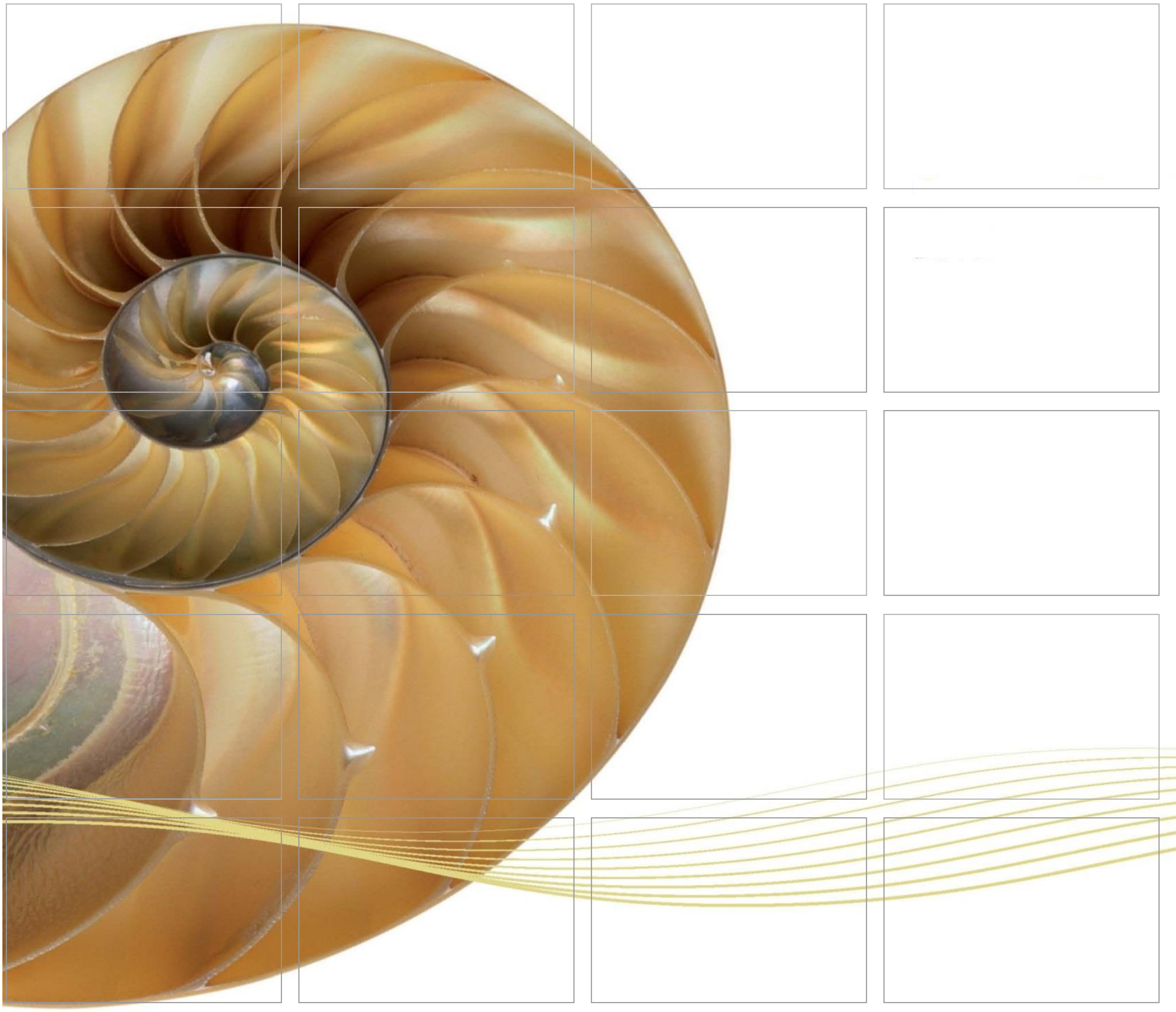
**Report**



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

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

8 May 2018


**Environmental Resources Management**
16/F, Berkshire House
25 Westlands Road
Quarry Bay, Hong Kong
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# Contract No. HY/2012/07
# Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section

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

***Document Code:***
***0215660_16th Qtr EM&A_20180508.doc***


**Environmental Resources Management**

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Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
http://www.erm.com


| | |
|---|---|
| Client:<br><br>Gammon | Project No:<br><br>0215660 |
| Summary:<br><br>This document presents the Sixteenth Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Southern Connection Viaduct Section. | Date:<br>8 May 2018<br><br>Approved by:<br><br>*Mr Craig Reid*<br>*Partner*<br><br>Certified by:<br><br>*Mr Jovy Tam*<br>*ET Leader* |

| | | | | | |
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| | | | | | |
| | 16th Quarterly EM&A Report | VAR | JT | CAR | 08/05/18 |
| Revision | Description | By | Checked | Approved | Date |



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Ref.: HYDHZMBEEM00_0_6470L.18

09 May 2018

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**
**16th Quarterly EM&A Summary Report (September to November 2017)**

Reference is made to the 16th Quarterly Environmental Monitoring and Audit (EM&A) Report (September to November 2017) (ET's ref.: "*0215660_16th Qtr EM&A_20180508.doc*" dated 8 May 2018) certified by the ET Leader and provided to us via e-mail on 8 May 2018.

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, TMC, ENPO Site

Q:\Projects\HYDHZMBEEM00\02_Proj_Mgt\02_Corr\2018\HYDHZMBEEM00_0_6470L.18.docx

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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 Hong Kong Ltd. was employed by the HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) in accordance with *Environmental Permit No. EP-354/2009/A*. Further applications for variation of environmental permit (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

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

The construction phase of the Contract commenced on 31 October 2013 and will be tentatively completed by 2018. The impact monitoring of the EM&A programme, including air quality, noise, water quality and marine ecological monitoring as well as environmental site inspections, commenced on 31 October 2013.

This is the Sixteenth Quarterly EM&A Report presenting the EM&A works carried out during the period from 1 September 2017 to 30 November 2017 for the Southern Connection Viaduct Section in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, major activities in the reporting period included:

<u>September 2017</u>

***Land-based Works***

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

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

<u>October 2017</u>

***Land-based Works***

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

<u>November 2017</u>

***Land-based Works***

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Launching gantry operation
- 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 (1) | 38 sessions |
| Dolphin monitoring | 6 sessions |

(1) Results of impact water quality monitoring were adopted from the published EM&A data of *Contract No. HY/2010/02 HKBCF- Reclamation Works*. Available at: http://www.hzmbenpo.com/

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**

Ninety-one (91) Action Level of Dissolved Oxygen (DO) exceedances, eight (8) Action Level of Suspended Solids (SS) exceedances and one (1) Limit Level of Turbidity exceedance were recorded for water quality impact monitoring in the reporting period.

**Impact Dolphin Monitoring**

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between September and November 2017. No unacceptable impact from the construction activities of the TM-CLKL Southern Connection Viaduct Section on Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphins) was noticeable from general observations during the dolphin monitoring in this reporting quarter.

Daily marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. 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 the Chinese White Dolphin was recorded in the monitoring period during the exclusion zone monitoring.

**Environmental Complaints, Non-compliance & Summons**

There was one (1) complaint received from EPD on 24 November 2017 regarding construction dust nuisance at Hong Kong Boundary Crossing Facilities of Hong Kong-Zhuhai-Macau Bridge Projects in the reporting period. Upon investigation, there is no evidence to indicate that the complaint case is related to this Contract.

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

**Reporting Change**

There was no reporting change in this reporting period.

**Upcoming Works for the Next Reporting Period**

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

<u>December 2017</u>

***Land-based Works***

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

<u>January 2018</u>

***Land-based Works***

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

<u>February 2018</u>

***Land-based Works***

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Installation of pier head and deck segments;
- Asphalt paving;
- Sign gantries construction;

- Parapet installation; and
- Slope work of Viaducts A, B, C & D.

**Future Key Issues**

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

# 1 INTRODUCTION

## 1.1 BACKGROUND

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

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

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

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

The construction phase of the Contract commenced on 31 October 2013 and will be tentatively be completed by 2018. The impact monitoring phase of the EM&A programme, including air quality, noise, water quality and marine ecological monitoring as well environmental site inspections, commenced on 31 October 2013.

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

### *1.2 Scope of Report*

This is the Sixteenth 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 September to 30 November 2017.

### *1.3 Organization Structure*

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

***Table 1.1 Contact Information of Key Personnel***

| Party | Position | Name | Telephone | Fax |
|---|---|---|---|---|
| HyD (Highways Department) | Project Coordinator | Stanley Chan | 2762 3406 | 3188 6614 |
| | Senior Engineer | Steven Shum | 2762 4133 | 3188 6614 |
| SOR (AECOM Asia Company Limited) | Chief Resident Engineer | Daniel Ip | 3553 3800 | 2492 2057 |
| | Resident Engineer | Kingman Chan | 3691 3950 | 3691 2899 |
| ENPO / IEC (Ramboll Hong Kong Ltd.) | ENPO Leader | Y.H. Hui | 3465 2850 | 3465 2899 |
| | IEC | Dr. F.C. Tsang | 3465 2851 | 3465 2899 |
| Contractor (Gammon Construction Limited) | Environmental 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 |

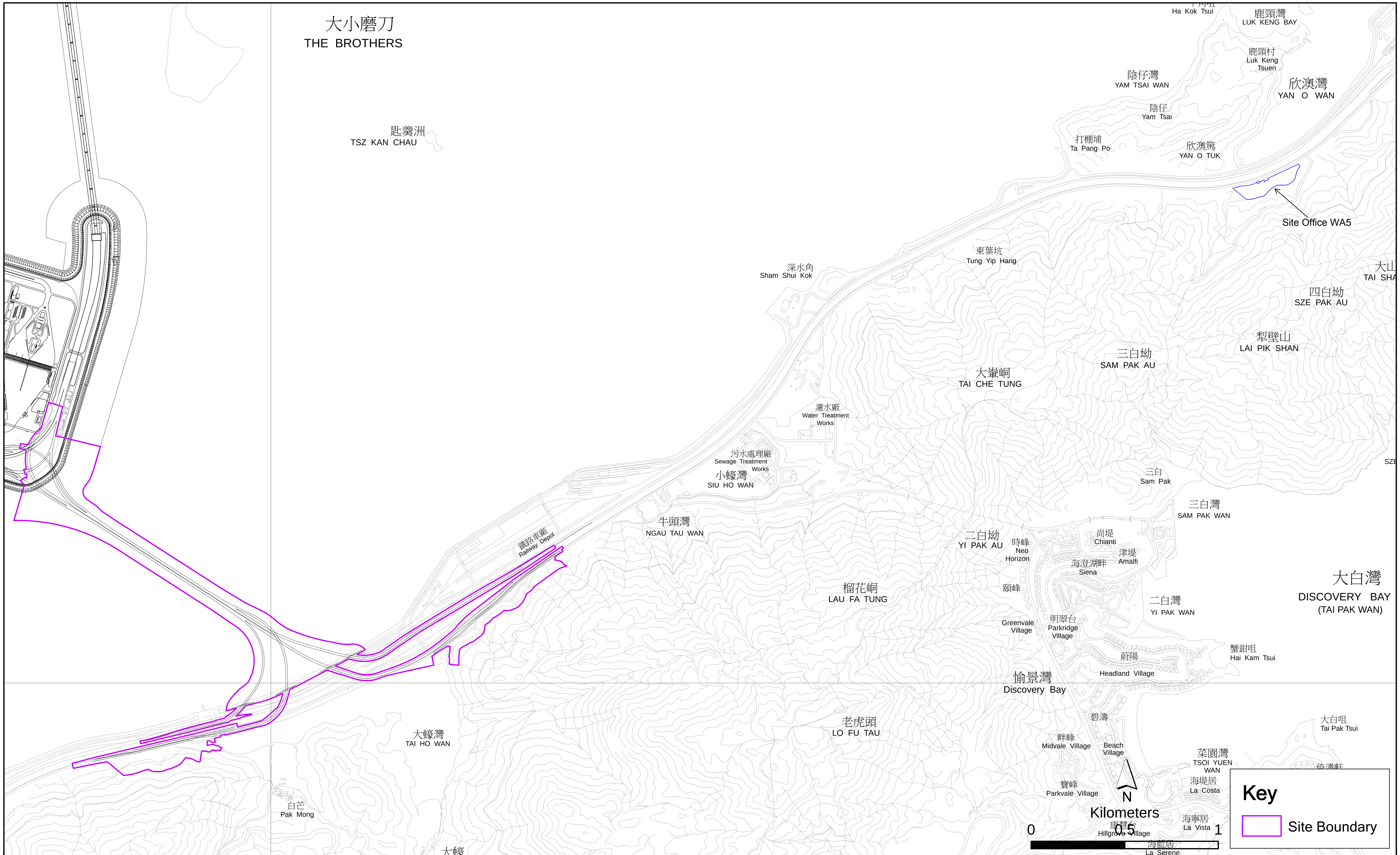


Figure 1.1

General Layout Plan of the Project

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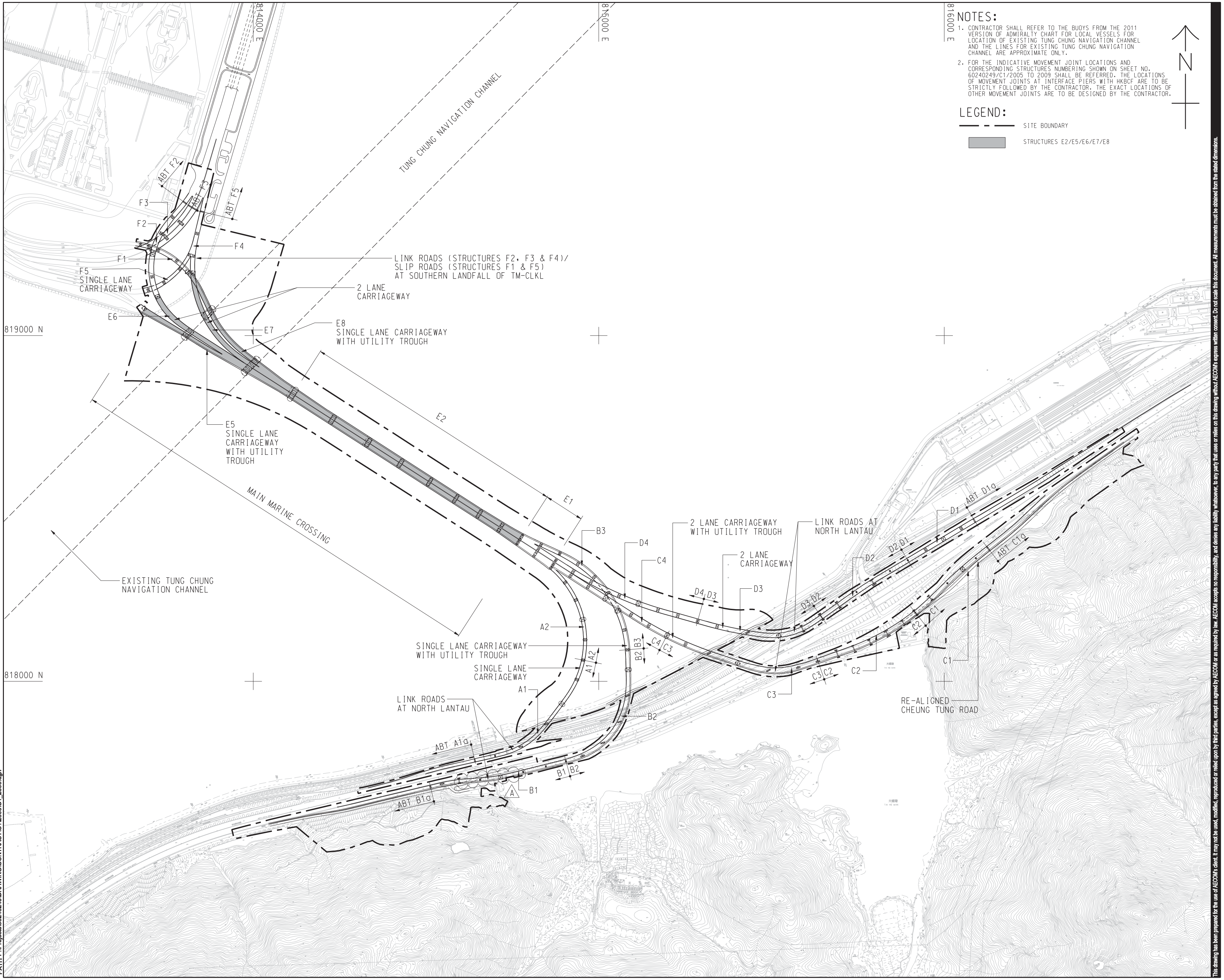
Date: 6/8/2014

Environmental Resources Management

ERM




NOTES:

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

LEGEND:

SITE BOUNDARY

STRUCTURES E2/E5/E6/E7/E8

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

Plot File by: HUANGC2 Nov-07-2012
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AECOM

**PROJECT** 項目

TUEN MUN -
CHEK LAP KOK LINK

**CONTRACT TITLE**

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

**CLIENT** 業主

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

**CONSULTANT** 工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

**SUB-CONSULTANTS** 分判工程顧問公司

# Figure 1.2a

**ISSUE/REVISION** 修訂

| I/R 修訂 | DATE 日期 | DESCRIPTION 內容摘要 | CHK. 核核 |
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| - | OCT. 12 | TENDER DRAWING | CWN |

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**KEY PLAN** 索引圖

**PROJECT NO.** 項目編號 60240249

**CONTRACT NO.** 合約編號 HY/2012/07

**SHEET TITLE** 圖紙名稱

SOUTHERN CONNECTION
GENERAL LAYOUT PLAN

**SHEET NUMBER** 圖紙編號

60240249/C1/2000A

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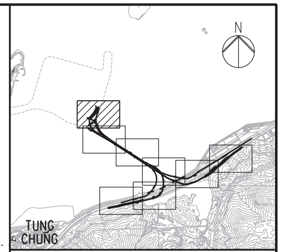


KEY PLAN

NOTES

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

LEGEND

SITE BOUNDARY

GF1 FAULT

EXISTING G.I.STATIONS :

BOREHOLE BY GIU DATA EXCLUDING VC

BOREHOLE BY GCL CONTRACT HY/2012/04

BOREHOLE BY GCL CONTRACT NL8/97

BOREHOLE BY GCL CONTRACT HY/2009/23

TRIAL PIT BY GCL CONTRACT HY/2012/04

SLOPE STRIPPING BY GCL CONTRACT HY/2012/04

PROPOSED G.I.STATIONS :

PBH01 PROPOSED BOREHOLE

TP01 PROPOSED TRIAL PIT

CH01 PROPOSED COREHOLE

SS01 SS02 PROPOSED SLOPE STRIPPING

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

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

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

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 1.2b

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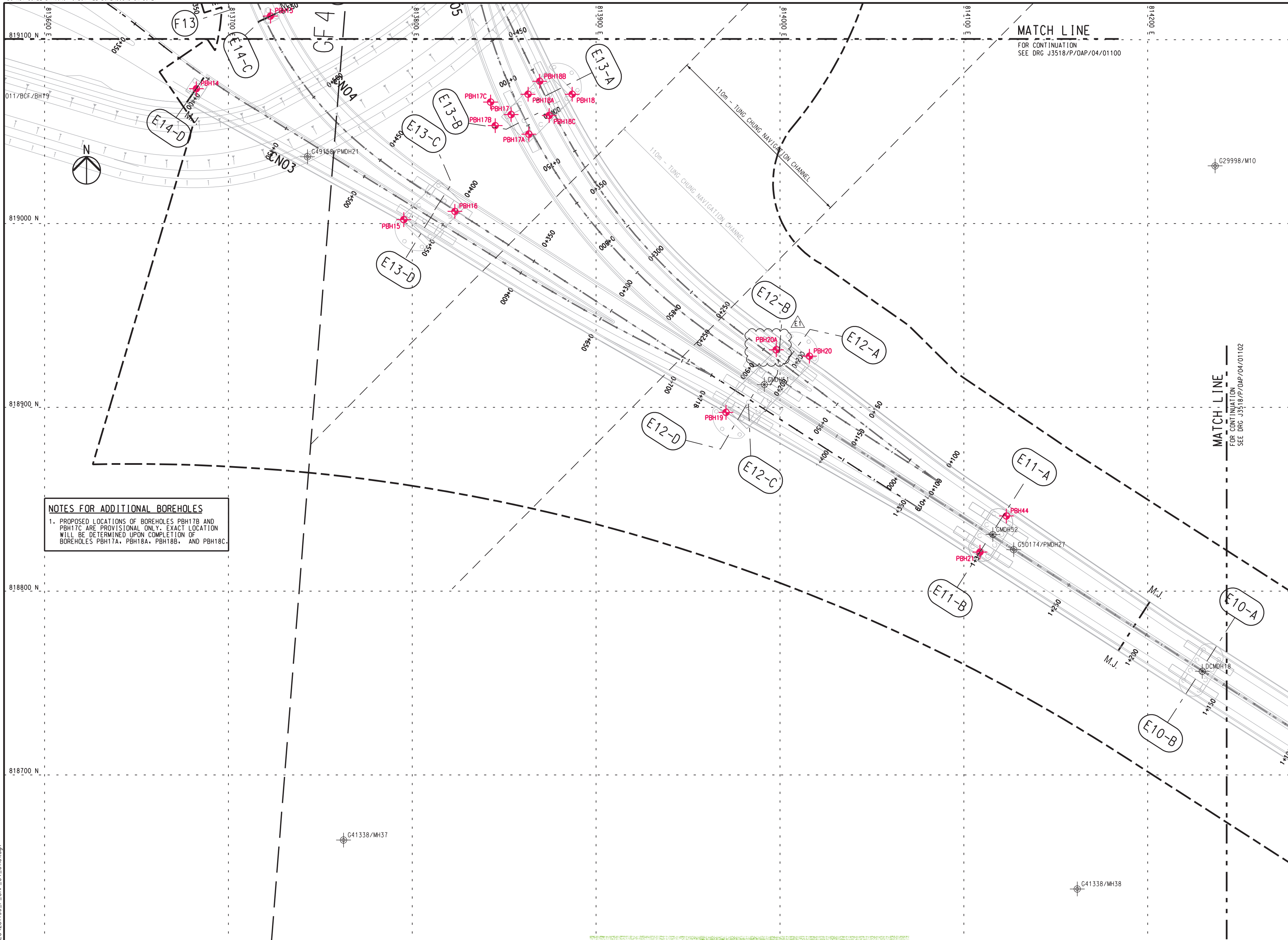
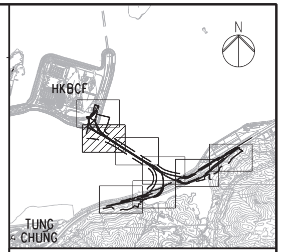



## NOTES FOR ADDITIONAL BOREHOLES

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




KEY PLAN

## NOTES

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## LEGEND

- SITE BOUNDARY
- GF1 FAULT

EXISTING G.I. STATIONS :

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

PROPOSED G.I. STATIONS :

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

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METRES
1 : 1000

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

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| Checked | Approved |
| DS | DOP |

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

Supervising Officer: AECOM

Contractor: Gammon

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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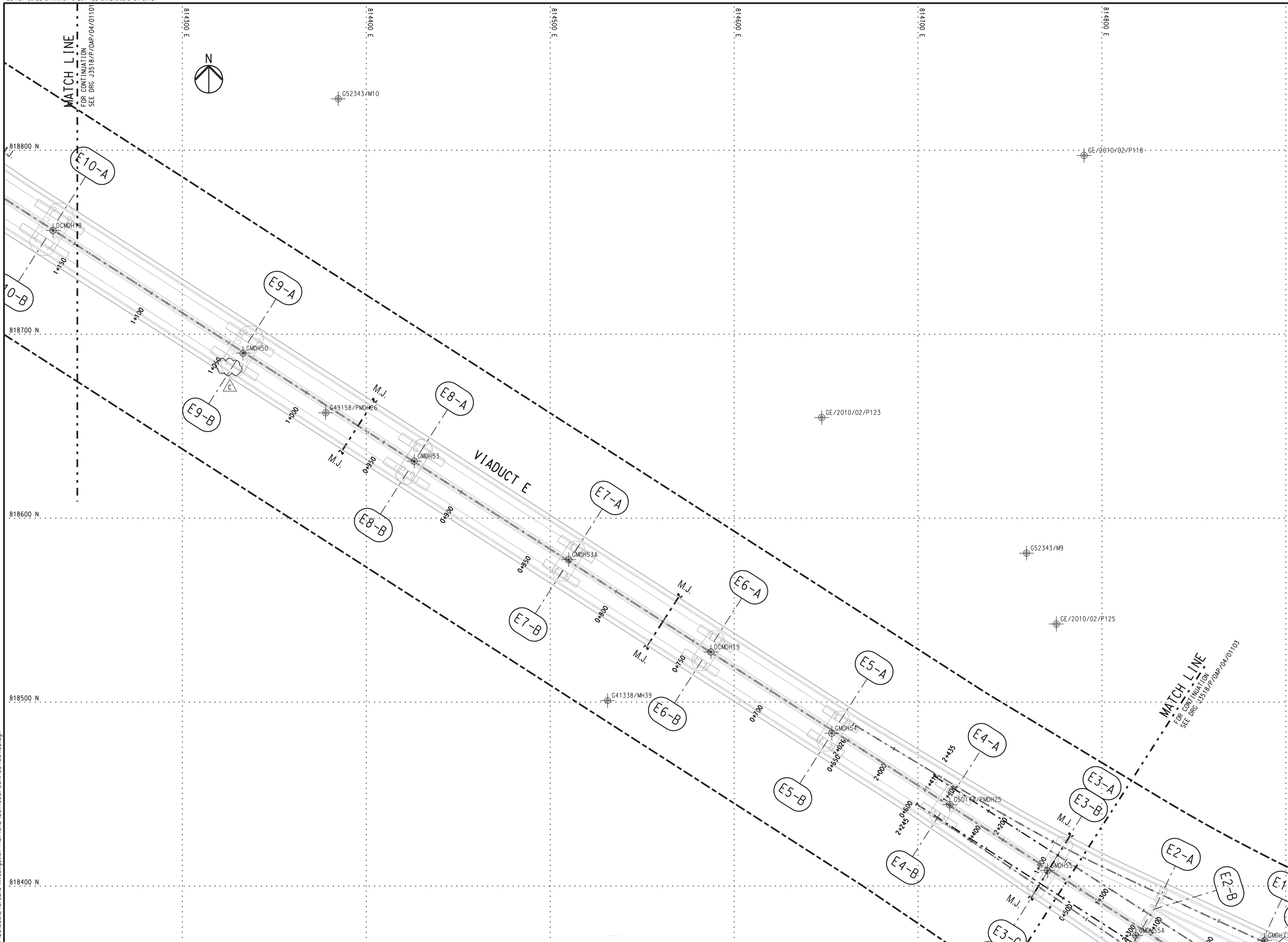


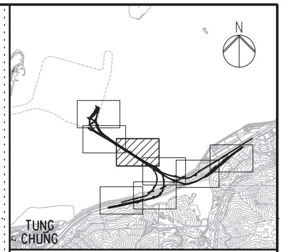


KEY PLAN

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LEGEND

SITE BOUNDARY

GF1 FAULT

EXISTING G.I.STATIONS :

BOREHOLE BY GIU DATA EXCLUDING VC

BOREHOLE BY GCL CONTRACT HY/2012/04

BOREHOLE BY GCL CONTRACT NL8/97

BOREHOLE BY GCL CONTRACT HY/2009/23

TRIAL PIT BY GCL CONTRACT HY/2012/04

SLOPE STRIPPING BY GCL CONTRACT HY/2012/04

PROPOSED G.I.STATIONS :

PBH01 PROPOSED BOREHOLE

TP01 PROPOSED TRIAL PIT

CH01 PROPOSED COREHOLE

SS01 SS02 PROPOSED SLOPE STRIPPING

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

| Drawn | Date |
|---|---|
| RL | 07/13 |
| Checked | Approved |
| DS | DOP |

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

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

Supervising Officer AECOM

Contractor Gammon

Originator ARUP

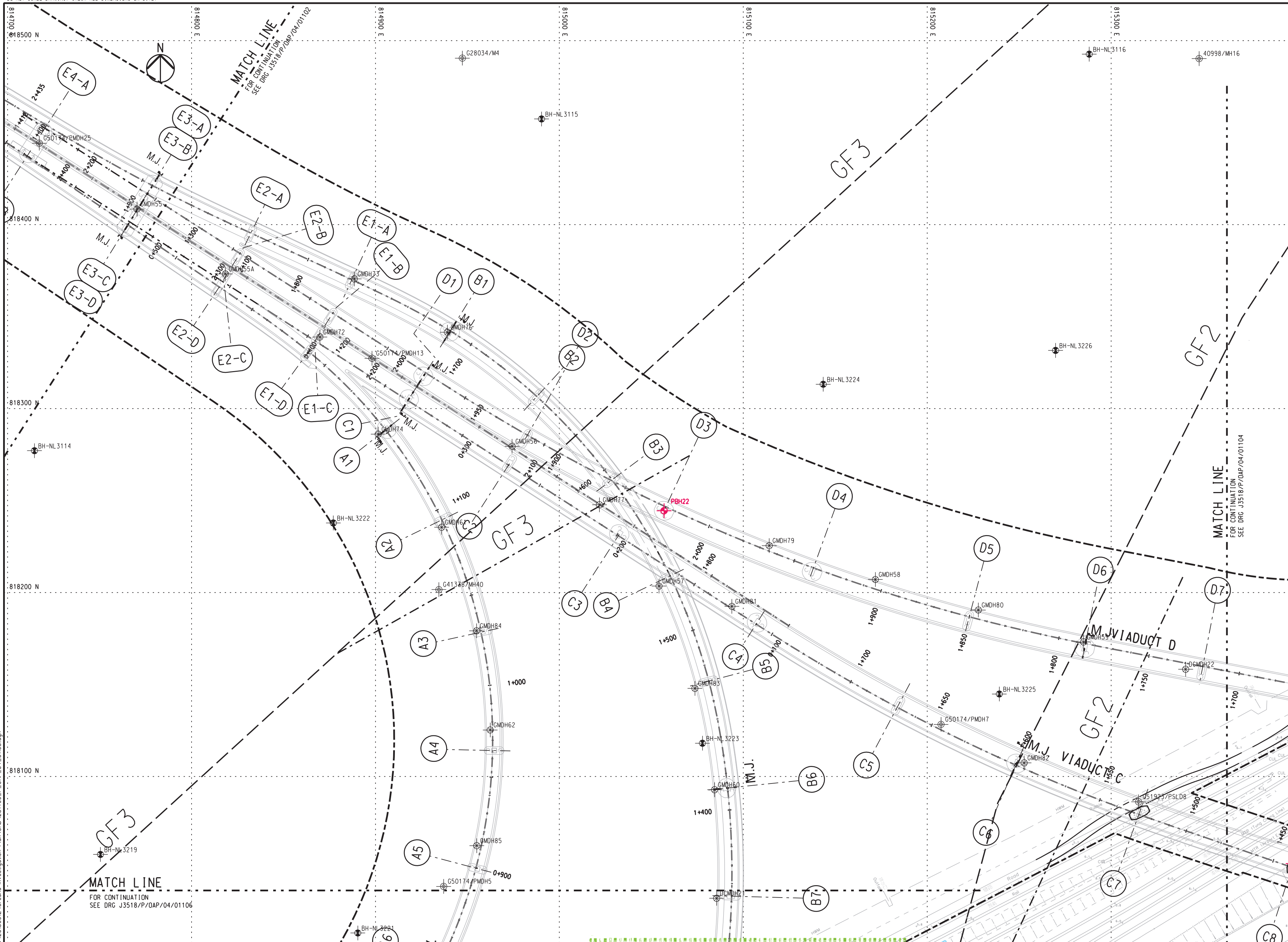
Project Title
Contract No. HY/2012/07
Tuen Mun - Chek Lap Kok Link
Southern Connection Viaduct Section

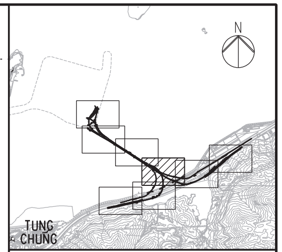
Drawing title
# Figure 1.2d

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

Printed by : 12/9/2013
Filename : J:\231499\RECORD\20130912\Ground Investigation Plan\CAD\231499_P_OAP_04_01102.dgn

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

SITE BOUNDARY

GF1 FAULT

EXISTING G.I.STATIONS :

BOREHOLE BY GIU DATA EXCLUDING VC

BOREHOLE BY GCL CONTRACT HY/2012/04

BOREHOLE BY GCL CONTRACT NL8/97

BOREHOLE BY GCL CONTRACT HY/2009/23

TRIAL PIT BY GCL CONTRACT HY/2012/04

SLOPE STRIPPING BY GCL CONTRACT HY/2012/04

PROPOSED G.I.STATIONS :

PBH01 PROPOSED BOREHOLE

TP01 PROPOSED TRIAL PIT

CH01 PROPOSED COREHOLE

SS01 SS02 PROPOSED SLOPE STRIPPING

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

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

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

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

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

Drawing title

# Figure 1.2e

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

Printed by : 13/9/2013
Filename : J:\231499\RECORD\20130912\Ground Investigation Plan\CAD\231499_P_OAP_04_01103.dgn

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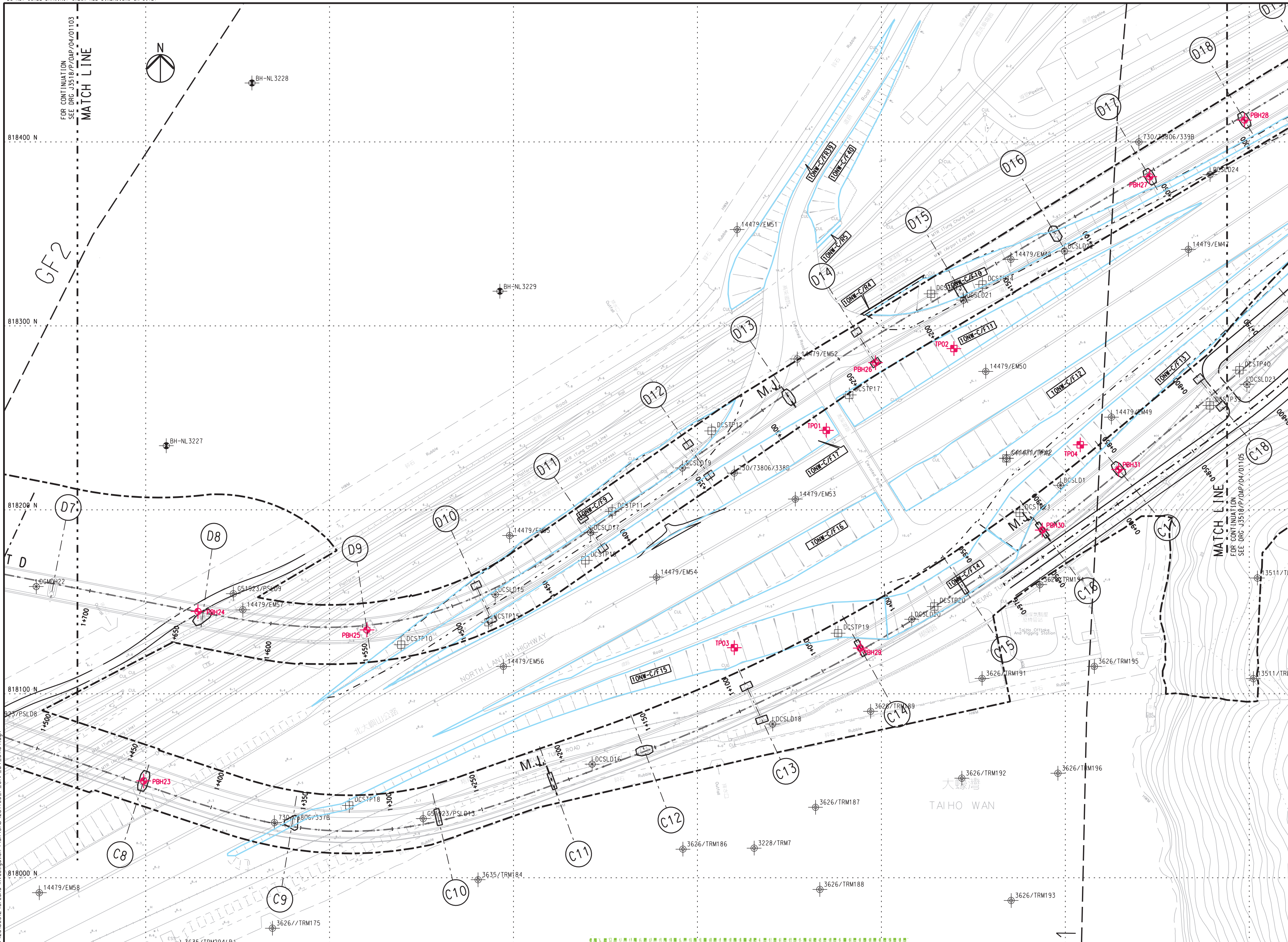
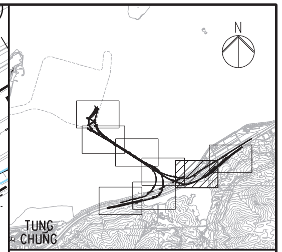



## KEY PLAN

## 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

0 10 20 30 40 50
METRES
1 : 1000

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

| Drawn | Date |
|---|---|
| RL | 07/13 |
| **Checked** | **Approved** |
| DS | DOP |

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

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

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

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

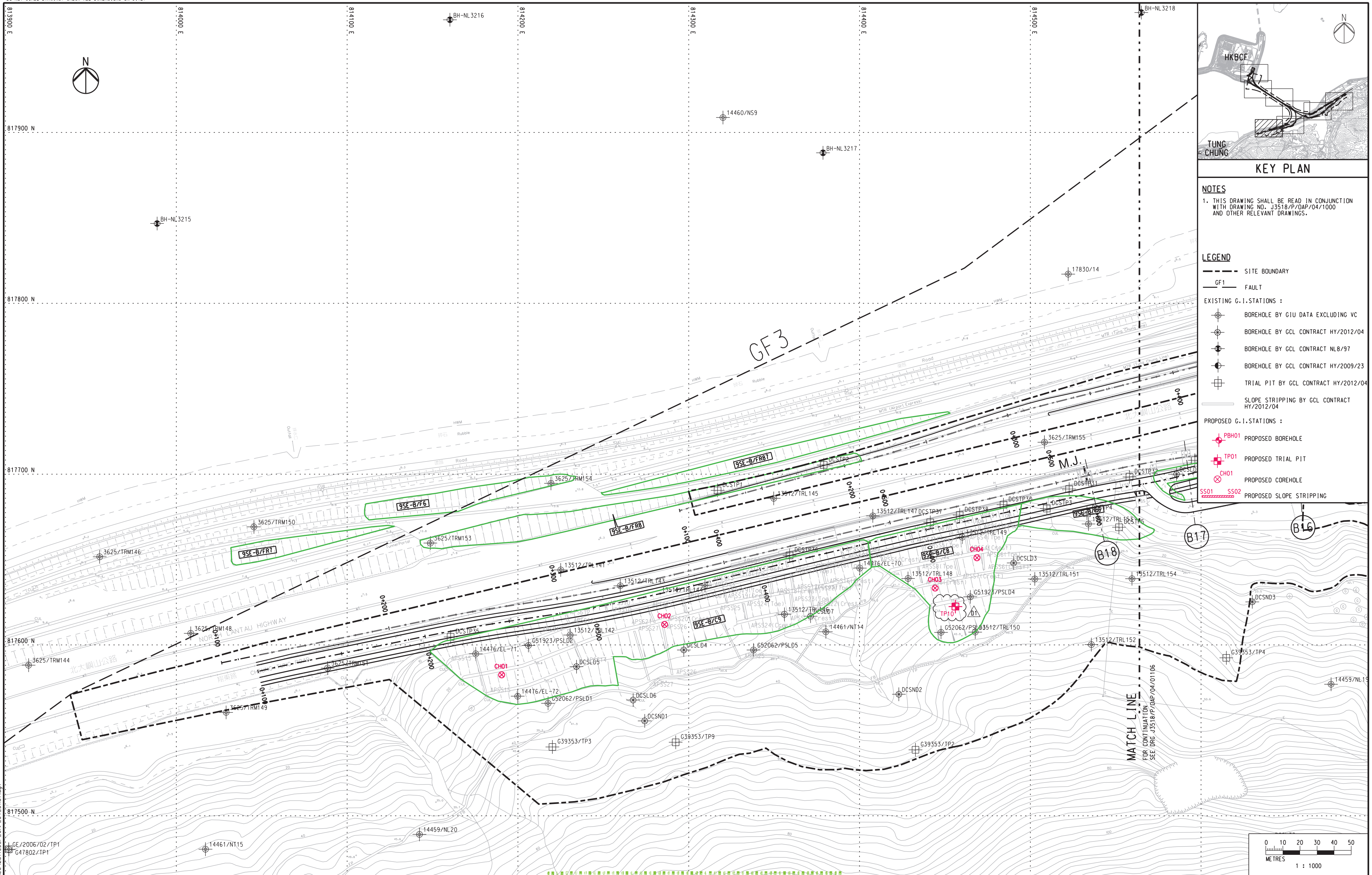
Drawing title:

# Figure 1.2f

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

Printed by : 12/9/2013
Filename : J:\231499\RECORD\20130912\Ground Investigation Plan\CAD\231499_P_OAP_04_01104.dgn

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.




