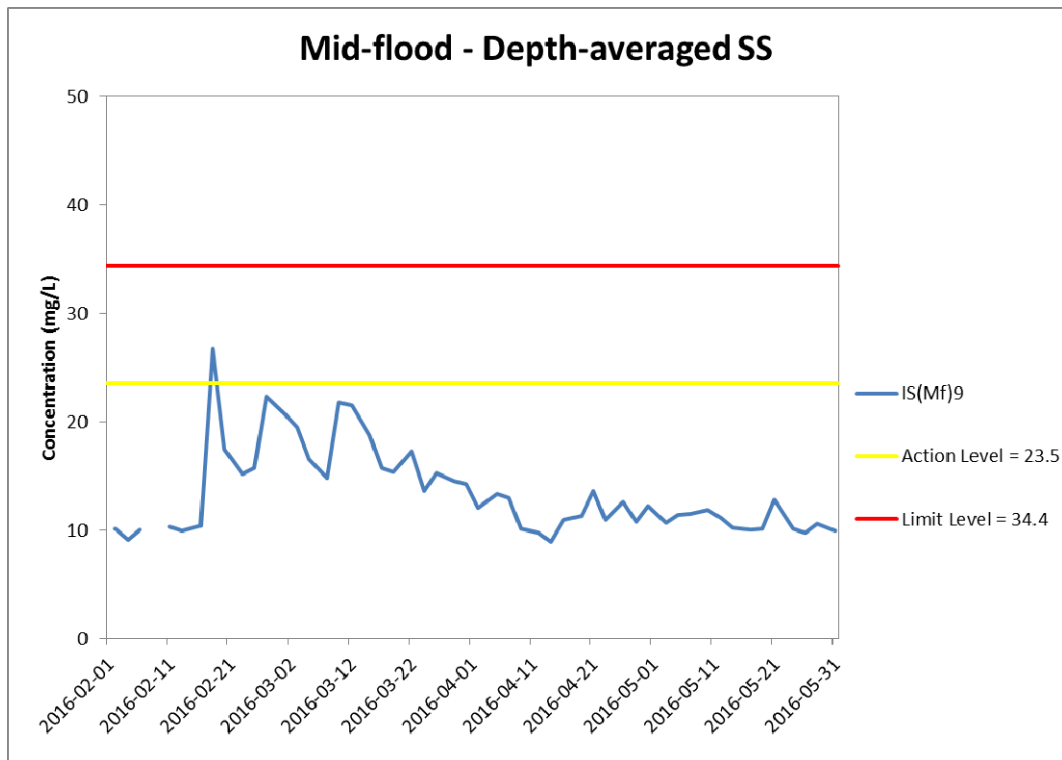
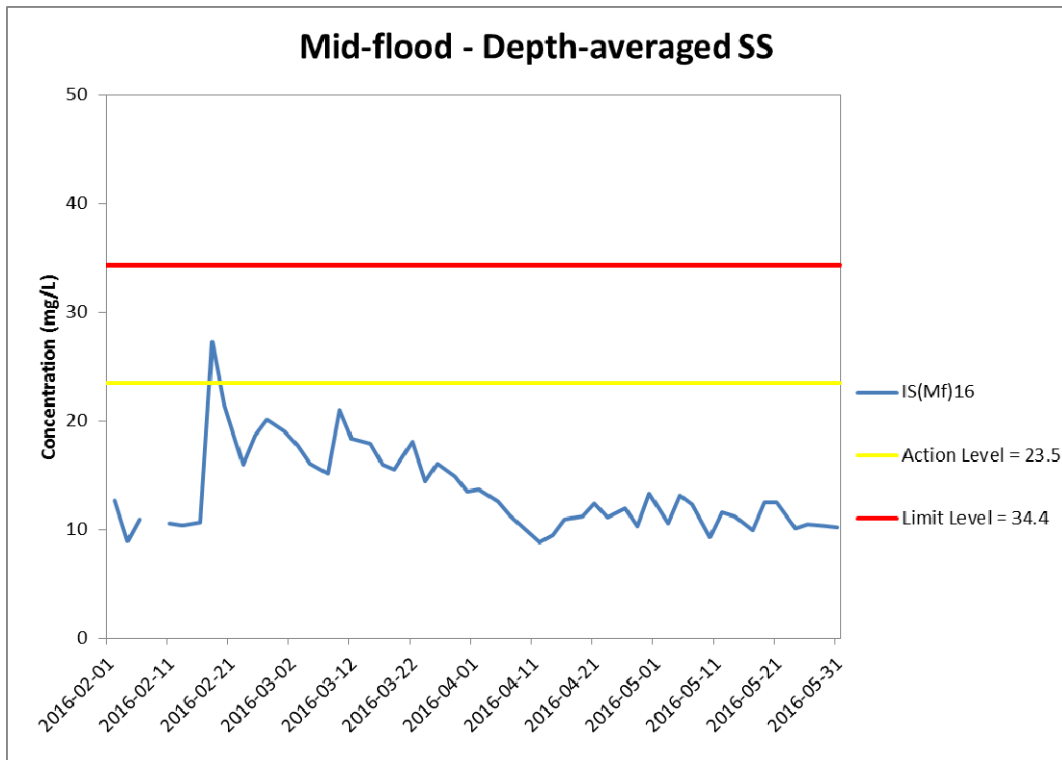


**Figure H33 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 February and 31 May 2016 at CS(Mf)3 and CS(Mf)5.**

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

**Environmental  
Resources  
Management**





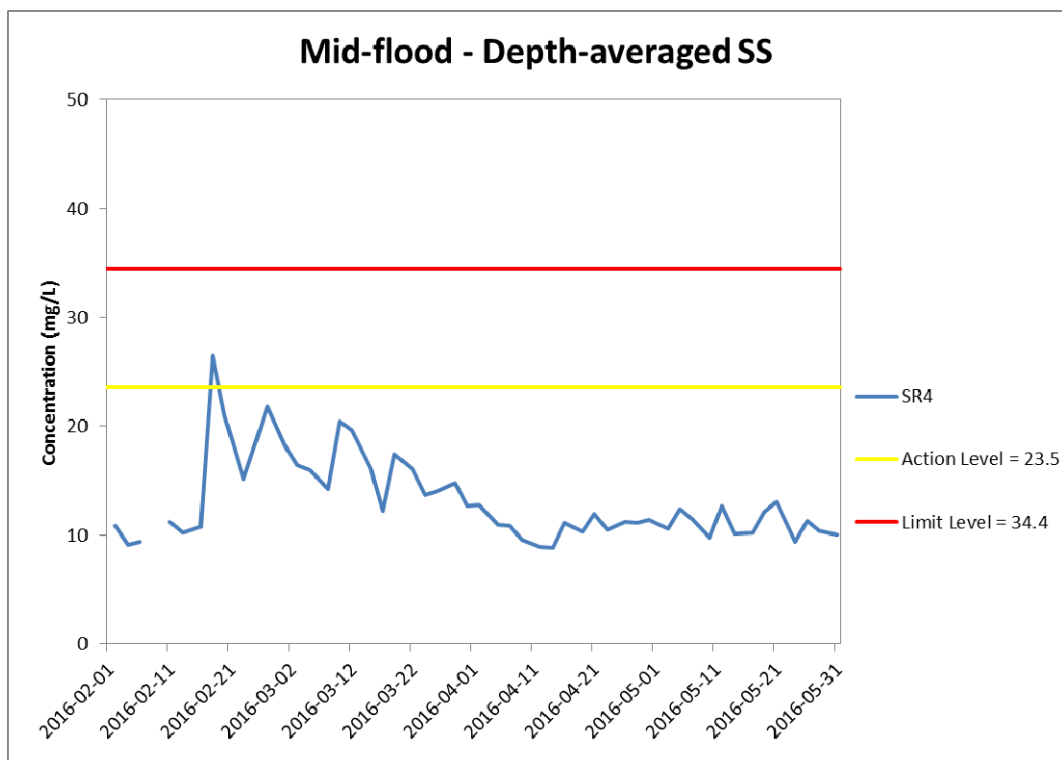
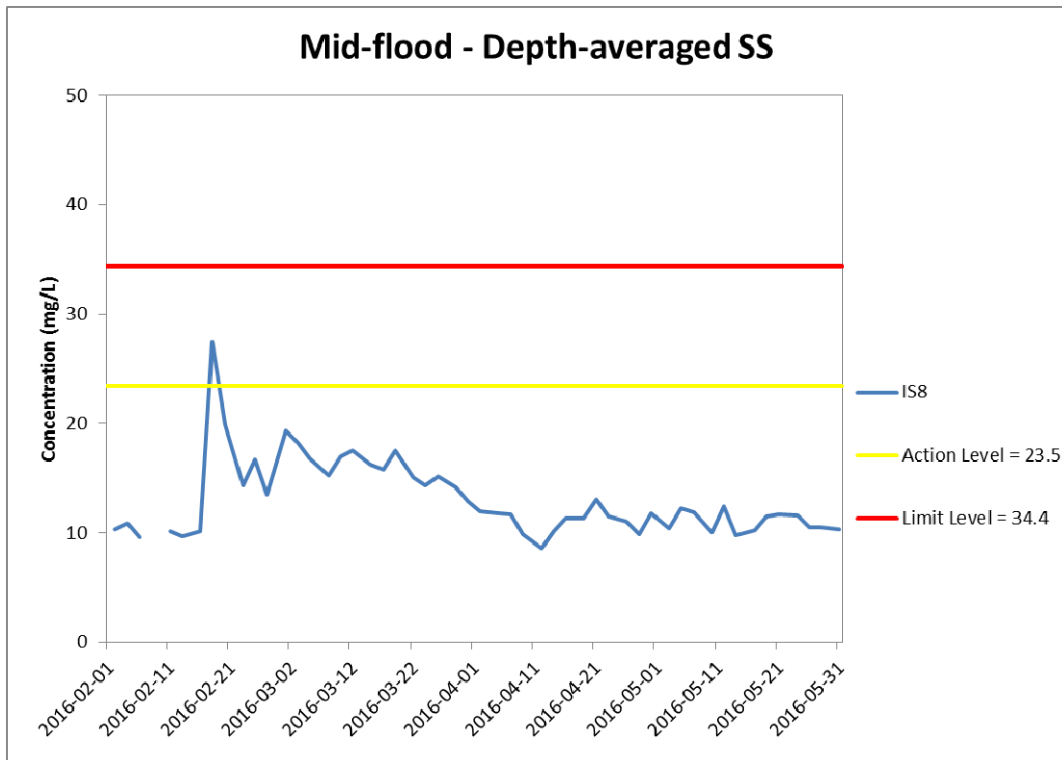
**Figure H34 Impact Monitoring - Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 February and 31 May 2016 at IS(Mf)16 and IS(Mf)9.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. Results higher than Action Level but lower than 120% of upstream control station at the same tide on the same day are not regarded as exceedance. (Weather condition varied between sunny to rainy within the reporting period.)*

*Marine works within the reporting period include 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.*

**Environmental  
Resources  
Management**





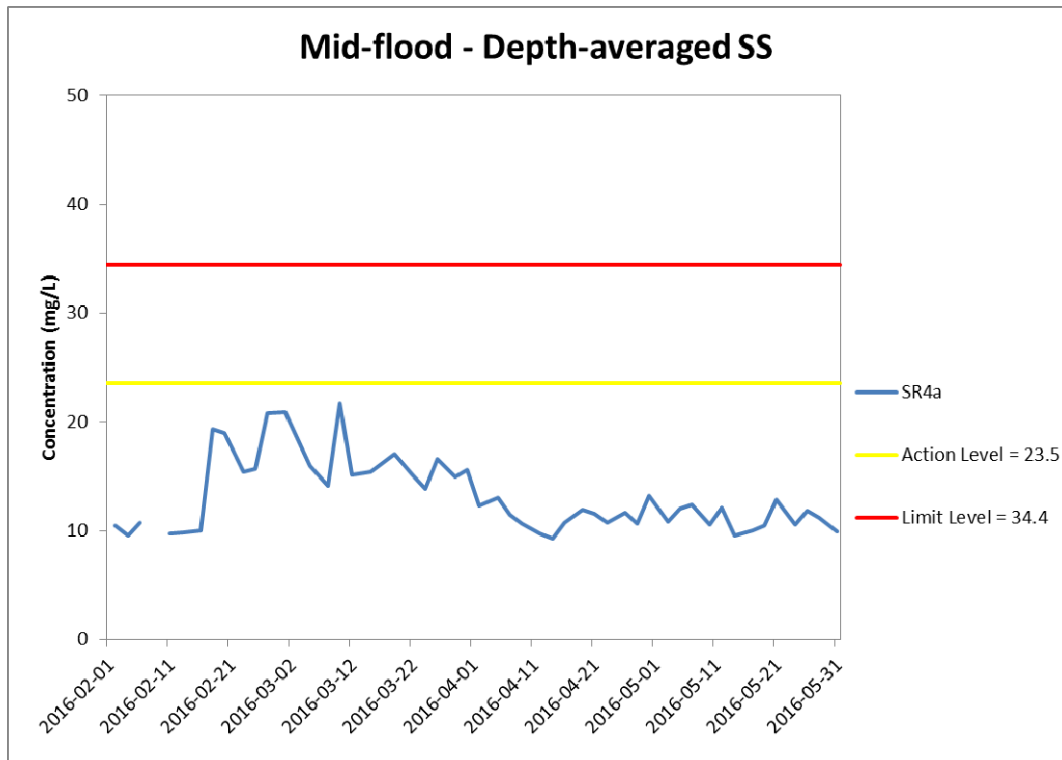
**Figure H35 Impact Monitoring - Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 February and 31 May 2016 at IS8 and SR4.**

*WQM was cancelled on 9 February 2016 due to suspension of marine works. Results higher than Action Level but lower than 120% of upstream control station at the same tide on the same day are not regarded as exceedance. (Weather condition varied between sunny to rainy within the reporting period.)*

*Marine works within the reporting period include 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.*

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

WQM was cancelled on 9 February 2016 due to suspension of marine works. (Weather condition varied between sunny to rainy within the reporting period.) Marine works within the reporting period include 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.