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

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

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

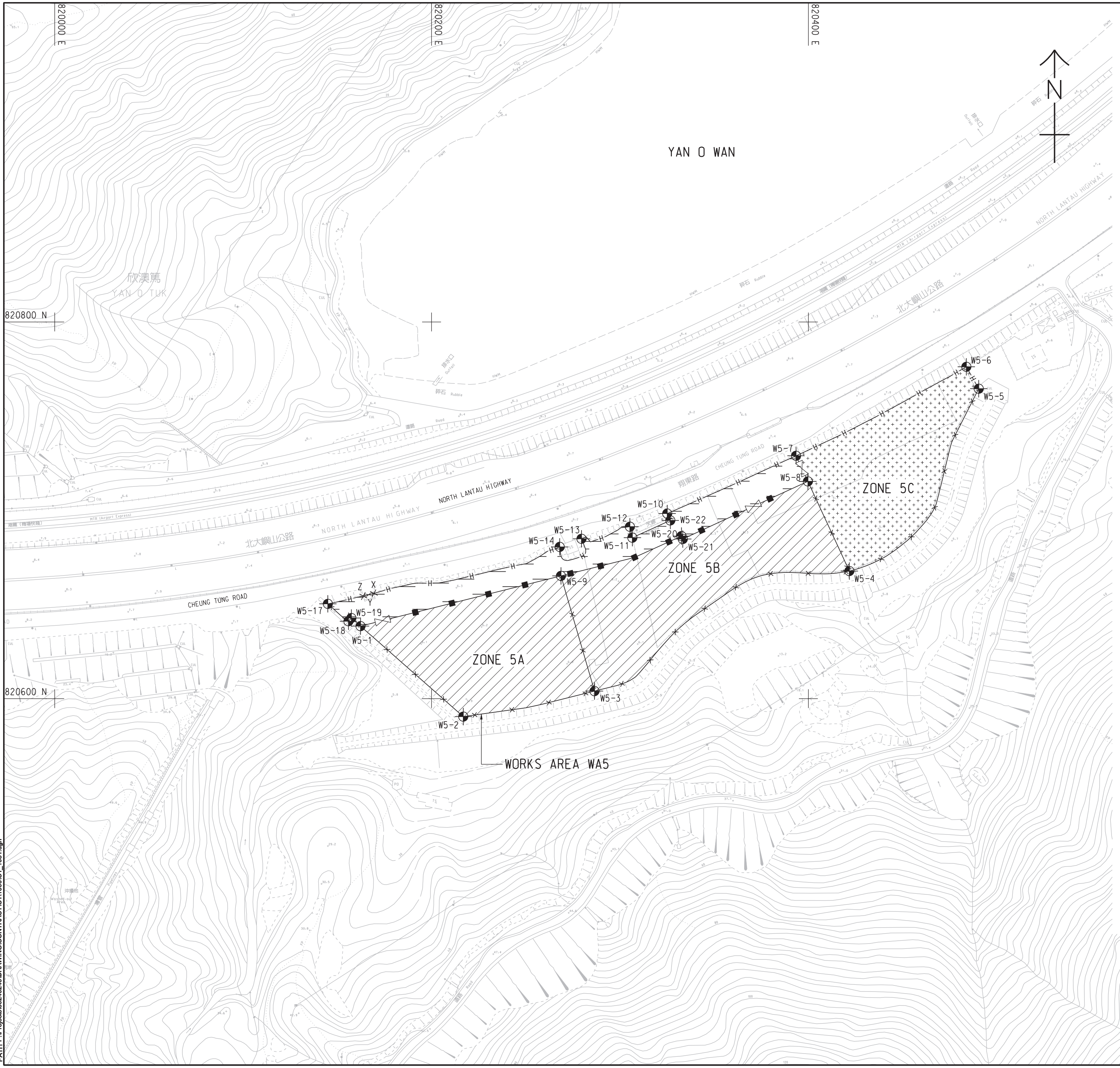
Project Title:
Contract No. HY/2012/07
Tuen Mun - Chek Lap Kok Link
Southern Connection Viaduct Section

Supervising Officer: AECOM
Contractor: Gammon
Originator: ARUP

Drawing title:
# Figure 1.2g

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

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




## NOTES:

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

## LEGEND:

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

## SETTING OUT COORDINATES OF WORKS AREA WA5

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



AECOM

**PROJECT** 項目

TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE

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

**CLIENT** 業主

路政署 HIGHWAYS DEPARTMENT

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

**CONSULTANT** 工程顧問公司

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**SUB-CONSULTANTS** 分判工程顧問公司

**ISSUE/REVISION** 修訂

| I/R 修訂 | DATE 日期 | DESCRIPTION 內容摘要 | CHK. 複核 |
|---|---|---|---|
| - | OCT. 12 | TENDER DRAWING | CWN |

**STATUS** 階段

**SCALE** 比例: A1 1 : 1000

**DIMENSION UNIT** 尺寸單位: METRES

**KEY PLAN** 索引圖

# Figure 1.2h

**PROJECT NO.** 項目編號: 60240249

**CONTRACT NO.** 合約編號: HY/2012/07

**SHEET TITLE** 圖紙名稱

WORKS AREA AND HOARDING PLAN

SHEET 1 OF 2

**SHEET NUMBER** 圖紙編號

60240249/C1/1051

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

Plot File by: LIUJ3 2012-10-24
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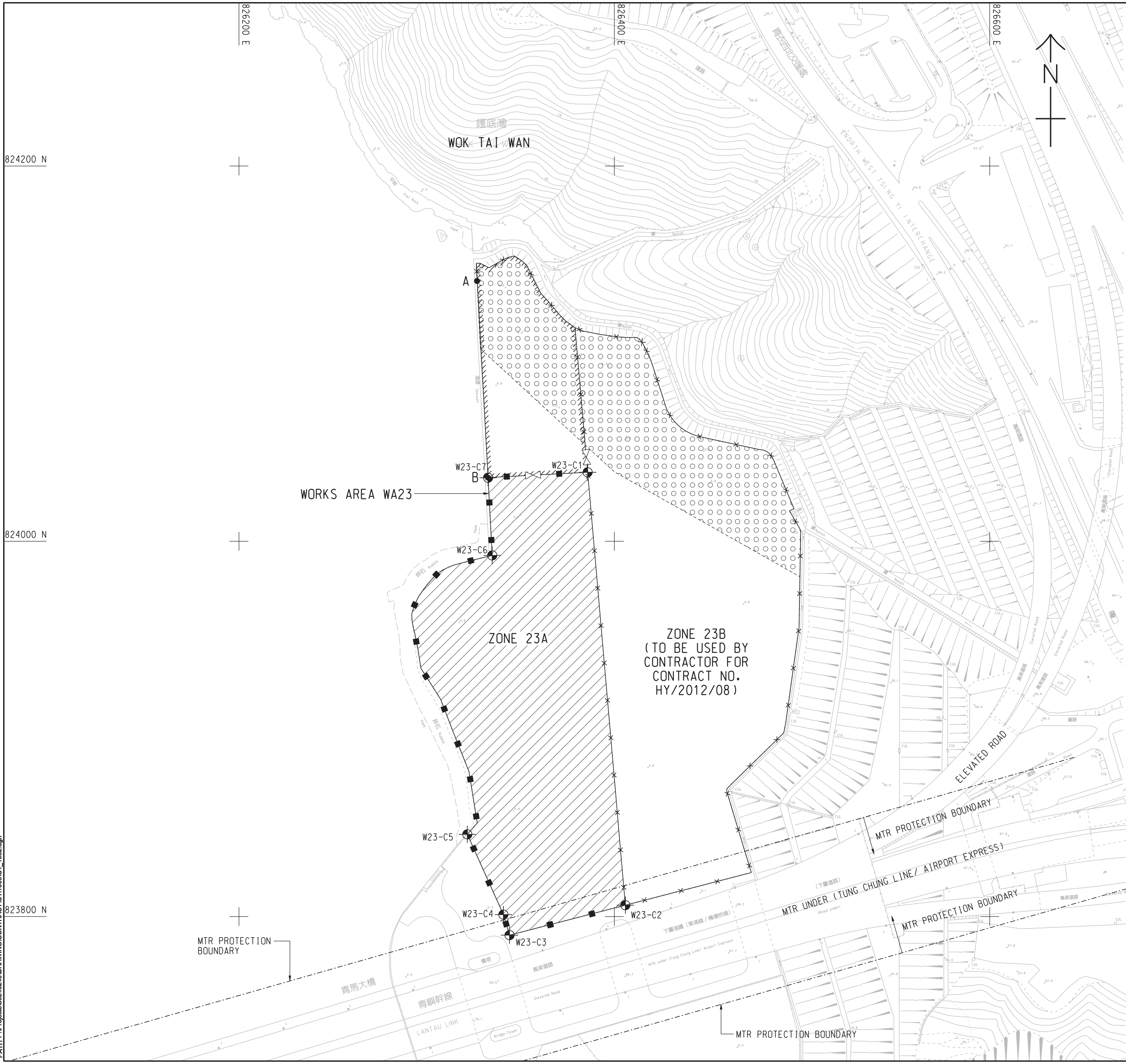


## NOTES:

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

## LEGEND:

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

## SETTING OUT COORDINATES OF WORKS AREA WA23

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

AECOM

PROJECT 項目

TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE

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

CLIENT 業主

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

CONSULTANT 工程顧問公司

AECOM Asia Company Ltd.
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ISSUE/REVISION 修訂

| I/R 修訂 | DATE 日期 | DESCRIPTION 內容摘要 | CHK. 複核 |
|---|---|---|---|
| - | OCT. 12 | TENDER DRAWING | CWN |

STATUS 階段

SCALE 比例: A1 1 : 1000

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖

# Figure 1.2i

PROJECT NO. 項目編號: 60240249

CONTRACT NO. 合約編號: HY/2012/07

SHEET TITLE 圖紙名稱

WORKS AREA AND HOARDING PLAN

SHEET 2 OF 2

SHEET NUMBER 圖紙編號

60240249/C1/1052

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

Plot File by: LIUJ3 2012-10-24
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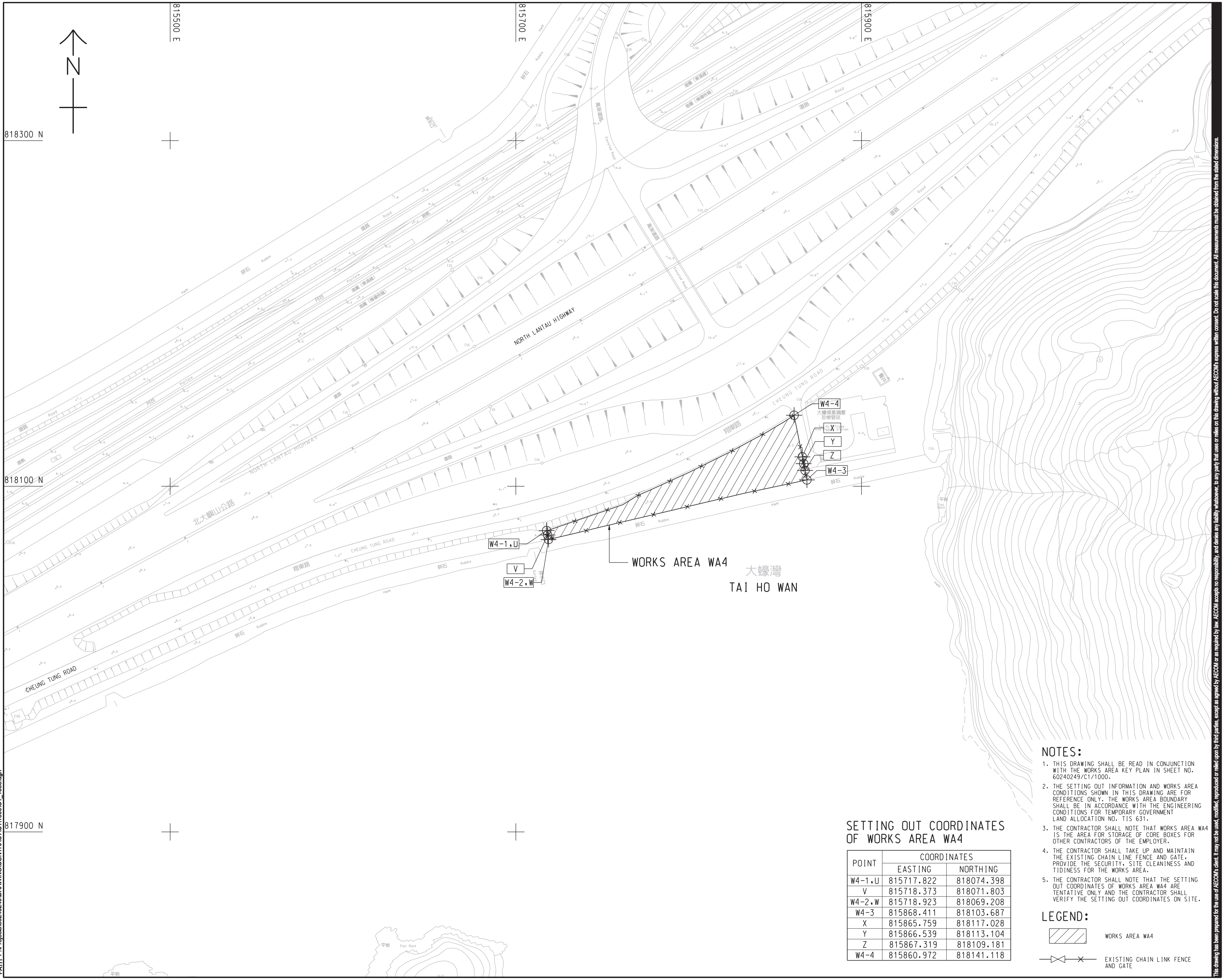


## SETTING OUT COORDINATES OF WORKS AREA WA4

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

## NOTES:

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

## LEGEND:

WORKS AREA WA4

EXISTING CHAIN LINK FENCE AND GATE

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

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

AECOM

**PROJECT** 項目

TUEN MUN - CHEK LAP KOK LINK

CONTRACT TITLE

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

**CLIENT** 業主

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

**CONSULTANT** 工程顧問公司

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# Figure 1.2j

**ISSUE/REVISION** 修訂

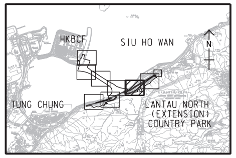
| I/R 修訂 | DATE 日期 | DESCRIPTION 內容摘要 | CHK. 複核 |
|---|---|---|---|
| - | NOV. 12 | TENDER ADDENDUM NO. 1 | CWN |

**STATUS** 階段

**SCALE** 比例: A1 1 : 1000

**DIMENSION UNIT** 尺寸單位: METRES

**KEY PLAN** 索引圖



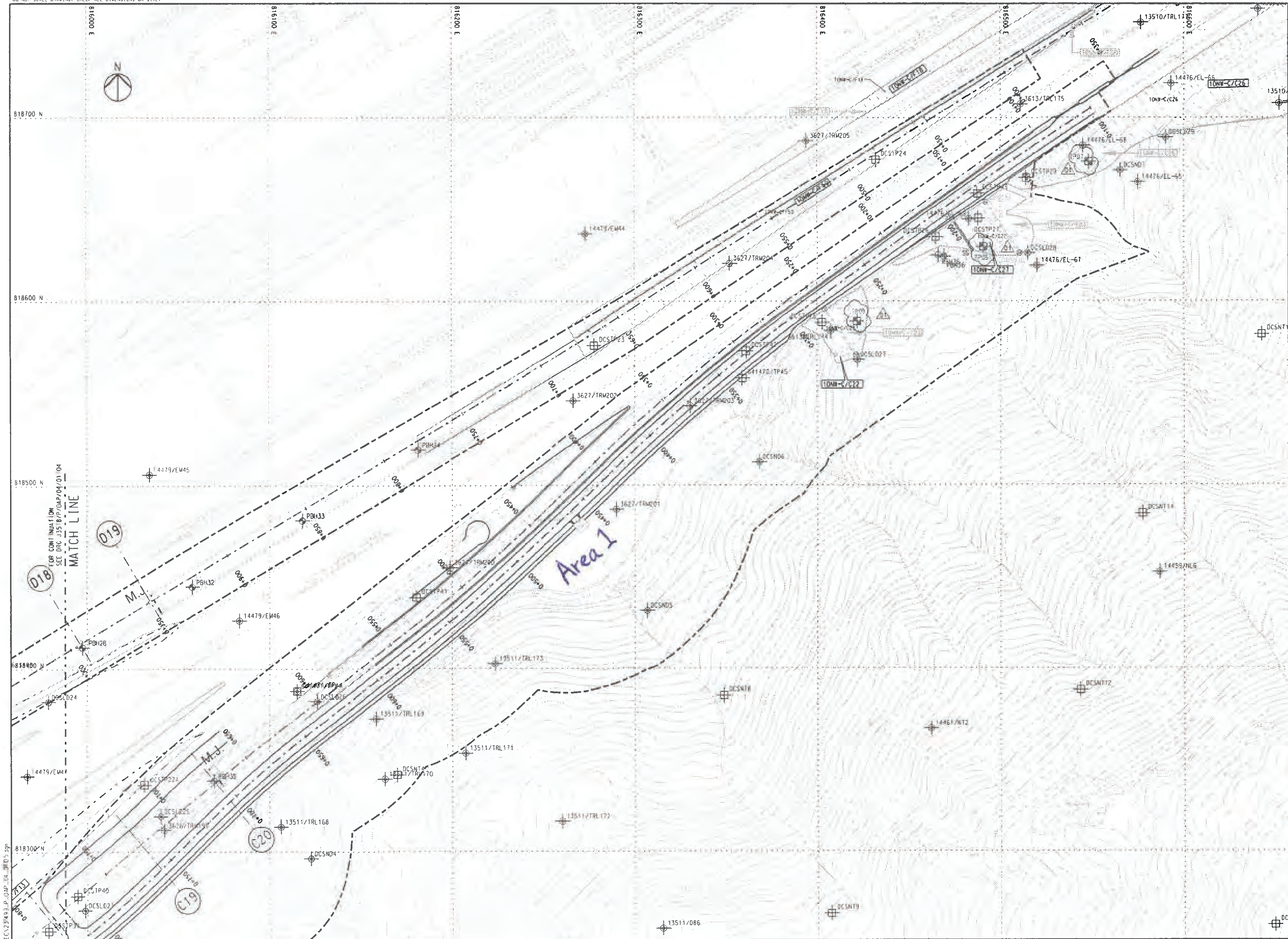

**PROJECT NO.** 項目編號: 60240249

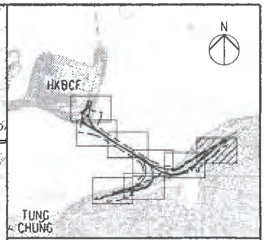
**CONTRACT NO.** 合約編號: HY/2012/07

**SHEET TITLE** 圖紙名稱: WORKS AREA WA4

**SHEET NUMBER** 圖紙編號: 60240249/C1/1053

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

SITE BOUNDARY

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 :

PROPOSED BOREHOLE

PROPOSED TRIAL PIT

PROPOSED COREHOLE

PROPOSED SLOPE STRIPPING

0 10 20 30 40 50 METRES 1 : 1000

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

| Drawn | Date |
|---|---|
| RL | 07/13 |
| Checked | Approved |
| DS | DOP |

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

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

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

Supervising Officer: AECOM

Contractor: Gammon

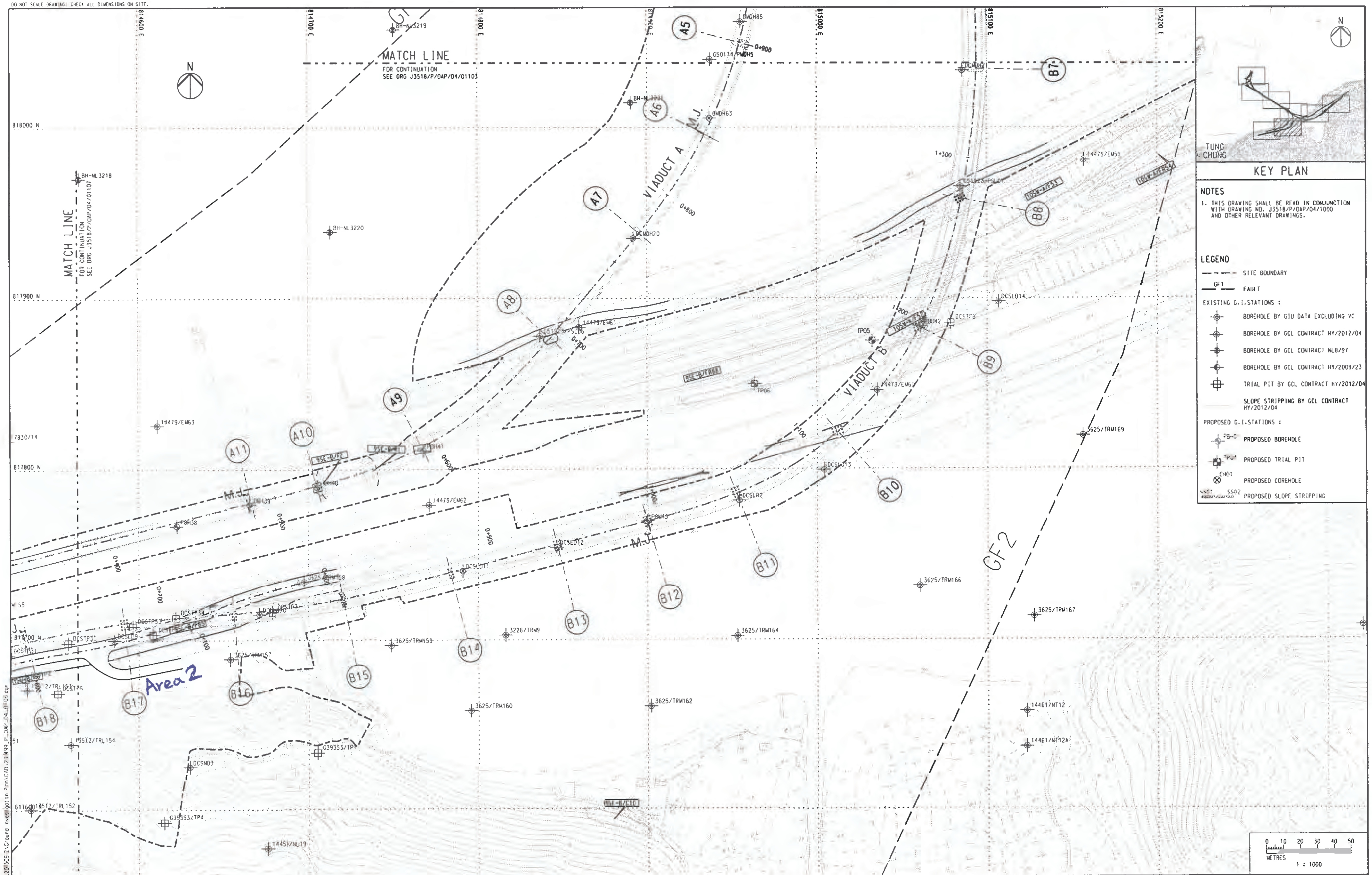
Originator: ARUP

Drawing title

# Figure 1.2k

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

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.




NOTES

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

LEGEND

- SITE BOUNDARY
- GF1 FAULT

EXISTING G.I. STATIONS :

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

PROPOSED G.I. STATIONS :

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

0 10 20 30 40 50 METRES 1 : 1000

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

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

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

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

Supervising Officer: AECOM

Contractor: Gammon

Originator: ARUP

Drawing title

# Figure 1.2I

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

## 1.4 *SUMMARY OF CONSTRUCTION WORKS*

The construction phase of the Contract commenced on 31 October 2013. The rolling construction programme for the period of September to November 2017 is shown in *Appendix B*.

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

September 2017

***Land-based Works***

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

October 2017

***Land-based Works***

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

November 2017

***Land-based Works***

- Pier construction;
- Re-alignment of Cheung Tung Road;
- Road works along North Lantau Highway;
- Launching gantry operation
- 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*.

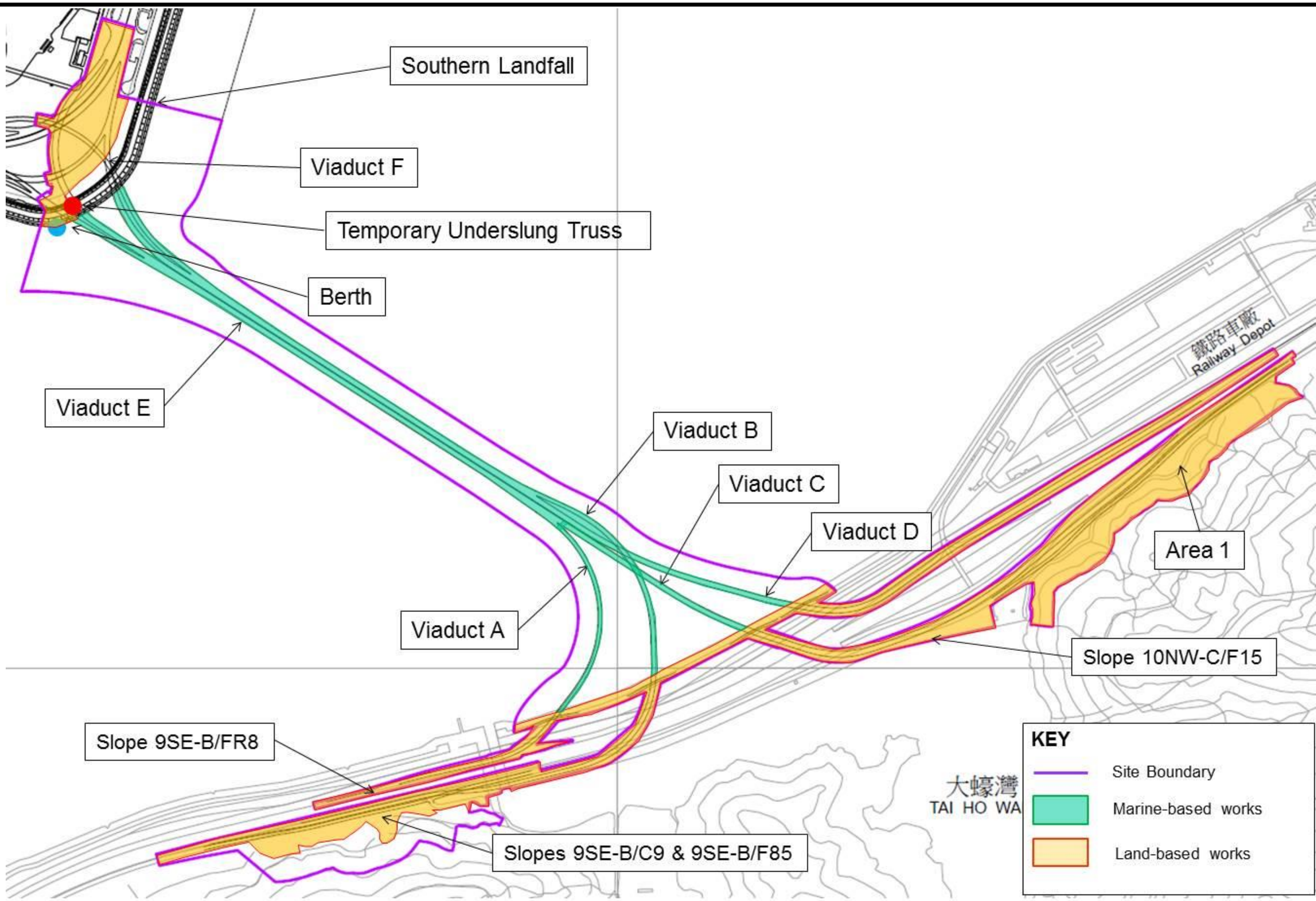
The environmental mitigation measures implementation schedule is presented in *Appendix C*.

### *1.5 SUMMARY OF EM&A PROGRAMME REQUIREMENTS*

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

- Monitoring parameters;
- Monitoring schedules for the reporting months and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event Action Plan;
- Results and observations;
- Environmental mitigation measures, as recommended in the approved EIA Report; and
- Environmental requirement in contract documents.

*Figure 1.3 Locations of Construction Activities in the Reporting Period*



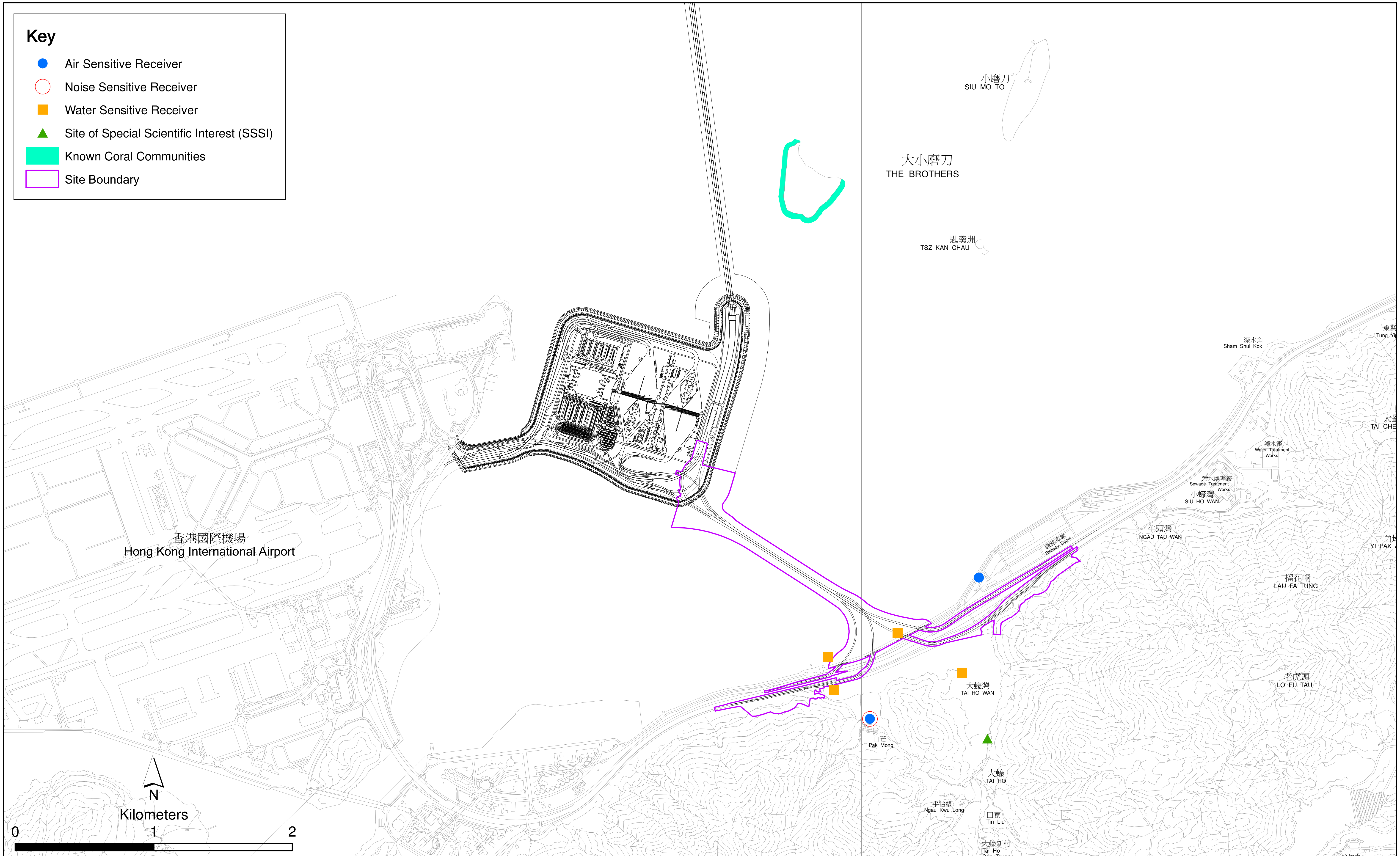



Figure 1.4

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

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Date: 18/5/2015

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# 2 EM&A RESULTS

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

## 2.1 AIR QUALITY

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

### 2.1.1 *Monitoring Requirements and Equipment*

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

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

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

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

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

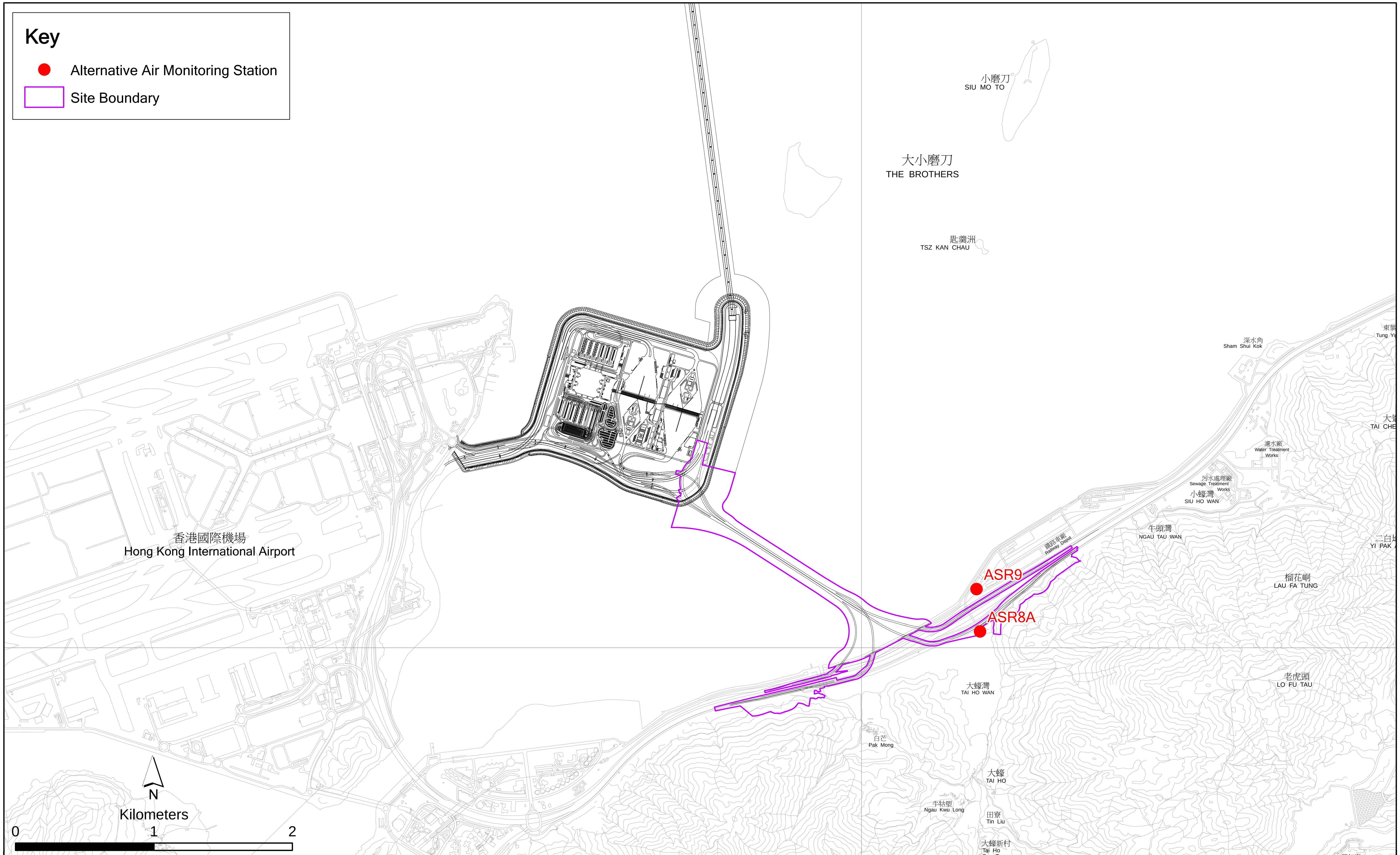


Figure 2.1

Locations of Air Quality Monitoring Stations

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Date: 7/1/2015

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

| **Monitoring Station (1)** | **Monitoring Period** | **Location** | **Description** | **Parameters & Frequency** |
|---|---|---|---|---|
| ASR8A<br><br>ASR9 | 6, 12, 18, 21 and 27 September 2017<br>3, 9, 12, 18, 24 and 30 October 2017<br>2, 8, 14, 20, 23 and 29 November 2017 | Area 4<br><br>MTR Depot | On ground at the works area, Area 4<br>On the ground nearby MTR Depot entrance | • 1-hour Total Suspended Particulates (1-hour TSP, $\mu g/m^3$), 3 times per day every 6 days<br>• 24-hour Total Suspended Particulates (24-hour TSP, $\mu g/m^3$), daily for 24-hour every 6 days |

Note:

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

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

| **Equipment** | **Brand and Model** |
|---|---|
| High Volume Sampler<br>(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 *Forty-seventh* to *Forty-ninth Monthly EM&A Reports*.

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

| Month | Station | Average ($\mu g/m^3$) | Range ($\mu g/m^3$) | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|---|---|---|
| September 2017 | ASR 8A | 85 | 22-169 | 394 | 500 |
| | ASR 9 | 99 | 21-206 | 393 | 500 |
| October 2017 | ASR 8A | 69 | 22-156 | 394 | 500 |
| | ASR 9 | 77 | 28-140 | 393 | 500 |
| November 2017 | ASR 8A | 82 | 33-165 | 394 | 500 |
| | ASR 9 | 83 | 35-148 | 393 | 500 |

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

| Month | Station | Average ($\mu g/m^3$) | Range ($\mu g/m^3$) | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|---|---|---|
| September 2017 | ASR 8A | 33 | 17-50 | 178 | 260 |
| | ASR 9 | 37 | 22-61 | 178 | 260 |
| October 2017 | ASR 8A | 60 | 21-102 | 178 | 260 |
| | ASR 9 | 59 | 28-93 | 178 | 260 |
| November 2017 | ASR 8A | 64 | 30-109 | 178 | 260 |
| | ASR 9 | 59 | 35-92 | 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 for 1-hour TSP and 24-hour TSP were undertaken within the reporting period, in which no Action or Limit Level exceedance for 1-hour and 24-hour TSP for air quality was recorded during the reporting period.

## 2.2 *NOISE MONITORING*

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

### 2.2.1 *Monitoring Requirements and Equipment*

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

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

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

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

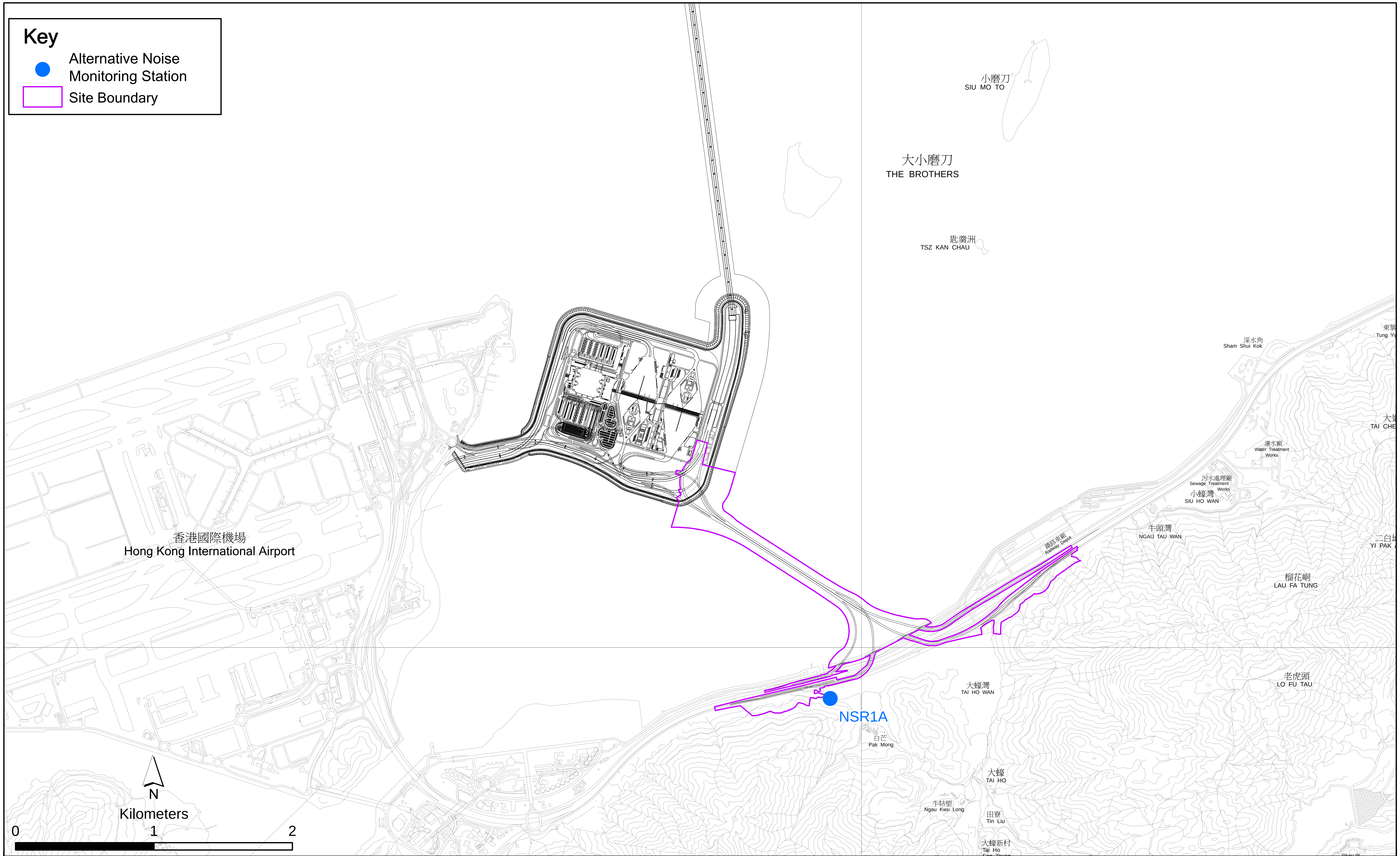


Figure 2.2

Location of Noise Monitoring Station

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

| Monitoring Station | Monitoring Period | Location | Parameters & Frequency |
|---|---|---|---|
| NSR1A | 6, 12, 18, 21 and 27 September 2017<br>3, 9, 12, 18, 24 and 30 October 2017<br>2, 8, 14, 20, 23 and 29 November 2017 | Pak Mong Village Pavilion | • 30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays (Monday to Saturday). $L_{eq}$, $L_{10}$ and $L_{90}$ would be recorded.<br>• At least once a week |

Note:

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

*Table 2.6* ***Noise Monitoring Equipment***

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

## 2.2.2 *Action and Limit Levels*

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

## 2.2.3 *Monitoring Schedule for the Reporting Quarter*

The schedule for construction noise monitoring in the reporting period is provided in *Appendix F*.

## 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 *Forty-seventh* to *Forty-ninth 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) |
|---|---|---|---|
| September 2017 | 64 | 62-67 | 75 |
| October 2017 | 63 | 62-64 | 75 |
| November 2017 | 63 | 62-64 | 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 construction works and nearby traffic noise and aircraft noise.

## 2.3 *WATER QUALITY MONITORING*

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

### 2.3.1 *Monitoring Requirements and Equipment*

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

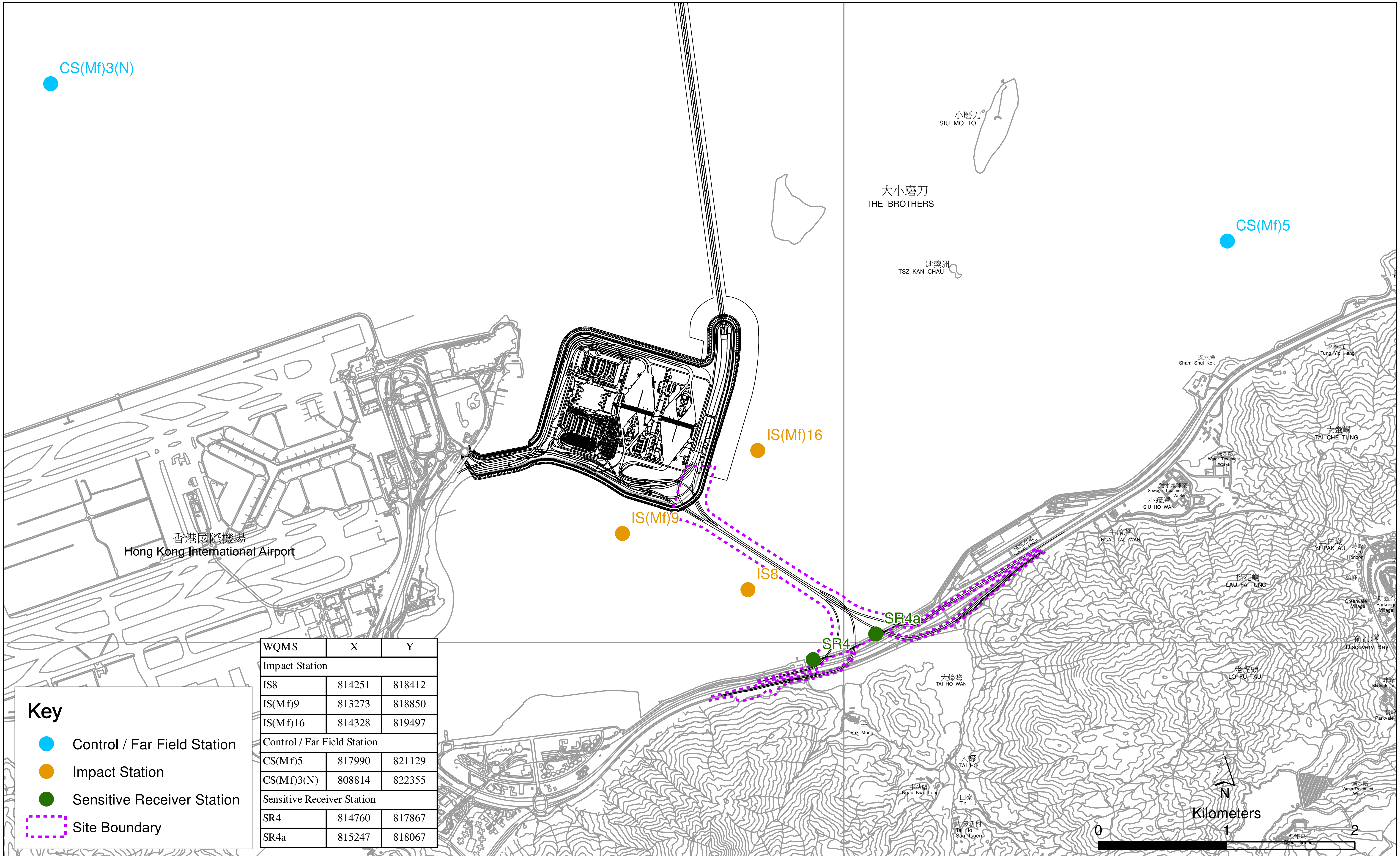
Due to Three-Runway System (3RS) marine construction works, an alternative water quality control station CS(Mf)3(N) was proposed to replace control station CS(Mf)3. The *Proposal of Alternative Water Quality Monitoring Station* (2) was submitted to EPD on 31 March 2017 and granted on 6 April 2017. Water quality monitoring at CS(Mf)3(N) is undertaken since 2 May 2017. The locations of the monitoring stations under the Contract are shown in *Figure 2.3* and *Table 2.8*.

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

| Station ID | Type | Coordinates | | *Parameters, unit | Depth | Frequency |
|---|---|---|---|---|---|---|
| | | Easting | Northing | | | |
| IS(Mf)9 | Impact Station (Close to HKBCF construction site) | 813273 | 818850 | • Temperature(°C)<br>• pH(pH unit)<br>• Turbidity (NTU)<br>• Water depth (m)<br>• Salinity (ppt)<br>• Dissolved Oxygen (DO) (mg/L and % of saturation)<br>• Suspended Solid (SS) (mg/L) | 3 water depths: 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water | Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Contract. |
| IS(Mf)16 | Impact Station (Close to HKBCF construction site) | 814328 | 819497 | | | |
| IS8 | Impact Station(Close to HKBCF construction site) | 814251 | 818412 | | | |

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

(2) *The Proposal of Alternative Water Quality Monitoring Station* with the verification letter from IEC was submitted to EPD on 31 March 2017, and subsequently replied with no objection on.6 April 2017.




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Figure 2.3

Locations of Water Quality Monitoring Stations

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Date: 28/4/2017

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| Station ID | Type | Coordinates | | *Parameters, unit | Depth | Frequency |
|---|---|---|---|---|---|---|
| | | Easting | Northing | | | |
| SR4 | Sensitive receiver (Tai Ho Inlet) | 814760 | 817867 | | depth less than 6m, mid-depth may be omitted. | |
| SR4a | Sensitive receiver | 815247 | 818067 | | | |
| CS(Mf)3(N) | Control Station | 808814 | 822355 | | | |
| CS(Mf)5 | Control Station | 817990 | 821129 | | | |

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

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

***Table 2.9 Water Quality Monitoring Equipment***

| Equipment | Brand and Model |
|---|---|
| Multi-parameters (Dissolved Oxygen, Salinity, Turbidity, Temperature, pH) | YSI ProDSS / YSI 6920 V2 Sonde |
| Positioning Equipment | Furuno GP-170 |
| Water Depth Detector | Lowrance Mark 5x / Garmin Striker 4 |
| Water Sampler | WildCo Vertical Alpha Bottles 1120-2.2L /1120-3.2L<br>Aquatic Research Instrument Vertical/Horizontal Point Water Sampler 2.2L / 3.0L |

### 2.3.2 *Action & Limit Levels*

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

### 2.3.3 *Monitoring Schedule for the Reporting Quarter*

The schedules for water quality monitoring in the reporting quarter are provided in *Appendix E*. Water quality monitoring on 4 September 2017 was canceled due to adverse weather.

### 2.3.4 *Results and Observations*

In this reporting period, a total of 38 monitoring events for impact water quality monitoring were conducted at monitoring stations in the reporting period. Monitoring results are presented graphically in *Appendix H* and detailed impact water quality monitoring results were reported in the *Forty-seventh* to *Forty-ninth Monthly EM&A Reports*.

Ninety-one (91) Action Level of Dissolved Oxygen (DO) exceedances, eight (8) Action Level of Suspended Solids (SS) exceedances and one (1) Limit Level of Turbidity exceedance were recorded for water quality impact monitoring in the reporting period. Actions were taken in accordance with the Event Action Plan as presented in *Appendix J*.

## 2.4 DOLPHIN MONITORING

### 2.4.1 Monitoring Requirements

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

### 2.4.2 Monitoring Equipment

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

**Table 2.10 Dolphin Monitoring Equipment**

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

### 2.4.3 Monitoring Parameter, Frequencies & Duration

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

### 2.4.4 *Monitoring Location*

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

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

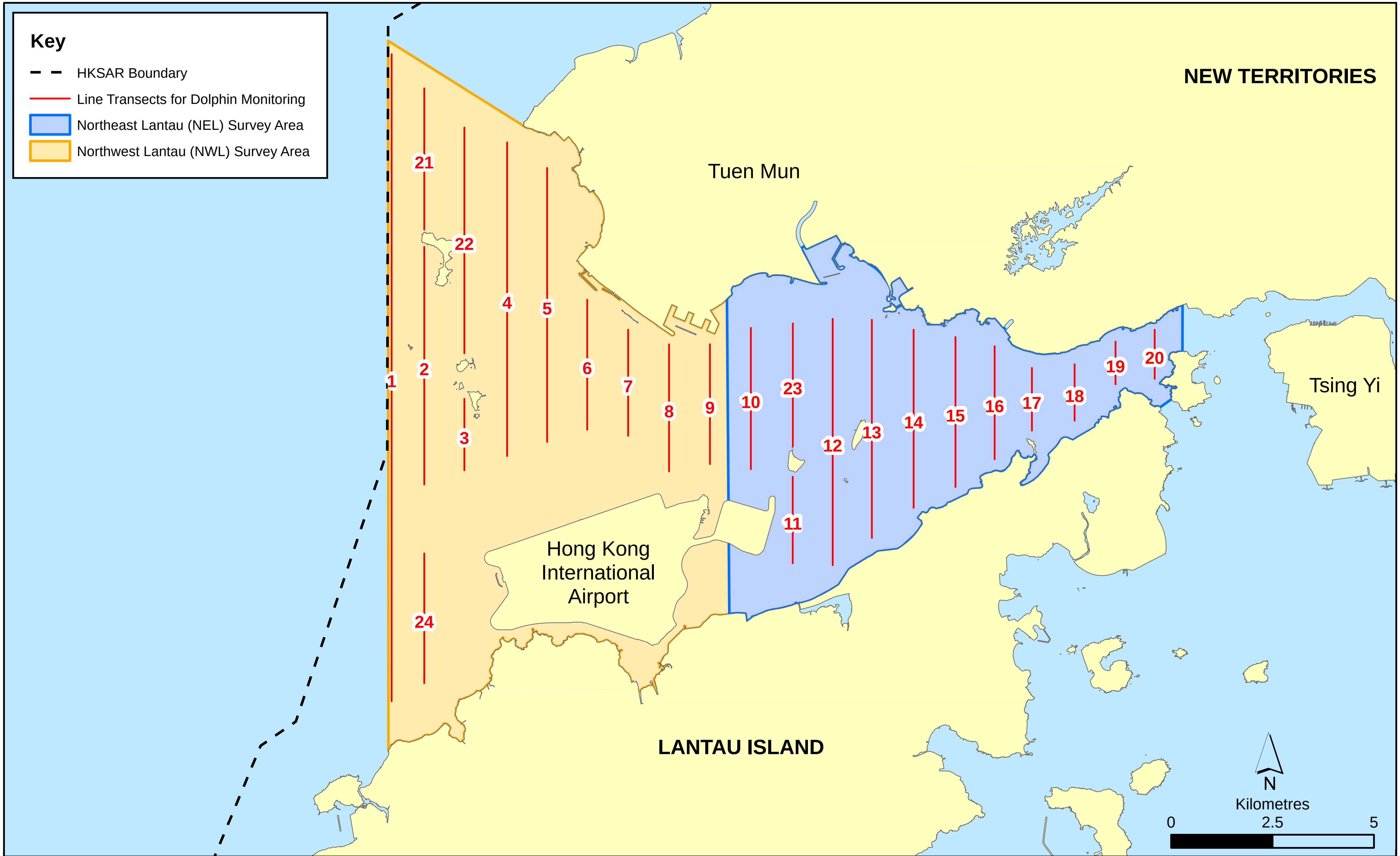


Figure 2.4

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

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Date: 21/9/2017

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*Table 2.11 Impact Dolphin Monitoring Line Transect Co-ordinates*

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

### 2.4.5 *Action & Limit Levels*

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

### 2.4.6 *Monitoring Schedule for the Reporting Period*

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

### 2.4.7 *Results & Observations*

A total of 802.12 km of survey effort was collected, with 96.0% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 297.00 km and 505.12 km of survey effort were conducted in NEL and NWL survey areas respectively. The total survey effort conducted on primary lines was 578.16 km, while the effort on secondary lines was 223.96 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 September to November 2017, a total of thirteen (13) groups of 50 Chinese White Dolphins were sighted. All dolphin sightings were made during on-effort, while twelve of the thirteen on-effort dolphin sightings were made on primary lines. In this quarterly period, all dolphin groups were sighted in NWL, no sighting of dolphin was sighted in NEL. Summary table of the dolphin sightings is shown in *Appendix II of Appendix I*.

Encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) in the reporting period with the results presented in *Tables 2.12* and *2.13*.

***Table 2.12 Individual Survey Event Encounter Rates***

| **Survey Area** | **Survey period** | **Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)** | **Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)** |
|---|---|---|---|
| | | Primary Lines Only | Primary Lines Only |
| NEL | Set 1: 15th/ 18th Sep 2017 | 0.0 | 0.0 |
| | Set 2: 22nd / 29th Sep 2017 | 0.0 | 0.0 |
| | Set 3: 4th /9th Oct 2017 | 0.0 | 0.0 |
| | Set 4: 18th / 26th Oct 2017 | 0.0 | 0.0 |
| | Set 5: 1st / 8th Nov 2017 | 0.0 | 0.0 |
| | Set 6: 17th /24th Nov 2017 | 0.0 | 0.0 |
| NWL | Set 1: 15th/ 18th Sep 2017 | 0.00 | 0.00 |
| | Set 2: 22nd / 29th Sep 2017 | 3.63 | 16.34 |
| | Set 3: 4th /9th Oct 2017 | 1.86 | 9.30 |
| | Set 4: 18th / 26th Oct 2017 | 4.89 | 4.89 |
| | Set 5: 1st / 8th Nov 2017 | 4.99 | 26.60 |
| | Set 6: 17th /24th Nov 2017 | 3.33 | 5.00 |

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

*Table 2.13* *Quarterly Average Encounter Rates*

| Survey Area | Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort) | | Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort) | |
|---|---|---|---|---|
| | **September – November 2017** | **September - November 2011** | **September – November 2017** | **September - November 2011** |
| **Northeast Lantau** | 0.0 | 6.00 ± 5.05 | 0.0 | 22.19 ± 26.81 |
| **Northwest Lantau** | 3.12 ± 1.91 | 9.85 ± 5.85 | 10.35 ± 9.66 | 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 twelve (12) individuals per group in North Lantau region during September to November 2017. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in *Table 2.14*.

*Table 2.14* *Comparison of Quarterly Average Group Sizes*

| | Average Dolphin Group Size | |
|---|---|---|
| | **September – November 2017** | **September - November 2011** |
| **Overall** | 3.85 ± 3.39 (n = 13) | 3.72 ± 3.13 (n = 66) |
| **Northeast Lantau** | --- | 3.18 ± 2.16 (n = 17) |
| **Northwest Lantau** | 3.85 ± 3.39 (n = 13) | 3.92 ± 3.40 (n = 49) |

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between September and November 2017.

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

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

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

### 2.4.8 *Marine Mammal Exclusion Zone Monitoring*

Daily marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. No sighting of 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. Thirteenth (13) site inspections were carried out in the reporting quarter on 6, 13, 20 and 28 September 2017, 4, 11, 18, 26 and 31 October 2017, and 8, 14, 22 and 30 November 2017.

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 |
|---|---|---|
| 6 September 2017 | Viaduct B (Pier B17)<br>• Chemical container was observed not placed in drip tray.<br>• General refuse in the skip should be cleared. | Viaduct B (Pier B17)<br>• The Contractor was reminded to place chemical container in drip tray.<br>• The Contractor was reminded to clear general refuse in the skip. |
| 13 September 2017 | Viaduct E (Pier E10)<br>• Chemical containers on the deck were observed not placed in drip tray.<br>• Stagnant water was observed in drip tray.<br>• Tarpaulin should be provided to cover the cement bags (over 20 bags). | Viaduct E (Pier E10)<br>• The Contractor was reminded to place chemical containers in drip tray.<br>• The Contractor was reminded to clear stagnant water in drip tray.<br>• The Contractor was reminded to provide tarpaulin and cover cement bags. |
| 20 September 2017 | Southern Landfall Portion A (HKBCF Portion S-c)<br>• Chemical containers were observed not placed in drip tray.<br>• Watering on exposed road should be maintained for dust suppression. | Southern Landfall Portion A (HKBCF Portion S-c)<br>• The Contractor was reminded to maintain watering on exposed road.<br>• The Contractor was reminded to place chemical containers in drip tray. |
| 28 September 2017 | Viaduct E (Pier E13CD)<br>• Oil stain was observed near the generator.<br>• Stagnant water was observed in drip tray.<br>Southern Landfall Portion A (HKBCF Portion S-c)<br>• Watering should be applied during pile head breaking works. | Viaduct E (Pier E13CD)<br>• The Contractor was reminded to clear oil stain near the generator.<br>• The Contractor was reminded to clear stagnant water in drip tray.<br>Southern Landfall Portion A (HKBCF Portion S-c)<br>• The Contractor was reminded to apply watering during pile head breaking works. |

| Inspection Date | Location & Environmental Observations | Recommendations/ Remarks |
|---|---|---|
| 4 October 2017 | Viaduct E (Pier E12)<br>• Oil stain was observed near the generator.<br>• | Viaduct B (Pier B17)<br>• The Contractor was reminded to clear the oil as chemical waste. |
| 11 October 2017 | Viaduct B (Pier B18)<br>• Chemical container was observed not placed in drip tray.<br>• EP should be replaced near the site entrance. | Viaduct B (Pier B18)<br>• The Contractor was reminded to place chemical container in drip tray.<br>• The Contractor was reminded to replace the missing pages of EP near the site entrance. |
| 18 October 2017 | Viaduct E (Pier E13AB)<br>• Oil stain was observed near the drip tray.<br>• Drip tray was observed not properly plugged. | Viaduct B (Pier B18)<br>• The Contractor was reminded to clear oil stain near to drip tray.<br>• The Contractor was reminded to plug the drip tray properly. |
| 26 October 2017 | Viaduct A (Pier A10)<br>• Chemical waste should be handled with care and disposed of at designated area.<br>Viaduct A (Ramp A) (Area A)<br>• Chemical containers were observed not placed in drip tray.<br>• General refuse should be cleared.<br>• NRMM label was observed not provided on the excavator.<br>Viaduct E (Pier E8)<br>• Drip tray was observed not properly plugged. | Viaduct A (Pier A10)<br>• The Contractor was reminded to handle chemical waste with care and disposed them of at designated area.<br>Viaduct A (Ramp A) (Area A)<br>• The Contractor was reminded to place chemical container in drip tray.<br>• The Contractor was reminded to clear general refuse.<br>• The Contractor was reminded to provide NRMM label on the excavator.<br>Viaduct E (Pier E8)<br>• The Contractor was reminded to plug the drip tray. |
| 31 October 2017 | Viaduct B (Pier B16)<br>• General refuse near the skip should be cleared.<br>• Chemical container was observed not placed in drip tray. | Viaduct E (Pier E13CD)<br>• The Contractor was reminded to clear general refuse near the skip.<br>• The Contractor was reminded to place chemical container in drip tray. |
| 8 November 2017 | Viaduct E (Pier E12)<br>• Accumulated refuse should be cleared.<br>• Chemical container was observed not placed in drip tray. | Viaduct E (Pier E12)<br>• The Contractor was reminded to clear accumulated refuse.<br>• The Contractor was reminded to place chemical container in drip tray. |
| 14 November 2017 | Viaduct A (Ramp A) (Area A)<br>• Accumulated refuse should be cleared.<br>• Chemical container was observed not placed in drip tray.<br>• Drip tray should be provided for chemicals used in wetsep. | Viaduct A (Ramp A) (Area A)<br>• The Contractor was reminded to clear accumulated refuse.<br>• The Contractor was reminded to place chemical container in drip tray.<br>• The Contractor was reminded to provide drip tray for chemicals used in wetsep. |
| 22 November 2017 | Viaduct E (Pier E13AB)<br>• NRMM label on the generator should be replaced.<br>Viaduct E (Pier E10)<br>• Stagnant water was observed in the drip tray.<br>• NRMM label on the generator should be replaced. | Viaduct E (Pier E13AB)<br>• The Contractor was reminded to replace NRMM label on the generator.<br>Viaduct E (Pier E10)<br>• The Contractor was reminded to clear stagnant water in the drip tray.<br>• The Contractor was reminded to replace NRMM label on the generator. |

| Inspection Date | Location & Environmental Observations | Recommendations/ Remarks |
|---|---|---|
| 30 November 2017 | Viaduct D (Ramp D) (Area I)<br>• Watering should be provided on unpaved road.<br>• Chemical containers were observed not placed in drip tray.<br>Viaduct D (Pier D6)<br>• Chemical containers were observed not placed in drip tray. | Viaduct D (Ramp D) (Area I)<br>• The Contractor was reminded to maintain watering on unpaved road.<br>• The Contractor was reminded to place chemical container in drip tray.<br>Viaduct D (Pier D6)<br>• The Contractor was reminded to place chemical container in drip tray. |

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

## 2.6 *WASTE MANAGEMENT STATUS*

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

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

***Table 2.16 Quantities of Different Waste Generated in the Reporting Period***

| Month/ Year | Inert C&D Materials (a) ($m^3$) | Imported Fill ($m^3$) | Inert Construction Waste Re-used ($m^3$) | Non-inert Construction Waste (b) (kg) | Recyclable Materials (c) (kg) | Chemical Wastes (kg) | Marine Sediment ($m^3$) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Category L | Category M ($M_p$ & $M_f$) | Category H |
| September 2017 | 3,142 | 0 | 0 | 185,420 | 18,100 | 0 | 1,517 | 1,047 | 127 |
| October 2017 | 3,005 | 0 | 0 | 172,690 | 63 | 0 | 0 | 0 | 0 |
| November 2017 | 3,354 | 0 | 0 | 159,650 | 5,868 | 5,400 | 0 | 0 | 0 |

**Notes:**

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

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

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

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

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

## 2.7 *ENVIRONMENTAL LICENSES AND PERMITS*

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

*Table 2.17 Summary of Environmental Licensing and Permit Status*

| License/ Permit | License or Permit No. | Date of Issue | Date of Expiry | License/ Permit Holder | Remarks |
|---|---|---|---|---|---|
| Environmental Permit | EP-353/2009/K | 11-Apr-16 | N/A | HyD | Hong Kong Boundary Crossing Facilities |
| Environmental Permit | EP-354/2009/D | 13-Mar-15 | N/A | HyD | Tuen Mun- Chek Lap Kok Link |
| Construction Dust Notification | 361571 | 05-Jul-13 | N/A | GCL | |
| Construction Dust Notification | 362093 | 17-Jul-13 | N/A | GCL | For Area 23 |
| Chemical Waste Registration | 5213-951-G2380-17 | 12-Jun-14 | N/A | GCL | Viaducts A, B, C, D & E |
| Chemical Waste Registration | 5213-961-G2380-13 | 10-Oct-13 | N/A | GCL | Chemical waste produced in Contract No. HY/2012/07 (Area 1 adjacent to Cheng Tung Road, Siu Ho Wan) |
| Chemical Waste Registration | 5213-961-G2380-14 | 10-Oct-13 | N/A | GCL | Chemical waste produced in Contract No. HY/2012/07 (Area 2 adjacent to Cheung Tung Road, Pak Mong Village) |
| Chemical Waste Registration | 5213-974-G2588-03 | 04-Nov-13 | N/A | GCL | Chemical waste produced in Contract No. HY/2012/07 (WA5 adjacent to Cheung Tung Road, Yam O) |
| Construction Waste Disposal Account | 7017735 | 10-Jul-13 | N/A | GCL | - |
| Construction Waste Disposal Account | 7019470 | 03-Mar-14 | N/A | GCL | Vessel CHIT Account |
| Waste Water Discharge License | WT00019017-2014 | 13-May-14 | 31-May-19 | GCL | Discharge for marine portion |
| Waste Water Discharge License | WT00019018-2014 | 13-May-14 | 31-May-19 | GCL | Discharge for land portion |
| Construction Noise Permit for night works and works in general holidays | GW-RW0294-17 | 19-Jun-17 | 18-Dec-17 | GCL | General works at WA5 |
| Construction Noise Permit for night works and works in general holidays | GW-RS0540-17 | 20-Jun-17 | 15-Dec-17 | GCL | Broad Permit for Whole Site Areas |
| Construction Noise Permit for night works and works in general holidays | GW-RS0639-17 | 31-Jul-17 | 29-Sep-17 | GCL | Broad Permit for Segment Launching at Land Portion |
| Construction Noise Permit for night works and works in general holidays | GW-RS0829-17 | 29-Sep-17 | 30-Nov-17 | GCL | Broad Permit for Segment Launching at Land Portion |
| Construction Noise Permit for night works and works in general holidays | GW-RS0668-17 | 7-Aug-17 | 6-Feb-18 | GCL | Pre-casted pile cap shell installation at E8-E13 |
| Construction Noise Permit for night works and works in general holidays | GW-RS0954-17 | 5-Nov-17 | 30-Nov-17 | GCL | Contingency plan for DN800T works at Tung Chung Seafront Road |
| Construction Noise Permit for percussive piling | PP-RS0010-17 | 12-Jun-17 | 15-Sep-17 | GCL | Percussive piling at Portion A |

| License/ Permit | License or Permit No. | Date of Issue | Date of Expiry | License/ Permit Holder | Remarks |
|---|---|---|---|---|---|
| Marine Dumping Permit | EP/MD/18-031 | 01-Jul-17 | 31-Dec-17 | GCL | For dumping Type I sediment |
| Marine Dumping Permit | EP/MD/18-061 | 16-Sep-17 | 15-Oct-17 | GCL | For dumping Type I 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 and construction noise monitoring complied with the Action/ Limit levels in the reporting period.

Ninety-one (91) Action Level of Dissolved Oxygen (DO) exceedances, eight (8) Action Level of Suspended Solids (SS) exceedances and one (1) Limit Level of Turbidity exceedance were recorded for water quality impact monitoring in the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation reports are presented in *Appendix L*.

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

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

| Station | Baseline Mean | | Ambient Mean [a] | | Quarterly Mean (September to November 2017) | |
|---|---|---|---|---|---|---|
| | **Mid-ebb** | **Mid-flood** | **Mid-ebb** | **Mid-flood** | **Mid-ebb** | **Mid-flood** |
| CS(Mf)3(N) | 9.2 | 12.8 | 12.0 | 16.6 | 8.8 | 10.1 |
| CS(Mf)5 | 9.2 | 11.5 | 11.9 | 14.9 | 5.8 | 6.9 |
| SR4 | 10.3 | 12.3 | 13.4 | 16.0 | 8.3 | 12.1 |
| SR4a | 9.1 | 9.8 | 11.9 | 12.7 | 9.3 | 12.5 |
| IS8 | 11.3 | 13.5 | 14.6 | 17.6 | 8.1 | 12.5 |
| IS(Mf)9 | 10.9 | 14.3 | 14.2 | 18.5 | 6.8 | 10.8 |
| IS(Mf)16 | 11.4 | 10.3 | 14.8 | 13.4 | 7.0 | 8.5 |

**Notes:**

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

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

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 one (1) complaint received from EPD on 24 November 2017 regarding construction dust nuisance at Hong Kong Boundary Crossing Facilities of Hong Kong-Zhuhai-Macau Bridge Projects in the reporting period. Upon investigation, there is no evidence to indicate that the complaint case is related to this Contract.