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Appendix I

## Impact Dolphin Monitoring Survey Results



**CONTRACT NO. HY/2012/07**

**Hong Kong-Zhuhai-Macao Bridge Tuen Mun – Chek Lap Kok Link  
(Southern Connection Viaduct Section)  
Dolphin Quarterly Monitoring**

*10<sup>th</sup> Quarterly Progress Report (March-May 2016)  
submitted to Gammon Construction Limited*

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

7 July 2016

**1. Introduction**

- 1.1. The Tuen Mun-Chek Lap Kok Link (TM-CLKL) comprises a 1.6 km long dual 2-lane viaduct section between the Hong Kong Boundary Crossing Facilities (HKBCF) and the North Lantau Highway and associated roads at Tai Ho. Gammon Construction Limited (hereinafter called the “Contractor”) was awarded as the main contractor of “Contract No. HY/2012/07 – Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chek Lap Kok Link – Southern Connection Viaduct Section”.
- 1.2. According to the updated Environmental Monitoring and Audit (EM&A) Manual (for TM-CLKL), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the Northwest (NWL) and Northeast Lantau (NEL) survey areas as in AFCD annual marine mammal monitoring programme. However, as such surveys have been undertaken by the HKLR03 and HKBCF projects in the same areas (i.e. NWL and NEL), a combined monitoring approach is recommended by the Highways Department, that the TM-CLKL EM&A project can utilize the monitoring data collected by HKLR03 or HKBCF project to avoid any redundancy in monitoring effort. Such exemption for the dolphin monitoring will end upon the completion of the dolphin monitoring carried out by HKLR03 contract as well as the TM-CLKL Northern Connection Sub-Sea Tunnel Section (HY/2012/08)
- 1.3. In November 2013, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by Gammon Construction Limited as the dolphin specialist for the TM-CLKL Southern Viaduct Section EM&A project. He is responsible for the dolphin monitoring study, including the data collection on Chinese White Dolphins during the construction phase (i.e. impact period) of the TM-CLKL project in Northwest Lantau (NWL) and Northeast Lantau (NEL) survey areas.
- 1.4. During the construction period of HKLR, the dolphin specialist would be in charge of

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

- 1.5. From the monitoring results, any changes in dolphin occurrence within the study area will be examined for possible causes, and appropriate actions and additional mitigation measures will be recommended as necessary.
- 1.6. This report is the tenth quarterly progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Gammon Construction Limited, summarizing the results of the surveys findings during the period of March to May 2016, utilizing the survey data collected by HKLR03 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	816506	819480
1	End Point	804671	831404		13	816506	824859
2	Start Point	805475	815913*		14	817537	820220
2	End Point	805477	826654		14	817537	824613
3	Start Point	806464	819435		15	818568	820735
3	End Point	806464	822911		15	818568	824433
4	Start Point	807518	819771		16	819532	821420
4	End Point	807518	829230		16	819532	824209
5	Start Point	808504	820220		17	820451	822125
5	End Point	808504	828602		17	820451	823671
6	Start Point	809490	820466		18	821504	822371
6	End Point	809490	825352		18	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<sup>®</sup> 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<sup>2</sup> grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km<sup>2</sup>) and dolphin densities (total number of dolphins from on-effort sightings per km<sup>2</sup>) 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 sightings per 100 units of survey effort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of dolphins per 100 units of survey effort. Among the 1-km<sup>2</sup> 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<sup>2</sup> grid within the study area:

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

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<sup>®</sup> 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

### 3. Monitoring Results

- 3.1. *Summary of survey effort and dolphin sightings*
- 3.1.1. During the period of March to May 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 896.56 km of survey effort was collected, with 90.3% 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, 341.16 km and 555.40 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 657.94 km, while the effort on secondary lines was 238.62 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 March to May 2016, a total of seven groups of 22 Chinese White Dolphins were sighted. Four of the seven dolphin sightings were made during on-effort search, while three of the four on-effort dolphin sightings were made on primary lines. In this quarterly period, all dolphin groups were sighted in NWL, while none was sighted at all in NEL. A summary table of the dolphin sightings is shown in Appendix II.
- 3.2. *Distribution*
- 3.2.1. Distribution of dolphin sightings made during the HKLR03 monitoring surveys from March to May 2016 is shown in Figure 1. Dolphin sightings made in the present quarter were mostly located to the north of Lung Kwu Chau, while one sighting each was made to the southwest of Lung Kwu Chau and at the northeast corner of the airport platform respectively (Figure 1). Notably, four of the five sightings located to the north of Lung Kwu Chau were all made on the same survey day.
- 3.2.2. Notably, none of the dolphin sightings was made near the TM-CLKL alignment, HKLR09 alignment or HKLR03 reclamation site. On the other hand, one dolphin group was sighted near the HKBCF reclamation site (Figure 1).
- 3.2.3. Sighting distribution of dolphins during the present impact phase monitoring period (March to May 2016) was drastically different from the one during the baseline monitoring period (September to November 2011). In the present quarter, dolphins have disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands, near Shum Shui Kok and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1). The nearly complete abandonment of NEL region by the dolphins has been consistently recorded in the past three years 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 the present impact phase periods. During the present impact monitoring period, much fewer dolphins occurred in this survey area (mostly near Lung Kwu 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 spring months in 2013-16 (Figure 2). Among the four spring periods, dolphins were regularly sighted throughout the North Lantau region in 2013, but their usage there have been significantly reduced 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

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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 March to May 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 (7 & 11 Mar 2016)	0.00	0.00
	Set 2 (22 & 23 Mar 2016)	0.00	0.00
	Set 3 (5 & 12 Apr 2016)	0.00	0.00
	Set 4 (15 & 19 Apr 2016)	0.00	0.00
	Set 5 (3 & 12 May 2016)	0.00	0.00
	Set 6 (17 & 26 May 2016)	0.00	0.00
Northwest Lantau	Set 1 (7 & 11 Mar 2016)	0.00	0.00
	Set 2 (22 & 23 Mar 2016)	1.59	4.78
	Set 3 (5 & 12 Apr 2016)	2.20	17.59
	Set 4 (15 & 19 Apr 2016)	2.10	6.31
	Set 5 (3 & 12 May 2016)	0.00	0.00
	Set 6 (17 & 26 May 2016)	0.00	0.00

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (March to May 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;  $\pm$  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)	
	March – May 2016	September - November 2011	March – May 2016	September - November 2011
Northeast Lantau	0.0	6.00 $\pm$ 5.05	0.0	22.19 $\pm$ 26.81
Northwest Lantau	0.98 $\pm$ 1.10	9.85 $\pm$ 5.85	4.78 $\pm$ 6.85	44.66 $\pm$ 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 0.83 sightings and 3.54 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 sighting being made, and such extremely low occurrence of dolphins in NEL have been consistently recorded in the past thirteen 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 been exceptionally low when compared to the baseline period (Table 4). Dolphins have been virtually absent from NEL waters since January 2014, with only two groups of five 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 spring months were highlighted in blue;  $\pm$  denotes the standard deviation of the average encounter rates)

	<b>Encounter rate (STG)</b> (no. of on-effort dolphin sightings per 100 km of survey effort)	<b>Encounter rate (ANI)</b> (no. of dolphins from all on-effort sightings per 100 km of survey effort)
<b>September-November 2011 (Baseline)</b>	6.00 $\pm$ 5.05	22.19 $\pm$ 26.81
<b>December 2012-February 2013 (Impact)</b>	3.14 $\pm$ 3.21	6.33 $\pm$ 8.64
<b>March-May 2013 (Impact)</b>	0.42 $\pm$ 1.03	0.42 $\pm$ 1.03
<b>June-August 2013 (Impact)</b>	0.88 $\pm$ 1.36	3.91 $\pm$ 8.36
<b>September-November 2013 (Impact)</b>	1.01 $\pm$ 1.59	3.77 $\pm$ 6.49
<b>December 2013-February 2014 (Impact)</b>	0.45 $\pm$ 1.10	1.34 $\pm$ 3.29
<b>March-May 2014 (Impact)</b>	0.00	0.00
<b>June-August 2014 (Impact)</b>	0.42 $\pm$ 1.04	1.69 $\pm$ 4.15
<b>September-November 2014 (Impact)</b>	0.00	0.00
<b>December 2014-February 2015 (Impact)</b>	0.00	0.00
<b>March-May 2015 (Impact)</b>	0.00	0.00
<b>June-August 2015 (Impact)</b>	0.44 $\pm$ 1.08	0.44 $\pm$ 1.08
<b>September-November 2015 (Impact)</b>	0.00	0.00
<b>December 2015-February 2016 (Impact)</b>	0.00	0.00
<b>March-May 2016 (Impact)</b>	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 90.1% and 89.3% 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 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 spring months were highlighted in blue;  $\pm$  denotes the standard deviation of the average encounter rates)

	<b>Encounter rate (STG)</b> (no. of on-effort dolphin sightings per 100 km of survey effort)	<b>Encounter rate (ANI)</b> (no. of dolphins from all on-effort sightings per 100 km of survey effort)
<b>September-November 2011 (Baseline)</b>	9.85 $\pm$ 5.85	44.66 $\pm$ 29.85
<b>December 2012-February 2013 (Impact)</b>	8.36 $\pm$ 5.03	35.90 $\pm$ 23.10
<b>March-May 2013 (Impact)</b>	7.75 $\pm$ 3.96	24.23 $\pm$ 18.05
<b>June-August 2013 (Impact)</b>	6.56 $\pm$ 3.68	27.00 $\pm$ 18.71
<b>September-November 2013 (Impact)</b>	8.04 $\pm$ 1.10	32.48 $\pm$ 26.51
<b>December 2013-February 2014 (Impact)</b>	8.21 $\pm$ 2.21	32.58 $\pm$ 11.21
<b>March-May 2014 (Impact)</b>	6.51 $\pm$ 3.34	19.14 $\pm$ 7.19
<b>June-August 2014 (Impact)</b>	4.74 $\pm$ 3.84	17.52 $\pm$ 15.12
<b>September-November 2014 (Impact)</b>	5.10 $\pm$ 4.40	20.52 $\pm$ 15.10
<b>December 2014-February 2015 (Impact)</b>	2.91 $\pm$ 2.69	11.27 $\pm$ 15.19
<b>March-May 2015 (Impact)</b>	0.47 $\pm$ 0.73	2.36 $\pm$ 4.07
<b>June-August 2015 (Impact)</b>	2.53 $\pm$ 3.20	9.21 $\pm$ 11.57
<b>September-November 2015 (Impact)</b>	3.94 $\pm$ 1.57	21.05 $\pm$ 17.19
<b>December 2015-February 2016 (Impact)</b>	2.64 $\pm$ 1.52	10.98 $\pm$ 3.81
<b>March-May 2016 (Impact)</b>	0.98 $\pm$ 1.10	4.78 $\pm$ 6.85

- 3.3.5. During the same spring quarters, the dolphin encounter rates in NWL during the spring months of 2015 and 2016 were much lower than the ones recorded in spring months of 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 (2015), 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 (fourteenth quarter of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0019 and 0.0173 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 fourteen quarters of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.000019 and 0.000005 respectively. Even if the alpha value is set at 0.00005, 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 2015).
- 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 eight individuals per group in North Lantau region during March to May 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.

Table 6. Comparison of average dolphin group sizes from impact monitoring period (March – May 2016) and baseline monitoring period (September – November 2011) (Note:  $\pm$  denotes the standard deviation of the average group size)

	Average Dolphin Group Size	
	March – May 2016	September – November 2011
<b>Overall</b>	3.14 $\pm$ 2.27 (n = 7)	3.72 $\pm$ 3.13 (n = 66)
<b>Northeast Lantau</b>	N/A	3.18 $\pm$ 2.16 (n = 17)
<b>Northwest Lantau</b>	3.14 $\pm$ 2.27 (n = 7)	3.92 $\pm$ 3.40 (n = 49)

- 3.4.2. The average dolphin group size in NWL waters during March to May 2016 was slightly

lower than the ones recorded during the three-month baseline period (Table 6). All except one dolphin groups were composed of 1-3 individuals only, while only one group was moderately large with eight individuals.

- 3.4.3. Distribution of the lone larger dolphin group (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 spring months of 2016, the only larger dolphin group was sighted to the southwest of Lung Kwu Chau (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 March to May 2016, the only area being utilized by Chinese White Dolphins was to the north and southwest of Lung Kwu Chau (Figures 4a and 4b). All grids near TMCLKL/HKLR09 alignments as well as 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 area with moderate to high dolphin densities was restricted to the waters near 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 present quarter 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 seven dolphin groups were engaged in feeding activity, while none of them was engaged in socializing, traveling or milling/resting activity during the three-month study period.
- 3.7.2. The percentage of sightings associated with feeding activities (14.3%) was similar to the one recorded during the baseline period (11.6%). However, it should be noted the sample sizes on total numbers of dolphin sightings during the present quarter (seven 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 feeding activity was sighted to the north of Lung Kwu Chau 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 seven 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 March to May 2016, over 800 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.
- 3.8.2. In total, 16 individuals sighted 18 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. The majority of identified individuals were sighted only once during the three-month period, with the exception of two individuals (NL48 and NL285) being sighted twice in the present quarter.
- 3.8.4. Notably, two of these 16 individuals (NL123 and NL320) were also sighted in West Lantau waters during the HKLR09 monitoring surveys from March to May 2016.

3.9. *Individual range use*

- 3.9.1. Ranging patterns of the 16 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, two individuals (NL123 and NL320) consistently utilized both North Lantau waters in the past have extended their range use to WL 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).