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

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

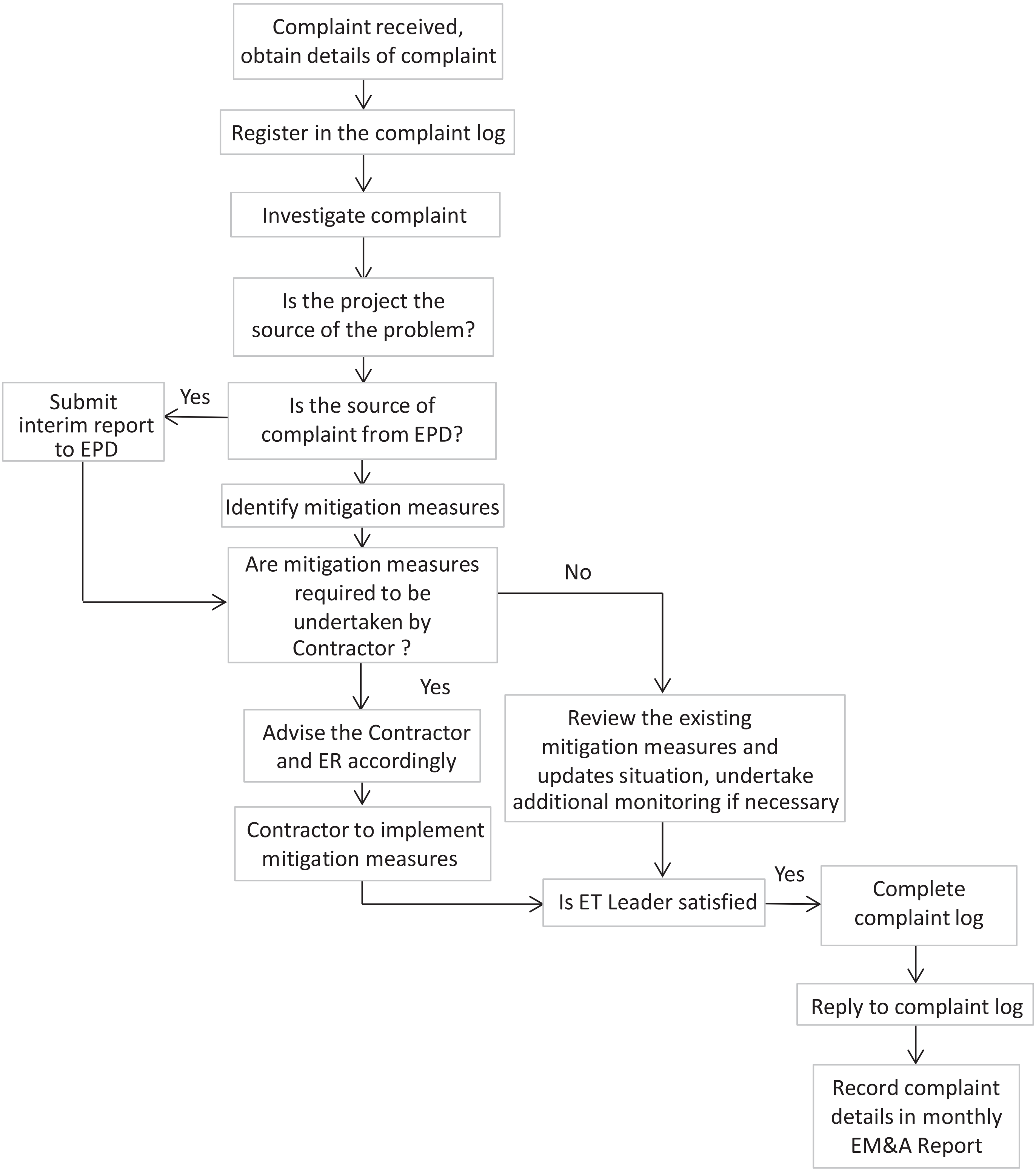



Figure 2.5

Environmental Complaint Handling Procedure

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

Environmental Resources Management

ERM

# 3 FUTURE KEY ISSUES

## 3.1 CONSTRUCTION ACTIVITIES FOR THE COMING QUARTER

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

December 2017

***Land-based Works***

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

January 2018

***Land-based Works***

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

February 2018

***Land-based Works***

- Pier construction;
- Re-alignment of Cheung Tung Road;

- Road works along North Lantau Highway;
- Installation of pier head and deck segments;
- Asphalt paving;
- Sign gantries construction;
- Parapet installation; and
- Slope work of Viaducts A, B, C & D.

### 3.2 *KEY ISSUES FOR THE COMING QUARTER*

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

### 3.3 *MONITORING SCHEDULE FOR THE COMING QUARTER*

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

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

# 4 CONCLUSIONS AND RECOMMENDATIONS

## 4.1 CONCLUSIONS

The Sixteenth Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 September to 30 November 2017, in accordance with the Updated EM&A Manual and the requirements of the *Environmental Permits* (*EP-354/2009/D* and *EP-353/2009/K*).

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

Ninety-one (91) Action Level of Dissolved Oxygen (DO) exceedances, eight (8) Action Level of Suspended Solids (SS) exceedances and one (1) Limit Level of Turbidity exceedance were recorded for water quality impact monitoring in the reporting period.

A total of thirteen (13) groups of fifty (50) Chinese White Dolphins were sighted during the six sets of survey from September to November 2017. One (1) Limit Level exceedance was recorded for the quarterly dolphin monitoring data between September to November 2017, no unacceptable impact from the activities of this Contract on Chinese White Dolphins was noticeable from the general observations. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

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

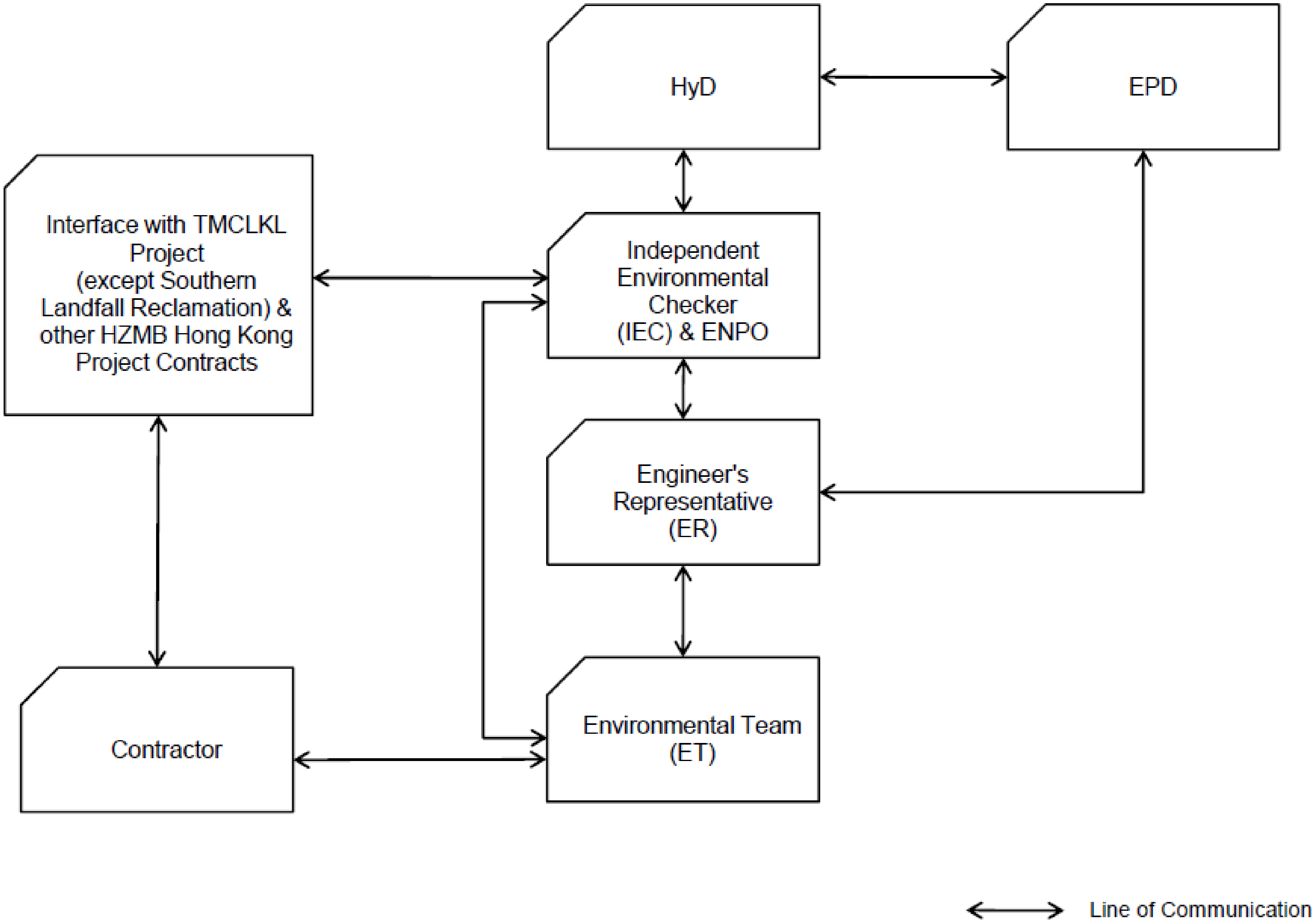
There was one (1) complaint received from EPD on 24 November 2017 regarding construction dust nuisance at Hong Kong Boundary Crossing Facilities of Hong Kong-Zhuhai-Macau Bridge Projects in the reporting period.

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

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

Appendix A

# Project Organization for Environmental Works




Appendix A1

DATE: 06/03/2013

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

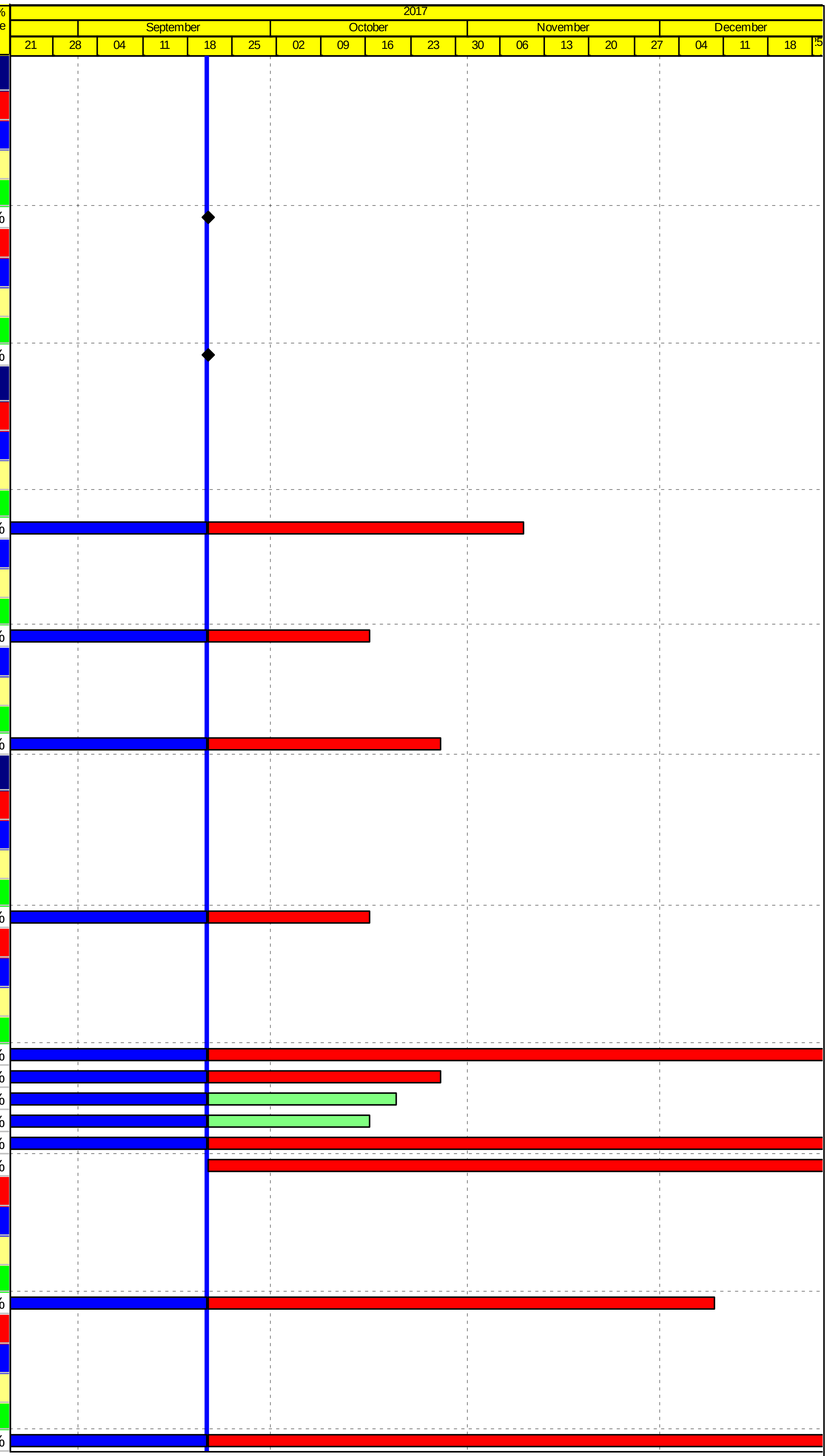
Environmental Resources Management

ERM

Appendix B

# Construction Programme for the Reporting Quarter

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Contract Milestones** | | | | | | | | | |
| **Key Dates for Completion** | | | | | | | | | |
| **Stage of the Works** | | | | | | | | | |
| **Completion Date** | | | | | | | | | |
| **General** | | | | | | | | | |
| KD03 | KD3 - Stage 3: TCSS Along NLH Near Viaduct C, D (EoT 8-Apr-16) | 0 | | 0 | 21-Sep-17* | | 08-Apr-16 | -530 | 0% |
| **Portion Handover Dates** | | | | | | | | | |
| **Possession of the Works Area** | | | | | | | | | |
| **Access Dates** | | | | | | | | | |
| **General** | | | | | | | | | |
| POS02-6B | Portion A - Area 6B (To be confirmed) | 0 | 21-Sep-17* | 0 | | 08-Jul-20 | | 1022 | 0% |
| **Design** | | | | | | | | | |
| **Detailed Design** | | | | | | | | | |
| **Slope Works Near Viaduct A** | | | | | | | | | |
| **Feature 9SE-B/FR8, B/R1, B/R2** | | | | | | | | | |
| **Slope Works Design** | | | | | | | | | |
| ARDD0596-1 | IC/SO Approval of Slope Combined AIP/DDA - CP11.01 | 60 | 13-Jun-17 A | 40 | 09-Nov-17 | 31-May-16 | 18-Jul-16 | -391 | 50% |
| **Slope Works Near Viaduct C** | | | | | | | | | |
| **Feature 10NW-C/C22, C/C26, C/C27, C/F13, C/F14, C/F15** | | | | | | | | | |
| **Slope Works Design** | | | | | | | | | |
| ARDD0589-2 | IC/SO Approval of Combined AIP/DDA - CP13.01 | 28 | 01-Jun-17 A | 20 | 16-Oct-17 | 26-Jul-16 | 17-Aug-16 | -345 | 90% |
| **Segment Target Geometry & Erection Engineering** | | | | | | | | | |
| **Viaduct F** | | | | | | | | | |
| **Design** | | | | | | | | | |
| ARDD0754-5 | Viaduct F - Issue Erection Manual | 30 | 26-Jun-17 A | 30 | 27-Oct-17 | 11-Nov-16 | 15-Dec-16 | -255 | 80% |
| **Procurement** | | | | | | | | | |
| **Precast Deck Segments** | | | | | | | | | |
| **Viaduct F - Bridge F1-F5** | | | | | | | | | |
| **Segment Manufacture** | | | | | | | | | |
| **General** | | | | | | | | | |
| MBFE0130-1 | F: Progressive Segment Manufacture (300 Nr) | 252 | 27-Oct-16 A | 20 | 16-Oct-17 | 16-Jan-17 | 10-Feb-17 | -202 | 95% |
| **Precast Parapets & Barriers** | | | | | | | | | |
| **Viaduct A to F** | | | | | | | | | |
| **Precast Parapet Manufacture** | | | | | | | | | |
| **General** | | | | | | | | | |
| PP6011-01 | Viaduct A - Precast Parapets/Barriers Production | 90 | 01-Sep-16 A | 90 | 10-Jan-18 | 12-Sep-16 | 30-Dec-16 | -304 | 55% |
| PP6011-02 | Viaduct B - Precast Parapets/Barriers Production | 120 | 03-May-16 A | 30 | 27-Oct-17 | 20-Sep-16 | 26-Oct-16 | -298 | 80% |
| PP6011-03 | Viaduct C - Precast Parapets/Barriers Production | 120 | 01-Apr-16 A | 24 | 20-Oct-17 | 09-Jun-20 | 08-Jul-20 | 801 | 90% |
| PP6011-04 | Viaduct D - Precast Parapets/Barriers Production | 120 | 01-Mar-16 A | 20 | 16-Oct-17 | 13-Jun-20 | 08-Jul-20 | 805 | 90% |
| PP6011-05 | Viaduct E - Precast Parapets/Barriers Production | 180 | 02-Jul-16 A | 156 | 04-Apr-18 | 16-May-16 | 18-Nov-16 | -404 | 40% |
| PP6011-06 | Viaduct F - Precast Parapets/Barriers Production | 198 | 21-Sep-17* | 198 | 26-May-18 | 18-Feb-17 | 18-Oct-17 | -176 | 0% |
| **Bearings** | | | | | | | | | |
| **Viaduct F** | | | | | | | | | |
| **Bearing Design & Manufacture** | | | | | | | | | |
| **General** | | | | | | | | | |
| PPBRF9 | Bearing Delivery - Viaduct F | 34 | 18-Jul-17 A | 66 | 09-Dec-17 | 16-Mar-17 | 08-Jun-17 | -154 | 30% |
| **Movement Joints** | | | | | | | | | |
| **Viaduct A to F** | | | | | | | | | |
| **MJ Design & Manufacture** | | | | | | | | | |
| **General** | | | | | | | | | |
| PP6MJ02-2 | Manufacture & delivery of MJ | 180 | 01-Apr-17 A | 126 | 24-Feb-18 | 21-Mar-16 | 23-Aug-16 | -446 | 80% |




Actual Work
Planned Bar
Critical Bar
Milestone

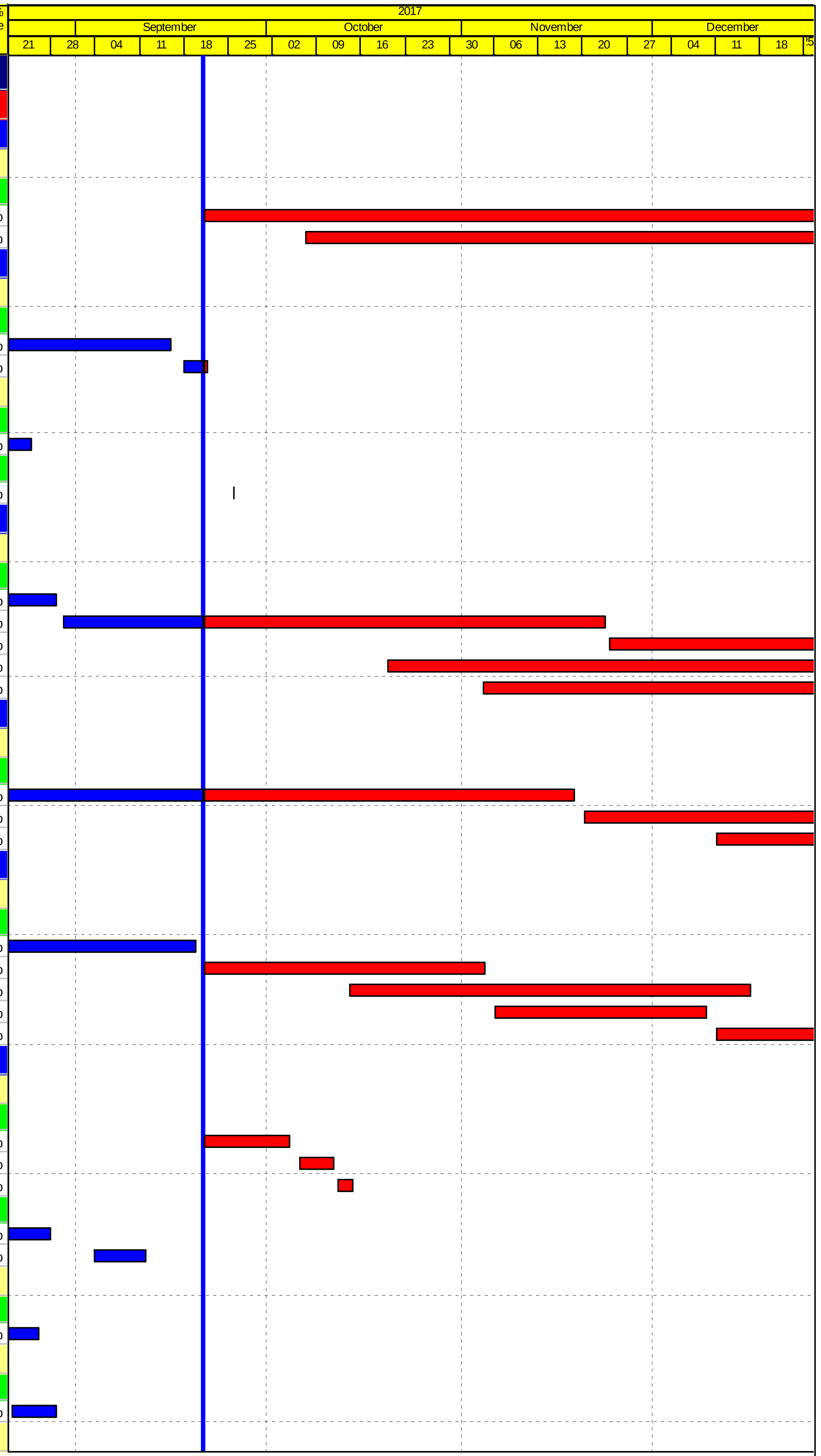
Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 1 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 01-Aug-17 | | PKN | HF |
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**
**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Construction** | | | | | | | | | |
| **Foundation & Substructure Works** | | | | | | | | | |
| **Ramp A** | | | | | | | | | |
| **Abutment & Approach Ramp A** | | | | | | | | | |
| **Ramp Structure** | | | | | | | | | |
| ARA-C6142 | Ramp A - Remaining RC Wall (Bay Wa2-Wa5 & Bay 9-12) with Backfill | 120 | 21-Sep-17 | 120 | 14-Feb-18 | 24-May-16 | 15-Oct-16 | -397 | 0% |
| ARA-C6150 | Ramp A - Backfill to Walls | 111 | 07-Oct-17 | 111 | 21-Feb-18 | 07-Jun-16 | 19-Oct-16 | -397 | 0% |
| **Viaduct B - Bridge B1** | | | | | | | | | |
| **Pier B17 (B1c)** | | | | | | | | | |
| **Pier Head Segment** | | | | | | | | | |
| B17-C5410 | B17 - PHS Diaphragm - Rebar, Formwork, Concreting | 22 | 21-Aug-17 A | 0 | 16-Sep-17 A | | | | 100% |
| B17-C5420 | B17 - PHS Diaphragm - Curing & Striking of Forms | 3 | 18-Sep-17 A | 1 | 21-Sep-17 | 08-Jun-16 | 08-Jun-16 | -384 | 0% |
| **Pier B18 (B1b)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| B18-C4210 | B18 - Pier Curing, Remove Formwork | 3 | 21-Aug-17 A | 0 | 25-Aug-17 A | | | | 100% |
| **Pier Head Segment** | | | | | | | | | |
| B18-C5310 | B18 - PHS Lift & Temp Support (1 seg) | 2 | 26-Sep-17 A | 0 | 26-Sep-17 A | | | | 100% |
| **Ramp B** | | | | | | | | | |
| **Abutment & Approach Ramp B** | | | | | | | | | |
| **Ramp Structure** | | | | | | | | | |
| ARB-C6120 | Ramp B - RE Wall - Panel Installation from 1st Row to 2nd Row | 66 | 12-Jun-17 A | 0 | 29-Aug-17 A | | | | 100% |
| ARB-C6130 | Ramp B - RE Wall - Panel Installation from 3rd Row to 6th Row | 66 | 30-Aug-17 A | 52 | 23-Nov-17 | 07-May-16 | 09-Jul-16 | -410 | 0% |
| ARB-C6135 | Ramp B - RE Wall - Panel installation from 7th Row to 11th Row | 72 | 24-Nov-17 | 72 | 22-Feb-18 | 11-Jul-16 | 04-Oct-16 | -410 | 0% |
| ARB-C6140 | Ramp B - RC Wall - Base Slab | 92 | 20-Oct-17 | 92 | 08-Feb-18 | 04-Jun-16 | 22-Sep-16 | -410 | 0% |
| ARB-C6150 | Ramp B - RC Wall - Side Wall | 92 | 04-Nov-17 | 92 | 26-Feb-18 | 20-Jun-16 | 07-Oct-16 | -410 | 0% |
| **Ramp C** | | | | | | | | | |
| **Abutment & Approach Ramp C** | | | | | | | | | |
| **Ramp Finishes, E&M & Roadworks** | | | | | | | | | |
| ARC-C7715 | Ramp C - Parapet Panels (Remaining) | 24 | 25-Apr-17 A | 48 | 18-Nov-17 | 07-May-16 | 05-Jul-16 | -410 | 85% |
| ARC-C7720 | Ramp C - Ducting, Gantry & TCSS Provisions (KD4) | 36 | 20-Nov-17 | 36 | 03-Jan-18 | 06-Jul-16 | 16-Aug-16 | -410 | 0% |
| ARC-C7810 | Ramp C - Drainage, Fire Main & E&M Services | 54 | 11-Dec-17 | 54 | 14-Feb-18 | 27-Jul-16 | 28-Sep-16 | -410 | 0% |
| **Ramp D** | | | | | | | | | |
| **Abutment & Approach Ramp D** | | | | | | | | | |
| **Ramp Finishes, E&M & Roadworks** | | | | | | | | | |
| ARD-C7710 | Ramp D - Parapet Panels | 42 | 15-Oct-16 A | 0 | 20-Sep-17 A | | | | 100% |
| ARD-C7720 | Ramp D - Ducting, Gantry & TCSS Provisions (KD4) | 36 | 21-Sep-17 | 36 | 04-Nov-17 | 02-Feb-16 | 17-Mar-16 | -484 | 0% |
| ARD-C7810 | Ramp D - Drainage, Fire Main & E&M Services | 54 | 14-Oct-17 | 54 | 16-Dec-17 | 26-Feb-16 | 04-May-16 | -484 | 0% |
| ARD-C7820 | Ramp D - Railings, Light Poles, Signs & Street Furniture | 30 | 06-Nov-17 | 30 | 09-Dec-17 | 18-Mar-16 | 26-Apr-16 | -484 | 0% |
| ARD-C7830 | Ramp D - Deck Paving & Roadmarking (KD14) | 18 | 11-Dec-17 | 18 | 03-Jan-18 | 27-Apr-16 | 19-May-16 | -484 | 0% |
| **Viaduct E - Bridge E5, E6, E7, E8** | | | | | | | | | |
| **Pier E12A (E8b)** | | | | | | | | | |
| **Pile Cap Dolphin** | | | | | | | | | |
| E12A-C3130 | E12A- Dolphin - Marine Pile Cap - Fixings, Dewatering & Trim Pile | 11 | 21-Sep-17* | 11 | 04-Oct-17 | 18-Sep-17 | 29-Sep-17 | -3 | 0% |
| E12A-C3150 | E12A - Dolphin - Marine Pile Cap - Rebar, Concreting | 5 | 06-Oct-17 | 5 | 11-Oct-17 | 30-Sep-17 | 07-Oct-17 | -3 | 0% |
| E12A-C3160 | E12A - Dolphin - Marine Pile Cap - CJ preparation & Curing | 3 | 12-Oct-17 | 3 | 14-Oct-17 | 09-Oct-17 | 11-Oct-17 | -3 | 0% |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E12A-C5145 | E12A - Install Infill Segments (6 nr) - THB | 26 | 07-Jul-17 A | 0 | 28-Aug-17 A | | | | 100% |
| E12A-C5150 | E12A - IFS Stitch & Remove Equipment | 12 | 04-Sep-17 A | 0 | 12-Sep-17 A | | | | 100% |
| **Pier E12B (E7b)** | | | | | | | | | |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E12B-C5150 | E12B - IFS Stitch & Remove Equipment | 12 | 14-Aug-17 A | 0 | 26-Aug-17 A | | | | 100% |
| **Pier E12C (E6b)** | | | | | | | | | |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E12C-C5150 | E12C - IFS Stitch & Remove Equipment | 12 | 22-Aug-17 A | 0 | 29-Aug-17 A | | | | 100% |
| **Pier E12D (E5b)** | | | | | | | | | |




Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

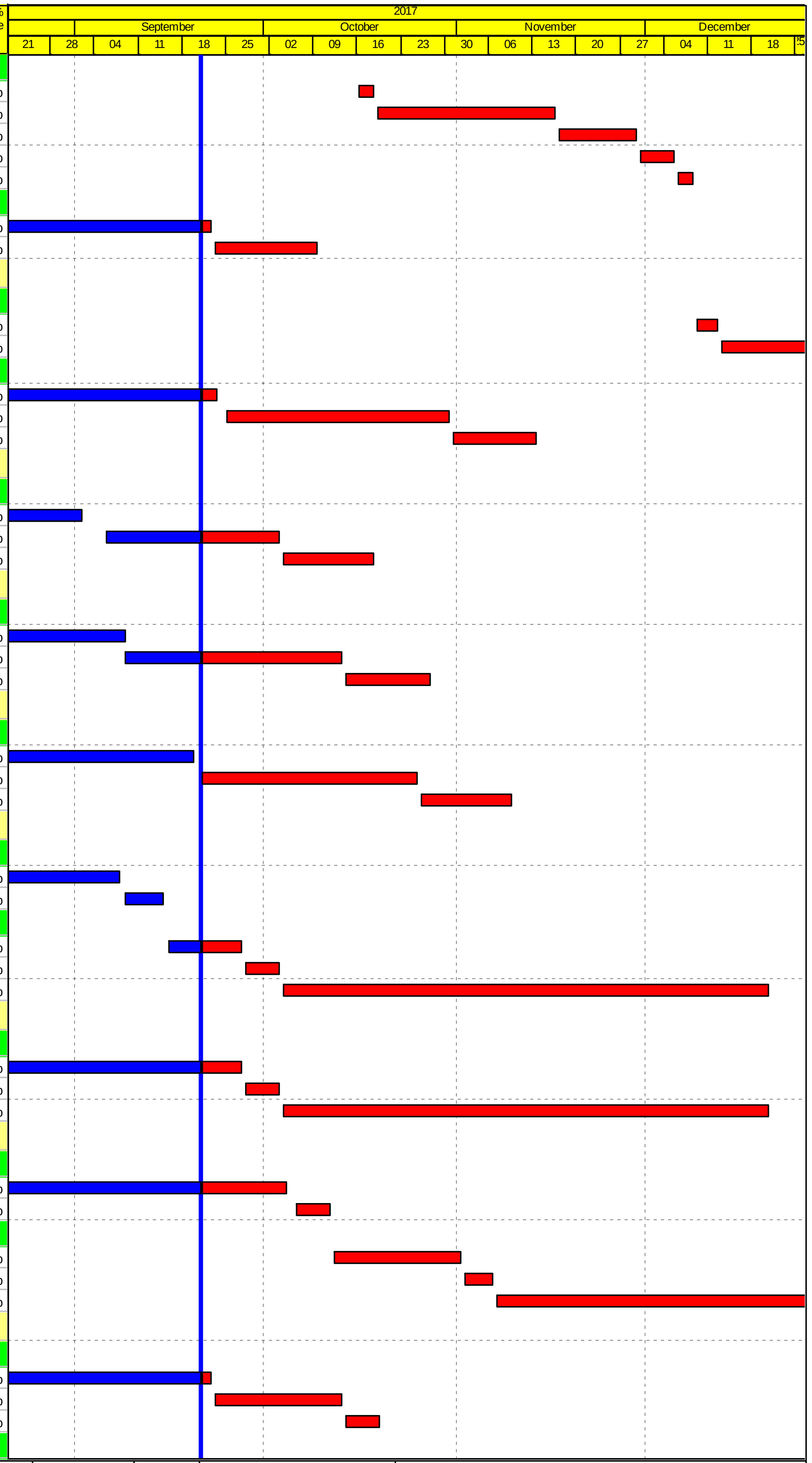
**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 2 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 01-Aug-17 | | PKN | HF |
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**

**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Pile Cap Dolphin** | | | | | | | | | |
| E12D-C3070 | E12D Dolphin - Marine Pile Cap - Collar frame to perm. casing of pile | 3 | 16-Oct-17* | 3 | 18-Oct-17 | 12-Oct-17 | 14-Oct-17 | -3 | 0% |
| E12D-C3080 | E12D Dolphin - Marine Pile Cap - Install precast shell in position | 24 | 19-Oct-17 | 24 | 16-Nov-17 | 16-Oct-17 | 13-Nov-17 | -3 | 0% |
| E12D-C3130 | E12D Dolphin - Marine Pile Cap - Fixings, Dewatering & Trim Pile | 11 | 17-Nov-17 | 11 | 29-Nov-17 | 14-Nov-17 | 25-Nov-17 | -3 | 0% |
| E12D-C3150 | E12D Dolphin - Marine Pile Cap - Rebar, Concreting | 5 | 30-Nov-17 | 5 | 05-Dec-17 | 27-Nov-17 | 01-Dec-17 | -3 | 0% |
| E12D-C3160 | E12D Dolphin - Marine Pile Cap - CJ preparation & Curing | 3 | 06-Dec-17 | 3 | 08-Dec-17 | 02-Dec-17 | 05-Dec-17 | -3 | 0% |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E12D-C5145 | E12D - Install Infill Segments (6 nr) - THB | 28 | 21-Aug-17 A | 2 | 22-Sep-17 | 20-Dec-16 | 21-Dec-16 | -222 | 0% |
| E12D-C5150 | E12D - IFS Stitch & Remove Equipment | 12 | 23-Sep-17 | 12 | 09-Oct-17 | 22-Dec-16 | 07-Jan-17 | -222 | 0% |
| **Pier E13A (E8c)** | | | | | | | | | |
| **Pile Cap Dolphin** | | | | | | | | | |
| E13A-C3070 | E13A Dolphin - Marine Pile Cap - Floating Seal & Casing Head Steelwork | 3 | 09-Dec-17 | 3 | 12-Dec-17 | 06-Dec-17 | 08-Dec-17 | -3 | 0% |
| E13A-C3080 | E13A Dolphin - Marine Pile Cap - Install precast shell in position | 24 | 13-Dec-17 | 24 | 12-Jan-18 | 09-Dec-17 | 09-Jan-18 | -3 | 0% |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E13A-C5140 | E13A - Remove Rail Beams, Spreader Beams, Brackets, Crane | 30 | 14-Aug-17 A | 3 | 23-Sep-17 | 02-May-17 | 05-May-17 | -119 | 0% |
| E13A-C5145 | E13A - Install Infill Segments (6 nr) - THB | 28 | 25-Sep-17 | 28 | 30-Oct-17 | 06-May-17 | 08-Jun-17 | -119 | 0% |
| E13A-C5150 | E13A - IFS Stitch & Remove Equipment | 12 | 31-Oct-17 | 12 | 13-Nov-17 | 09-Jun-17 | 22-Jun-17 | -119 | 0% |
| **Pier E13B (E7c)** | | | | | | | | | |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E13B-C5140 | E13B - Remove Rail Beams, Spreader Beams, Brackets | 16 | 28-Jul-17 A | 0 | 02-Sep-17 A | | | | 100% |
| E13B-C5145 | E13B - Install Infill Segments (6 nr) - THB | 42 | 06-Sep-17 A | 10 | 03-Oct-17 | 15-Dec-16 | 28-Dec-16 | -226 | 0% |
| E13B-C5150 | E13B - IFS Stitch & Remove Equipment | 12 | 04-Oct-17 | 12 | 18-Oct-17 | 29-Dec-16 | 12-Jan-17 | -226 | 0% |
| **Pier E13C (E6c)** | | | | | | | | | |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E13C-C5140 | E13C - Remove Rail Beams, Spreader Beams, Brackets | 16 | 08-Aug-17 A | 0 | 09-Sep-17 A | | | | 100% |
| E13C-C5145 | E13C - Install Infill Segments (6 nr) - THB | 42 | 09-Sep-17 A | 18 | 13-Oct-17 | 28-Dec-16 | 18-Jan-17 | -217 | 0% |
| E13C-C5150 | E13C - IFS Stitch & Remove Equipment | 12 | 14-Oct-17 | 12 | 27-Oct-17 | 19-Jan-17 | 04-Feb-17 | -217 | 0% |
| **Pier E13D (E5c)** | | | | | | | | | |
| **Pier Head Segment / Infill Segment** | | | | | | | | | |
| E13D-C5140 | E13D - Remove Rail Beams, Spreader Beams, Brackets, Crane | 16 | 12-Aug-17 A | 0 | 20-Sep-17 A | | | | 100% |
| E13D-C5145 | E13D - Install Infill Segments (6 nr) - THB | 28 | 21-Sep-17 | 28 | 25-Oct-17 | 19-Dec-16 | 23-Jan-17 | -223 | 0% |
| E13D-C5150 | E13D - IFS Stitch & Remove Equipment | 12 | 26-Oct-17 | 12 | 09-Nov-17 | 24-Jan-17 | 09-Feb-17 | -223 | 0% |
| **Pier E14A (E8d)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| E14A-C4510 | E14A Pier - Scaffold, Rebar, Formwork, Concrete (5th Lift) | 16 | 24-Jul-17 A | 0 | 08-Sep-17 A | | | | 100% |
| E14A-C4610 | E14A Pier - Curing, Remove Formwork | 5 | 09-Sep-17 A | 0 | 15-Sep-17 A | | | | 100% |
| **Pier Head Segment** | | | | | | | | | |
| E14A-C5110 | E14A Pier Head - Scaffold, Temp Works | 17 | 16-Sep-17 A | 6 | 27-Sep-17 | 13-Oct-16 | 19-Oct-16 | -280 | 40% |
| E14A-C5210 | E14A Pier Head - Erect PH Segment (2 nr) | 4 | 28-Sep-17 | 4 | 03-Oct-17 | 20-Oct-16 | 24-Oct-16 | -280 | 0% |
| E14A-C5310 | E14A Pier Head - Construct Diaphragm (2nd Cast) in PHS | 65 | 04-Oct-17 | 65 | 20-Dec-17 | 25-Oct-16 | 11-Jan-17 | -280 | 0% |
| **Pier E14B (E7d)** | | | | | | | | | |
| **Pier Head Segment** | | | | | | | | | |
| E14B-C5110 | E14B Pier Head - Scaffold, Temp Works | 17 | 09-Aug-17 A | 6 | 27-Sep-17 | 24-Oct-16 | 29-Oct-16 | -271 | 0% |
| E14B-C5210 | E14B Pier Head - Erect PH Segment (2 nr) | 4 | 28-Sep-17 | 4 | 03-Oct-17 | 31-Oct-16 | 03-Nov-16 | -271 | 0% |
| E14B-C5310 | E14B Pier Head - Construct Diaphragm (2nd Cast) in PHS | 65 | 04-Oct-17 | 65 | 20-Dec-17 | 04-Nov-16 | 21-Jan-17 | -271 | 0% |
| **Pier E14C (E6d)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| E14C-C4410 | E14C Pier - Scaffold, Rebar, Formwork, Concrete (4th Lift) | 18 | 27-Jun-17 A | 11 | 04-Oct-17 | 25-Feb-17 | 09-Mar-17 | -170 | 85% |
| E14C-C4510 | E14C Pier - Curing, Remove Formwork | 5 | 06-Oct-17 | 5 | 11-Oct-17 | 10-Mar-17 | 15-Mar-17 | -170 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| E14C-C5110 | E14C Pier Head - Scaffold, Temp Works | 17 | 12-Oct-17 | 17 | 01-Nov-17 | 16-Mar-17 | 05-Apr-17 | -170 | 0% |
| E14C-C5210 | E14C Pier Head - Erect PH Segment (2 nr) | 4 | 02-Nov-17 | 4 | 06-Nov-17 | 06-Apr-17 | 10-Apr-17 | -170 | 0% |
| E14C-C5310 | E14C Pier Head - Construct Diaphragm (2nd Cast) in PHS | 65 | 07-Nov-17 | 65 | 24-Jan-18 | 11-Apr-17 | 03-Jul-17 | -170 | 0% |
| **Pier E14D (E5d)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| E14D-C4310 | E14D Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 16 | 18-Jul-17 A | 2 | 22-Sep-17 | 15-Sep-16 | 17-Sep-16 | -301 | 95% |
| E14D-C4410 | E14D Pier - Scaffold, Rebar, Formwork, Concrete (4th Lift) | 16 | 23-Sep-17 | 16 | 13-Oct-17 | 19-Sep-16 | 07-Oct-16 | -301 | 0% |
| E14D-C4510 | E14D Pier - Curing, Remove Formwork | 5 | 14-Oct-17 | 5 | 19-Oct-17 | 08-Oct-16 | 14-Oct-16 | -301 | 0% |
| **Pier Head Segment** | | | | | | | | | |




Actual Work
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Layout: J3518-DWP-3MRP Submission - M52
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**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 3 of 10 Pages)**
**(Progress as of 21-Sep-17)**

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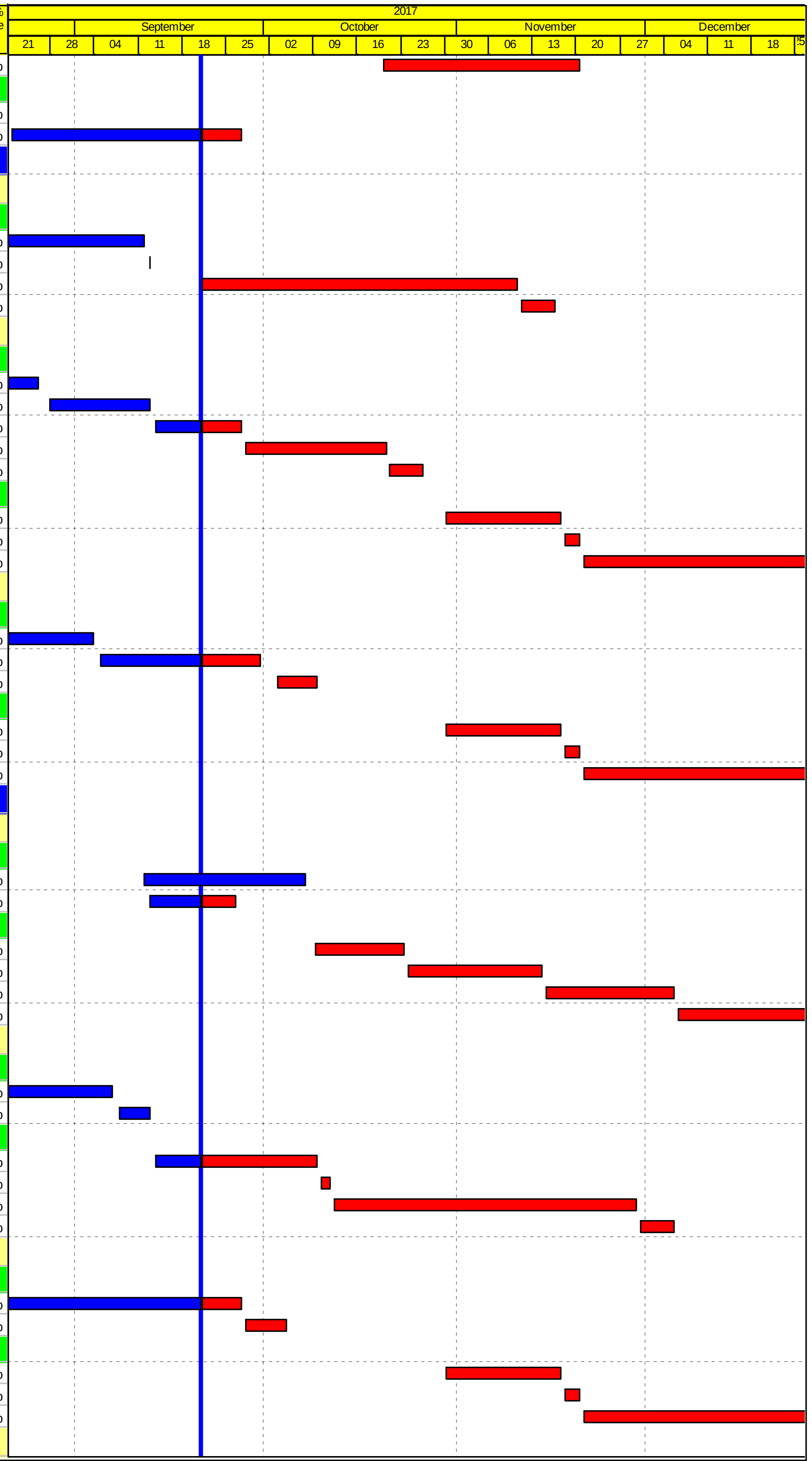
**DWG. No.:**
**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| E14D-C5110 | E14D Pier Head - Erect Steel Temp Tower on E14D | 26 | 20-Oct-17 | 26 | 20-Nov-17 | 15-Oct-16 | 14-Nov-16 | -301 | 0% |
| **Temporary Tower Between Pier E14D & E13D** | | | | | | | | | |
| E14D-C5730 | E14D-E13D Temp Tower - Reinstate Rock Armour | 18 | 03-Aug-17 A | 0 | 21-Aug-17 A | | | | 100% |
| E14D-C5740 | E14D-E13D Temp Tower - Erect Steel Tower | 28 | 22-Aug-17 A | 6 | 27-Sep-17 | 18-Nov-16 | 24-Nov-16 | -249 | 90% |
| **Viaduct F - Bridge F1** | | | | | | | | | |
| **Pier F1 (F1b)** | | | | | | | | | |
| **Pier Head Segment** | | | | | | | | | |
| F01-C5110 | F1 Pier Head - Scaffold, Temp Works | 17 | 21-Aug-17 A | 0 | 12-Sep-17 A | | | | 100% |
| F01-C5210 | F1 Pier Head - Erect PH Segment (1 nr) | 2 | 13-Sep-17 A | 0 | 13-Sep-17 A | | | | 100% |
| F01-C5310 | F1 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 21-Sep-17 | 41 | 10-Nov-17 | 16-Nov-16 | 05-Jan-17 | -251 | 0% |
| F01-C5410 | F1 Pier Head - Curing, Remove Temp Works | 5 | 11-Nov-17 | 5 | 16-Nov-17 | 06-Jan-17 | 11-Jan-17 | -251 | 0% |
| **Pier F2 (F1c)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F02-C4210 | F2 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 16-Aug-17 A | 0 | 26-Aug-17 A | | | | 100% |
| F02-C4310 | F2 Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 18 | 28-Aug-17 A | 0 | 13-Sep-17 A | | | | 100% |
| F02-C4410 | F2 Pier - Scaffold, Rebar, Formwork, Concrete (4th Lift) | 18 | 14-Sep-17 A | 6 | 27-Sep-17 | 12-Nov-16 | 18-Nov-16 | -254 | 75% |
| F02-C4510 | F2 Pier - Scaffold, Rebar, Formwork, Concrete (5th Lift) | 18 | 28-Sep-17 | 18 | 20-Oct-17 | 19-Nov-16 | 09-Dec-16 | -254 | 0% |
| F02-C4610 | F2 Pier - Curing, Remove Formwork | 5 | 21-Oct-17 | 5 | 26-Oct-17 | 10-Dec-16 | 15-Dec-16 | -254 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F02-C5110 | F2 Pier Head - Scaffold, Temp Works | 17 | 30-Oct-17 | 17 | 17-Nov-17 | 16-Dec-16 | 07-Jan-17 | -255 | 0% |
| F02-C5210 | F2 Pier Head - Erect PH Segment (1 nr) | 2 | 18-Nov-17 | 2 | 20-Nov-17 | 09-Jan-17 | 10-Jan-17 | -255 | 0% |
| F02-C5310 | F2 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 21-Nov-17 | 41 | 10-Jan-18 | 11-Jan-17 | 02-Mar-17 | -255 | 0% |
| **Pier F3 (F1d)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F03-C4310 | F3 Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 18 | 19-Aug-17 A | 0 | 04-Sep-17 A | | | | 100% |
| F03-C4410 | F3 Pier - Scaffold, Rebar, Formwork, Concrete (4th Lift) | 18 | 05-Sep-17 A | 9 | 30-Sep-17 | 08-Feb-17 | 17-Feb-17 | -185 | 55% |
| F03-C4510 | F3 Pier - Curing, Remove Formwork | 5 | 03-Oct-17 | 5 | 09-Oct-17 | 18-Feb-17 | 23-Feb-17 | -185 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F03-C5110 | F3 Pier Head - Scaffold, Temp Works | 17 | 30-Oct-17 | 17 | 17-Nov-17 | 24-Feb-17 | 15-Mar-17 | -201 | 0% |
| F03-C5210 | F3 Pier Head - Erect PH Segment (1 nr) | 2 | 18-Nov-17 | 2 | 20-Nov-17 | 16-Mar-17 | 17-Mar-17 | -201 | 0% |
| F03-C5310 | F3 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 21-Nov-17 | 41 | 10-Jan-18 | 18-Mar-17 | 11-May-17 | -201 | 0% |
| **Viaduct F - Bridge F2** | | | | | | | | | |
| **Pier F4 (F2b)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F04-C3210 | F4 Pile Cap - Blinding, Formwork, Rebar, Concrete | 19 | 12-Sep-17 A | 0 | 07-Oct-17 A | | | | 100% |
| F04-C3310 | F4 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 13-Sep-17 A | 5 | 26-Sep-17 | 25-Aug-17 | 30-Aug-17 | -23 | 40% |
| **Pier** | | | | | | | | | |
| F04-C4110 | F4 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 09-Oct-17* | 13 | 23-Oct-17 | 09-Sep-17 | 23-Sep-17 | -23 | 0% |
| F04-C4210 | F4 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 24-Oct-17 | 18 | 14-Nov-17 | 25-Sep-17 | 17-Oct-17 | -23 | 0% |
| F04-C4310 | F4 Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 18 | 15-Nov-17 | 18 | 05-Dec-17 | 18-Oct-17 | 08-Nov-17 | -23 | 0% |
| F04-C4410 | F4 Pier - Scaffold, Rebar, Formwork, Concrete (4th Lift) | 18 | 06-Dec-17 | 18 | 28-Dec-17 | 09-Nov-17 | 29-Nov-17 | -23 | 0% |
| **Pier F5 (F2c)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F05-C4310 | F5 Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 18 | 29-Jul-17 A | 0 | 07-Sep-17 A | | | | 100% |
| F05-C4410 | F5 Pier - Curing, Remove Formwork | 5 | 08-Sep-17 A | 0 | 13-Sep-17 A | | | | 100% |
| **Pier Head Segment** | | | | | | | | | |
| F05-C5110 | F5 Pier Head - Scaffold, Temp Works | 17 | 14-Sep-17 A | 14 | 09-Oct-17 | 28-Oct-16 | 12-Nov-16 | -267 | 20% |
| F05-C5210 | F5 Pier Head - Erect PH Segment (1 nr) | 2 | 10-Oct-17 | 2 | 11-Oct-17 | 14-Nov-16 | 15-Nov-16 | -267 | 0% |
| F05-C5310 | F5 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 12-Oct-17 | 41 | 29-Nov-17 | 16-Nov-16 | 05-Jan-17 | -267 | 0% |
| F05-C5410 | F5 Pier Head - Curing, Remove Temp Works | 5 | 30-Nov-17 | 5 | 05-Dec-17 | 06-Jan-17 | 11-Jan-17 | -267 | 0% |
| **Pier F6 (F2d)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F06-C4210 | F6 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 06-Jul-17 A | 6 | 27-Sep-17 | 03-Jun-17 | 09-Jun-17 | -93 | 60% |
| F06-C4310 | F6 Pier - Curing, Remove Formwork | 5 | 28-Sep-17 | 5 | 04-Oct-17 | 10-Jun-17 | 15-Jun-17 | -93 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F06-C5110 | F6 Pier Head - Scaffold, Temp Works | 17 | 30-Oct-17* | 17 | 17-Nov-17 | 16-Jun-17 | 06-Jul-17 | -112 | 0% |
| F06-C5210 | F6 Pier Head - Erect PH Segment (1 nr) | 2 | 18-Nov-17 | 2 | 20-Nov-17 | 07-Jul-17 | 08-Jul-17 | -112 | 0% |
| F06-C5310 | F6 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 21-Nov-17 | 41 | 10-Jan-18 | 10-Jul-17 | 25-Aug-17 | -112 | 0% |
| **Pier F7 (F2e)** | | | | | | | | | |




Actual Work
Planned Bar
Critical Bar
Milestone

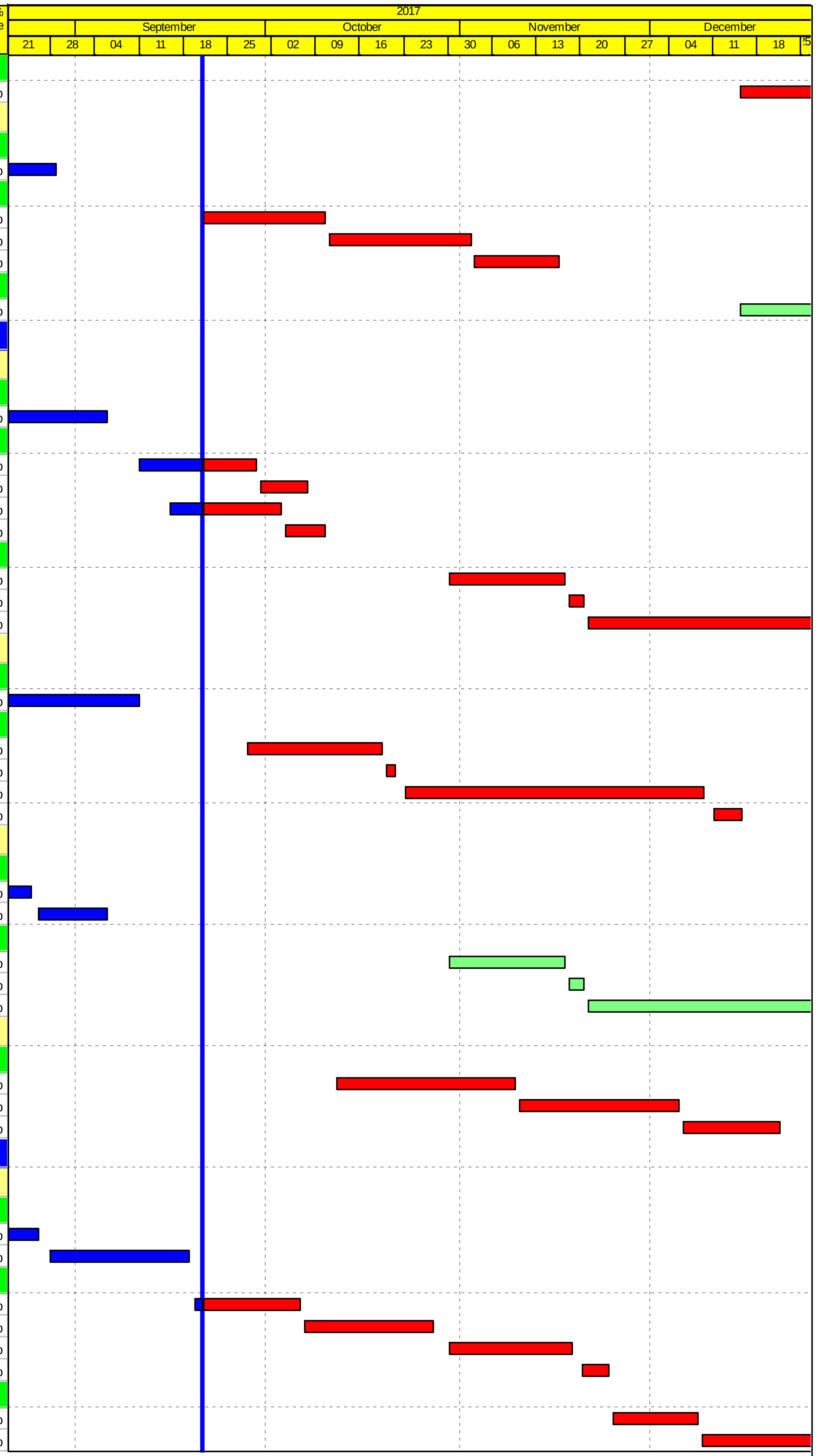
Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 4 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 01-Aug-17 | | PKN | HF |
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**
**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Pier Head Segment** | | | | | | | | | |
| F07-C5110 | F7 Pier Head - Scaffold, Temp Works | 17 | 15-Dec-17* | 17 | 06-Jan-18 | 16-Nov-17 | 05-Dec-17 | -25 | 0% |
| **Pier F8 (F2f)** | | | | | | | | | |
| **Foundation - Bored Piles** | | | | | | | | | |
| F08-C2210 | F8 Fr PIle - Curing & Sonic Test | 18 | 05-Aug-17 A | 0 | 29-Aug-17 A | | | | 100% |
| **Pile Cap** | | | | | | | | | |
| F08-C3110 | F8 Pile Cap - Excavate, Break Pile Head | 15 | 21-Sep-17* | 15 | 10-Oct-17 | 24-Aug-17 | 09-Sep-17 | -24 | 0% |
| F08-C3210 | F8 Pile Cap - Blinding, Formwork, Rebar, Concrete | 19 | 11-Oct-17 | 19 | 02-Nov-17 | 11-Sep-17 | 03-Oct-17 | -24 | 0% |
| F08-C3310 | F8 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 03-Nov-17 | 12 | 16-Nov-17 | 04-Oct-17 | 18-Oct-17 | -24 | 0% |
| **Pier** | | | | | | | | | |
| F08-C4110 | F8 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 15-Dec-17* | 13 | 02-Jan-18 | 22-Dec-17 | 09-Jan-18 | 6 | 0% |
| **Viaduct F - Bridge F3** | | | | | | | | | |
| **Pier F9 (F3d)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F09-C3310 | F9 Pile Cap - Curing, Remove Formwork, Backfill | 14 | 19-Aug-17 A | 0 | 06-Sep-17 A | | | | 100% |
| **Pier** | | | | | | | | | |
| F09-C4110 | F9 Pier - Scaffold, Rebar, Formwork, Concrete (Pier A) | 13 | 11-Sep-17 A | 8 | 29-Sep-17 | 05-Sep-17 | 13-Sep-17 | -14 | 0% |
| F09-C4210 | F9 Pier - Curing, Remove Formwork (Pier A) | 5 | 30-Sep-17 | 5 | 07-Oct-17 | 14-Sep-17 | 19-Sep-17 | -14 | 0% |
| F09-C4310 | F9 Pier - Scaffold, Rebar, Formwork, Concrete (Pier B) | 13 | 16-Sep-17 A | 10 | 03-Oct-17 | 02-Sep-17 | 13-Sep-17 | -16 | 20% |
| F09-C4410 | F9 Pier - Curing, Remove Formwork (Pier B) | 5 | 04-Oct-17 | 5 | 10-Oct-17 | 14-Sep-17 | 19-Sep-17 | -16 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F09-C5110 | F9 Pier Head - Scaffold, Temp Works | 17 | 30-Oct-17 | 17 | 17-Nov-17 | 20-Sep-17 | 11-Oct-17 | -31 | 0% |
| F09-C5210 | F9 Pier Head - Erect PH Segment (2 nr) | 2 | 18-Nov-17 | 2 | 20-Nov-17 | 12-Oct-17 | 13-Oct-17 | -31 | 0% |
| F09-C5310 | F9 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 21-Nov-17 | 41 | 10-Jan-18 | 14-Oct-17 | 01-Dec-17 | -31 | 0% |
| **Pier F10 (F3c)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F10-C4210 | F10 Pier - Curing, Remove Formwork (Pier A) | 5 | 02-Aug-17 A | 0 | 11-Sep-17 A | | | | 100% |
| **Pier Head Segment** | | | | | | | | | |
| F10-C5110 | F10 Pier Head - Scaffold, Temp Works | 17 | 28-Sep-17* | 17 | 19-Oct-17 | 20-Sep-17 | 11-Oct-17 | -7 | 0% |
| F10-C5210 | F10 Pier Head - Erect PH Segment (2 nr) | 2 | 20-Oct-17 | 2 | 21-Oct-17 | 12-Oct-17 | 13-Oct-17 | -7 | 0% |
| F10-C5310 | F10 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 23-Oct-17 | 41 | 09-Dec-17 | 14-Oct-17 | 01-Dec-17 | -7 | 0% |
| F10-C5410 | F10 Pier Head - Curing, Remove Temp Works | 5 | 11-Dec-17 | 5 | 15-Dec-17 | 02-Dec-17 | 07-Dec-17 | -7 | 0% |
| **Pier F11 (F3b)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F11-C4310 | F11 Pier - Scaffold, Rebar, Formwork, Concrete (Pier B) | 13 | 17-Jul-17 A | 0 | 25-Aug-17 A | | | | 100% |
| F11-C4410 | F11 Pier - Curing, Remove Formwork (Pier B) | 5 | 26-Aug-17 A | 0 | 06-Sep-17 A | | | | 100% |
| **Pier Head Segment** | | | | | | | | | |
| F11-C5110 | F11 Pier Head - Scaffold, Temp Works | 17 | 30-Oct-17 | 17 | 17-Nov-17 | 14-Dec-17 | 05-Jan-18 | 39 | 0% |
| F11-C5210 | F11 Pier Head - Erect PH Segment (2 nr) | 2 | 18-Nov-17 | 2 | 20-Nov-17 | 06-Jan-18 | 08-Jan-18 | 39 | 0% |
| F11-C5310 | F11 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 21-Nov-17 | 41 | 10-Jan-18 | 09-Jan-18 | 28-Feb-18 | 39 | 0% |
| **Pier F12 (F3a)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F12-C3110 | F12 Pile Cap - Excavate, Break Pile Head | 24 | 12-Oct-17* | 24 | 09-Nov-17 | 08-Aug-17 | 04-Sep-17 | -54 | 0% |
| F12-C3210 | F12 Pile Cap - Blinding, Formwork, Rebar, Concrete | 22 | 10-Nov-17 | 22 | 05-Dec-17 | 05-Sep-17 | 29-Sep-17 | -54 | 0% |
| F12-C3310 | F12 Pile Cap - Curing, Remove Formwork, Backfill | 14 | 06-Dec-17 | 14 | 21-Dec-17 | 30-Sep-17 | 18-Oct-17 | -54 | 0% |
| **Viaduct F - Bridge F4** | | | | | | | | | |
| **Pier F16 (F5a/F4a)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F16-C3210 | F16 Pile Cap - Blinding, Formwork, Rebar, Concrete | 19 | 01-Aug-17 A | 0 | 26-Aug-17 A | | | | 100% |
| F16-C3310 | F16 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 28-Aug-17 A | 0 | 19-Sep-17 A | | | | 100% |
| **Pier** | | | | | | | | | |
| F16-C4110 | F16 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 20-Sep-17 A | 12 | 06-Oct-17 | 26-May-17 | 09-Jun-17 | -99 | 0% |
| F16-C4210 | F16 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 07-Oct-17 | 18 | 27-Oct-17 | 10-Jun-17 | 30-Jun-17 | -99 | 0% |
| F16-C4310 | F16 Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 18 | 30-Oct-17 | 18 | 18-Nov-17 | 03-Jul-17 | 22-Jul-17 | -99 | 0% |
| F16-C4410 | F16 Pier - Curing, Remove Temp Works | 5 | 20-Nov-17 | 5 | 24-Nov-17 | 24-Jul-17 | 28-Jul-17 | -99 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F16-C5110 | F16 Pier Head - Construct Footing for Falsework | 12 | 25-Nov-17 | 12 | 08-Dec-17 | 29-Jul-17 | 11-Aug-17 | -99 | 0% |
| F16-C5210 | F16 Pier Head - Erect Falsework & Temp Platform | 45 | 09-Dec-17 | 45 | 02-Feb-18 | 12-Aug-17 | 04-Oct-17 | -99 | 0% |




Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
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 5 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
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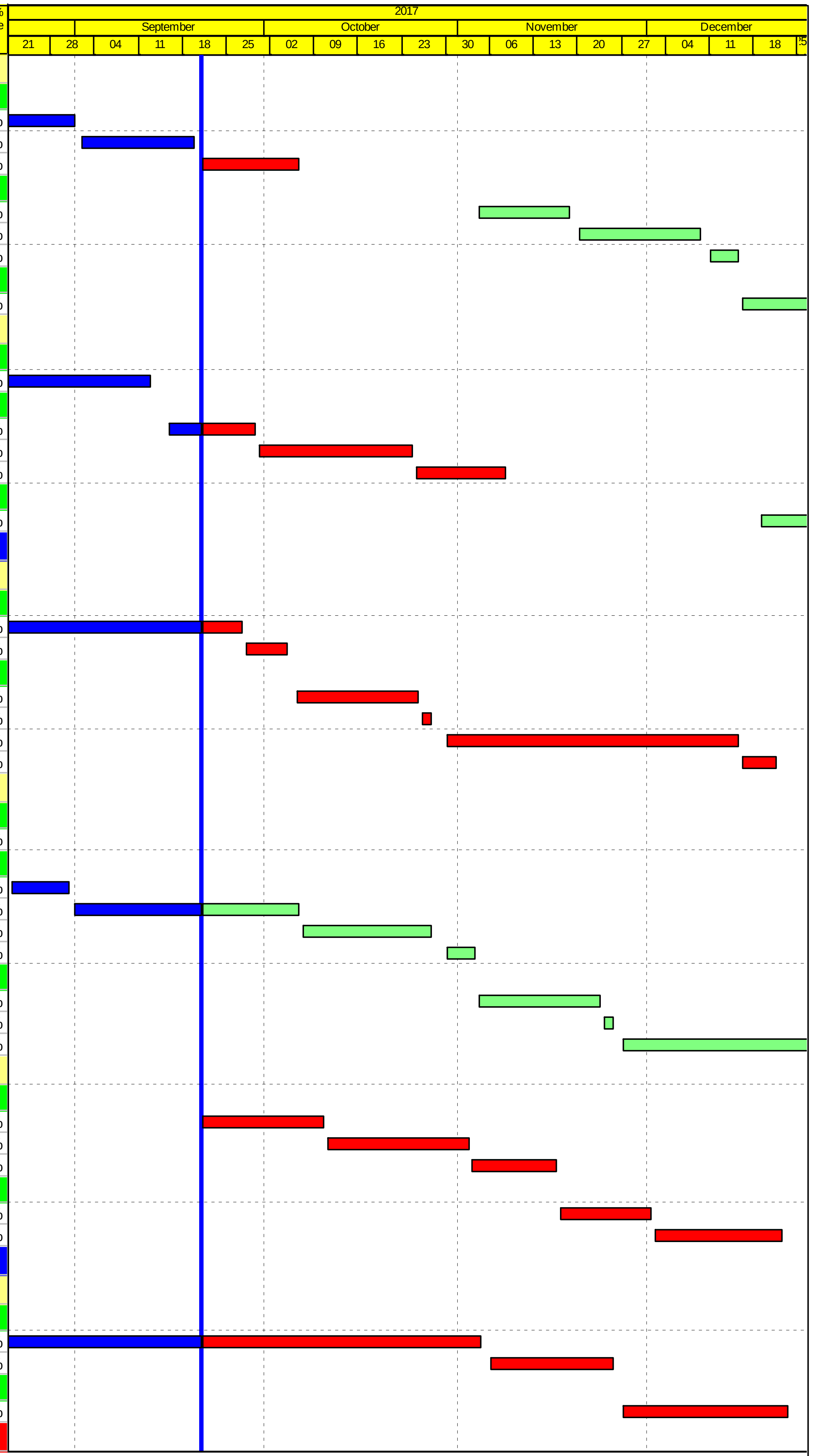
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**

**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Pier F17 (F4b)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F17-C3110 | F17 Pile Cap - Excavate, Break Pile Head | 15 | 09-Aug-17 A | 0 | 01-Sep-17 A | | | | 100% |
| F17-C3210 | F17 Pile Cap - Blinding, Formwork, Rebar, Concrete | 19 | 02-Sep-17 A | 0 | 20-Sep-17 A | | | | 100% |
| F17-C3310 | F17 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 21-Sep-17 | 12 | 06-Oct-17 | 27-May-17 | 10-Jun-17 | -98 | 0% |
| **Pier** | | | | | | | | | |
| F17-C4110 | F17 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 04-Nov-17* | 13 | 18-Nov-17 | 15-Nov-17 | 29-Nov-17 | 9 | 0% |
| F17-C4210 | F17 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 20-Nov-17 | 18 | 09-Dec-17 | 30-Nov-17 | 20-Dec-17 | 9 | 0% |
| F17-C4310 | F17 Pier - Curing, Remove Temp Works | 5 | 11-Dec-17 | 5 | 15-Dec-17 | 21-Dec-17 | 28-Dec-17 | 9 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F17-C5110 | F17 Pier Head - Scaffold, Temp Works | 17 | 16-Dec-17 | 17 | 08-Jan-18 | 29-Dec-17 | 18-Jan-18 | 9 | 0% |
| **Pier F18 (F4c)** | | | | | | | | | |
| **Foundation - Bored Piles** | | | | | | | | | |
| F18-C2210 | F18 Fr PIle - Curing & Sonic Test | 18 | 19-Jul-17 A | 0 | 13-Sep-17 A | | | | 100% |
| **Pile Cap** | | | | | | | | | |
| F18-C3110 | F18 Pile Cap - Excavate, Break Pile Head | 15 | 16-Sep-17 A | 8 | 29-Sep-17 | 01-Sep-17 | 09-Sep-17 | -17 | 50% |
| F18-C3210 | F18 Pile Cap - Blinding, Formwork, Rebar, Concrete | 19 | 30-Sep-17 | 19 | 24-Oct-17 | 11-Sep-17 | 03-Oct-17 | -17 | 0% |
| F18-C3310 | F18 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 25-Oct-17 | 12 | 08-Nov-17 | 04-Oct-17 | 18-Oct-17 | -17 | 0% |
| **Pier** | | | | | | | | | |
| F18-C4110 | F18 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 19-Dec-17* | 13 | 05-Jan-18 | 29-Dec-17 | 13-Jan-18 | 7 | 0% |
| **Viaduct F - Bridge F5** | | | | | | | | | |
| **Pier F13 (F5d)** | | | | | | | | | |
| **Pier** | | | | | | | | | |
| F13-C4210 | F13 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 10-Aug-17 A | 6 | 27-Sep-17 | 03-Mar-17 | 09-Mar-17 | -165 | 50% |
| F13-C4310 | F13 Pier - Curing, Remove Formwork | 5 | 28-Sep-17 | 5 | 04-Oct-17 | 10-Mar-17 | 15-Mar-17 | -165 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F13-C5110 | F13 Pier Head - Scaffold, Temp Works | 17 | 06-Oct-17 | 17 | 25-Oct-17 | 16-Mar-17 | 05-Apr-17 | -165 | 0% |
| F13-C5210 | F13 Pier Head - Erect PH Segment (1 nr) | 2 | 26-Oct-17 | 2 | 27-Oct-17 | 06-Apr-17 | 07-Apr-17 | -165 | 0% |
| F13-C5310 | F13 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 30-Oct-17 | 41 | 15-Dec-17 | 08-Apr-17 | 01-Jun-17 | -165 | 0% |
| F13-C5410 | F13 Pier Head - Curing, Remove Temp Works | 5 | 16-Dec-17 | 5 | 21-Dec-17 | 02-Jun-17 | 07-Jun-17 | -165 | 0% |
| **Pier F14 (F5c)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F14-C3310 | F14 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 10-Aug-17 A | 0 | 21-Aug-17 A | | | | 100% |
| **Pier** | | | | | | | | | |
| F14-C4110 | F14 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 22-Aug-17 A | 0 | 31-Aug-17 A | | | | 100% |
| F14-C4210 | F14 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 01-Sep-17 A | 12 | 06-Oct-17 | 18-Oct-17 | 01-Nov-17 | 21 | 65% |
| F14-C4310 | F14 Pier - Scaffold, Rebar, Formwork, Concrete (3rd Lift) | 18 | 07-Oct-17 | 18 | 27-Oct-17 | 02-Nov-17 | 22-Nov-17 | 21 | 0% |
| F14-C4410 | F14 Pier - Curing, Remove Formwork | 5 | 30-Oct-17 | 5 | 03-Nov-17 | 23-Nov-17 | 28-Nov-17 | 21 | 0% |
| **Pier Head Segment** | | | | | | | | | |
| F14-C5110 | F14 Pier Head - Scaffold, Temp Works | 17 | 04-Nov-17 | 17 | 23-Nov-17 | 29-Nov-17 | 18-Dec-17 | 21 | 0% |
| F14-C5210 | F14 Pier Head - Erect PH Segment (1 nr) | 2 | 24-Nov-17 | 2 | 25-Nov-17 | 19-Dec-17 | 20-Dec-17 | 21 | 0% |
| F14-C5310 | F14 Pier Head - Construct Diaphragm (2nd Cast) in PHS | 41 | 27-Nov-17 | 41 | 16-Jan-18 | 21-Dec-17 | 09-Feb-18 | 21 | 0% |
| **Pier F15 (F5b)** | | | | | | | | | |
| **Pile Cap** | | | | | | | | | |
| F15-C3110 | F15 Pile Cap - Excavate, Break Pile Head | 15 | 21-Sep-17* | 15 | 10-Oct-17 | 31-Aug-17 | 16-Sep-17 | -18 | 0% |
| F15-C3210 | F15 Pile Cap - Blinding, Formwork, Rebar, Concrete | 19 | 11-Oct-17 | 19 | 02-Nov-17 | 18-Sep-17 | 11-Oct-17 | -18 | 0% |
| F15-C3310 | F15 Pile Cap - Curing, Remove Formwork, Backfill | 12 | 03-Nov-17 | 12 | 16-Nov-17 | 12-Oct-17 | 25-Oct-17 | -18 | 0% |
| **Pier** | | | | | | | | | |
| F15-C4110 | F15 Pier - Scaffold, Rebar, Formwork, Concrete (1st Lift) | 13 | 17-Nov-17* | 13 | 01-Dec-17 | 26-Oct-17 | 10-Nov-17 | -18 | 0% |
| F15-C4210 | F15 Pier - Scaffold, Rebar, Formwork, Concrete (2nd Lift) | 18 | 02-Dec-17 | 18 | 22-Dec-17 | 11-Nov-17 | 01-Dec-17 | -18 | 0% |
| **Ramp F** | | | | | | | | | |
| **Abutment & Approach Ramp F** | | | | | | | | | |
| **Foundation - Bored Piles** | | | | | | | | | |
| ARF-C2120 | Ramp F Fr Pile - Sleeve, Casing, Excavate, Rebar, Concrete (20 nr) | 126 | 19-May-17 A | 36 | 04-Nov-17 | 22-Mar-17 | 09-May-17 | -149 | 55% |
| ARF-C2210 | Ramp F Fr PIle - Curing & Sonic Test | 18 | 06-Nov-17 | 18 | 25-Nov-17 | 10-May-17 | 31-May-17 | -149 | 0% |
| **Ramp Structure** | | | | | | | | | |
| ARF-C6110 | Ramp F - Strip Beams | 24 | 27-Nov-17 | 24 | 23-Dec-17 | 01-Jun-17 | 28-Jun-17 | -149 | 0% |
| **Superstructure & Associated Works** | | | | | | | | | |




Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 6 of 10 Pages)**
**(Progress as of 21-Sep-17)**