#### 4. Conclusion

- 4.1. During this quarter of dolphin monitoring, no adverse impact from the activities of the TMCLKL construction project on Chinese White Dolphins was noticeable from general observations.
- 4.2. Although the dolphins infrequently occurred along the alignment of TMCLKL southern connection viaduct in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL, and many individuals have shifted away from the important habitat around the Brothers Islands.
- 4.3. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

#### 5. References

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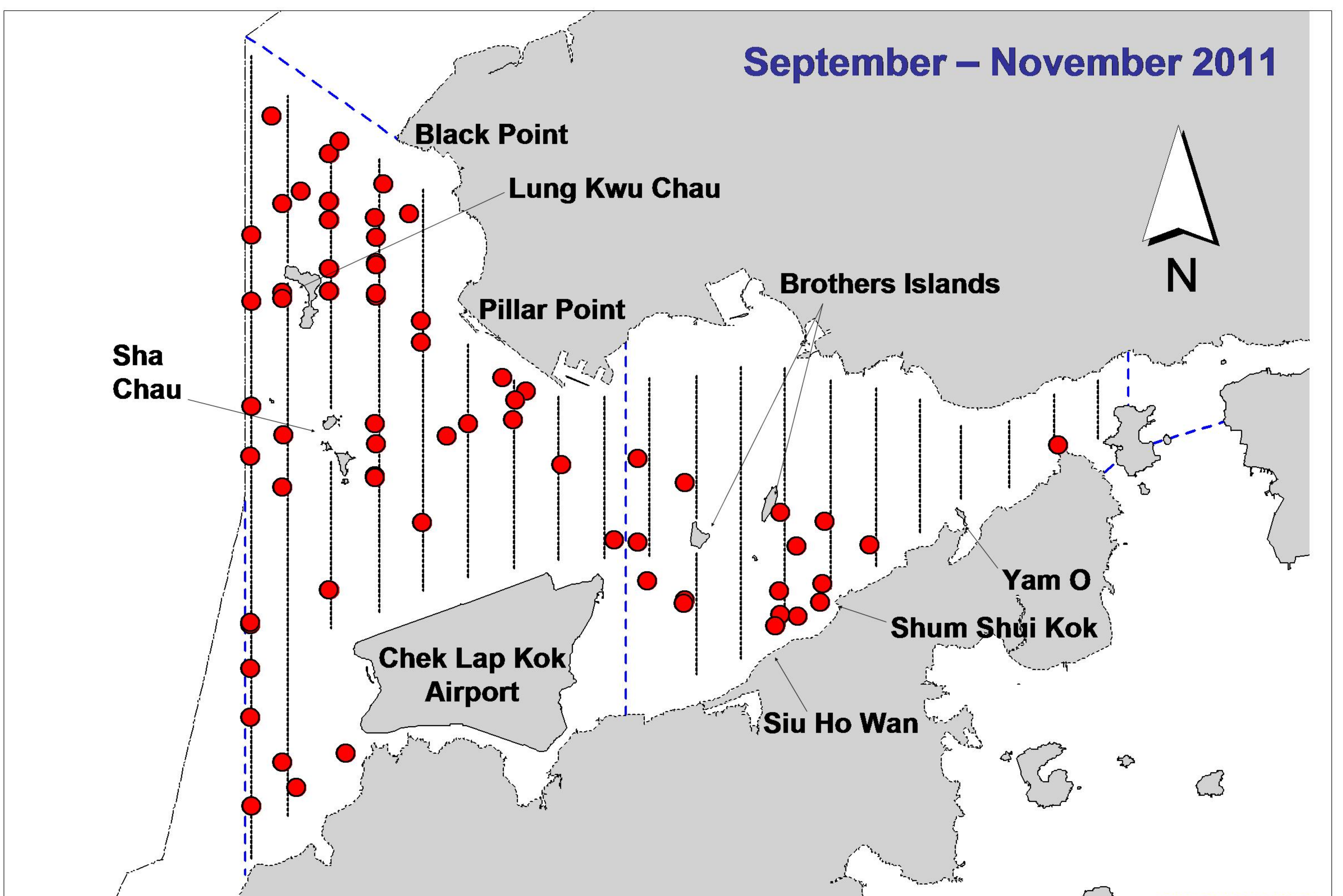
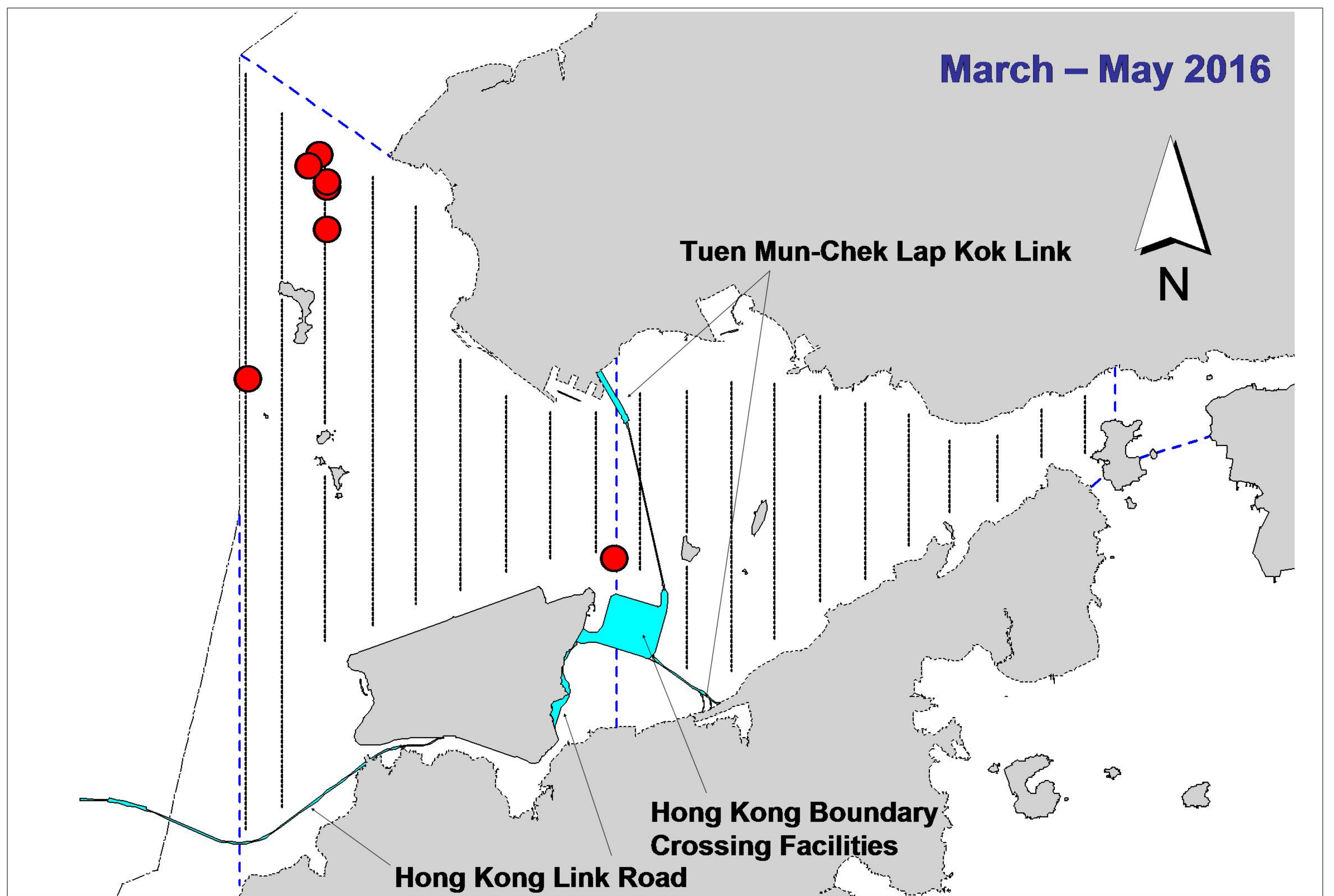


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

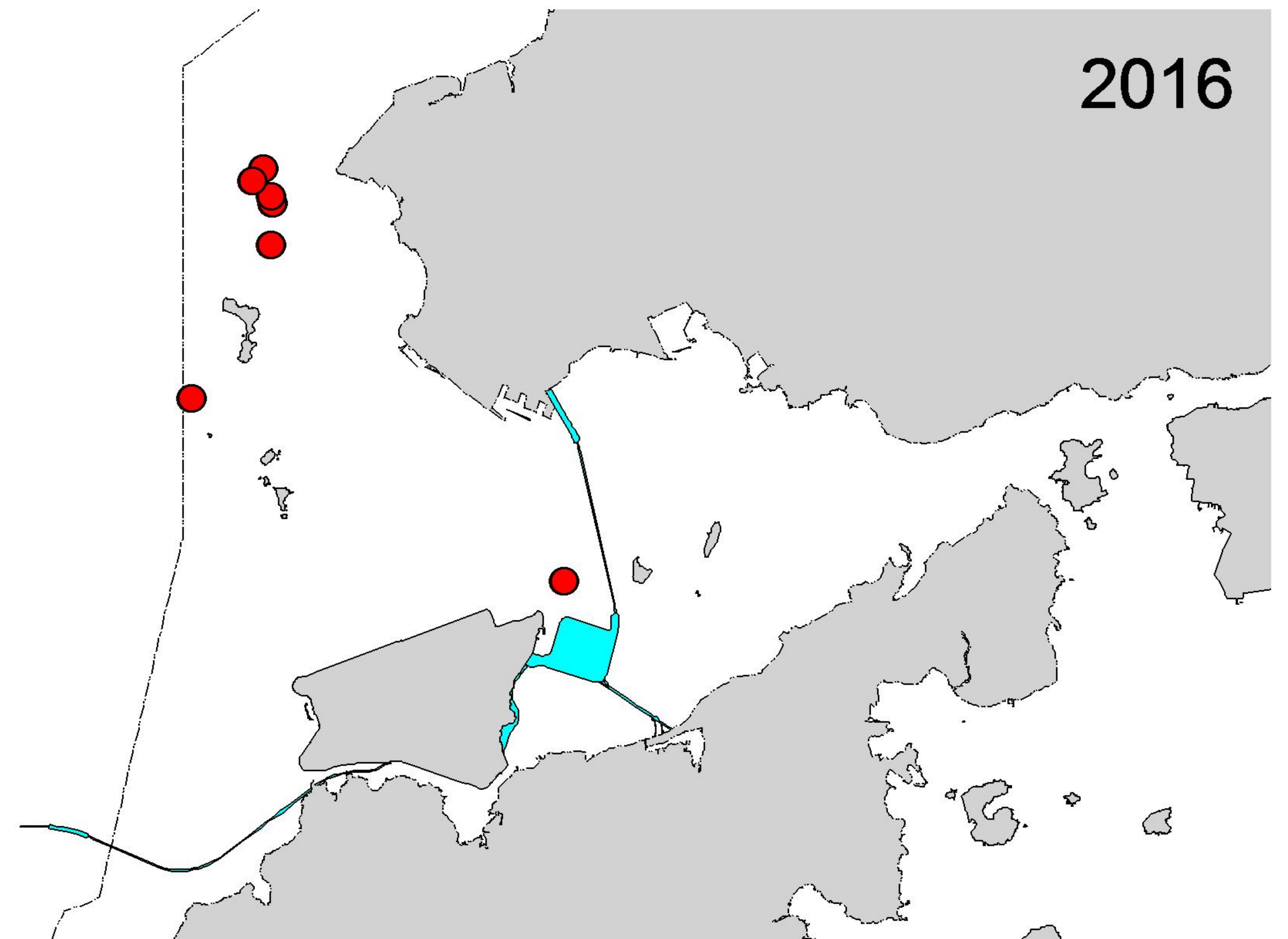
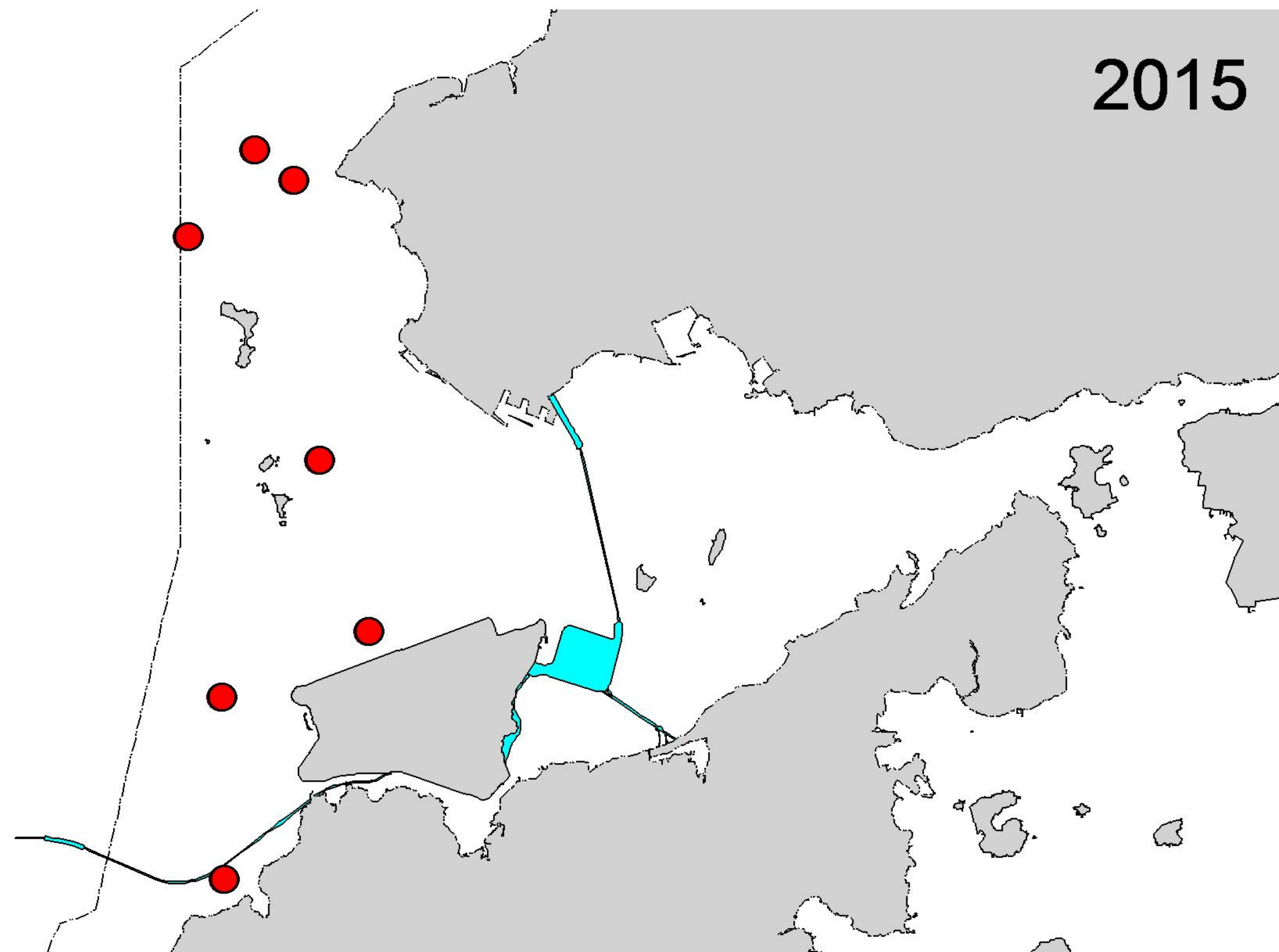
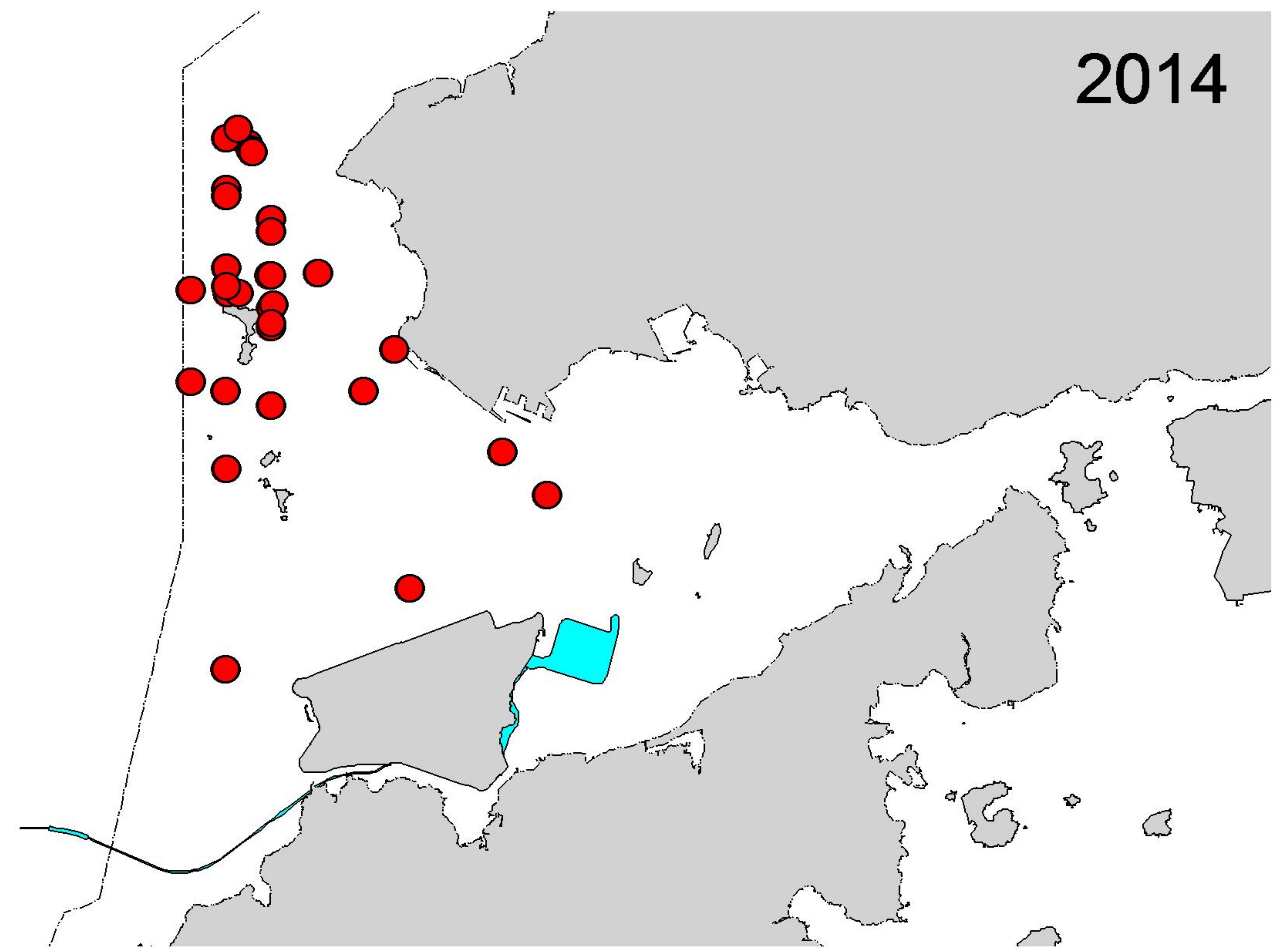
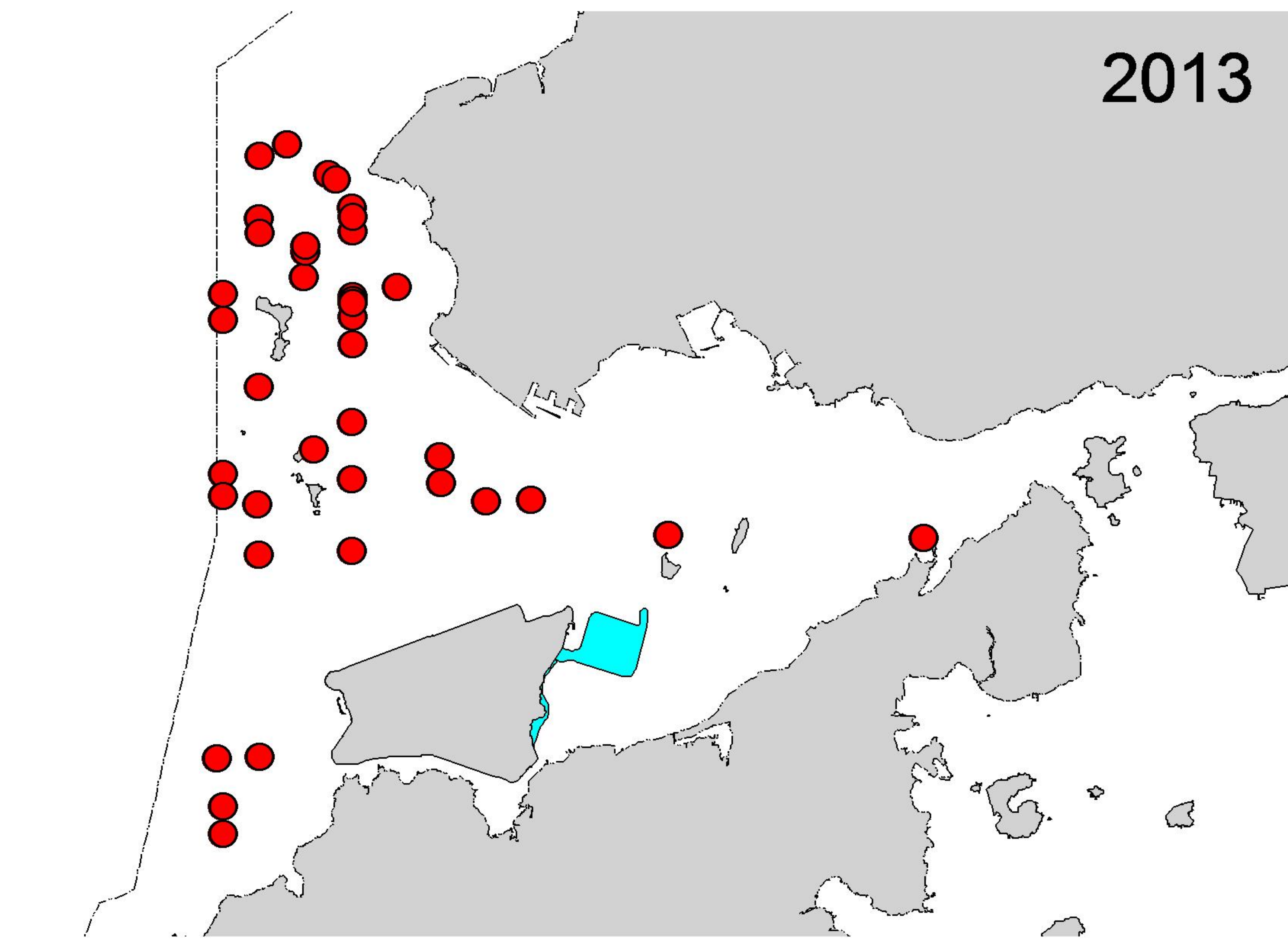