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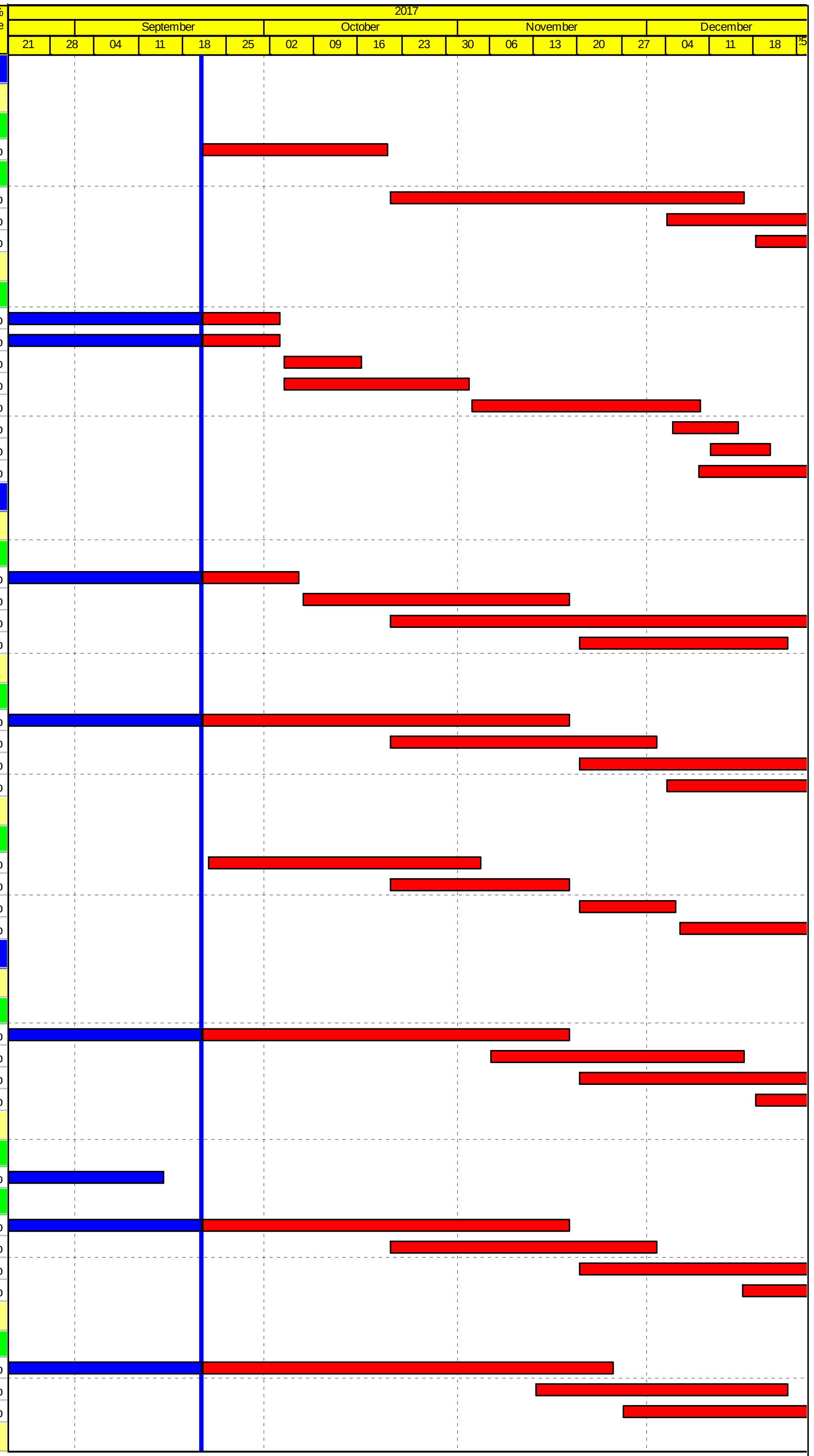
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**

**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Viaduct A** | | | | | | | | | |
| **Bridge A2** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| VA2-C6510 | Viaduct A2 - Final Stitch & Stressing to Span | 24 | 21-Sep-17 | 24 | 20-Oct-17 | 15-Aug-16 | 10-Sep-16 | -328 | 0% |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VA2-C7710 | Viaduct A2 - Parapet Panels | 48 | 21-Oct-17 | 48 | 16-Dec-17 | 12-Sep-16 | 09-Nov-16 | -328 | 0% |
| VA2-C7720 | Viaduct A2 - Gantry & TCSS Provisions (KD5) | 36 | 04-Dec-17 | 36 | 17-Jan-18 | 27-Oct-16 | 07-Dec-16 | -328 | 0% |
| VA2-C7810 | Viaduct A2 - Drainage, Fire Main & E&M Services | 60 | 18-Dec-17 | 60 | 03-Mar-18 | 10-Jan-17 | 23-Mar-17 | -279 | 0% |
| **Bridge A1** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| A06-C6320 | A6 - End Span to A7 (8 nr) - THB | 34 | 24-Feb-17 A | 10 | 03-Oct-17 | 03-Aug-16 | 13-Aug-16 | -338 | 75% |
| A08-C6510 | A8 - Cantilever Span (Remaining 21 nr) (MTR) - KF | 32 | 28-Jul-17 A | 10 | 03-Oct-17 | 19-Apr-16 | 29-Apr-16 | -425 | 50% |
| A09-C6310 | A9 - Cantilever Span (Initial 5 nr) - Crane | 10 | 04-Oct-17 | 10 | 16-Oct-17 | 30-Apr-16 | 12-May-16 | -425 | 0% |
| A09-C6410 | A9 - Relocate & Install KF (MTR) | 24 | 04-Oct-17 | 24 | 02-Nov-17 | 30-Apr-16 | 30-May-16 | -425 | 0% |
| A09-C6510 | A9 - Cantilever Span (Remaining 20 nr) (MTR) - KF | 32 | 03-Nov-17 | 32 | 09-Dec-17 | 31-May-16 | 08-Jul-16 | -425 | 0% |
| A10-C6310 | A10 - Cantilever Span (Initial 5 nr) - Crane | 10 | 05-Dec-17 | 10 | 15-Dec-17 | 04-Jul-16 | 14-Jul-16 | -425 | 0% |
| A10-C6410 | A10 - Relocate & Install KF | 9 | 11-Dec-17 | 9 | 20-Dec-17 | 09-Jul-16 | 19-Jul-16 | -425 | 0% |
| A11-C6210 | A11 - Falsework for End Span to A10 | 24 | 09-Dec-17 | 24 | 09-Jan-18 | 08-Jul-16 | 04-Aug-16 | -425 | 0% |
| **Viaduct B** | | | | | | | | | |
| **Bridge B3** | | | | | | | | | |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VB3-C7710 | Viaduct B3 - Parapet Panels | 48 | 16-Dec-16 A | 12 | 06-Oct-17 | 13-Oct-16 | 26-Oct-16 | -280 | 95% |
| VB3-C7720 | Viaduct B3 - Gantry & TCSS Provisions (KD5) | 36 | 07-Oct-17* | 36 | 18-Nov-17 | 27-Oct-16 | 07-Dec-16 | -280 | 0% |
| VB3-C7810 | Viaduct B3 - Drainage, Fire Main & E&M Services | 60 | 21-Oct-17 | 60 | 03-Jan-18 | 10-Jan-17 | 23-Mar-17 | -231 | 0% |
| VB3-C7820 | Viaduct B3 - Railings, Light Poles, Signs & Street Furniture | 30 | 20-Nov-17 | 30 | 23-Dec-17 | 10-Feb-17 | 16-Mar-17 | -231 | 0% |
| **Bridge B2** | | | | | | | | | |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VB2-C7710 | Viaduct B2 - Parapet Panels | 60 | 21-Aug-17 A | 48 | 18-Nov-17 | 27-Sep-16 | 23-Nov-16 | -292 | 0% |
| VB2-C7720 | Viaduct B2 - Gantry & TCSS Provisions (KD5) | 36 | 21-Oct-17 | 36 | 02-Dec-17 | 27-Oct-16 | 07-Dec-16 | -292 | 0% |
| VB2-C7810 | Viaduct B2 - Drainage, Fire Main & E&M Services | 48 | 20-Nov-17 | 48 | 17-Jan-18 | 24-Jan-17 | 23-Mar-17 | -243 | 0% |
| VB2-C7820 | Viaduct B2 - Railings, Light Poles, Signs & Street Furniture | 30 | 04-Dec-17 | 30 | 10-Jan-18 | 10-Feb-17 | 16-Mar-17 | -243 | 0% |
| **Bridge B1** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| B17-C6310 | B17 - Cantilever Span (26 nr) - Crane | 35 | 22-Sep-17 | 35 | 04-Nov-17 | 10-Jun-16 | 21-Jul-16 | -384 | 0% |
| B18-C6210 | B18 - Falsework for End Span to B11 | 24 | 21-Oct-17 | 24 | 18-Nov-17 | 08-Jul-16 | 04-Aug-16 | -384 | 0% |
| B18-C6310 | B18 - End Span to B17 (8 nr) - Crane | 14 | 20-Nov-17 | 14 | 05-Dec-17 | 05-Aug-16 | 20-Aug-16 | -384 | 0% |
| VB1-C6510 | Viaduct B1 - Final Stitch & Stressing to Span | 24 | 06-Dec-17 | 24 | 05-Jan-18 | 22-Aug-16 | 19-Sep-16 | -384 | 0% |
| **Viaduct C** | | | | | | | | | |
| **Bridge C4** | | | | | | | | | |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VC4-C7710 | Viaduct C4 - Parapet Panels | 48 | 12-Jun-17 A | 48 | 18-Nov-17 | 16-May-16 | 12-Jul-16 | -404 | 20% |
| VC4-C7720 | Viaduct C4 - Gantry & TCSS Provisions (KD4) | 36 | 06-Nov-17 | 36 | 16-Dec-17 | 28-Jun-16 | 09-Aug-16 | -404 | 0% |
| VC4-C7810 | Viaduct C4 - Drainage, Fire Main & E&M Services | 60 | 20-Nov-17 | 60 | 31-Jan-18 | 13-Jul-16 | 21-Sep-16 | -404 | 0% |
| VC4-C7820 | Viaduct C4 - Railings, Light Poles, Signs & Street Furniture | 30 | 18-Dec-17 | 30 | 24-Jan-18 | 10-Aug-16 | 13-Sep-16 | -404 | 0% |
| **Bridge C3** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| VC3-C6510 | Viaduct C3 - Final Stitch & Stressing to Span | 24 | 05-Aug-17 A | 0 | 15-Sep-17 A | | | | 100% |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VC3-C7710 | Viaduct C3 - Parapet Panels | 60 | 16-Aug-17 A | 48 | 18-Nov-17 | 30-May-16 | 26-Jul-16 | -392 | 0% |
| VC3-C7720 | Viaduct C3 - Gantry & TCSS Provisions (KD4) | 36 | 21-Oct-17 | 36 | 02-Dec-17 | 28-Jun-16 | 09-Aug-16 | -392 | 0% |
| VC3-C7810 | Viaduct C3 - Drainage, Fire Main & E&M Services | 48 | 20-Nov-17 | 48 | 17-Jan-18 | 27-Jul-16 | 21-Sep-16 | -392 | 0% |
| VC3-C7820 | Viaduct C3 - Railings, Light Poles, Signs & Street Furniture | 30 | 16-Dec-17 | 30 | 23-Jan-18 | 10-Aug-16 | 13-Sep-16 | -403 | 0% |
| **Bridge C2** | | | | | | | | | |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VC2-C7710 | Viaduct C2 - Parapet Panels | 48 | 13-Jun-17 A | 54 | 25-Nov-17 | 07-May-16 | 12-Jul-16 | -410 | 15% |
| VC2-C7720 | Viaduct C2 - Gantry & TCSS Provisions (KD4) | 36 | 13-Nov-17 | 36 | 23-Dec-17 | 28-Jun-16 | 09-Aug-16 | -410 | 0% |
| VC2-C7810 | Viaduct C2 - Drainage, Fire Main & E&M Services | 60 | 27-Nov-17 | 60 | 07-Feb-18 | 13-Jul-16 | 21-Sep-16 | -410 | 0% |
| **Bridge C1** | | | | | | | | | |




Actual Work
Planned Bar
Critical Bar
◆ Milestone

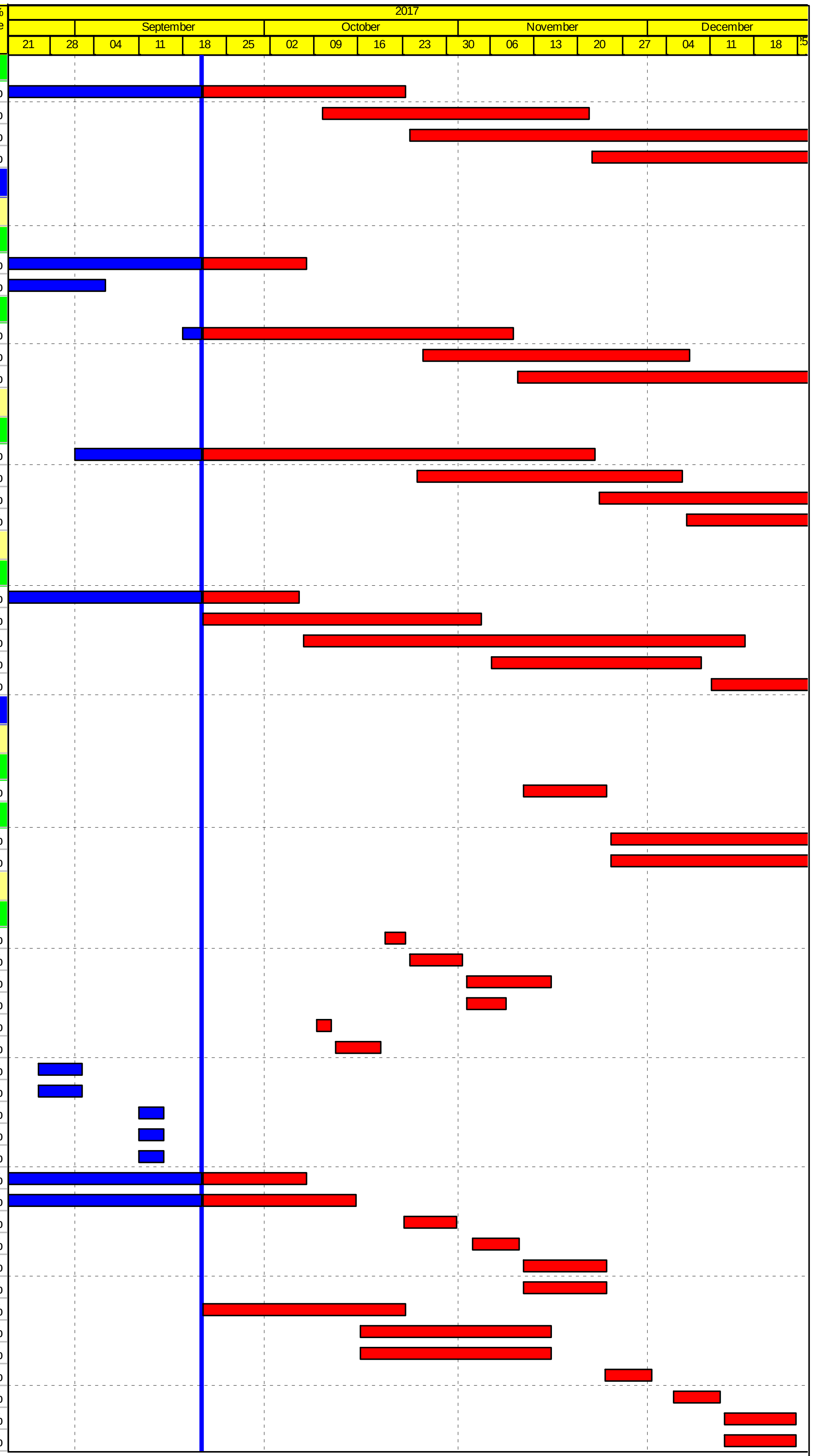
Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 7 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 01-Aug-17 | | PKN | HF |
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**
**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VC1-C7710 | Viaduct C1 - Parapet Panels | 48 | 31-May-17 A | 26 | 23-Oct-17 | 11-Jun-16 | 12-Jul-16 | -382 | 0% |
| VC1-C7720 | Viaduct C1 - Gantry & TCSS Provisions (KD4) | 36 | 10-Oct-17 | 36 | 21-Nov-17 | 28-Jun-16 | 09-Aug-16 | -382 | 0% |
| VC1-C7810 | Viaduct C1 - Drainage, Fire Main & E&M Services | 60 | 24-Oct-17 | 60 | 05-Jan-18 | 13-Jul-16 | 21-Sep-16 | -382 | 0% |
| VC1-C7820 | Viaduct C1 - Railings, Light Poles, Signs & Street Furniture | 30 | 22-Nov-17 | 30 | 28-Dec-17 | 10-Aug-16 | 13-Sep-16 | -382 | 0% |
| **Viaduct D** | | | | | | | | | |
| **Bridge D3** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| D06-C6610 | D6 - Launch LG1 from D6 to E2B for Dismantling | 18 | 07-Aug-17 A | 13 | 07-Oct-17 | 24-Mar-16 | 12-Apr-16 | -443 | 100% |
| VD3-C6510 | Viaduct D3 - Final Stitch & Stressing to Span | 24 | 09-Aug-17 A | 0 | 05-Sep-17 A | | | | 100% |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VD3-C7710 | Viaduct D3 - Parapet Panels | 48 | 18-Sep-17 A | 40 | 09-Nov-17 | 25-May-16 | 12-Jul-16 | -396 | 0% |
| VD3-C7720 | Viaduct D3 - Gantry & TCSS Provisions (KD4) | 36 | 26-Oct-17 | 36 | 07-Dec-17 | 28-Jun-16 | 09-Aug-16 | -396 | 0% |
| VD3-C7810 | Viaduct D3 - Drainage, Fire Main & E&M Services | 60 | 10-Nov-17 | 60 | 22-Jan-18 | 13-Jul-16 | 21-Sep-16 | -396 | 0% |
| **Bridge D2** | | | | | | | | | |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VD2-C7710 | Viaduct D2 - Parapet Panels | 60 | 01-Sep-17 A | 51 | 22-Nov-17 | 26-May-16 | 26-Jul-16 | -395 | 0% |
| VD2-C7720 | Viaduct D2 - Gantry & TCSS Provisions (KD4) | 36 | 25-Oct-17 | 36 | 06-Dec-17 | 28-Jun-16 | 09-Aug-16 | -395 | 0% |
| VD2-C7810 | Viaduct D2 - Drainage, Fire Main & E&M Services | 48 | 23-Nov-17 | 48 | 20-Jan-18 | 27-Jul-16 | 21-Sep-16 | -395 | 0% |
| VD2-C7820 | Viaduct D2 - Railings, Light Poles, Signs & Street Furniture | 30 | 07-Dec-17 | 30 | 13-Jan-18 | 10-Aug-16 | 13-Sep-16 | -395 | 0% |
| **Bridge D1** | | | | | | | | | |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VD1-C7710 | Viaduct D1 - Parapet Panels | 48 | 01-Jun-17 A | 12 | 06-Oct-17 | 28-Jun-16 | 12-Jul-16 | -368 | 0% |
| VD1-C7720 | Viaduct D1 - Gantry & TCSS Provisions (KD4) | 36 | 21-Sep-17 | 36 | 04-Nov-17 | 28-Jun-16 | 09-Aug-16 | -368 | 0% |
| VD1-C7810 | Viaduct D1 - Drainage, Fire Main & E&M Services | 60 | 07-Oct-17 | 60 | 16-Dec-17 | 13-Jul-16 | 21-Sep-16 | -368 | 0% |
| VD1-C7820 | Viaduct D1 - Railings, Light Poles, Signs & Street Furniture | 30 | 06-Nov-17 | 30 | 09-Dec-17 | 10-Aug-16 | 13-Sep-16 | -368 | 0% |
| VD1-C7830 | Viaduct D1 - Deck Paving & Roadmarking (KD14) | 18 | 11-Dec-17 | 18 | 03-Jan-18 | 14-Sep-16 | 06-Oct-16 | -368 | 0% |
| **Viaduct E** | | | | | | | | | |
| **Bridge E1** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| VE1-C6510 | Viaduct E1 - E3A/E4A, E3B/E4A & E3C/E4B Stitches | 12 | 11-Nov-17 | 12 | 24-Nov-17 | 29-Apr-16 | 13-May-16 | -457 | 0% |
| **Deck Fnishes, E&M and Roadworks** | | | | | | | | | |
| VE1AB-C7710 | Viaduct E1A/B - Parapet Panels | 48 | 25-Nov-17 | 48 | 23-Jan-18 | 16-May-16 | 12-Jul-16 | -457 | 0% |
| VE1CD-C7710 | Viaduct E1C/D - Parapet Panels | 48 | 25-Nov-17 | 48 | 23-Jan-18 | 16-May-16 | 12-Jul-16 | -457 | 0% |
| **Bridge E2** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| E03A-C6410 | E3A - Launch LG1 from E3B to E3A - *LG1 | 3 | 20-Oct-17 | 3 | 23-Oct-17 | 25-Apr-16 | 27-Apr-16 | -443 | 0% |
| E03A-C6510 | E3A - End Span to E4A (7 nr) - *LG1 | 7 | 24-Oct-17 | 7 | 01-Nov-17 | 28-Apr-16 | 06-May-16 | -443 | 0% |
| E03A-C6610 | E3A/B - Stitch between E3A/B and E4A | 12 | 02-Nov-17 | 12 | 15-Nov-17 | 08-Aug-17 | 21-Aug-17 | -71 | 0% |
| E03A-C6710 | E3A - Launch LG1 from E3A to E4/E5 for Dismanlting | 6 | 02-Nov-17 | 6 | 08-Nov-17 | 07-May-16 | 13-May-16 | -443 | 0% |
| E03B-C6410 | E3B - Launch LG1 from E2B to E3B - *LG1 | 3 | 09-Oct-17* | 3 | 11-Oct-17 | 13-Apr-16 | 15-Apr-16 | -443 | 0% |
| E03B-C6510 | E3B - End Span to E4A (7 nr) - *LG1 | 7 | 12-Oct-17 | 7 | 19-Oct-17 | 16-Apr-16 | 23-Apr-16 | -443 | 0% |
| E03C-C6610 | E3C/B - Stitch between E3C/D and E4B | 12 | 26-Aug-17 A | 0 | 02-Sep-17 A | | | | 100% |
| E04B-C6420 | E4B - E3D/E4B Stitch | 8 | 26-Aug-17 A | 0 | 02-Sep-17 A | | | | 100% |
| E04B-C6430 | E4A & E4B - E4A/E5A & E4B/E5B Stitches | 8 | 11-Sep-17 A | 0 | 15-Sep-17 A | | | | 100% |
| E05A-C6610 | E5A - Stitch between E4A and E5A | 12 | 11-Sep-17 A | 0 | 15-Sep-17 A | | | | 100% |
| E05B-C6610 | E5B - Stitch between E4B and E5B | 12 | 11-Sep-17 A | 0 | 15-Sep-17 A | | | | 100% |
| E06A-C6410 | E6A - Drop in (E6A-E5A) - THB | 30 | 13-Jul-17 A | 14 | 07-Oct-17 | 23-Mar-16 | 07-Apr-16 | -497 | 50% |
| E06A-C6510 | E6A & E6B - Quarter Span (E6-E7) - TLB | 30 | 04-Jul-17 A | 22 | 15-Oct-17 | 05-Mar-16 | 30-Mar-16 | -512 | 50% |
| E06A-C6520 | E6A & E6B - E5A/E6A & E5B/E6B Stitches | 8 | 23-Oct-17 | 8 | 31-Oct-17 | 08-Apr-16 | 16-Apr-16 | -512 | 0% |
| E06A-C6530 | E7A & E7B - E6A/E7A & E6B/E7B Stitches | 8 | 03-Nov-17 | 8 | 10-Nov-17 | 20-Apr-16 | 28-Apr-16 | -512 | 0% |
| E06A-C6610 | E6A/E7A: Install Bearing & Stress Continuity Tendons | 12 | 11-Nov-17 | 12 | 24-Nov-17 | 08-Aug-17 | 21-Aug-17 | -79 | 0% |
| E06A-C6620 | E6B/E7B: Install Bearing & Stress Continuity Tendons | 12 | 11-Nov-17 | 12 | 24-Nov-17 | 08-Aug-17 | 21-Aug-17 | -79 | 0% |
| E06B-C6510 | E6B - Drop in (E6B-E5B) - THB | 30 | 21-Sep-17 | 30 | 23-Oct-17 | 05-Mar-16 | 08-Apr-16 | -512 | 0% |
| E08A-C6410 | E8A - Drop in (E8A-E7A) - THB | 30 | 16-Oct-17 | 30 | 15-Nov-17 | 17-Aug-17 | 15-Sep-17 | -57 | 0% |
| E08A-C6510 | E8A & E8B - Quarter Span (E8-E9) - TLB | 30 | 16-Oct-17 | 30 | 15-Nov-17 | 18-Jul-17 | 16-Aug-17 | -87 | 0% |
| E08A-C6520 | E8A & E8B - E7A/E8A & E7B/E8B Stitches | 8 | 24-Nov-17 | 8 | 01-Dec-17 | 15-Sep-17 | 22-Sep-17 | -66 | 0% |
| E08A-C6530 | E9A & E9B - E8A/E9A & E8B/E9B Stitches | 8 | 05-Dec-17 | 8 | 12-Dec-17 | 26-Sep-17 | 06-Oct-17 | -66 | 0% |
| E08A-C6610 | E8A/E9A: Install Bearing & Stress Continuity Tendons | 12 | 13-Dec-17 | 12 | 24-Dec-17 | 07-Oct-17 | 18-Oct-17 | -66 | 0% |
| E08A-C6620 | E8B/E9B: Install Bearing & Stress Continuity Tendons | 12 | 13-Dec-17 | 12 | 24-Dec-17 | 07-Oct-17 | 18-Oct-17 | -66 | 0% |




Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

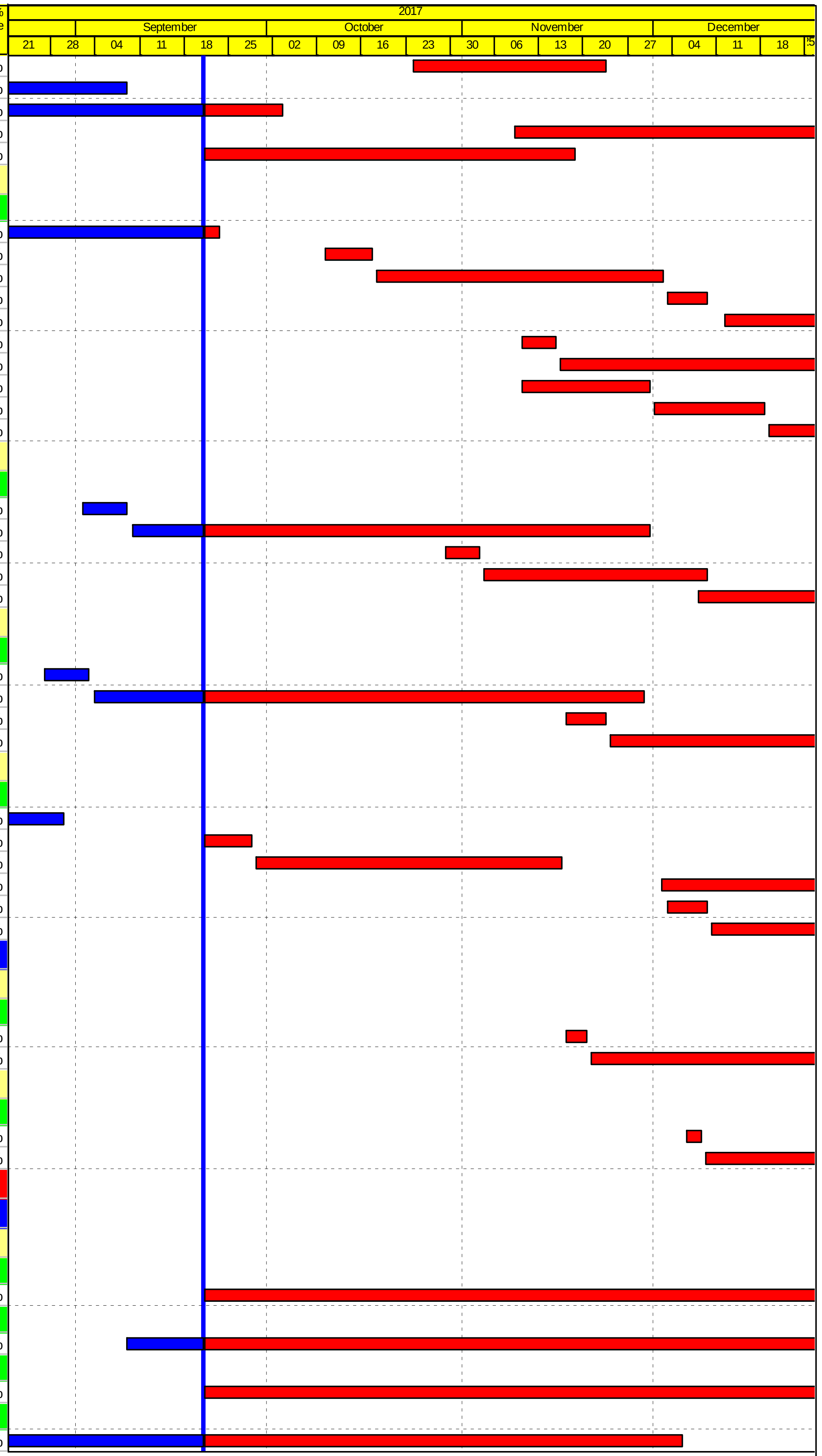
**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 8 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 01-Aug-17 | | PKN | HF |
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**

**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| E08B-C6510 | E8B - Drop in (E8B-E7B) - THB | 30 | 24-Oct-17 | 30 | 23-Nov-17 | 16-Aug-17 | 14-Sep-17 | -66 | 0% |
| E11A-C6410 | E11A - Bifurcation Span to E10A (12 nr) with 1st Stitch - THB | 48 | 08-Jun-17 A | 0 | 09-Sep-17 A | | | | 100% |
| E11B-C6410 | E11B - Bifurcation Span to E10B (12 nr) with 1st Stitch - THB | 48 | 24-Jul-17 A | 11 | 03-Oct-17 | 27-Apr-17 | 08-May-17 | -144 | 0% |
| VE2-C6610 | Viaduct E2 - Dismantle LG1 | 48 | 09-Nov-17 | 48 | 06-Jan-18 | 11-Jul-17 | 04-Sep-17 | -101 | 0% |
| VE2-C6620 | Viaduct E2 - Dismantle LG2 | 48 | 21-Sep-17 | 48 | 18-Nov-17 | 26-Jun-17 | 21-Aug-17 | -74 | 0% |
| **Bridge E5** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| E11B-C6310 | E11B Deck - Bifurcation Span to E12B (18 nr) with 1st Stitch - THB | 48 | 27-Jul-17 A | 3 | 23-Sep-17 | 05-Jan-17 | 07-Jan-17 | -251 | 0% |
| E12D-C6110 | E12D Deck - Install THB | 8 | 10-Oct-17 | 8 | 17-Oct-17 | 08-Jan-17 | 15-Jan-17 | -264 | 0% |
| E12D-C6210 | E12D Deck - Cantilever Span (16 seg) with 2 stitches - THB | 45 | 18-Oct-17 | 45 | 02-Dec-17 | 16-Jan-17 | 05-Mar-17 | -264 | 0% |
| E12D-C6220 | E12D Deck - Install WLF | 7 | 03-Dec-17 | 7 | 09-Dec-17 | 06-Mar-17 | 12-Mar-17 | -264 | 0% |
| E12D-C6230 | E12D Deck - Cantelever span (26 seg) with 1 stitch - WLF | 53 | 12-Dec-17 | 53 | 04-Feb-18 | 15-Mar-17 | 08-May-17 | -264 | 0% |
| E13D-C6110 | E13D Deck - Install KF and THB | 6 | 10-Nov-17 | 6 | 15-Nov-17 | 10-Feb-17 | 15-Feb-17 | -265 | 0% |
| E13D-C6210 | E13D Deck - Cantilever Span (22 seg) with 2 stitches - KF and THB | 49 | 16-Nov-17 | 49 | 05-Jan-18 | 16-Feb-17 | 06-Apr-17 | -265 | 0% |
| E14D-C6110 | E14D Deck - Preparation Works & Deliver Underslung Truss to Site | 18 | 10-Nov-17 | 18 | 30-Nov-17 | 04-Nov-16 | 24-Nov-16 | -301 | 0% |
| E14D-C6115 | E14D Deck - Install Truss/Fixings & Initial ICE Check | 15 | 01-Dec-17 | 15 | 18-Dec-17 | 25-Nov-16 | 12-Dec-16 | -301 | 0% |
| E14D-C6120 | E14D Deck - Install Sliding System, T&C & Final ICE Check | 15 | 19-Dec-17 | 15 | 08-Jan-18 | 13-Dec-16 | 31-Dec-16 | -301 | 0% |
| **Bridge E6** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| E12C-C6110 | E12C Deck - Install WLF | 8 | 02-Sep-17 A | 0 | 09-Sep-17 A | | | | 100% |
| E12C-C6210 | E12C Deck - Cantilever Span (42 seg) with 2 stitches - THB | 67 | 10-Sep-17 A | 67 | 30-Nov-17 | 15-Jun-17 | 21-Aug-17 | -97 | 5% |
| E13C-C6110 | E13C Deck - Install KF and THB | 6 | 29-Oct-17* | 6 | 03-Nov-17 | 06-Feb-17 | 11-Feb-17 | -257 | 0% |
| E13C-C6210 | E13C Deck - Cantilever Span (18 seg) with 1 stitch - KF and THB | 36 | 04-Nov-17 | 36 | 09-Dec-17 | 12-Feb-17 | 19-Mar-17 | -257 | 0% |
| E13C-C6220 | E13C Deck - Install TLB with T&C | 19 | 08-Dec-17 | 19 | 27-Dec-17 | 18-Mar-17 | 06-Apr-17 | -257 | 0% |
| **Bridge E7** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| E12B-C6110 | E12B Deck - Install WLF | 8 | 27-Aug-17 A | 0 | 03-Sep-17 A | | | | 100% |
| E12B-C6210 | E12B Deck - Cantilever Span (40 seg) with 3 stitches - WLF | 66 | 04-Sep-17 A | 66 | 29-Nov-17 | 21-Apr-17 | 27-Jun-17 | -150 | 5% |
| E13B-C6110 | E13B Deck - Install KF | 7 | 17-Nov-17* | 7 | 23-Nov-17 | 13-Jan-17 | 19-Jan-17 | -296 | 0% |
| E13B-C6210 | E13B Deck - Cantilever Span (44 seg) with 3 stitches - KF | 82 | 24-Nov-17 | 82 | 15-Feb-18 | 20-Jan-17 | 16-Apr-17 | -296 | 0% |
| **Bridge E8** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| E11A-C6310 | E11A Deck - Bifurcation Span to E12A (18 nr) w/ 1st Stitch - THB | 48 | 09-Jun-17 A | 0 | 30-Aug-17 A | | | | 100% |
| E12A-C6210 | E12A Deck - Install THB | 8 | 21-Sep-17 | 8 | 28-Sep-17 | 12-Nov-16 | 21-Nov-16 | -296 | 0% |
| E12A-C6310 | E12A Deck - Cantilever Span (22 nr) with 1st stitch - THB | 45 | 29-Sep-17 | 45 | 16-Nov-17 | 22-Nov-16 | 12-Jan-17 | -296 | 0% |
| E12A-C6420 | E12A deck - Install WLF & install (18nr) - WLF | 52 | 02-Dec-17 | 52 | 24-Jan-18 | 30-Jun-17 | 21-Aug-17 | -150 | 0% |
| E13A-C6210 | E13A Deck - Install KF | 7 | 03-Dec-17 | 7 | 09-Dec-17 | 23-Jun-17 | 29-Jun-17 | -158 | 0% |
| E13A-C6410 | E13A Deck - Cantilever Span(32 nr) with 3 stitches - KF | 72 | 10-Dec-17 | 72 | 25-Feb-18 | 30-Jun-17 | 10-Sep-17 | -158 | 0% |
| **Viaduct F** | | | | | | | | | |
| **Bridge F1** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| F01-C6210 | F1 Deck - Install THB | 3 | 17-Nov-17 | 3 | 20-Nov-17 | 12-Jan-17 | 14-Jan-17 | -251 | 0% |
| F01-C6310 | F1 Deck - Cantilever Span (10 nr) - THB (Props at 5th Pair) | 42 | 21-Nov-17 | 42 | 11-Jan-18 | 16-Jan-17 | 08-Mar-17 | -251 | 0% |
| **Bridge F2** | | | | | | | | | |
| **Deck Span Segment** | | | | | | | | | |
| F05-C6210 | F5 Deck - Install THB | 3 | 06-Dec-17 | 3 | 08-Dec-17 | 12-Jan-17 | 14-Jan-17 | -267 | 0% |
| F05-C6220 | F5 Deck - Cantilever Span (10 nr) - THB (Props at 5th Pair) | 42 | 09-Dec-17 | 42 | 30-Jan-18 | 16-Jan-17 | 08-Mar-17 | -267 | 0% |
| **At-Grade Works & Miscellaneous Works** | | | | | | | | | |
| **At-Grade Works Along North Lantau Highway** | | | | | | | | | |
| **Slope Works Near Viaduct D** | | | | | | | | | |
| **Slope 10NW-C/F9** | | | | | | | | | |
| M201200 | 10NW-C/F9 - Slope works (incl. L-Shape Ret. Walls) | 110 | 21-Sep-17 | 110 | 02-Feb-18 | 19-Sep-16 | 02-Feb-17 | -299 | 0% |
| **Slope 10NW-C/F10** | | | | | | | | | |
| M201160 | 10NW-C/F10 - Slope works (incl. L-Shape Ret. Walls) | 110 | 09-Sep-17 A | 100 | 22-Jan-18 | 14-Jul-16 | 10-Nov-16 | -355 | 10% |
| **Slope 10NW-C/R4** | | | | | | | | | |
| M201170 | 10NW-C/R4 - Slope works | 80 | 21-Sep-17 | 80 | 28-Dec-17 | 06-Aug-16 | 10-Nov-16 | -335 | 0% |
| **Slope 10NW-C/F50** | | | | | | | | | |
| M201150 | 10NW-C/F50 - Slope works | 165 | 11-Jan-17 A | 62 | 05-Dec-17 | 27-Aug-16 | 10-Nov-16 | -317 | 5% |




Actual Work
Planned Bar
Critical Bar
Milestone

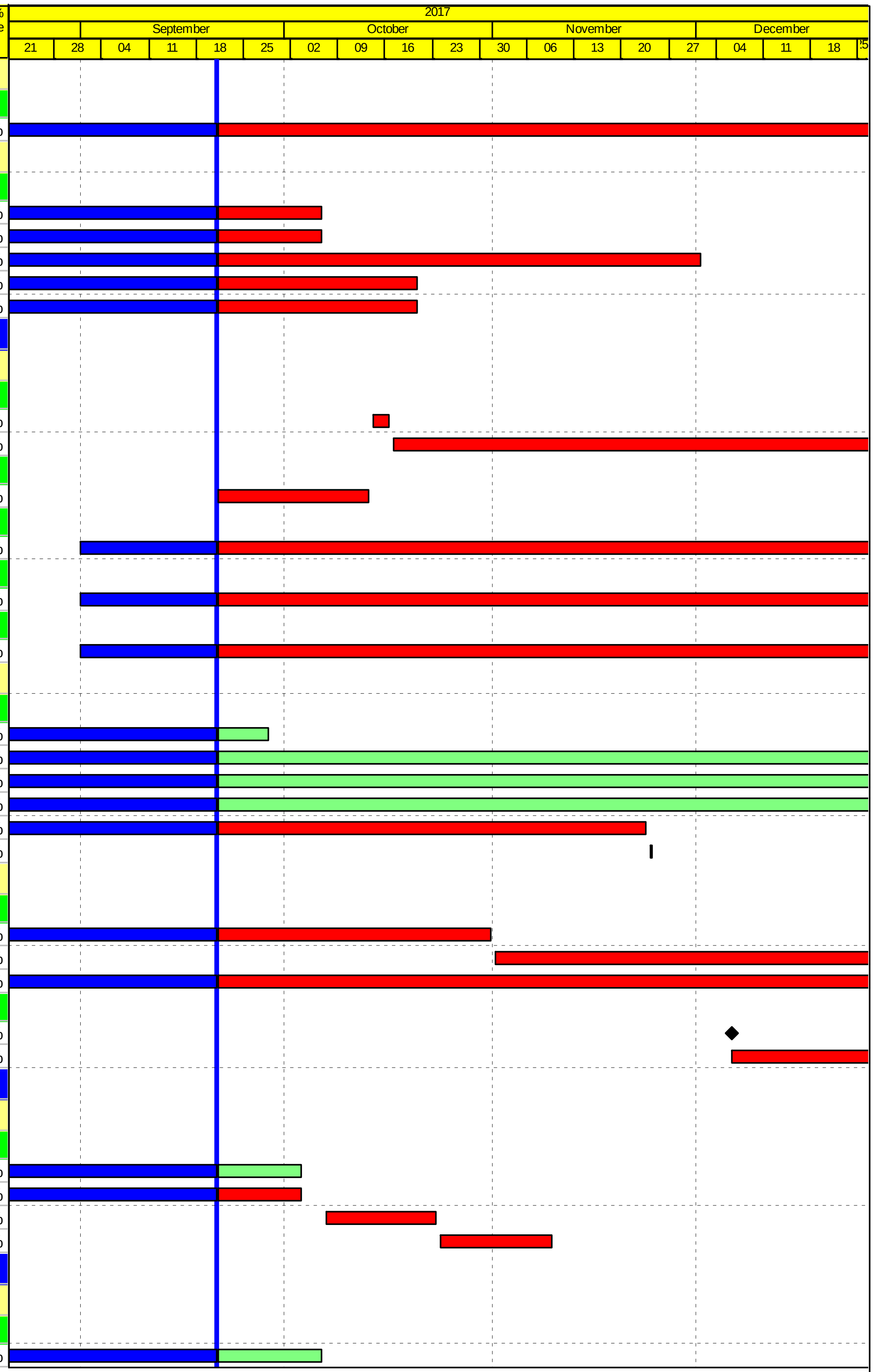
Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
Filter: TASK filters: 3-Month Lookahead, No CC Milestones, No Level of Effort.