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the same spring quarters (March-May) of HKLR03 impact phase in 2013-16



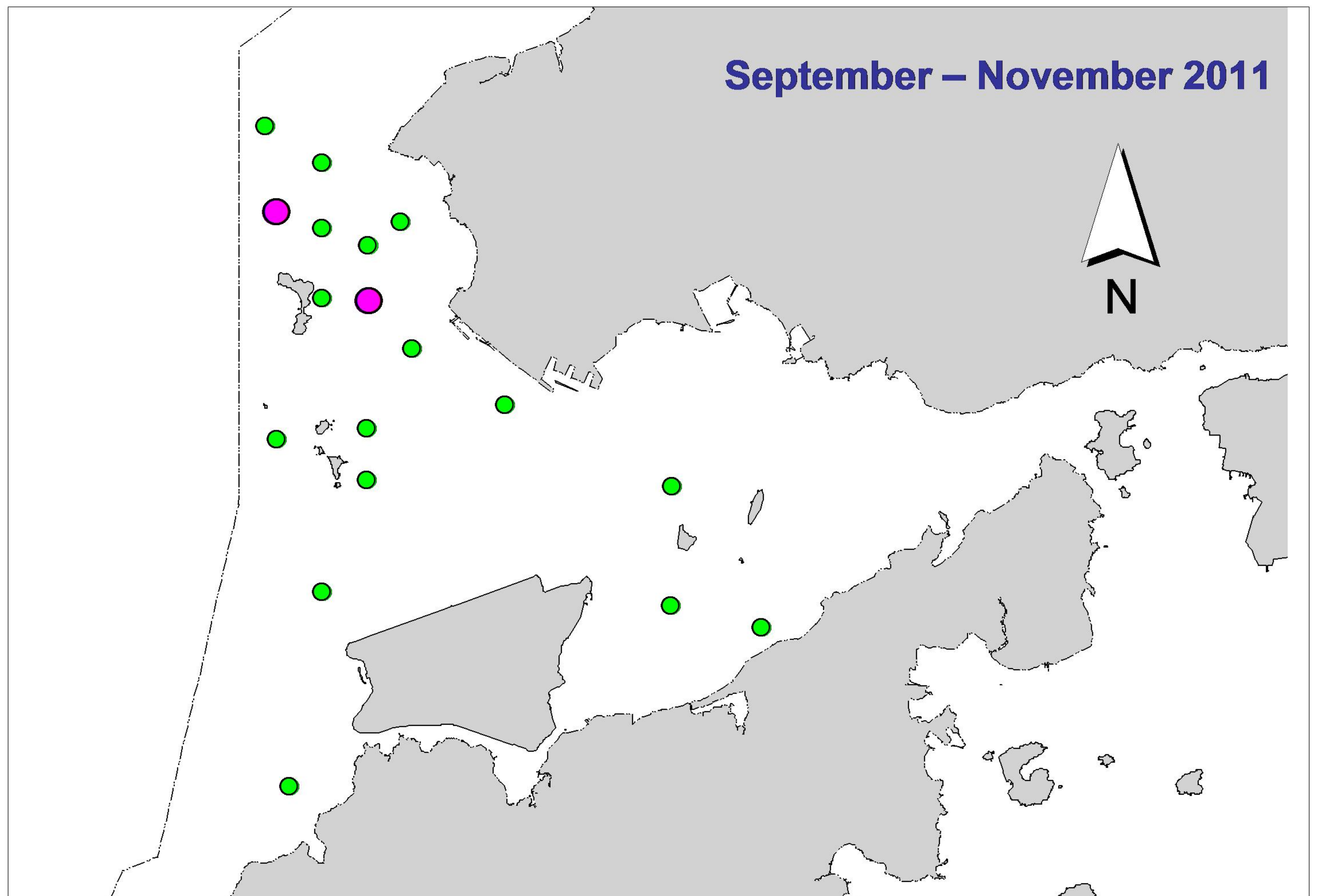
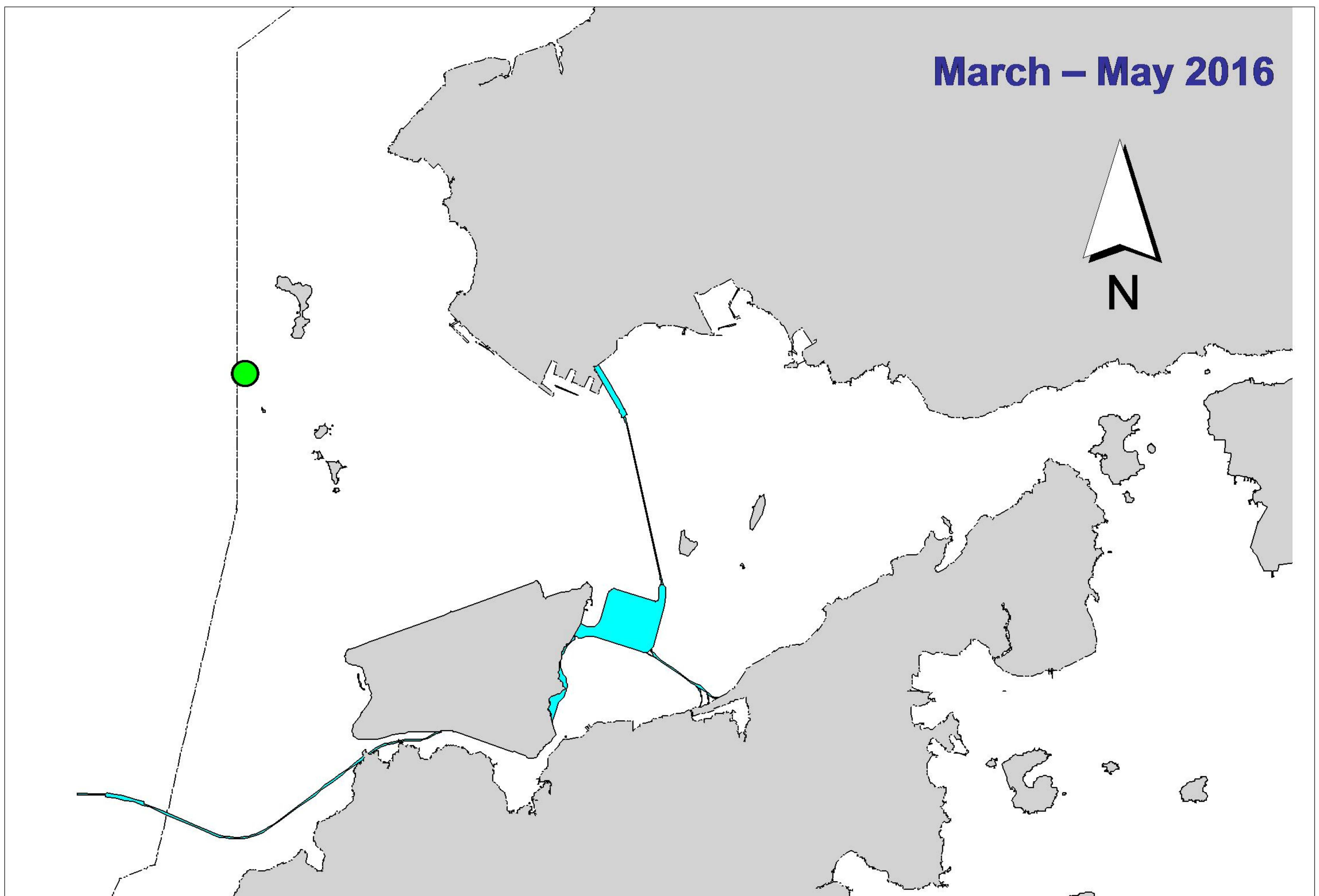


Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR03 impact phase (top) and baseline monitoring surveys (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