**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 9 of 10 Pages)**
**(Progress as of 21-Sep-17)**

| Date | Revision | Checked | Approved |
|---|---|---|---|
| 01-Aug-17 | | PKN | HF |
| 29-Aug-17 | | PKN | HF |
| 29-Sep-17 | | PKN | HF |

**DWG. No.:**
**J3518/GCL/PGM/3MRP-M52**

| Activity ID | Activity Name | Orig. Durn. | Act. Start / FC Early Start | Rem. Durn. | Act. Finish / FC Early Finish | Late Start | Late Finish | Total Float | Physical % Complete |
|---|---|---|---|---|---|---|---|---|---|
| **Road Works Along NLH Westbound** | | | | | | | | | |
| **General** | | | | | | | | | |
| RW10020 | NLH W/B (Viaduct C) - Road Drainage Works for tie-in | 104 | 26-Jun-17 A | 102 | 24-Jan-18 | 02-Dec-16 | 07-Apr-17 | -237 | 15% |
| **Road Works Along NLH Eastbound** | | | | | | | | | |
| **General** | | | | | | | | | |
| RW20080-1 | Ch650 - 800 Portion 4 (viaduct D area): Roadwork | 81 | 11-Jan-17 A | 12 | 06-Oct-17 | 24-Mar-17 | 07-Apr-17 | -147 | 90% |
| RW20080-2 | Ch475 - 650 Portion 5 (viaduct D area) : Roadwork | 81 | 11-Jan-17 A | 12 | 06-Oct-17 | 24-Mar-17 | 07-Apr-17 | -147 | 87% |
| RW20080-3 | Ch275 - 475 Portion 6 (viaduct D area) ; Roadwork | 162 | 11-Jan-17 A | 59 | 01-Dec-17 | 25-Jan-17 | 07-Apr-17 | -194 | 75% |
| RW20080-4 | Ch157 - 275 Portion 7 (Viaduct D area) : Roadwork | 98 | 11-Jan-17 A | 24 | 20-Oct-17 | 10-Mar-17 | 07-Apr-17 | -159 | 77% |
| RW20084 | NLH E/B Viaduct A - Ch200-388 Roadwork (SL & HS) & Reinstate NLH | 127 | 17-Dec-16 A | 24 | 20-Oct-17 | 10-Mar-17 | 07-Apr-17 | -159 | 75% |
| **At-Grade Works Along Cheung Tung Road** | | | | | | | | | |
| **Slope Works Near Viaduct C** | | | | | | | | | |
| **Slope 10NW-C/C26** | | | | | | | | | |
| SWVC1995 | TTA for closure of NLH HS | 2 | 14-Oct-17 | 2 | 16-Oct-17 | 16-Aug-16 | 17-Aug-16 | -345 | 0% |
| SWVC2000 | 10NW-C/C26 - Slope works | 166 | 17-Oct-17 | 166 | 11-May-18 | 18-Aug-16 | 09-Mar-17 | -345 | 0% |
| **Slope PF1 & PF2** | | | | | | | | | |
| SWVC7000 | PF1 & PF2 slope works | 18 | 21-Sep-17 | 18 | 13-Oct-17 | 26-Jul-16 | 15-Aug-16 | -345 | 0% |
| **Slope 10NW-C/F13** | | | | | | | | | |
| SWVC4000 | 10NW-C/F13 - Slope works | 100 | 01-Sep-17 A | 86 | 05-Jan-18 | 30-Jul-16 | 10-Nov-16 | -341 | 0% |
| **Slope 10NW-C/F14** | | | | | | | | | |
| SWVC5000 | 10NW-C/F14 - Slope works | 100 | 01-Sep-17 A | 95 | 16-Jan-18 | 14-Jun-16 | 05-Oct-16 | -380 | 0% |
| **Slope 10NW-C/F15** | | | | | | | | | |
| SWVC6000 | 10NW-C/F15 - Slope works | 108 | 01-Sep-17 A | 100 | 22-Jan-18 | 07-Jun-16 | 05-Oct-16 | -385 | 0% |
| **Re-alignment of CTR Along Viaduct B** | | | | | | | | | |
| **General** | | | | | | | | | |
| RP00074-3 | Ch100-300: Road Drainage | 38 | 06-May-17 A | 7 | 28-Sep-17 | 30-Jun-20 | 08-Jul-20 | 818 | 85% |
| RP00076 | Ch100-300: Lay Telecom Cable | 10 | 22-May-17 A | 120 | 14-Feb-18 | 11-Feb-20 | 08-Jul-20 | 705 | 85% |
| RP00077 | Ch100-300: Street Lighting & Draw Pit | 13 | 27-Jun-17 A | 120 | 14-Feb-18 | 11-Feb-20 | 08-Jul-20 | 705 | 25% |
| RP00078 | Ch100-300: Relocation of Vent Pipe | 18 | 13-May-17 A | 120 | 14-Feb-18 | 11-Feb-20 | 08-Jul-20 | 705 | 55% |
| RP00083 | Ch100-300: Drainage & Roadwork for New CTR | 52 | 13-May-17 A | 52 | 23-Nov-17 | 22-Oct-16 | 21-Dec-16 | -272 | 30% |
| RP00084 | Ch100-300: TTA to New CTR | 1 | 24-Nov-17 | 1 | 24-Nov-17 | 22-Dec-16 | 22-Dec-16 | -272 | 0% |
| **Re-alignment of CTR Along Viaduct C** | | | | | | | | | |
| **East Portion** | | | | | | | | | |
| RW60050 | CTR East (stage 2) TTA 090-5 : Roadwork | 77 | 26-Apr-17 A | 32 | 31-Oct-17 | 03-Oct-16 | 09-Nov-16 | -288 | 65% |
| RW60060 | CTR East (stage 3) TTA 090-6 : Roadwork | 66 | 01-Nov-17 | 66 | 19-Jan-18 | 10-Nov-16 | 01-Feb-17 | -288 | 0% |
| RW60080 | CTR Tie in Works | 116 | 18-May-17 A | 88 | 08-Jan-18 | 19-Dec-16 | 07-Apr-17 | -223 | 20% |
| **Emergency Gates G6 & G7** | | | | | | | | | |
| RP10100 | Open re-aligned CTR & activate new gates G6 & G7 | 0 | 06-Dec-17 | 0 | | 10-Mar-17 | | -221 | 0% |
| RP10110 | Remove old gates G6 & G7 and reprovision Expressway Fence | 24 | 06-Dec-17 | 24 | 05-Jan-18 | 10-Mar-17 | 07-Apr-17 | -221 | 0% |
| **At-Grade Works at Southern Landfall** | | | | | | | | | |
| **HKBCF Area** | | | | | | | | | |
| **General** | | | | | | | | | |
| RW30028-2 | Construct FMH2046 and Lay Pipe Work | 14 | 27-Jun-17 A | 10 | 03-Oct-17 | 26-Jun-20 | 08-Jul-20 | 815 | 85% |
| RW30028-3 | Construct FMH2047 and Lay Pipe Work | 14 | 27-Jun-17 A | 10 | 03-Oct-17 | 31-May-17 | 10-Jun-17 | -96 | 90% |
| RW30028-4 | Construct FMH2048 and Lay Pipe Work | 14 | 07-Oct-17 | 14 | 23-Oct-17 | 12-Jun-17 | 27-Jun-17 | -98 | 0% |
| RW30028-5 | Construct FMH2049 and Lay Pipe Work | 14 | 24-Oct-17 | 14 | 09-Nov-17 | 28-Jun-17 | 14-Jul-17 | -98 | 0% |
| **Watermain from Tung Chung to Southern Landfall** | | | | | | | | | |
| **Watermain Works** | | | | | | | | | |
| **General** | | | | | | | | | |
| WM00120 | Lay DN450 Fresh Water Main at Re-aligned CTR (approx. 500m) | 48 | 22-Apr-15 A | 12 | 06-Oct-17 | 29-Nov-17 | 12-Dec-17 | 56 | 90% |




Actual Work
Planned Bar
Critical Bar
Milestone

Project ID: TMCLK-DWPI-1-M52
Layout: J3518-DWP-3MRP Submission - M52
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**Tuen Mun - Chek Lap Kok Link - Southern Connection**
**3-Month Rolling Programme (Page 10 of 10 Pages)**
**(Progress as of 21-Sep-17)**

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**DWG. No.:**

**J3518/GCL/PGM/3MRP-M52**

Appendix C

# Environmental Mitigation and Enhancement Measure Implementation Schedules

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

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

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

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|---|---|---|---|---|---|---|---|---|---|
| | | | | | | D | C | O | |
| 6.10 | - | Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes. | All areas/ throughout construction period | Contractor | Marine Fill Committee Guidelines. DASO permit conditions. | | Y | | ✓ |
| 6.10 | - | Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation. | All areas/ throughout construction period | Contractor | Marine Fill Committee Guidelines. DASO permit conditions. | | Y | | ✓ |
| 6.10 | - | Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved | All areas/ throughout construction period | Contractor | Marine Fill Committee Guidelines. DASO permit conditions. | | Y | | ✓ |
| 6.10 | - | Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; | All areas/ throughout construction period | Contractor | Marine Fill Committee Guidelines. DASO permit conditions. | | Y | | ✓ |
| 6.10 | - | All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash. | All areas/ throughout construction period | Contractor | Marine Fill Committee Guidelines. DASO permit conditions. | | Y | | ✓ |
| 6.10 | - | The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. | All areas/ throughout construction period | Contractor | Marine Fill Committee Guidelines. DASO permit conditions. | | Y | | ✓ |
| *Temporary Staging work* | | | | | | | | | |
| | 5.2 | Regular inspection for the accumulation of floating refuse and collection of floating refuse if required | During temporary staging works | Contractor | | | Y | | ✓ |
| | 5.2 | Provision of temporary drainage system on the temporary staging for collection of construction site runoff to allow appropriate treatment before discharge into the sea | During temporary staging works | Contractor | | | Y | | <> |
| | 5.2 | Wastewater generated from construction works such as bored / drilling water will be collected, treated, neutralized and de-silted through silt trap or sedimentation tank before disposal | During temporary staging works | Contractor | | | Y | | ✓ |
| | 5.2 | One additional water quality monitoring station is | During temporary | Contractor | | | Y | | ✓ |

| EIA Reference | EM&A Manual Reference | Environmental Protection Measures | Location/ Timing | Implementation Agent | Relevant Standard or Requirement | Implementation Stages | | | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | D | C | O | |
| | | proposed at station SR4a In case elevated SS or turbidity is identified during the water quality monitoring, the source of pollution will be tracked down and be removed as soon as possible. In case depletion of dissolved oxygen is identified, artificial aeration will be arranged at the monitoring station SR4a, | staging works | | | | | | |
| *Land Works* | | | | | | | | | |
| 6.10 | - | Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Sewage effluent and discharges from on- site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Temporary access roads should be surfaced with crushed stone or gravel. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | <> |

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|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 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 | | ✓ |

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|---|---|---|---|---|---|---|---|---|---|
| | | | | | | D | C | O | |
| 6.10 | - | All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system. | All areas/ throughout construction period | Contractor | TM-EIAO | | Y | | ✓ |
| 6.10 | - | Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals. | Roadside/design and operation | Design Consultant/ Contractor | TM-EIAO | Y | | Y | ✓ |
| 6.10 | Section 5 | All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice. | All areas/ throughout construction period | Contractor | EM&A Manual | | Y | | ✓ |
| *Water Quality Monitoring* | | | | | | | | | |
| 6.10 | Section 5 | Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period.<br>One year operation phase water quality monitoring at designated stations | Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year. | Contractor | EM&A Manual | | Y | Y | ✓ |
| **ECOLOGY** | | | | | | | | | |
| 8.14 | 6.3 | Specification for and implement pre, during and post construction dolphin abundance monitoring. | All Areas/Detailed Design/ during construction works/post construction | Design Consultant/ Contractor | TMEIA | Y | Y | Y | ✓ |
| 8.14 | 6.3 | Specification for bored piling monitoring | Detailed Design | Design Consultant | TMEIA | Y | | | n/a |
| 8.14 | 6.3 | Implement any recommendations of the bored piling monitoring | Southern marine viaduct/Throughout | Contractor | TMEIA | | Y | | ✓ |

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|---|---|---|---|---|---|---|---|---|---|
| | | | | | | D | C | O | |
| | | | construction during bored piling | | | | | | |
| 8.14 | 6.3,6.5 | Avoidance of peak CWD calving season in May and June for driving of metal caissons during bored piling works | Southern marine viaduct/ May and June during bored piling | Contractor | TMEIA | | Y | | n/a |
| 8.14 | 6.3,6.5 | Specification and implementation of 250m dolphin exclusion zone. | All marine bored piling and temporary staging works areas/Detailed Design/during all marine bored piling and temporary staging works | Design Consultant/ Contractor | TMEIA | Y | Y | | ✓ |
| 8.15 | 6.3, 6.5 | Specification and deployment of an artificial reef of an area of 3,600 m² 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<br>To be enforced by AFCD. |
| 8.14 | 6.3, 6.5 | Specification and implementation of marine vessel control specifications | All areas/Detailed Design/during construction works | Design Consultant/ Contractor | TMEIA | Y | Y | | ✓ |
| 8.14 | 6.3, 6.5 | Design and implementation of acoustic decoupling methods for marine bored piling and the whole lifespan of temporary staging works. | All areas/ Detailed Design/during marine bored piling and temporary staging works | Design Consultant/ Contractor | TMEIA | Y | Y | | ✓ |
| 8.15 | 6.3, 6.4 | Pre-construction phase survey and coral translocation | Tai Ho Wan (donar site) and Yam Tsui Wan (receptor site) /Detailed Design/Prior to construction | Design Consultant/ Contractor | TMEIA | Y | Y | | n/a |
| 8.15 | 6.5 | Audit coral translocation success | Yam Tsui Wan (receptor site)/Post translocation | Contractor | TMEIA | | Y | | **Completed in October 2014** |
| 7.13 | 6.5 | Undertaken gabion wall works in Stream NL1 in the dry season | North Lantau slope works/dry | Contractor | TMEIA | | Y | | n/a |

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| | | | | | | 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 /<br>As soon as accessible | Contractor | TMEIA | | Y | | n/a.<br>To be approved by AFCD/LCSD |
| 7.13 | 6.5 | Spoil heaps shall be covered at all times. | All areas / Throughout construction period | Contractor | TMEIA | | Y | | ✔ |
| 7.13 | 6.5 | Avoid damage and disturbance to the remaining and surrounding natural habitat | All areas / Throughout construction period | Contractor | TMEIA | | Y | | <> |
| 7.13 | 6.5 | Placement of equipment in designated areas within the existing disturbed land | All areas / Throughout construction period | Contractor | TMEIA | | Y | | <> |
| 7.13 | 6.5 | Disturbed areas to be reinstated immediately after completion of the works. | All areas / Throughout construction period | Contractor | TMEIA | | Y | | ✔ |
| 7.13 | 6.5 | Construction activities should be restricted to the proposed works boundary | All areas / Throughout construction period | Contractor | TMEIA | | Y | | ✔ |
| **LANDSCAPE AND VISUAL** | | | | | | | | | |
| 10.9 | 7.6 | Round angle, patterned finishes, and oval shaped pier were considered in the viaduct design, and further details will be developed under ACABAS submission (DM3) | All areas/detailed design | Design Consultant | TMEIA | Y | | | n/a |
| 10.9 | 7.6 | Details of the street furniture will be developed in the detailed design stage (DM4) | All areas/detailed design | Design Consultant | TMEIA | Y | | | n/a |
| 10.9 | 7.6 | Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5) | All areas/detailed design | Design Consultant | TMEIA | Y | | | n/a |
| 10.9 | 7.6 | Existing trees on boundary of the Project Area shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees | All areas/detailed design/ during construction | Design Consultant/ Contractor | TMEIA | Y | Y | | ✔ |

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

| EIA Reference | EM&A Manual Reference | Environmental Protection Measures | Location/ Timing | Implementation Agent | Relevant Standard or Requirement | Implementation Stages | | | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | D | C | O | |
| 10.9 | 7.6 | Recycle/Reuse all felled trees and vegetation, e.g. mulching (CM9) | All areas/detailed design/ during construction | Design Consultant/ Contractor | TMEIA | Y | Y | | n/a<br>No felled trees or vegetation suitable for recycle |
| 10.9 | 7.6 | Compensatory tree planting shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Felling Application process under ETWBTC 3/2006 (CM10). | All areas/detailed design/ during construction | Design Consultant/ Contractor | TMEIA | Y | Y | | ✓ |
| 10.9 | 7.6 | Re-vegetation of affected woodland/shrubland with native species (OM1) | All areas/detailed design/ during construction/ during operation | Design Consultant/ Contractor | TMEIA | Y | Y | Y | n/a.<br>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<br>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<br>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.<br>To be implemented by HyD/LCSD |
| 10.9 | 7.6 | Structure, ornamental tree / shrub / climber planting should be provided along roadside amenity strips, central dividers and newly formed slopes to enhance the townscape quality and further greenery enhancement | All areas/detailed design/ during construction / during operation | Design Consultant/ Contractor | TMEIA | Y | Y | Y | n/a.<br>To be implemented by |

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

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

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

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

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

**Notes:**

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

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

**Status:**

✓ Compliance of Mitigation Measures

<> Compliance of Mitigation but need improvement

x Non-compliance of Mitigation Measures

▲ Non-compliance of Mitigation Measures but rectified by Contractor

Δ Deficiency of Mitigation Measures but rectified by Contractor

n/a Not Applicable in Reporting Period

Appendix D

# Summary of Action and Limit Levels

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

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

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

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

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

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

**Notes:**

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

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

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

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

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

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

*Table D4* *Action and Limit Levels for Impact Dolphin Monitoring*

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

**Notes:**

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

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

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

Appendix E

# EM&A Monitoring Schedules

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Noise Monitoring Schedule (1 to 30 September 2017)

Alternative Noise Monitoring at Pak Mong Village Entrance

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

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Air Quality Monitoring Schedule (1 to 30 September 2017)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

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

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Noise Monitoring Schedule (1 to 31 October 2017)

Alternative Noise Monitoring at Pak Mong Village Entrance

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

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Air Quality Monitoring Schedule (1 to 31 October 2017)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

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

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Noise Monitoring Schedule (1 to 30 November 2017)

Alternative Noise Monitoring at Pak Mong Village Entrance

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

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Air Quality Monitoring Schedule (1 to 30 November 2017)

Alternative Air Quality Monitoring at WA4 and MTRC Depot Entrance

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

# HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
# Impact Marine Water Quality Monitoring (WQM) Schedule (September 2017)

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | | | | 1-Sep | 2-Sep |
| | | | | | ebb tide 7:55 - 11:25<br>flood tide 15:41 - 19:11 | |
| 3-Sep | 4-Sep | 5-Sep | 6-Sep | 7-Sep | 8-Sep | 9-Sep |
| | **WQM is canceled due to adverse weather** | | ebb tide 11:20 - 14:50<br>flood tide 18:00 - 21:30 | | ebb tide 12:29 - 15:59<br>flood tide 6:10 - 9:40 | |
| 10-Sep | 11-Sep | 12-Sep | 13-Sep | 14-Sep | 15-Sep | 16-Sep |
| | ebb tide 14:31 - 18:01<br>flood tide 8:39 - 12:09 | | ebb tide 16:38 - 20:08<br>flood tide 11:16 - 14:46 | | ebb tide 6:50 - 10:20<br>flood tide 14:31 - 18:01 | |
| 17-Sep | 18-Sep | 19-Sep | 20-Sep | 21-Sep | 22-Sep | 23-Sep |
| | ebb tide 9:56 - 13:26<br>flood tide 16:48 - 20:18 | | ebb tide 11:22 - 14:52<br>flood tide 17:46 - 21:16 | | ebb tide 12:35 - 16:05<br>flood tide 6:19 - 9:49 | |
| 24-Sep | 25-Sep | 26-Sep | 27-Sep | 28-Sep | 29-Sep | 30-Sep |
| | ebb tide 14:16 - 17:46<br>flood tide 8:26 - 11:56 | | ebb tide 16:09 - 19:28<br>flood tide 10:48 - 14:18 | | ebb tide 5:39 - 9:09<br>flood tide 14:30 - 18:00 | |

# HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
# Impact Marine Water Quality Monitoring (WQM) Schedule (October 2017)

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| 1/Oct | 2/Oct | 3/Oct | 4/Oct | 5/Oct | 6/Oct | 7/Oct |
| | ebb tide 8:50 - 12:20<br>flood tide 15:59 - 19:29 | | ebb tide 10:11 - 13:41<br>flood tide 16:46 - 20:16 | | ebb tide 11:27 - 14:57<br>flood tide 5:18 - 8:48 | |
| 8/Oct | 9/Oct | 10/Oct | 11/Oct | 12/Oct | 13/Oct | 14/Oct |
| | ebb tide 13:33 - 17:03<br>flood tide 7:46 - 11:16 | | ebb tide 15:22 - 18:52<br>flood tide 10:00 - 13:30 | | ebb tide 4:48 - 8:18<br>flood tide 13:10 - 16:40 | |
| 15/Oct | 16/Oct | 17/Oct | 18/Oct | 19/Oct | 20/Oct | 21/Oct |
| | ebb tide 8:48 - 12:18<br>flood tide 15:41 - 19:11 | | ebb tide 10:20 - 13:50<br>flood tide 16:36 - 20:06 | | ebb tide 11:36 - 15:06<br>flood tide 5:34 - 9:04 | |
| 22/Oct | 23/Oct | 24/Oct | 25/Oct | 26/Oct | 27/Oct | 28/Oct |
| | ebb tide 13:18 - 16:48<br>flood tide 7:36 - 11:06 | | ebb tide 14:36 - 18:06<br>flood tide 9:14 - 12:44 | | ebb tide 3:24 - 6:54<br>flood tide 15:49 - 19:19 | |
| 29/Oct | 30/Oct | 31/Oct | | | | |
| | ebb tide 6:58 - 10:28<br>flood tide 14:36 - 18:06 | | | | | |

## HY/2012/07 - Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Marine Water Quality Monitoring (WQM) Schedule (November 2017)

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | | 1/Nov | 2/Nov | 3/Nov | 4/Nov |
| | | | ebb tide 8:50 - 12:20<br>flood tide 15:31 - 19:01 | | ebb tide 10:19 - 13:49<br>flood tide 4:21 - 7:51 | |
| 5/Nov | 6/Nov | 7/Nov | 8/Nov | 9/Nov | 10/Nov | 11/Nov |
| | ebb tide 12:36 - 16:06<br>flood tide 6:55 - 10:25 | | ebb tide 14:18 - 17:48<br>flood tide 8:54 - 12:24 | | ebb tide 16:45 - 19:47<br>flood tide 11:17 - 14:47 | |
| 12/Nov | 13/Nov | 14/Nov | 15/Nov | 16/Nov | 17/Nov | 18/Nov |
| | ebb tide 7:21 - 10:51<br>flood tide 14:26 - 17:56 | | ebb tide 9:13 - 12:43<br>flood tide 15:27 - 18:57 | | ebb tide 10:38 - 14:08<br>flood tide 4:51 - 8:21 | |
| 19/Nov | 20/Nov | 21/Nov | 22/Nov | 23/Nov | 24/Nov | 25/Nov |
| | ebb tide 12:26 - 15:56<br>flood tide 6:56 - 10:26 | | ebb tide 13:35 - 17:05<br>flood tide 8:15 - 11:45 | | ebb tide 15:16 - 17:59<br>flood tide 9:52 - 13:22 | |
| 26/Nov | 27/Nov | 28/Nov | 29/Nov | 30/Nov | | |
| | ebb tide 4:33 - 8:03<br>flood tide 12:58 - 16:28 | | ebb tide 7:03 - 10:33<br>flood tide 14:07 - 17:37 | | | |

**HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section**
**Impact Dolphin Monitoring Survey Schedule (1 to 30 September 2017)**

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

## HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section
## Impact Dolphin Monitoring Survey Schedule (1 to 31 October 2017)

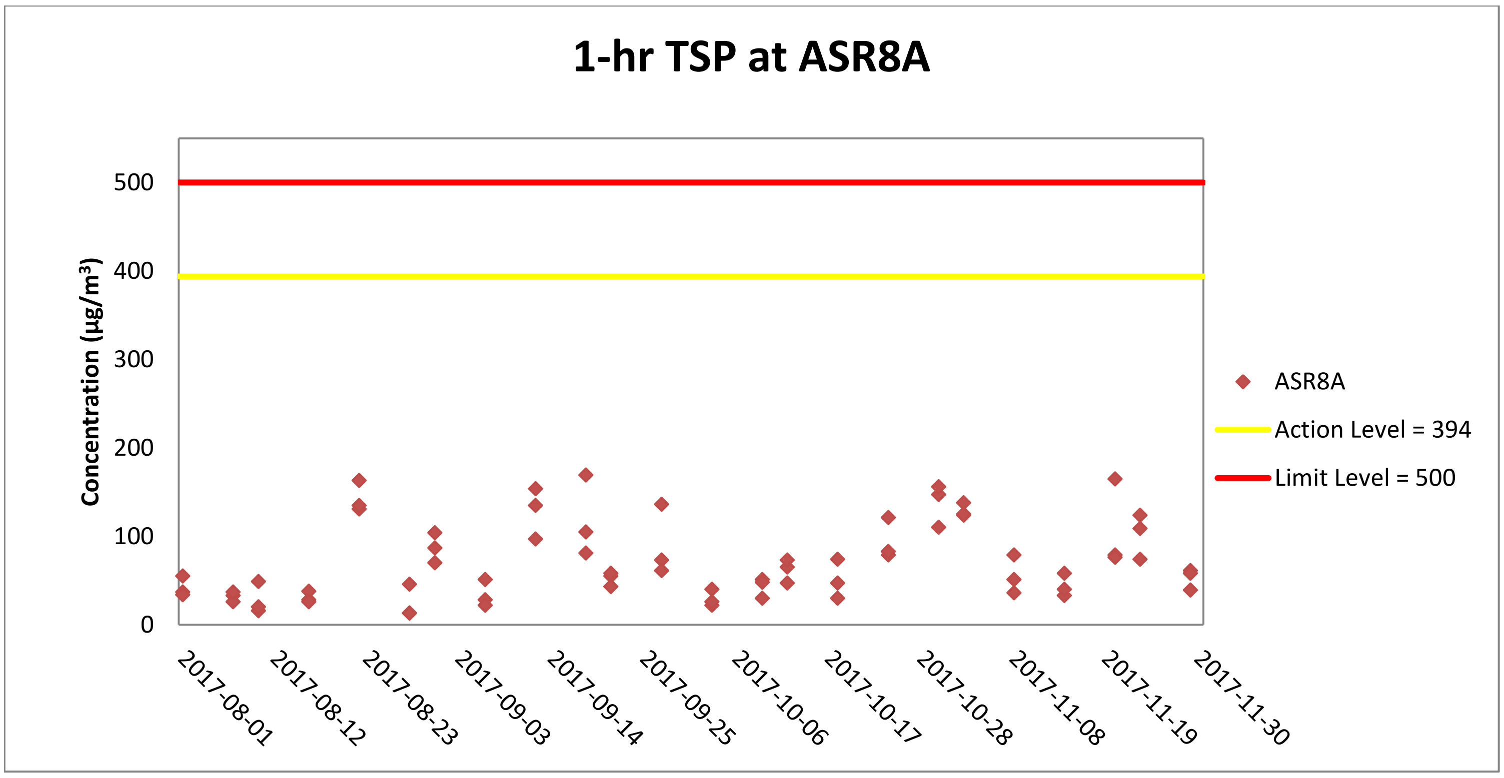
| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| 01-Oct | 02-Oct | 03-Oct | 04-Oct | 05-Oct | 06-Oct | 07-Oct |
| | | | Impact Dolphin Monitoring | | | |
| 08-Oct | 09-Oct | 10-Oct | 11-Oct | 12-Oct | 13-Oct | 14-Oct |
| | Impact Dolphin Monitoring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

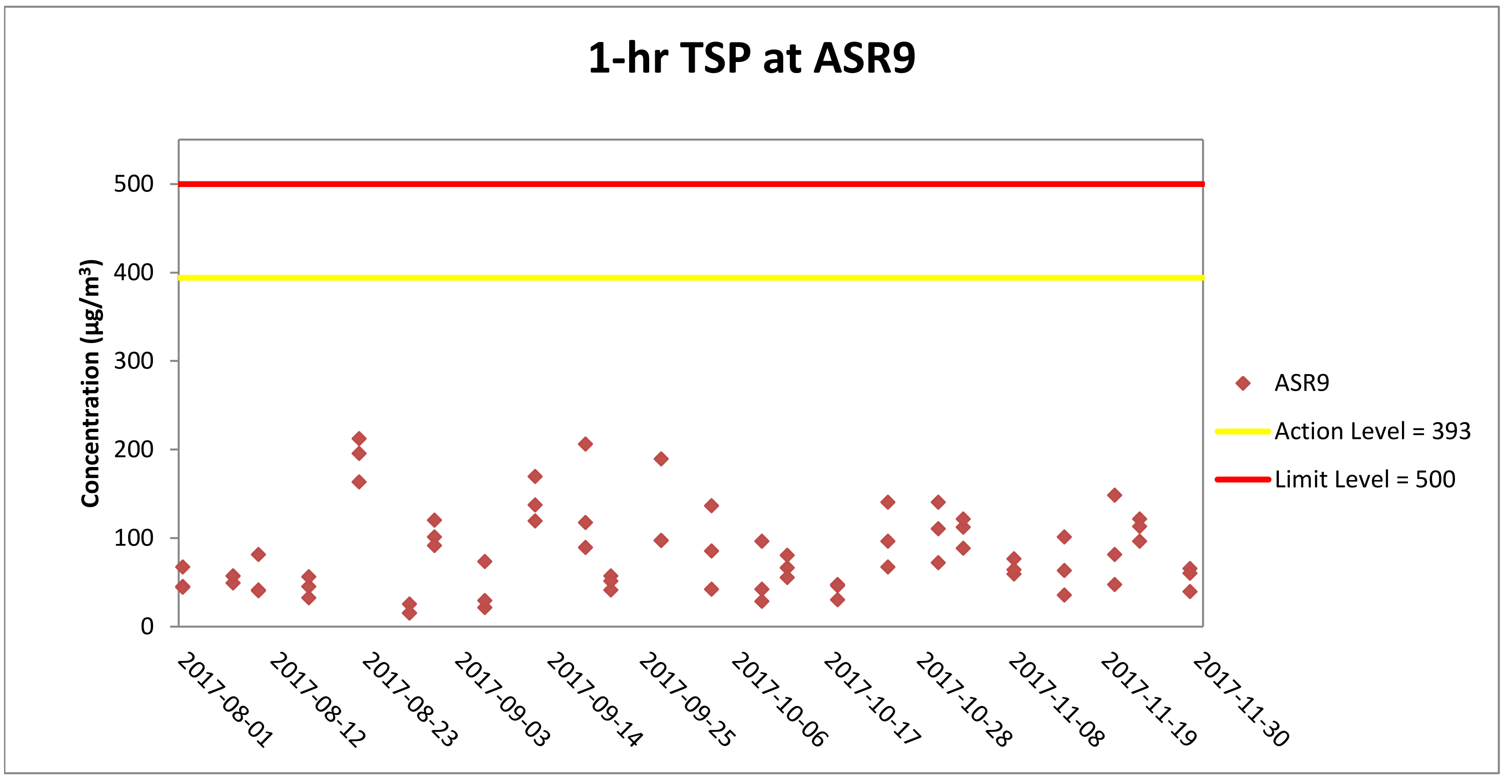
**HY/2012/07 Tuen Mun - Chek Lap Kok Link - Southern Connection Viaduct Section**
**Impact Dolphin Monitoring Survey Schedule (1 to 30 November 2017)**