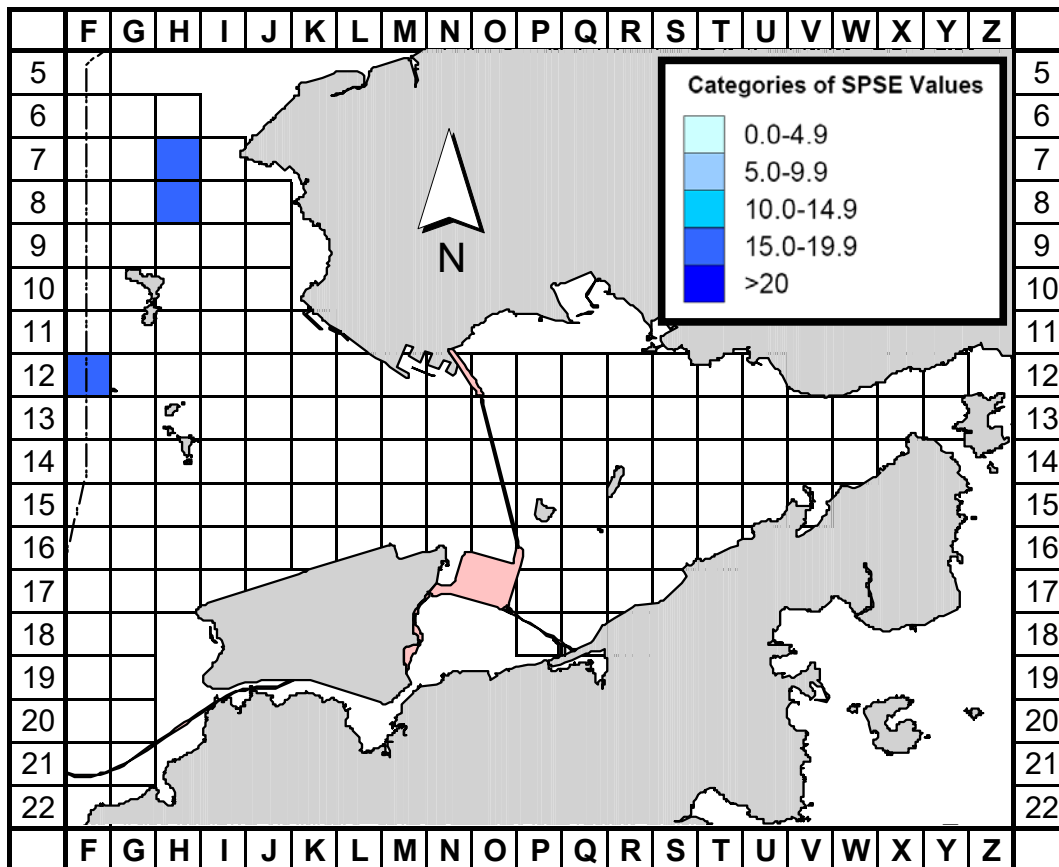


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (March-May 2016) (SPSE = no. of on-effort sightings per 100 units of survey effort)

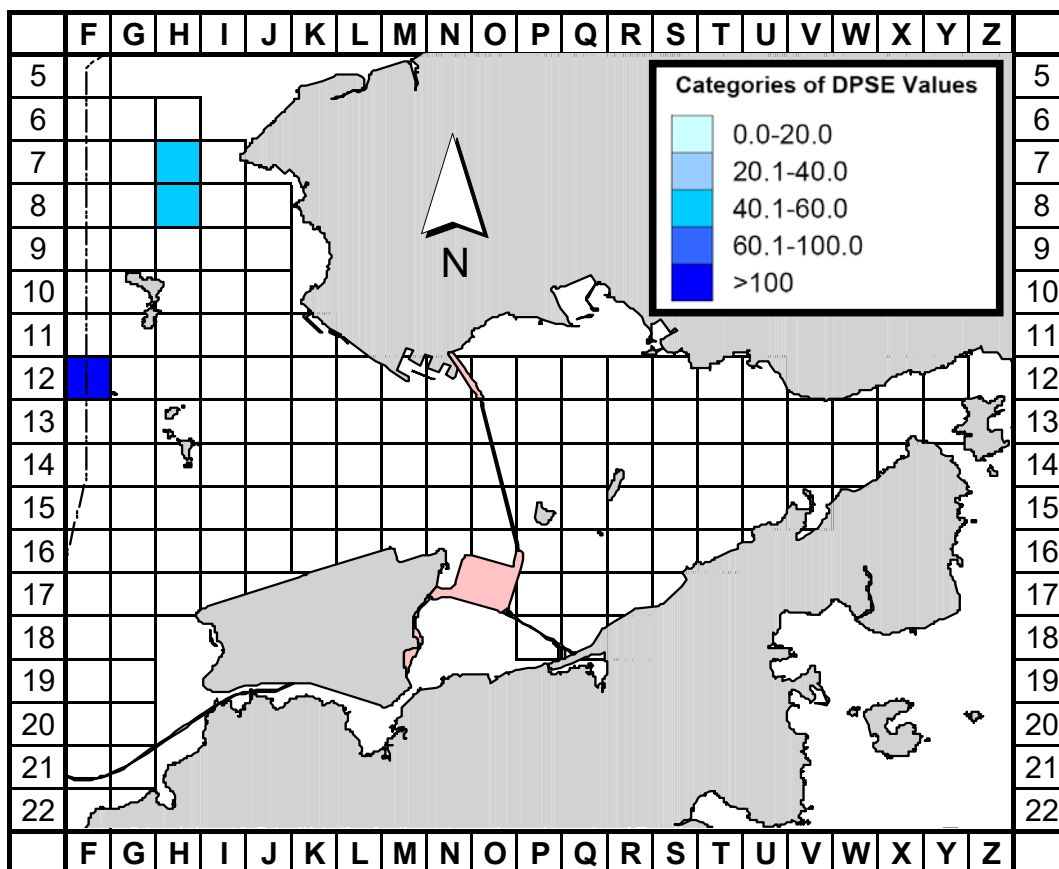


Figure 4b. Density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (March-May 2016) (DPSE = no. of dolphins per 100 units of survey effort)

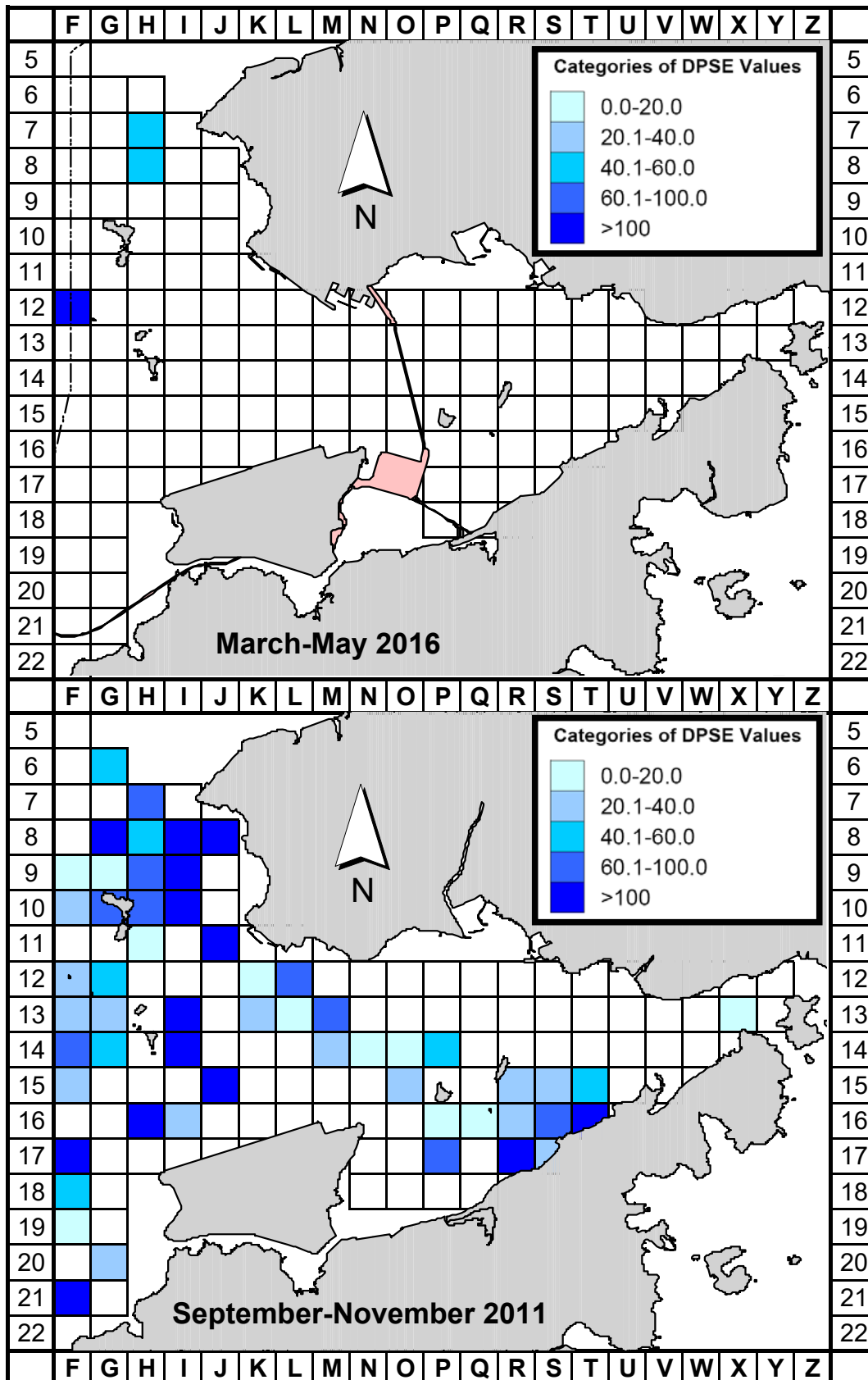


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km<sup>2</sup> in Northwest and Northeast Lantau survey area between the impact monitoring period (March-May 2016) and baseline monitoring period (September-November 2011) (DPSE = no. of dolphins per 100 units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

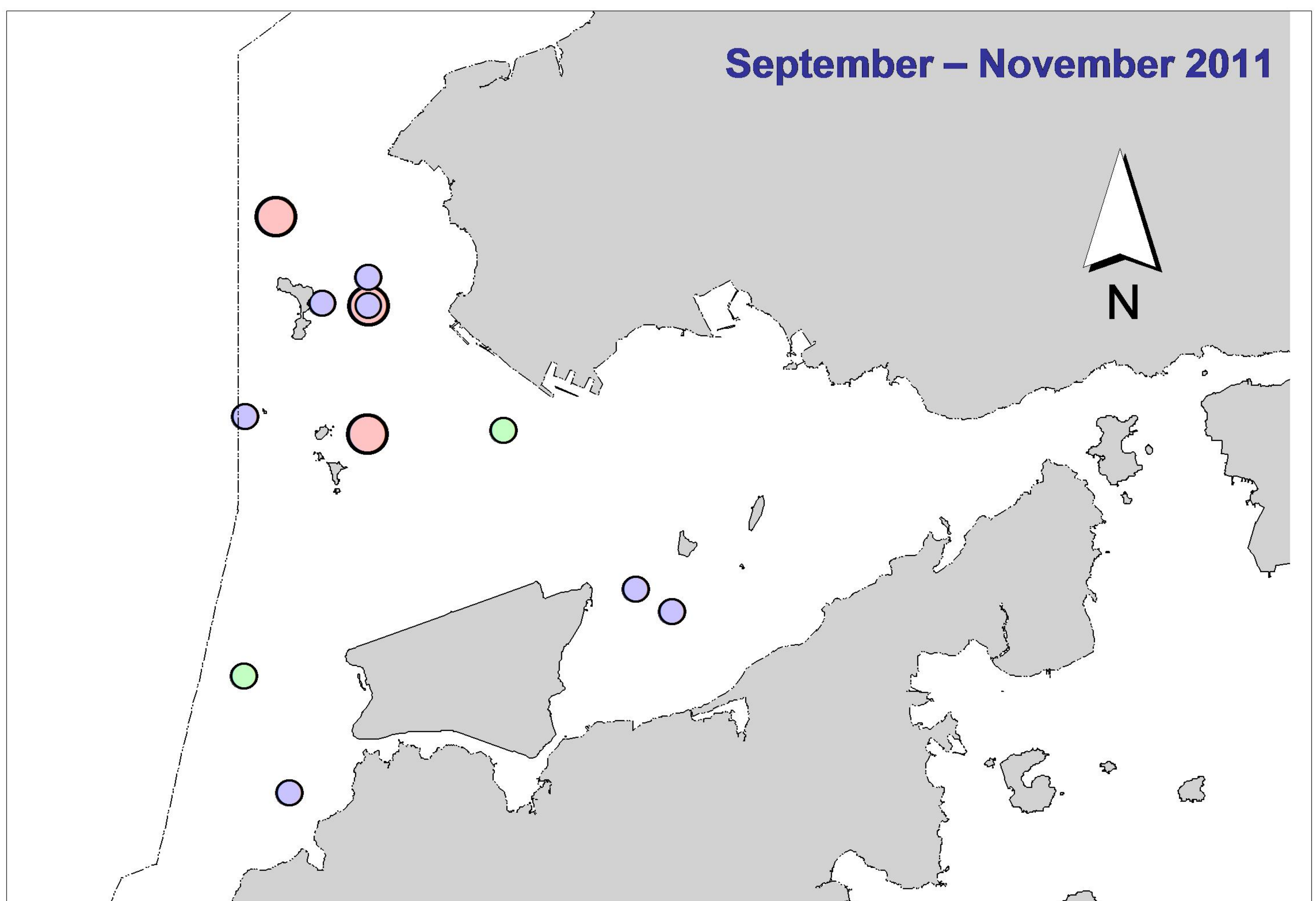
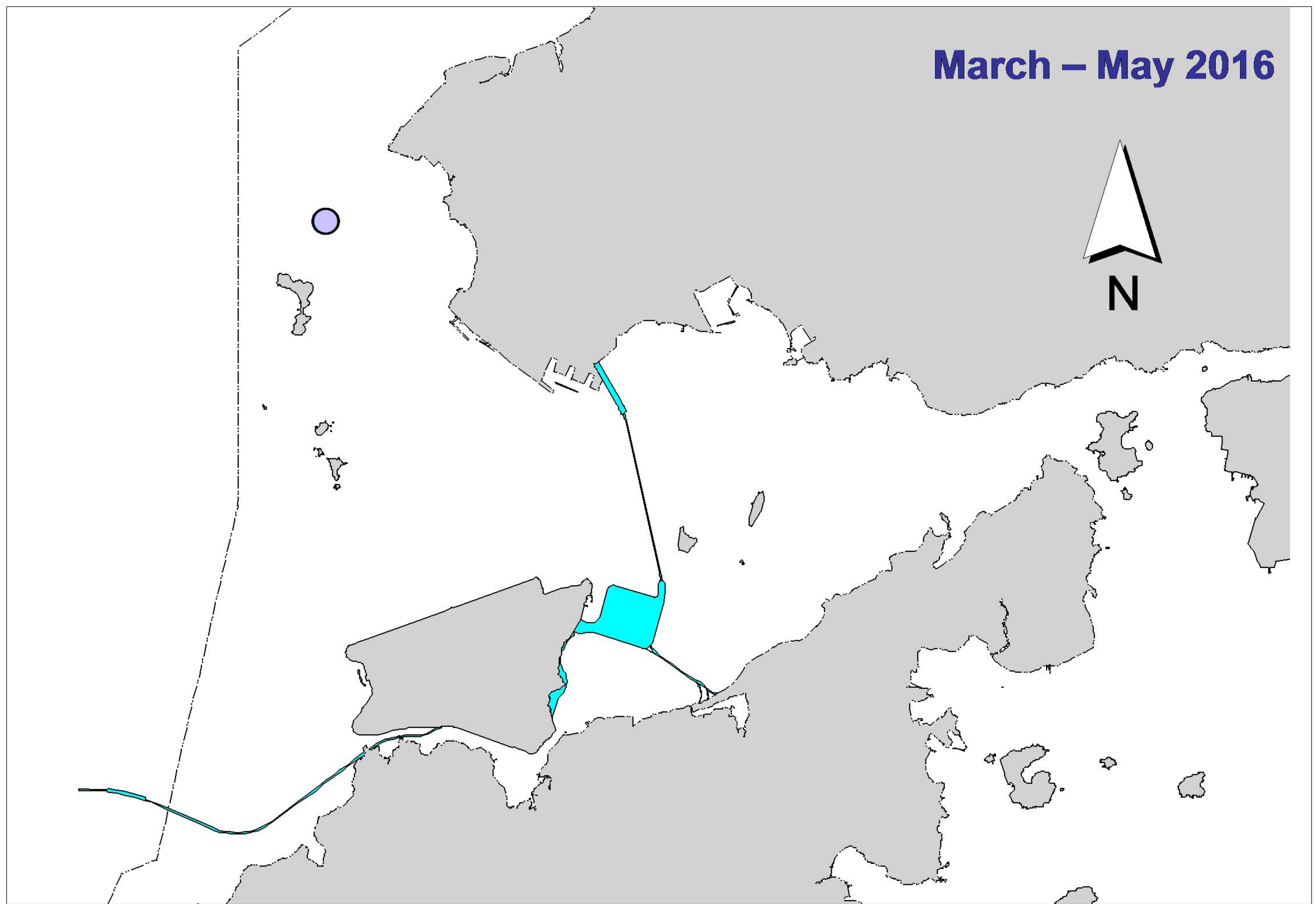


Figure 6. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

## Appendix I. HKLR03 Survey Effort Database (March-May 2016)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
7-Mar-16	NW LANTAU	1	18.42	SPRING	STANDARD31516	HKLR	P
7-Mar-16	NW LANTAU	2	10.78	SPRING	STANDARD31516	HKLR	P
7-Mar-16	NW LANTAU	3	10.30	SPRING	STANDARD31516	HKLR	P
7-Mar-16	NW LANTAU	1	2.50	SPRING	STANDARD31516	HKLR	S
7-Mar-16	NW LANTAU	2	3.70	SPRING	STANDARD31516	HKLR	S
7-Mar-16	NW LANTAU	3	6.70	SPRING	STANDARD31516	HKLR	S
7-Mar-16	NE LANTAU	2	16.44	SPRING	STANDARD31516	HKLR	P
7-Mar-16	NE LANTAU	2	10.46	SPRING	STANDARD31516	HKLR	S
11-Mar-16	NW LANTAU	2	15.40	SPRING	STANDARD31516	HKLR	P
11-Mar-16	NW LANTAU	3	16.20	SPRING	STANDARD31516	HKLR	P
11-Mar-16	NW LANTAU	2	7.60	SPRING	STANDARD31516	HKLR	S
11-Mar-16	NW LANTAU	3	0.30	SPRING	STANDARD31516	HKLR	S
11-Mar-16	NE LANTAU	1	2.04	SPRING	STANDARD31516	HKLR	P
11-Mar-16	NE LANTAU	2	17.97	SPRING	STANDARD31516	HKLR	P
11-Mar-16	NE LANTAU	1	2.40	SPRING	STANDARD31516	HKLR	S
11-Mar-16	NE LANTAU	2	6.19	SPRING	STANDARD31516	HKLR	S
11-Mar-16	NE LANTAU	3	2.20	SPRING	STANDARD31516	HKLR	S
22-Mar-16	NE LANTAU	2	7.42	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NE LANTAU	3	27.44	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NE LANTAU	4	2.30	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NE LANTAU	2	5.86	SPRING	STANDARD31516	HKLR	S
22-Mar-16	NE LANTAU	3	8.18	SPRING	STANDARD31516	HKLR	S
22-Mar-16	NE LANTAU	4	0.40	SPRING	STANDARD31516	HKLR	S
22-Mar-16	NW LANTAU	2	3.59	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NW LANTAU	3	9.39	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NW LANTAU	4	8.10	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NW LANTAU	5	2.40	SPRING	STANDARD31516	HKLR	P
22-Mar-16	NW LANTAU	2	1.40	SPRING	STANDARD31516	HKLR	S
22-Mar-16	NW LANTAU	3	5.12	SPRING	STANDARD31516	HKLR	S
23-Mar-16	NW LANTAU	2	27.12	SPRING	STANDARD31516	HKLR	P
23-Mar-16	NW LANTAU	3	22.69	SPRING	STANDARD31516	HKLR	P
23-Mar-16	NW LANTAU	2	4.11	SPRING	STANDARD31516	HKLR	S
23-Mar-16	NW LANTAU	3	5.20	SPRING	STANDARD31516	HKLR	S
5-Apr-16	NW LANTAU	0	0.83	SPRING	STANDARD31516	HKLR	P
5-Apr-16	NW LANTAU	1	5.38	SPRING	STANDARD31516	HKLR	P
5-Apr-16	NW LANTAU	2	21.07	SPRING	STANDARD31516	HKLR	P
5-Apr-16	NW LANTAU	3	13.64	SPRING	STANDARD31516	HKLR	P
5-Apr-16	NW LANTAU	2	3.00	SPRING	STANDARD31516	HKLR	S
5-Apr-16	NW LANTAU	3	10.08	SPRING	STANDARD31516	HKLR	S
5-Apr-16	NE LANTAU	1	1.60	SPRING	STANDARD31516	HKLR	P
5-Apr-16	NE LANTAU	2	15.44	SPRING	STANDARD31516	HKLR	P
5-Apr-16	NE LANTAU	1	2.10	SPRING	STANDARD31516	HKLR	S
5-Apr-16	NE LANTAU	2	8.06	SPRING	STANDARD31516	HKLR	S
12-Apr-16	NE LANTAU	2	3.81	SPRING	STANDARD31516	HKLR	P
12-Apr-16	NE LANTAU	3	13.73	SPRING	STANDARD31516	HKLR	P
12-Apr-16	NE LANTAU	4	2.60	SPRING	STANDARD31516	HKLR	P
12-Apr-16	NE LANTAU	2	4.20	SPRING	STANDARD31516	HKLR	S
12-Apr-16	NE LANTAU	3	6.46	SPRING	STANDARD31516	HKLR	S
12-Apr-16	NW LANTAU	3	4.57	SPRING	STANDARD31516	HKLR	P
12-Apr-16	NW LANTAU	4	25.36	SPRING	STANDARD31516	HKLR	P
12-Apr-16	NW LANTAU	5	1.90	SPRING	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
12-Apr-16	NW LANTAU	3	5.97	SPRING	STANDARD31516	HKLR	S
12-Apr-16	NW LANTAU	4	2.10	SPRING	STANDARD31516	HKLR	S
15-Apr-16	NW LANTAU	2	5.14	SPRING	STANDARD31516	HKLR	P
15-Apr-16	NW LANTAU	3	20.36	SPRING	STANDARD31516	HKLR	P
15-Apr-16	NW LANTAU	4	6.20	SPRING	STANDARD31516	HKLR	P
15-Apr-16	NW LANTAU	2	3.40	SPRING	STANDARD31516	HKLR	S
15-Apr-16	NW LANTAU	3	3.10	SPRING	STANDARD31516	HKLR	S
15-Apr-16	NW LANTAU	4	1.40	SPRING	STANDARD31516	HKLR	S
15-Apr-16	NE LANTAU	2	14.06	SPRING	STANDARD31516	HKLR	P
15-Apr-16	NE LANTAU	3	6.93	SPRING	STANDARD31516	HKLR	P
15-Apr-16	NE LANTAU	2	7.11	SPRING	STANDARD31516	HKLR	S
15-Apr-16	NE LANTAU	3	2.90	SPRING	STANDARD31516	HKLR	S
19-Apr-16	NE LANTAU	3	10.81	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NE LANTAU	4	6.46	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NE LANTAU	3	10.03	SPRING	STANDARD31516	HKLR	S
19-Apr-16	NW LANTAU	2	6.79	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NW LANTAU	3	15.26	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NW LANTAU	4	9.20	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NW LANTAU	5	9.70	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NW LANTAU	6	1.30	SPRING	STANDARD31516	HKLR	P
19-Apr-16	NW LANTAU	2	3.83	SPRING	STANDARD31516	HKLR	S
19-Apr-16	NW LANTAU	3	3.01	SPRING	STANDARD31516	HKLR	S
19-Apr-16	NW LANTAU	4	6.39	SPRING	STANDARD31516	HKLR	S
3-May-16	NE LANTAU	2	15.29	SPRING	STANDARD31516	HKLR	P
3-May-16	NE LANTAU	3	1.40	SPRING	STANDARD31516	HKLR	P
3-May-16	NE LANTAU	2	10.01	SPRING	STANDARD31516	HKLR	S
3-May-16	NW LANTAU	2	16.24	SPRING	STANDARD31516	HKLR	P
3-May-16	NW LANTAU	3	23.50	SPRING	STANDARD31516	HKLR	P
3-May-16	NW LANTAU	2	7.16	SPRING	STANDARD31516	HKLR	S
3-May-16	NW LANTAU	3	5.60	SPRING	STANDARD31516	HKLR	S
12-May-16	NW LANTAU	2	15.26	SPRING	STANDARD31516	HKLR	P
12-May-16	NW LANTAU	3	16.74	SPRING	STANDARD31516	HKLR	P
12-May-16	NW LANTAU	2	7.60	SPRING	STANDARD31516	HKLR	S
12-May-16	NE LANTAU	2	6.52	SPRING	STANDARD31516	HKLR	P
12-May-16	NE LANTAU	3	13.33	SPRING	STANDARD31516	HKLR	P
12-May-16	NE LANTAU	2	4.72	SPRING	STANDARD31516	HKLR	S
12-May-16	NE LANTAU	3	6.69	SPRING	STANDARD31516	HKLR	S
17-May-16	NE LANTAU	2	10.20	SPRING	STANDARD31516	HKLR	P
17-May-16	NE LANTAU	3	9.92	SPRING	STANDARD31516	HKLR	P
17-May-16	NE LANTAU	2	6.30	SPRING	STANDARD31516	HKLR	S
17-May-16	NE LANTAU	3	4.38	SPRING	STANDARD31516	HKLR	S
17-May-16	NW LANTAU	2	2.74	SPRING	STANDARD31516	HKLR	P
17-May-16	NW LANTAU	3	28.07	SPRING	STANDARD31516	HKLR	P
17-May-16	NW LANTAU	4	0.79	SPRING	STANDARD31516	HKLR	P
17-May-16	NW LANTAU	3	7.80	SPRING	STANDARD31516	HKLR	S
26-May-16	NW LANTAU	2	14.13	SPRING	STANDARD31516	HKLR	P
26-May-16	NW LANTAU	3	26.67	SPRING	STANDARD31516	HKLR	P
26-May-16	NW LANTAU	2	7.10	SPRING	STANDARD31516	HKLR	S
26-May-16	NW LANTAU	3	6.00	SPRING	STANDARD31516	HKLR	S
26-May-16	NE LANTAU	2	2.62	SPRING	STANDARD31516	HKLR	P
26-May-16	NE LANTAU	3	14.38	SPRING	STANDARD31516	HKLR	P
26-May-16	NE LANTAU	2	3.70	SPRING	STANDARD31516	HKLR	S
26-May-16	NE LANTAU	3	6.10	SPRING	STANDARD31516	HKLR	S

## Appendix II. HKLR03 Chinese White Dolphin Sighting Database (March-May 2016)

(Abbreviations: 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 Line)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
11-Mar-16	1	1300	1	NW LANTAU	2	ND	OFF	HKLR	821158	812895	SPRING	NONE	
23-Mar-16	1	1338	3	NW LANTAU	2	5	ON	HKLR	828123	806459	SPRING	NONE	P
5-Apr-16	1	1059	8	NW LANTAU	2	454	ON	HKLR	824938	804702	SPRING	NONE	P
19-Apr-16	1	1426	2	NW LANTAU	2	ND	OFF	HKLR	828998	806471	SPRING	NONE	
19-Apr-16	2	1451	2	NW LANTAU	2	ND	OFF	HKLR	829109	806461	SPRING	NONE	
19-Apr-16	3	1504	3	NW LANTAU	2	177	ON	HKLR	829696	806297	SPRING	NONE	P
19-Apr-16	4	1519	3	NW LANTAU	2	465	ON	HKLR	829442	806050	SPRING	NONE	S

**Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in March-May 2016**

<b>ID#</b>	<b>DATE</b>	<b>STG#</b>	<b>AREA</b>
CH65	05/04/16	1	NW LANTAU
NL48	11/03/16	1	NW LANTAU
	05/04/16	1	NW LANTAU
NL120	05/04/16	1	NW LANTAU
NL123	05/04/16	1	NW LANTAU
NL145	05/04/16	1	NW LANTAU
NL202	19/04/16	1	NW LANTAU
NL224	05/04/16	1	NW LANTAU
NL259	05/04/16	1	NW LANTAU
NL261	05/04/16	1	NW LANTAU
NL264	05/04/16	1	NW LANTAU
NL285	23/03/16	1	NW LANTAU
	05/04/16	1	NW LANTAU
NL286	19/04/16	1	NW LANTAU
NL287	05/04/16	1	NW LANTAU
NL288	05/04/16	1	NW LANTAU
NL308	19/04/16	3	NW LANTAU
NL320	23/03/16	1	NW LANTAU



Appendix IV. Sixteen individual dolphins that were identified during March-May 2016 under HKLR03 impact phase monitoring surveys



Appendix IV. (cont'd)

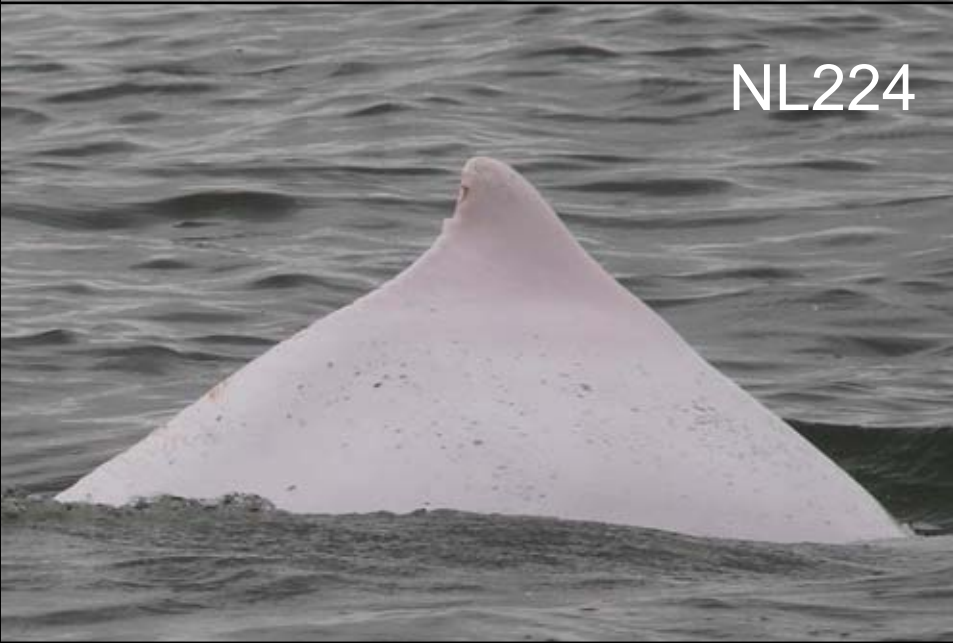
NL145



NL202



NL224



NL259



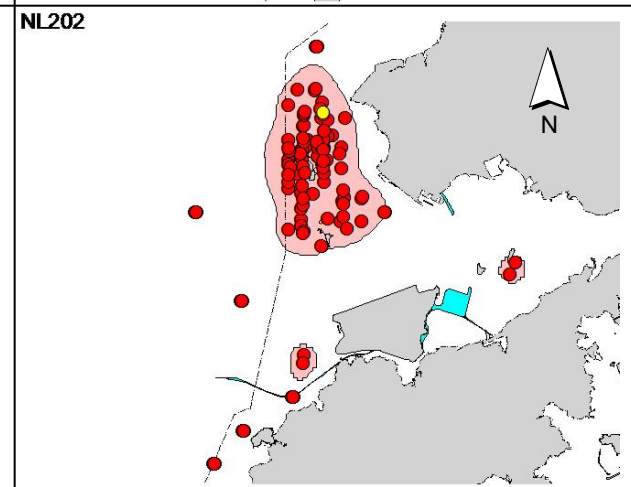
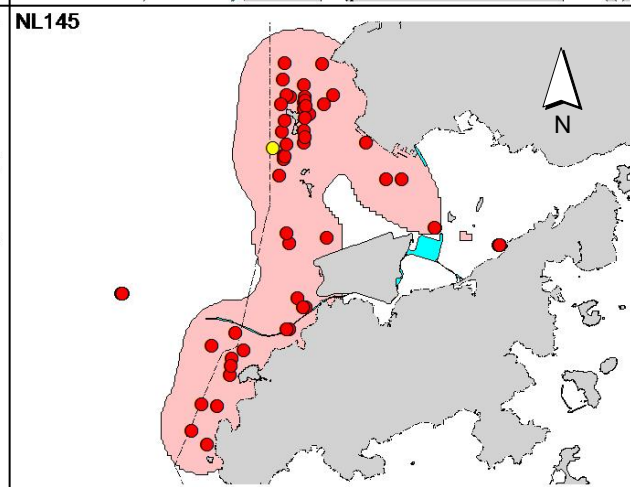
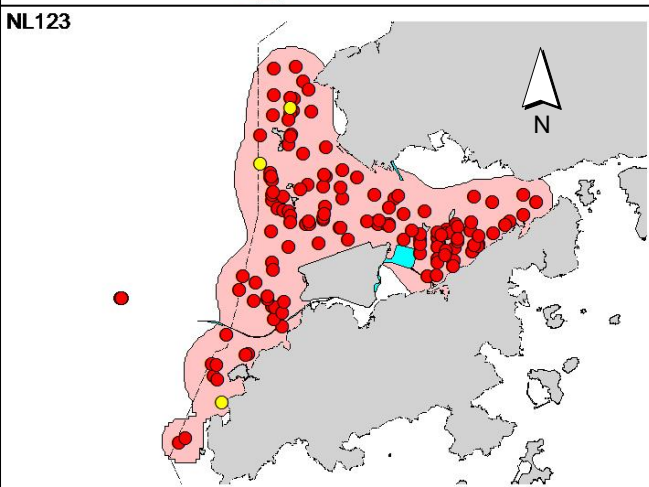
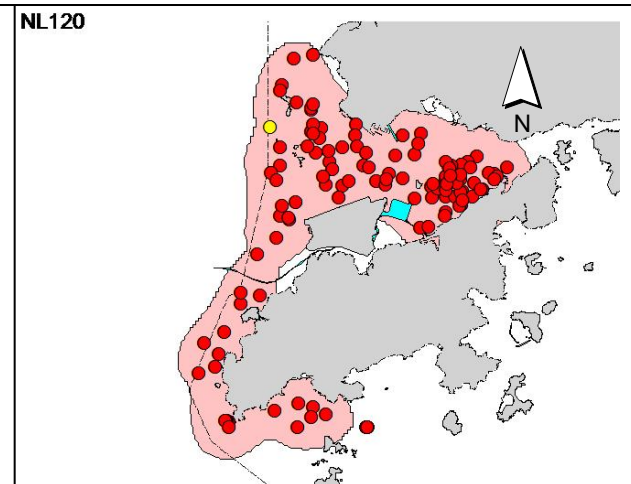
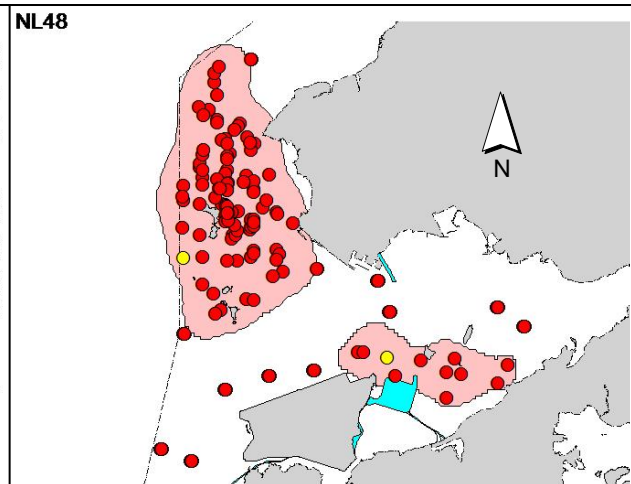
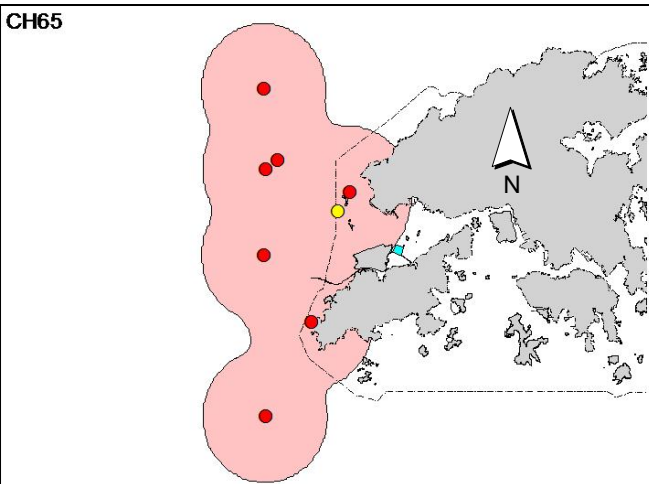
Appendix IV. (cont'd)



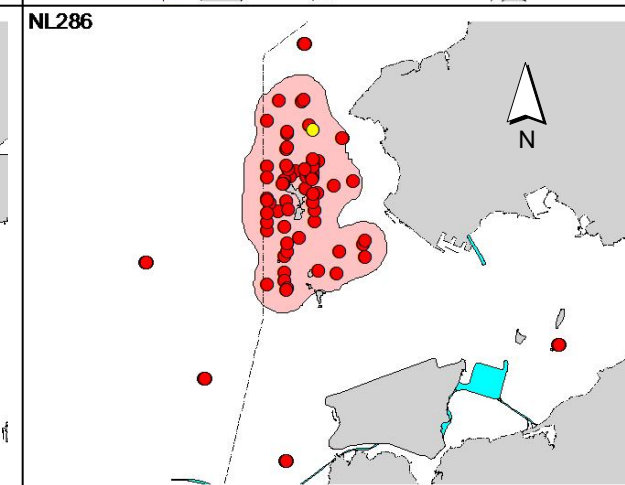
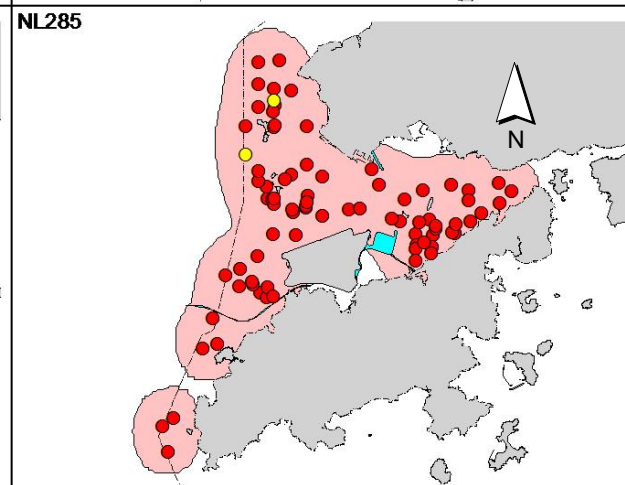
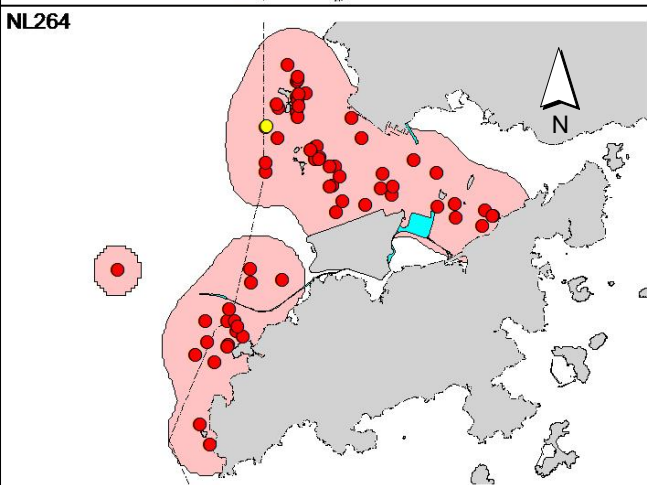
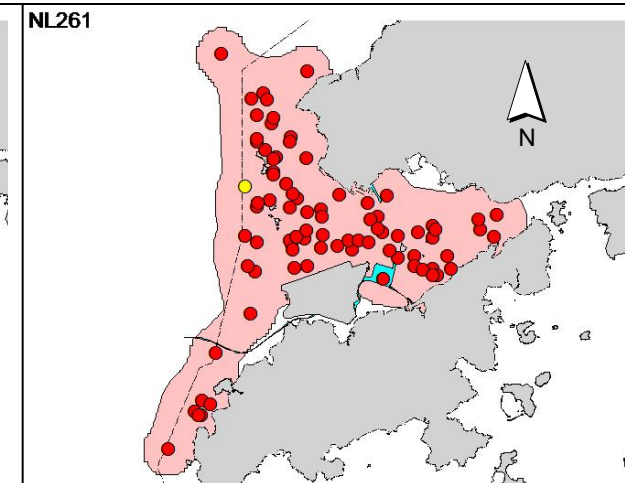
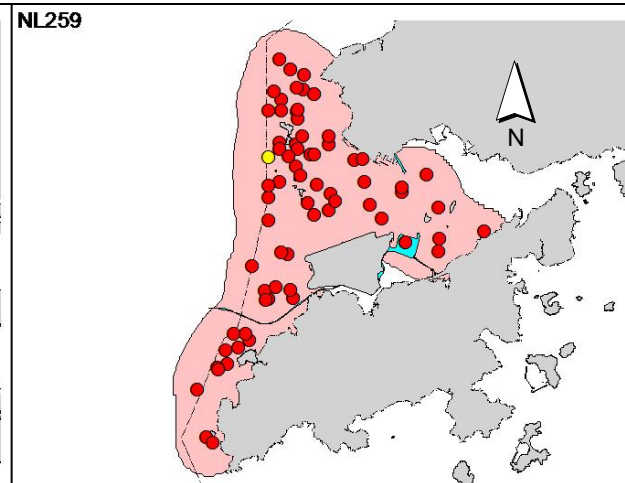
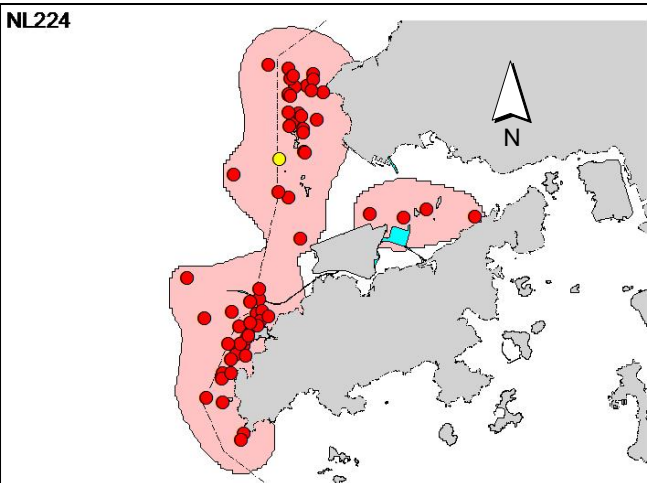
Appendix IV. (cont'd)



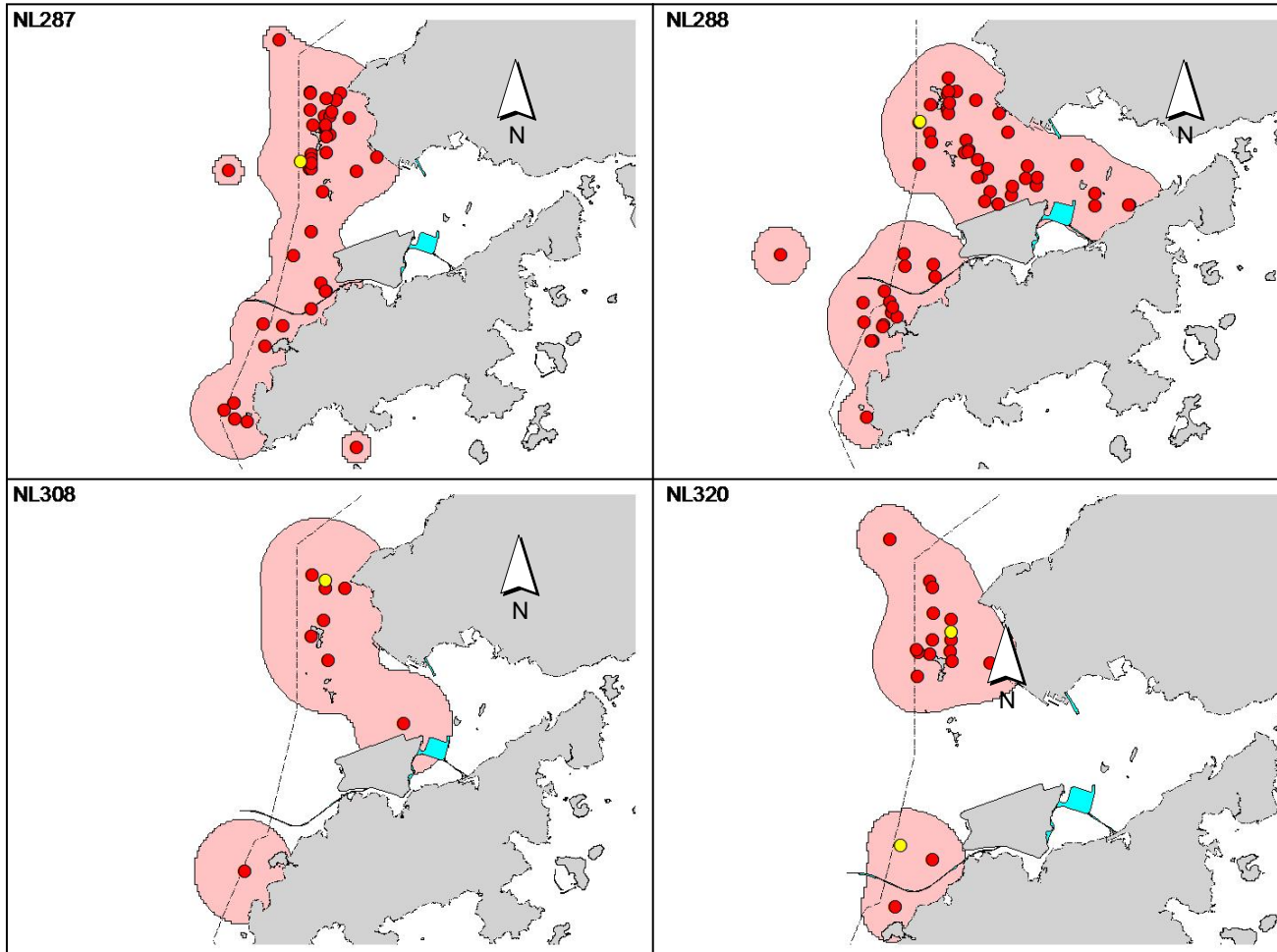
Appendix V. Ranging patterns (95% kernel ranges) of 16 individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicates sightings made in March-May 2016)



Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix J

## Event Action Plan



*Appendix J1 Event/ Action Plan for Air Quality*

EVENT	ET <sup>(1)</sup>	ACTION		
		IEC <sup>(1)</sup>	SOR <sup>(1)</sup>	Contractor
<b>Action Level</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify the source.</li> <li>2. Inform the IEC and the SOR.</li> <li>3. Repeat measurement to confirm finding.</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET.</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice</li> <li>2. Amend working methods if appropriate</li> </ol>
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify the source.</li> <li>2. Inform the IEC and the SOR.</li> <li>3. Repeat measurements to confirm findings.</li> <li>4. Increase monitoring frequency to daily.</li> <li>5. Discuss with the IEC and the Contractor on remedial actions required.</li> <li>6. If exceedance continues, arrange meeting with the IEC and the SOR.</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET.</li> <li>2. Check the Contractor's working method.</li> <li>3. Discuss with the ET and the Contractor on possible remedial measures.</li> <li>4. Advise the SOR on the effectiveness of the proposed remedial measures.</li> <li>5. Supervisor implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>2. Implement the agreed proposals</li> <li>3. Amend proposal if appropriate</li> </ol>

ACTION				
EVENT	ET <sup>(1)</sup>	IEC <sup>(1)</sup>	SOR <sup>(1)</sup>	Contractor
<b>Limit Level</b>				
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.

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the SOR informed of the results.

8. If exceedance stops cease  
additional monitoring.

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*Appendix J2 Event/ Action Plan for Construction Noise*

<b>ACTION</b>					
<b>EVENT</b>	<b>ET</b>	<b>IEC</b>	<b>SOR</b>	<b>Contractor</b>	
Action Level	<ol style="list-style-type: none"> <li>1. Notify the IEC and the Contractor.</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IEC and the Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures.</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the SOR accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC</li> <li>2. Implement noise mitigation proposals</li> </ol>	
Limit Level	<ol style="list-style-type: none"> <li>1. Notify the IEC, the SOR, the DEP and the Contractor.</li> <li>2. Identify the source.</li> <li>3. Repeat measurement to confirm findings.</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.</li> <li>6. Inform the IEC, the SOR and the DEP the causes &amp; actions taken for the exceedances.</li> <li>7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results.</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst the SOR, the ET and the Contractor on the potential remedial actions.</li> <li>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SOR accordingly.</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated.</li> </ol>	

**Appendix J3**      **Event/ Action Plan for Water Quality**

<b>Event</b>	<b>ET Leader</b>	<b>IEC</b>	<b>SOR</b>	<b>Contractor</b>
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat in situ measurement on next day of exceedance to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform IEC, contractor and SOR;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods.</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor's working methods.</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of non-compliance in writing;</li> <li>Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the SOR and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Amend working methods if appropriate.</li> </ol>
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> <li>Repeat measurement on next day of exceedance to confirm findings;</li> <li>Identify source(s) of impact;</li> <li>Inform IEC, contractor, SOR and EPD;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, SOR and Contractor;</li> <li>Ensure mitigation measures are implemented;</li> <li>Increase the monitoring frequency to daily until no exceedance of Action level;</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial actions;</li> <li>Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly;</li> <li>Supervise the implementation of mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with IEC on the proposed mitigation measures;</li> <li>Ensure mitigation measures are properly implemented;</li> <li>Assess the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the Supervising Officer and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment and consider changes of working methods;</li> <li>Submit proposal of additional mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR;</li> <li>Implement the agreed mitigation measures.</li> </ol>
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat measurement on next day of exceedance to confirm findings;</li> <li>Identify source(s) of impact;</li> </ol>	<ol style="list-style-type: none"> <li>Check monitoring data submitted by ET and Contractor's working method;</li> <li>Discuss with ET and Contractor</li> </ol>	<ol style="list-style-type: none"> <li>Confirm receipt of notification of failure in writing;</li> <li>Discuss with IEC, ET and Contractor on the proposed</li> </ol>	<ol style="list-style-type: none"> <li>Inform the SOR and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> </ol>

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

<b>Event</b>	<b>ET Leader</b>	<b>IEC</b>	<b>SOR</b>	<b>Contractor</b>
Action Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</li> <li>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, SOR and Contractor;</li> <li>5. Check monitoring data.</li> <li>6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and findings with the ET and the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss monitoring with the IEC and any other measures proposed by the ET;</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the SOR and confirm notification of the non-compliance in writing;</li> <li>2. Discuss with the ET and the IEC and propose measures to the IEC and the SOR;</li> <li>3. Implement the agreed measures.</li> </ol>

<b>Event</b>	<b>ET Leader</b>	<b>IEC</b>	<b>SOR</b>	<b>Contractor</b>
Limit Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</li> <li>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, ER/SOR and Contractor of findings;</li> <li>5. Check monitoring data;</li> <li>6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary;</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and findings with the ET and the Contractor;</li> <li>3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures;</li> <li>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;</li> <li>5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures;</li> <li>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;</li> <li>3. Supervise the implementation of additional monitoring and/or any other mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER/SOR and confirm notification of the non-compliance in writing;</li> <li>2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures;</li> <li>3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary;</li> <li>4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.</li> </ol>



**Appendix J5**      *Event and Action Plan on Dolphin Acoustic Behaviour*

EVENT	ACTION			
	ET Leader	IEC	SO	Contractor
<u>Action Level</u>				
With the numerical values presented in <i>Table 5.7 of Baseline Monitoring Report</i> , 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 <i>Table 5.8 of Baseline Monitoring Report</i> ), 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	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences;</li> <li>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, SO and Contractor;</li> <li>5. Check monitoring data;</li> <li>6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring with the ET and the Contractor;</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET;</li> <li>2. Make agreement on measures to be implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the SO and confirm notification of the non-compliance in writing;</li> <li>2. Discuss with the ET and the IEC and propose measures to the IEC and the SO;</li> <li>3. Implement the agreed measures.</li> </ol>

EVENT	ACTION			
	ET Leader	IEC	SO	Contractor
<p><u>Limit Level</u></p> <p>With the numerical values presented in <i>Table 5.7 of Baseline Monitoring Report</i>, 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 <i>Table 5.8 of Baseline Monitoring Report</i>), 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</p>	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data to ascertain if differences are as a result of natural variation or seasonal differences;</li> <li>3. Identify source(s) of impact;</li> <li>4. Inform the IEC, SO and Contractor;</li> <li>5. Check monitoring data;</li> <li>6. Carry out audit to ensure all dolphin protective measures are implemented fully and additional measures be proposed if necessary</li> <li>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.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring with the ET and the Contractor;</li> <li>3. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the IEC the repeat monitoring and any other measures proposed by the ET;</li> <li>2. Make agreement on measures to be implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the SO and confirm notification of the non-compliance in writing;</li> <li>2. Discuss with the ET and the IEC and propose measures to the IEC and the SO;</li> <li>3. Implement the agreed measures.</li> </ol>

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 <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('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	1.021	0.192	0.581	-	0.440	-	-	-	-	3.000	75.620	-	-	-	-	
Jun	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>SUB-TOTAL</b>	<b>6.601</b>	<b>1.470</b>	<b>2.605</b>	<b>-</b>	<b>3.996</b>	<b>0.000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8.000</b>	<b>398.850</b>	<b>-</b>	<b>8.640</b>	<b>0.301</b>	<b>-</b>	
Jul																
Aug																
Sep																
Oct																
Nov																
Dec																
<b>TOTAL</b>	<b>6.601</b>	<b>1.470</b>	<b>2.605</b>	<b>-</b>	<b>3.996</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8.000</b>	<b>398.850</b>	<b>-</b>	<b>8.640</b>	<b>0.301</b>	<b>-</b>	

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	5

*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

**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** 19 August 2016

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



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Dear Sir or Madam,

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

0215660\_Mar2016/May2016\_dolphin\_STG&ANI\_NEL&NWL

A total of one limit level exceedance was recorded in the quarterly impact  
dolphin monitoring data between March and May 2016.

Regards,

A handwritten signature in black ink, appearing to read 'Jovy Tam', is positioned above the typed name.

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_Mar2016/May2016_dolphin_STG&ANI_NEL&NWL [Total No. of Exceedance = 1]	
Date	March to May 2016 (monitored) 8 July 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 = 0.98 & ANI = 4.78
	One Limit Level Exceedance was recorded in the quarterly impact dolphin monitoring at NEL and NWL between March and May 2016. The exceedance was reported in the approved <i>Thirty-First Monthly EM&amp;A Report</i> dated 8 June 2016.	
Statistical Analyses	<p>Further to the review of the available and relevant dolphin monitoring data in the EM&amp;A under this Contract, statistical analyses were conducted as follows:</p> <ul style="list-style-type: none"> <li>A two-way ANOVA with repeated measures and unequal sample size was conducted using Period (2 levels: baseline vs impact – present impact quarter, March to May 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 <math>\alpha = 0.05</math> as the significance level in the statistical tests, significant differences in STG (<math>p = 0.0019</math>) and ANI (<math>p = 0.0173</math>) were detected between Periods.</li> <li>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 May 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 <math>\alpha = 0.00005</math> as the significance level in the statistical tests, significant difference in STG (<math>p = 0.000019</math>) and in ANI (<math>p = 0.000005</math>) between Cumulative Period and Location were detected.</li> </ul> <p>* Note: The commencement date under <i>Contract No. HY/2012/07</i> is 31 October 2013.</p>	
Works Undertaken (in the monitoring quarter)	<p>In the quarter between March 2016 and May 2016, the major marine works under <i>Contract No. HY/2012/07</i> included:</p> <ul style="list-style-type: none"> <li>Construction and installation of pile caps;</li> <li>Uninstallation of marine piling platform;</li> <li>Pier construction;</li> <li>Construction of marine section of berth at Southern Landfall;</li> <li>Launching gantry operation; and</li> <li>Installation of deck segment and pier head segment.</li> </ul>	



<p><b>Possible Reason for Action or Limit Level Exceedance(s)</b></p>	<p>The potential factors that may have contributed to the observed exceedance are reviewed below:</p> <ul style="list-style-type: none"> <li>• Blocking of CWD travelling corridor: The <i>Monitoring of Marine Mammals in Hong Kong Waters (2015 – 16)</i> <sup>(1)</sup> 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.</li> <li>• Marine works of the Contract: As per the findings from the EIA report (<i>Section 8.11.9</i>), the major influences on the Chinese White Dolphin (CWD) <i>Sousa chinensis</i> under this Contract are marine traffics and bored piling works. The <i>Monitoring of Marine Mammals in Hong Kong Waters (2015-2016)</i> 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 <i>EP-354/2009/D</i> and the updated <i>EM&amp;A Manual</i>. 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.</li> <li>• Impact on water quality: According to the findings in the water quality monitoring results at the impact monitoring stations between March 2016 and May 2016, there was no exceedance on WQM. Although impact mean levels of depth-averaged SS at SR4a during mid-flood tide, SR4 and SR4a during mid-ebb tide (SR4 and SR4a during mid-ebb: 13.5 mg/L; SR4a during mid-flood: 13.1 mg/L) were higher than the corresponding ambient levels (SR4 during mid-ebb: 13.4mg/L; SR4a during mid-ebb: 11.9 mg/L; SR4a during mid-flood: 12.7 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.</li> </ul> <p>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.</p>
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(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](https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/files/Final_Report_2015_16.pdf)

<p><b>Actions Taken/ To Be Taken</b></p>	<p>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:</p> <ol style="list-style-type: none"> <li>1. 250m dolphin exclusion zone;</li> <li>2. Acoustic decoupling plan;</li> <li>3. Training to workers;</li> <li>4. Offsite vessel routing control in accordance with Regular Marine Travel Routes Plan, including routing control within existing and proposed marine park boundaries;</li> <li>5. Vessels speed limited at 5 knots and 10 knots within existing and proposed marine park boundaries and site boundary respectively;</li> <li>6. Idling and mooring of working vessels within site boundary;</li> </ol> <p>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).</p> <p>A joint team meeting was held on 22 July 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, and Representatives of Main Contractor for Contract No. 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.</p>
<p><b>Remarks</b></p>	<p>The results of impact water quality and impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved <i>Twenty Ninth to Thirty First Monthly EM&amp;A Reports</i>. Comparison on water quality between impact and baseline periods is elaborated in the <i>10<sup>th</sup> Quarterly EM&amp;A Report</i>.</p>