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

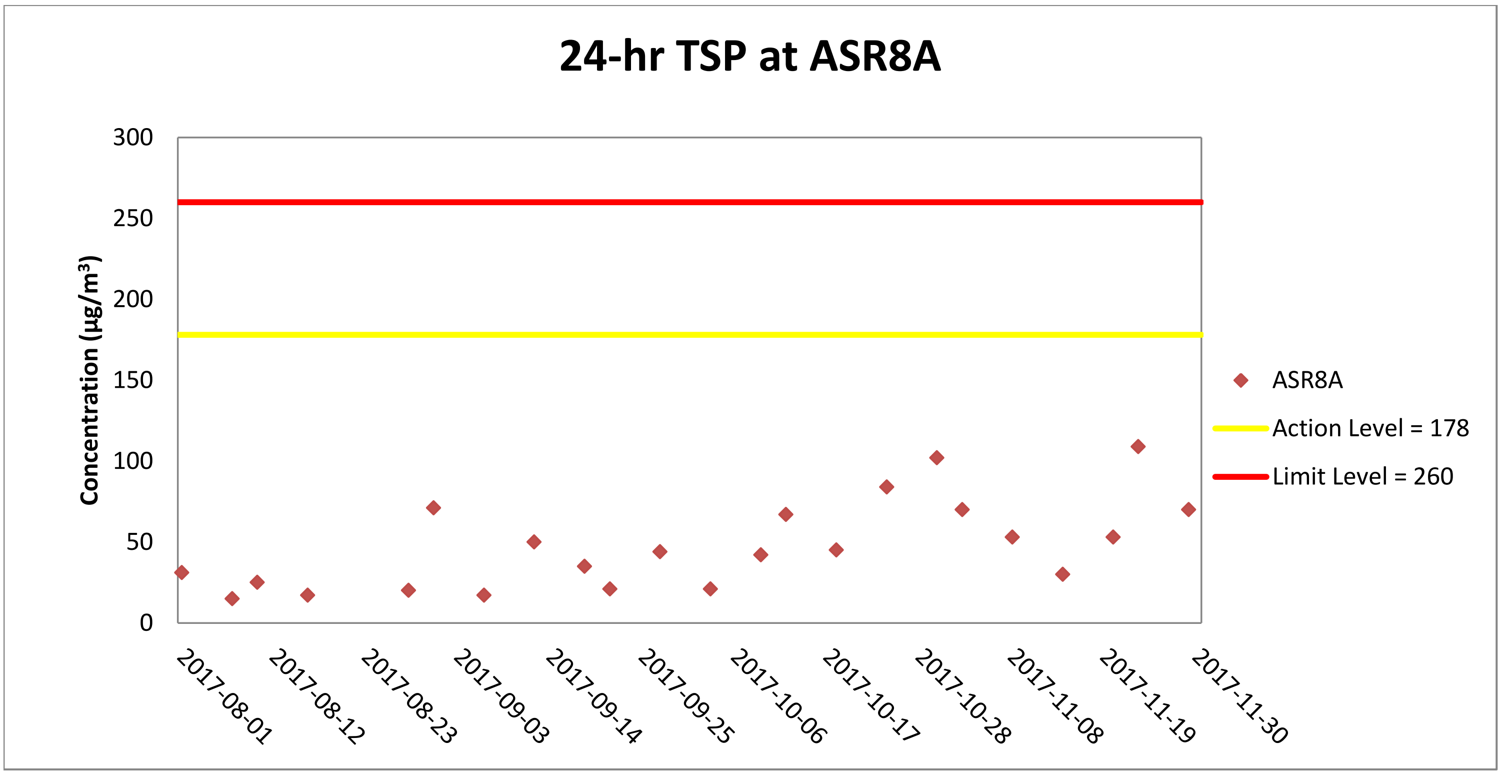
Appendix F

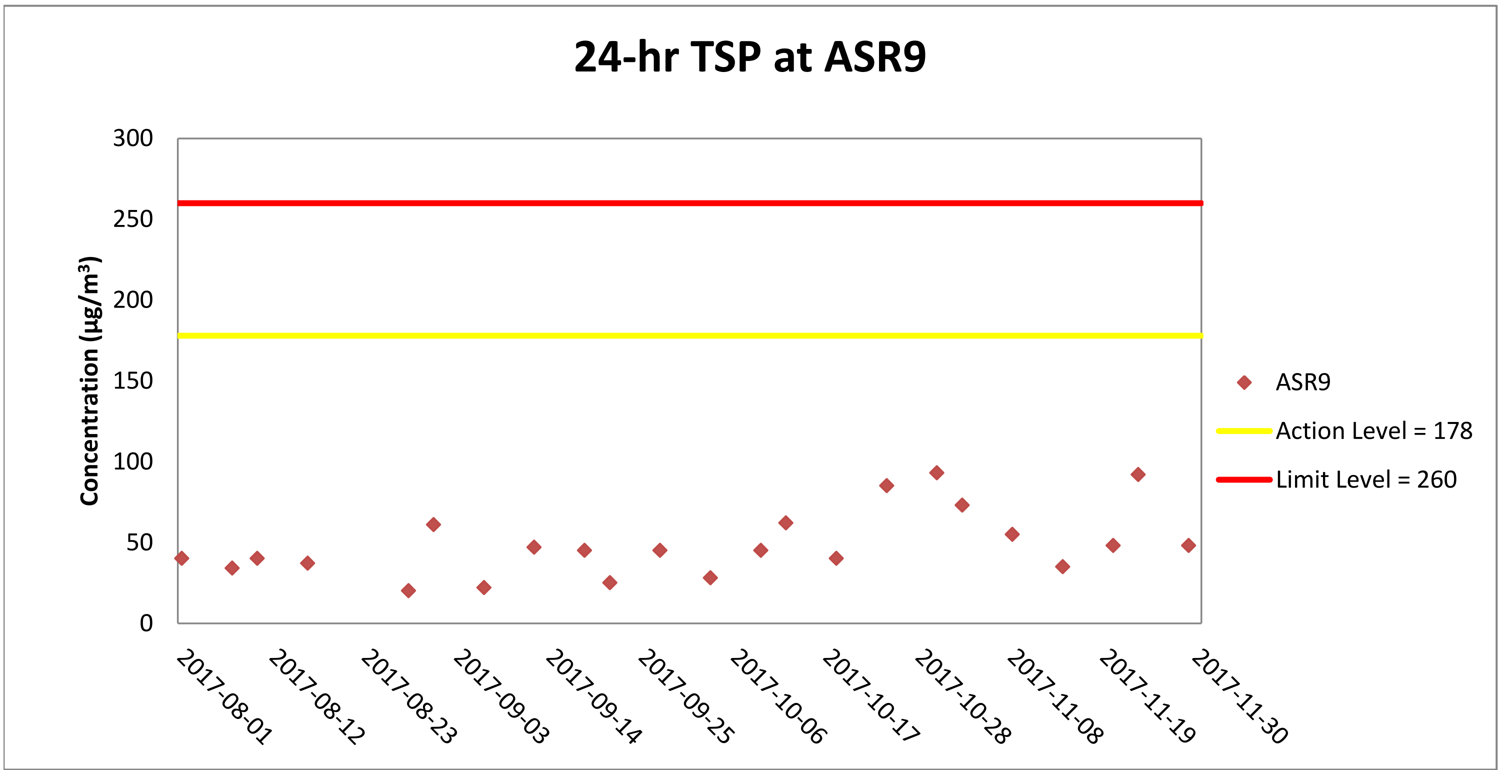
# Impact Air Quality Monitoring Graphical Presentation




*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; Road works along North Lantau Highway; Launching gantry operation; Installation of pier head and deck segments; and Slope work of Viaducts A, B & C.*

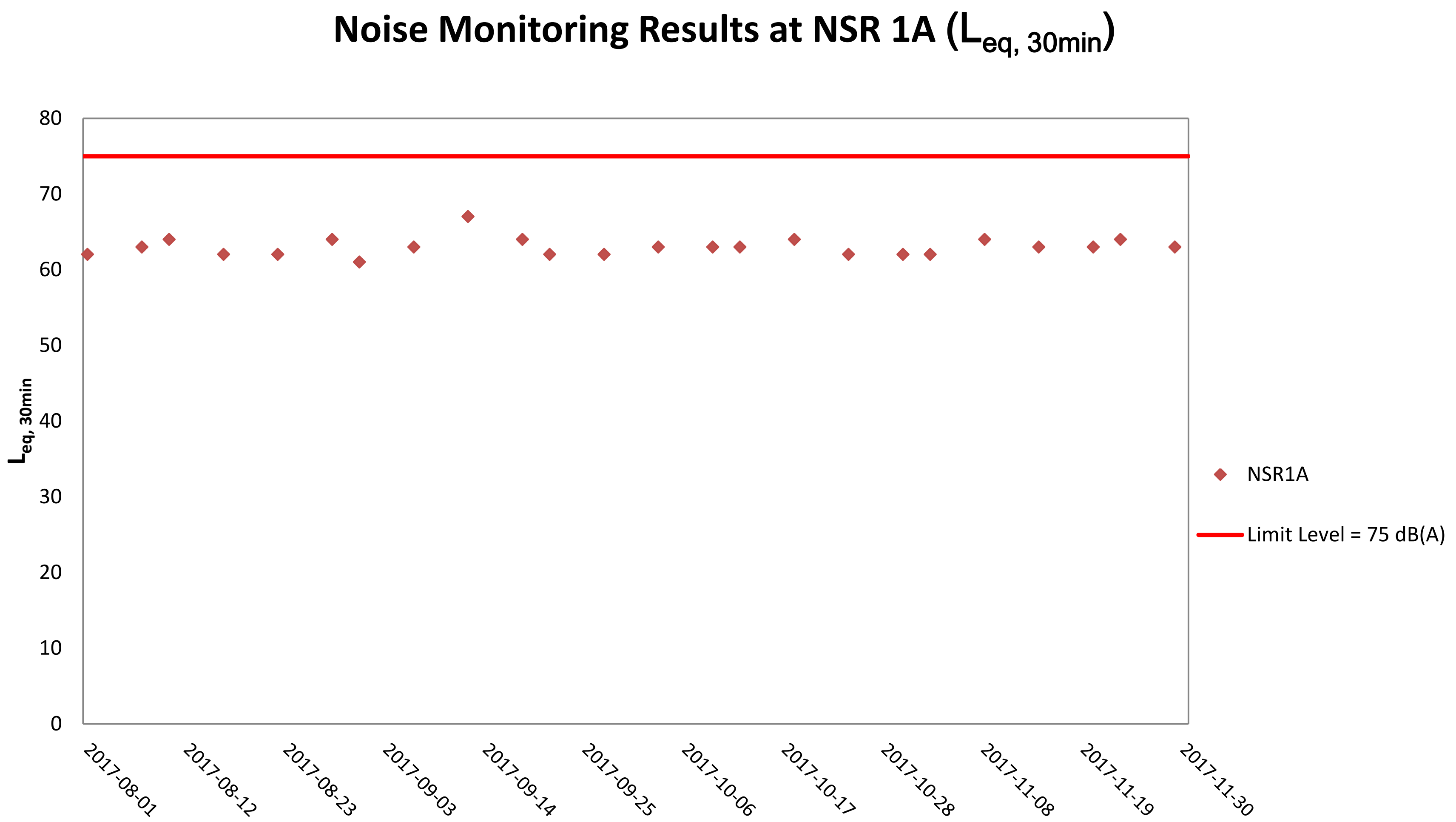



*Weather condition within the reporting period varied between sunny to rainy.*
*Major construction works undertaken within the reporting period include Pier construction; Re-alignment of Cheung Tung Road; Road works along North Lantau Highway; Launching gantry operation; Installation of pier head and deck segments; and Slope work of Viaducts A, B & C.*

Appendix G

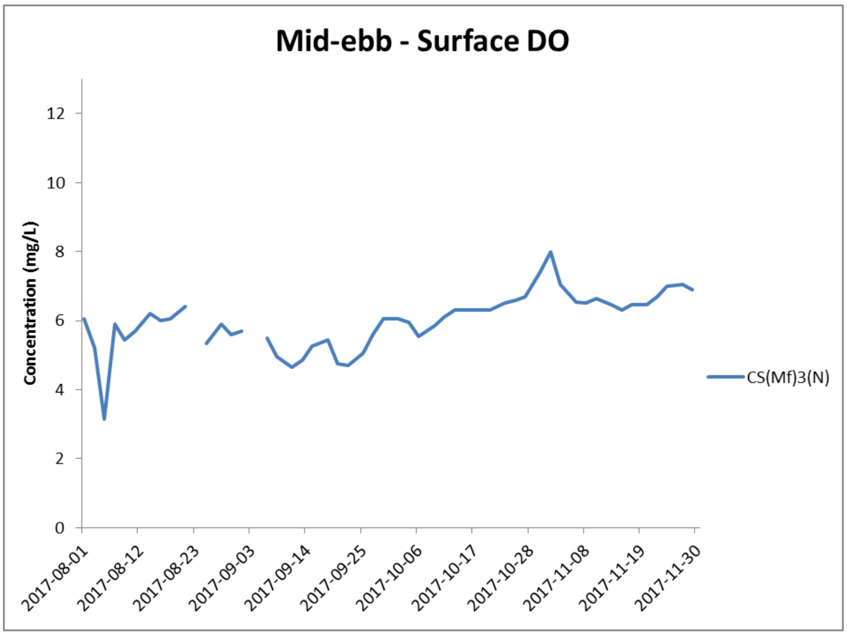
# Impact Noise Monitoring Graphical Presentation




*Weather condition within the reporting period varied between sunny to rainy.*
*Major construction works undertaken within the reporting period include Pier construction; Re-alignment of Cheung Tung Road; Road works along North Lantau Highway; Launching gantry operation; Installation of pier head and deck segments; and Slope work of Viaducts A, B & C.*

Appendix H

# Impact Water Quality Monitoring Graphical Presentation



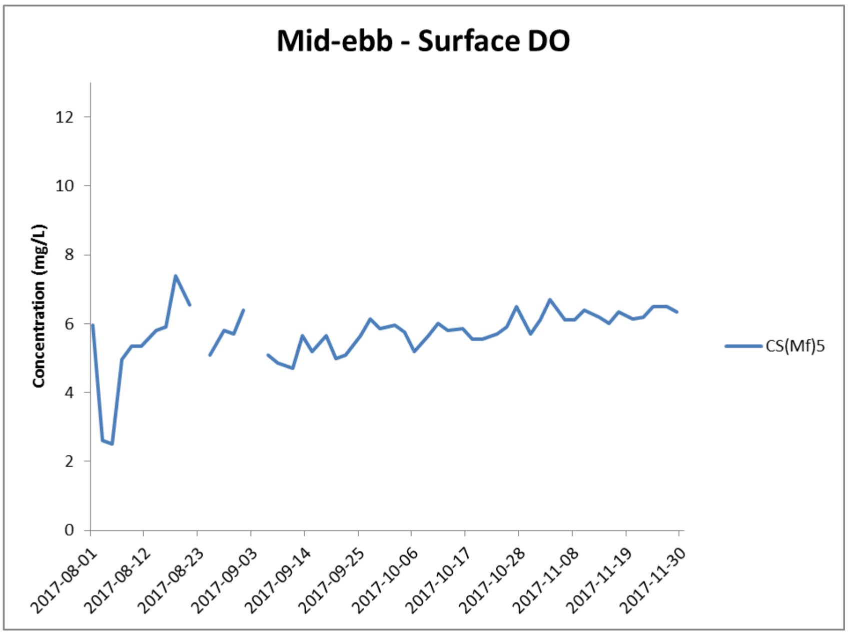
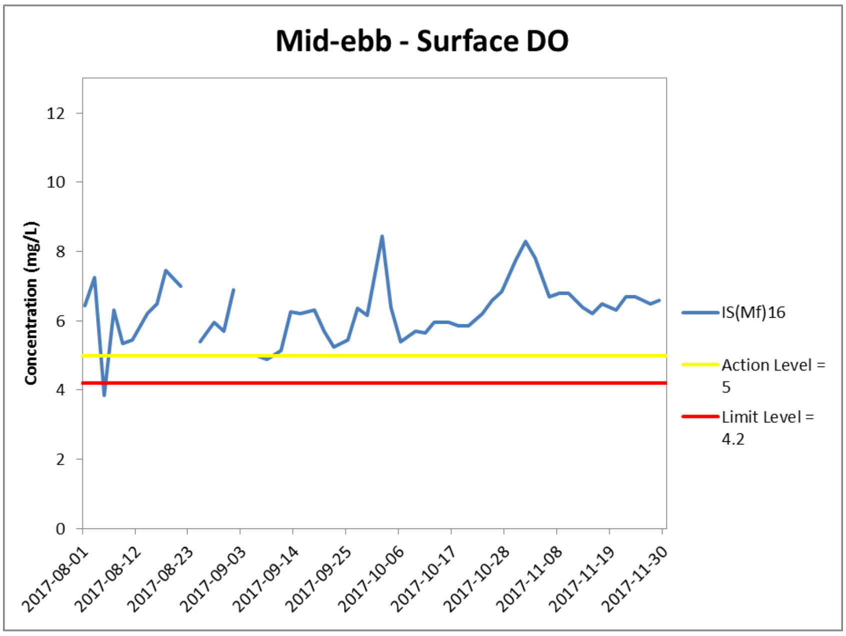




**Figure H1 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



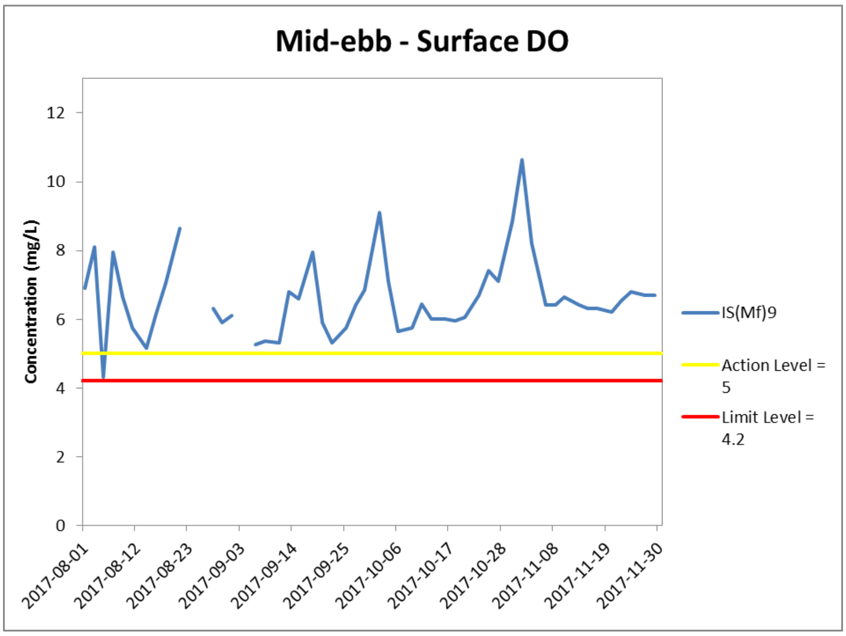
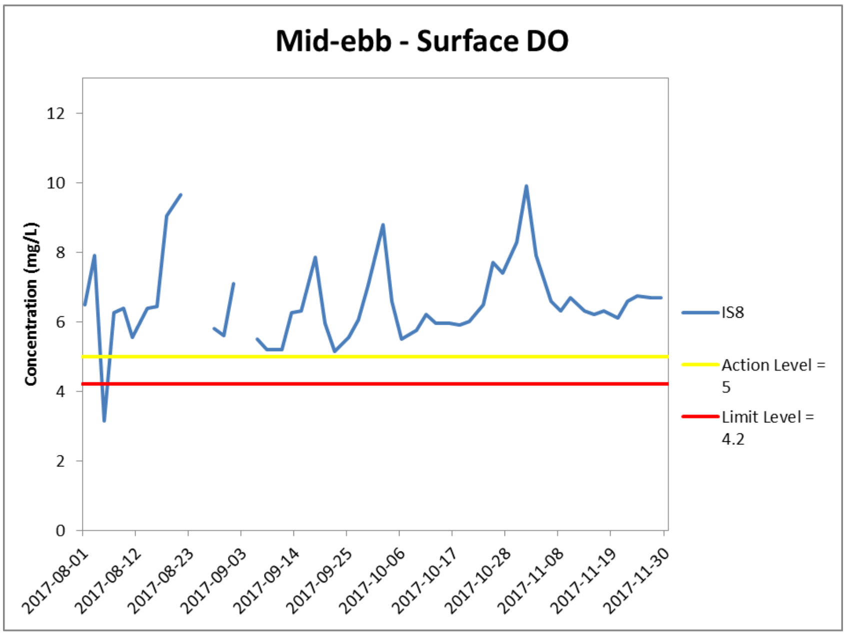




**Figure H2 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



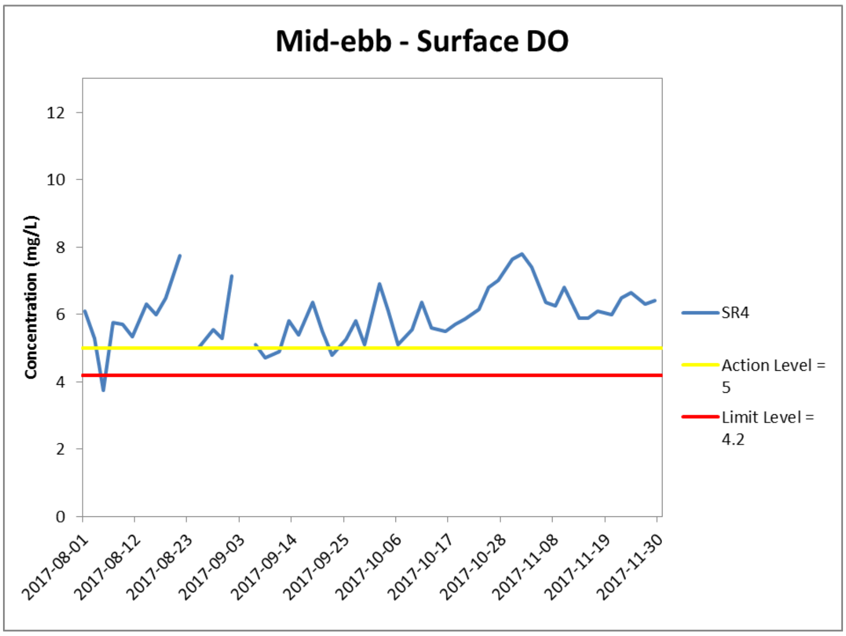




**Figure H3 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

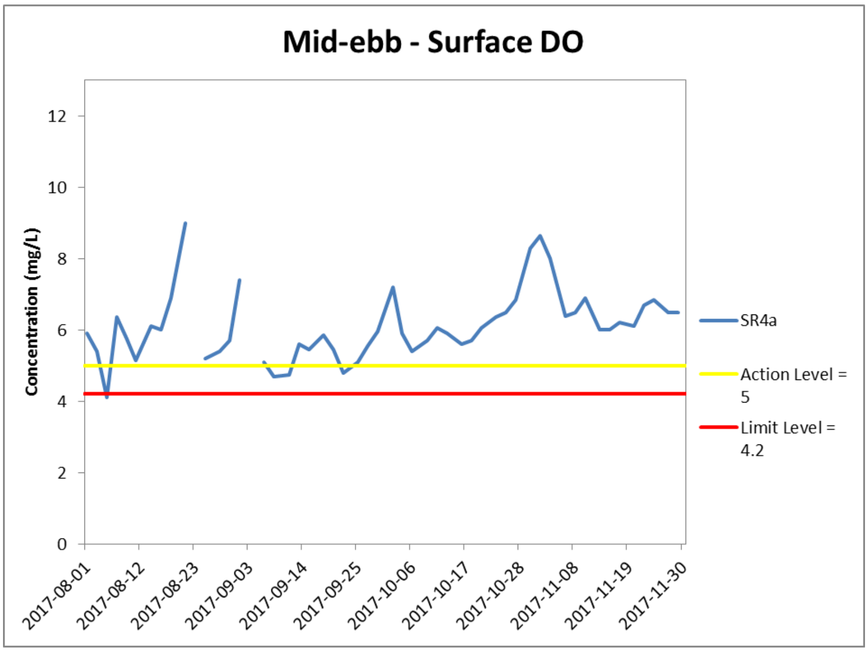
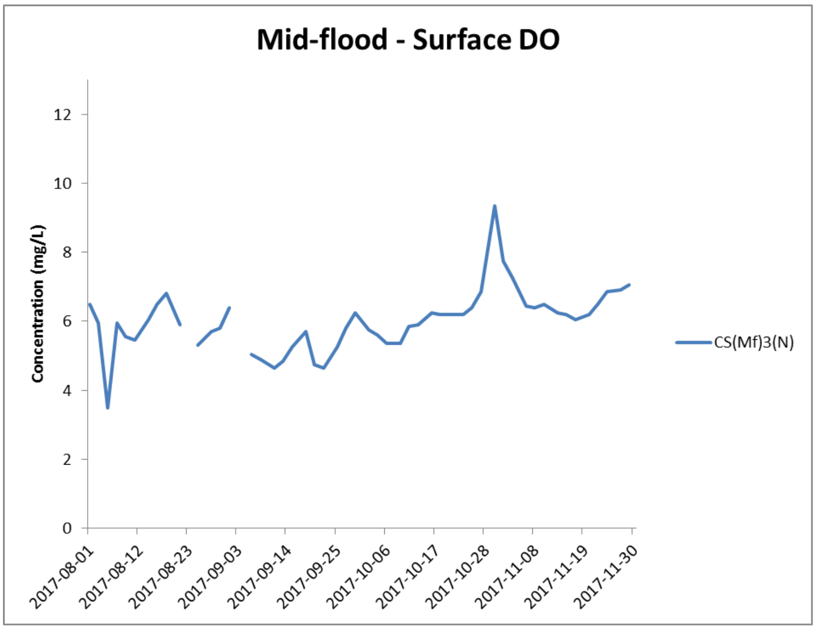



**Figure H4 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at SR4a.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



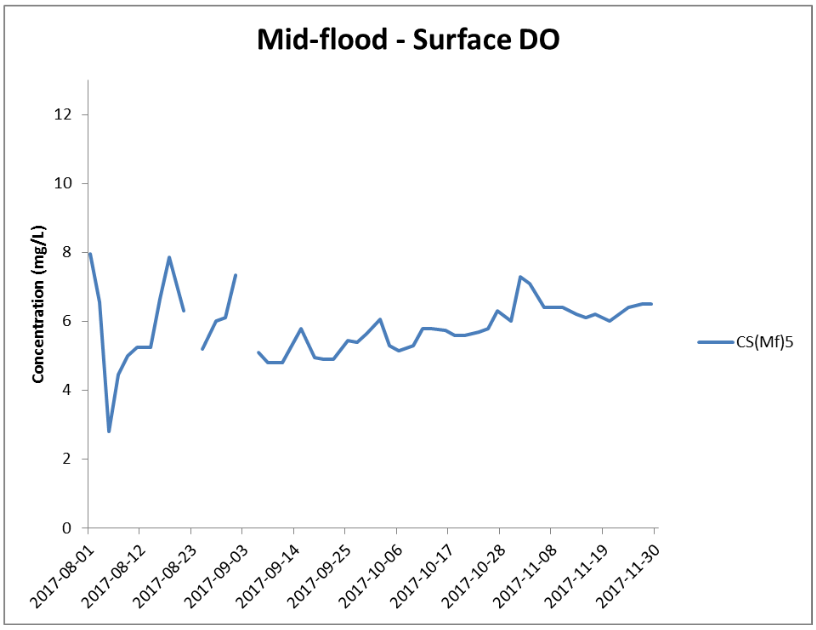
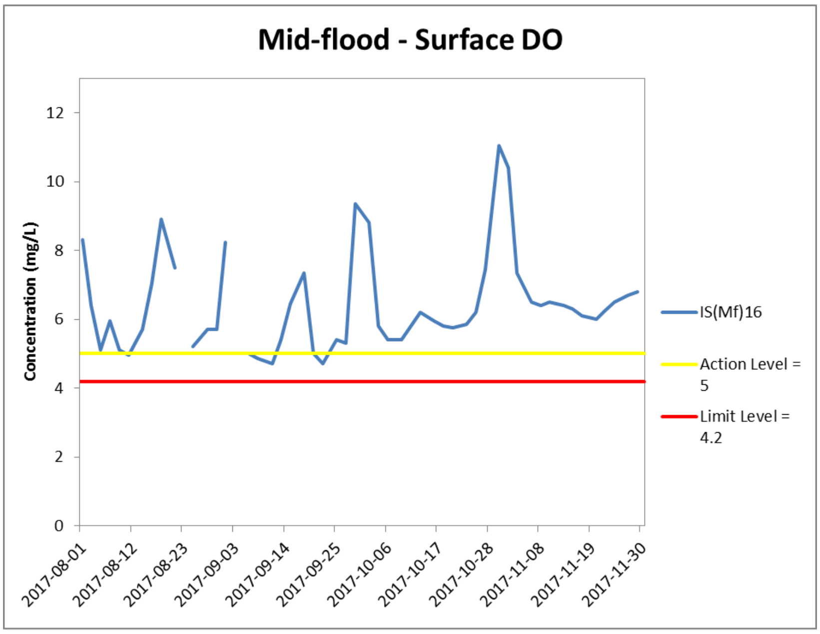




**Figure H5 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



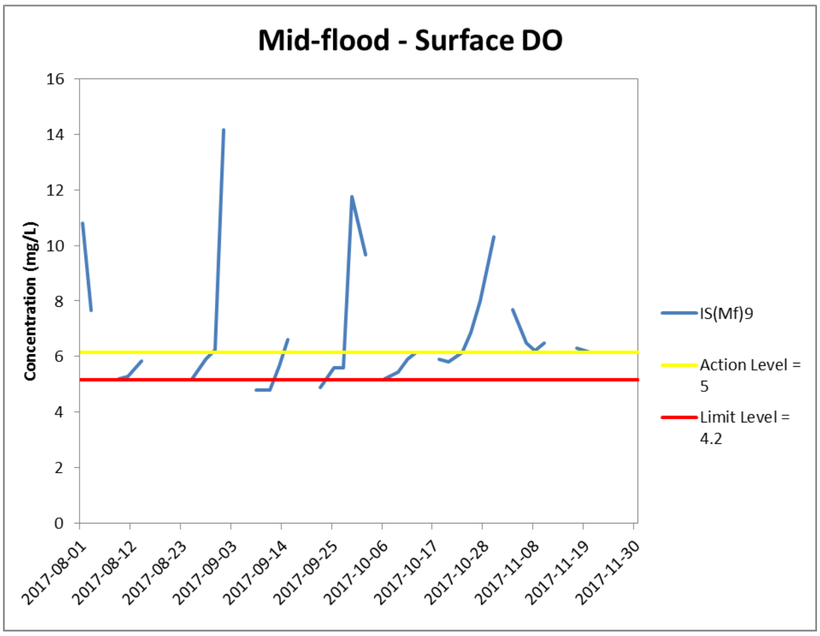
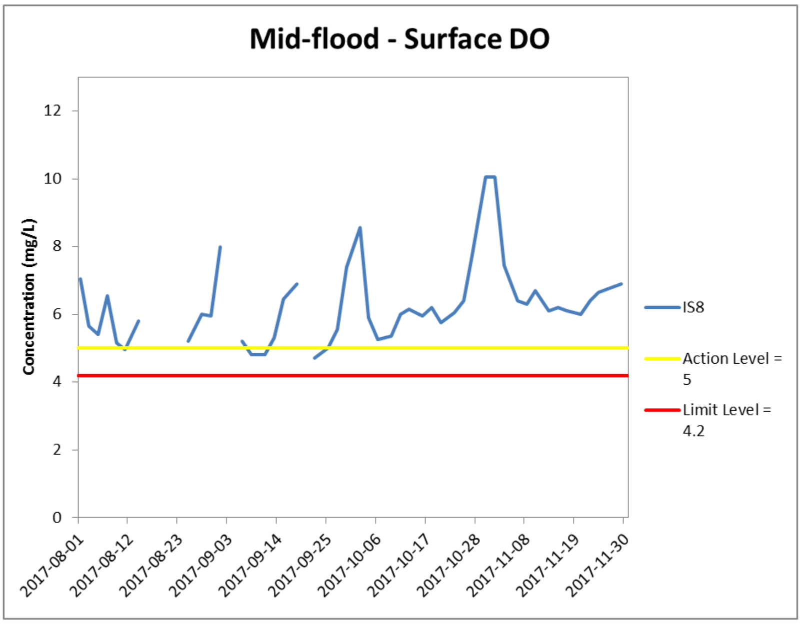



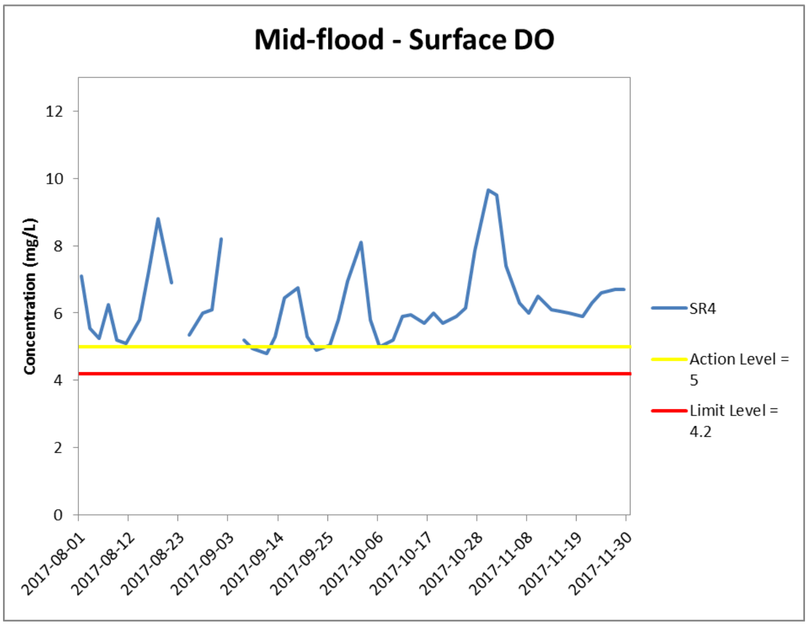

**Figure H6 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.)*
*WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM




| | |
|---|---|
| **Figure H7 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**<br><br>*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.* | **Environmental Resources Management** ERM |

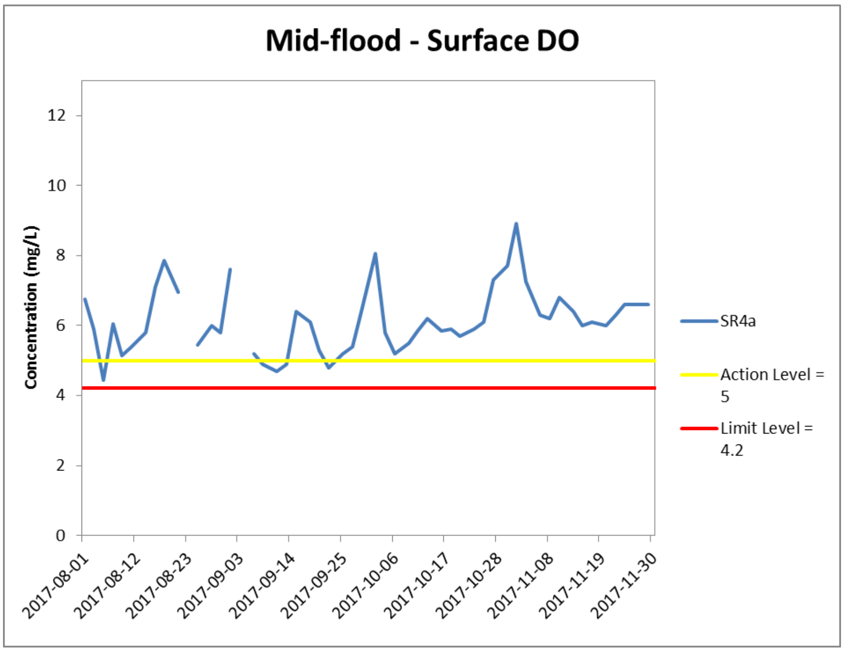
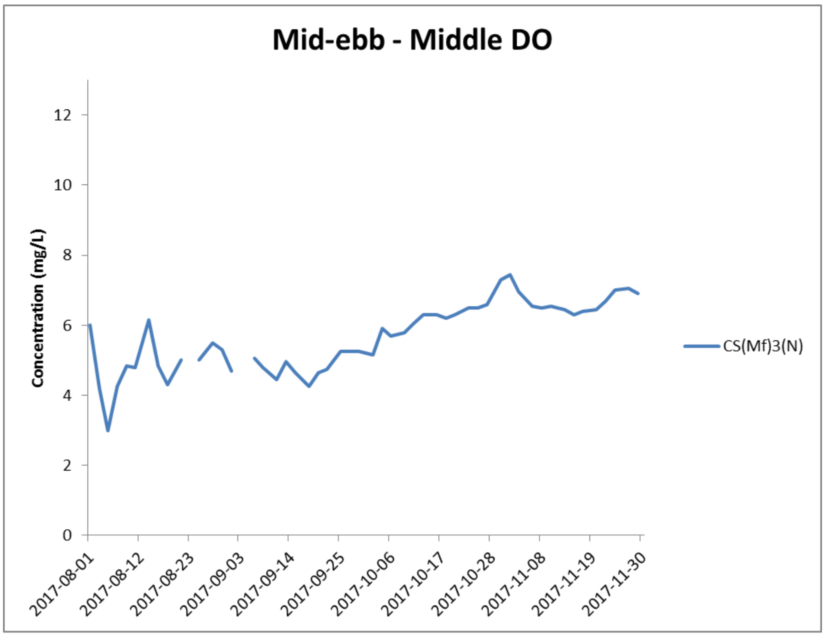



**Figure H8 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide between 1 August 2017 and 30 November 2017 at SR4a.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



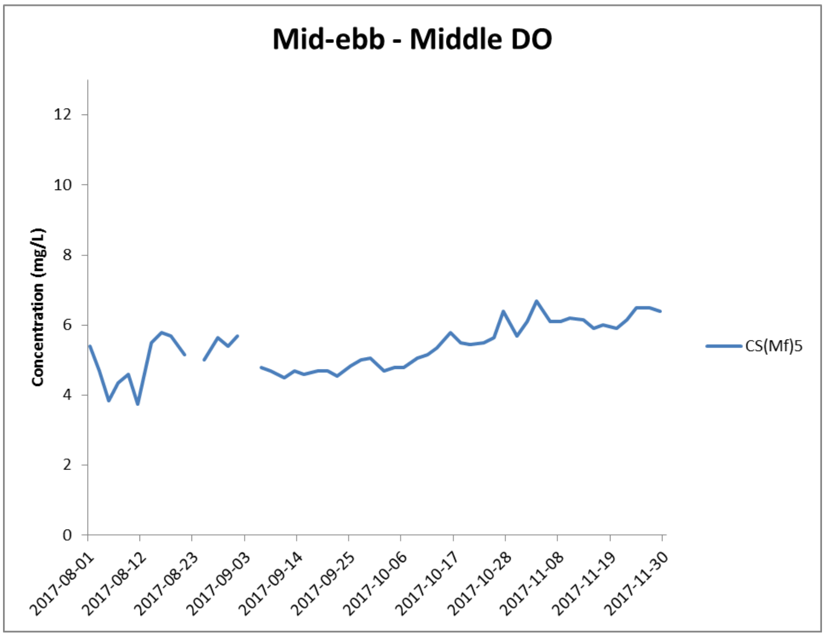




**Figure H9 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

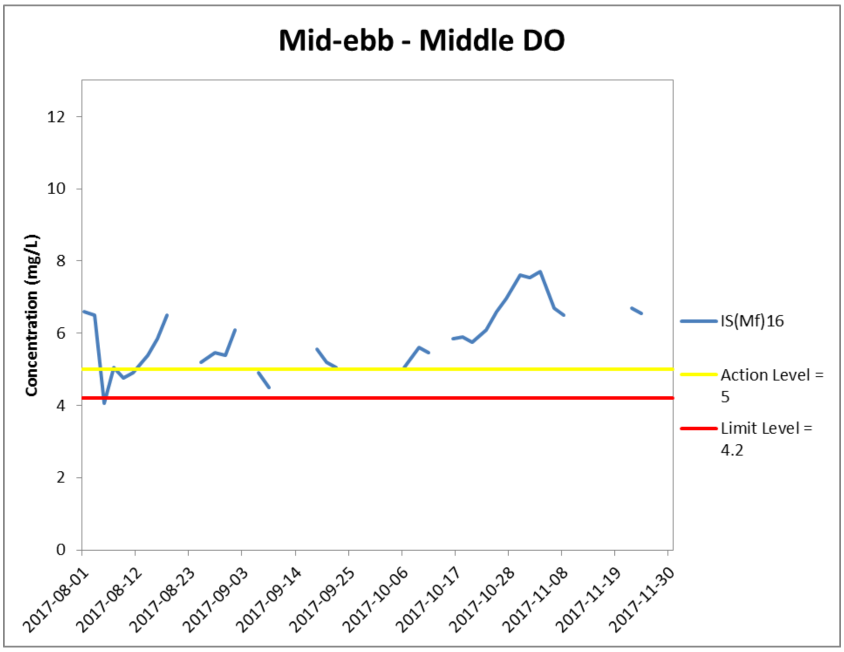
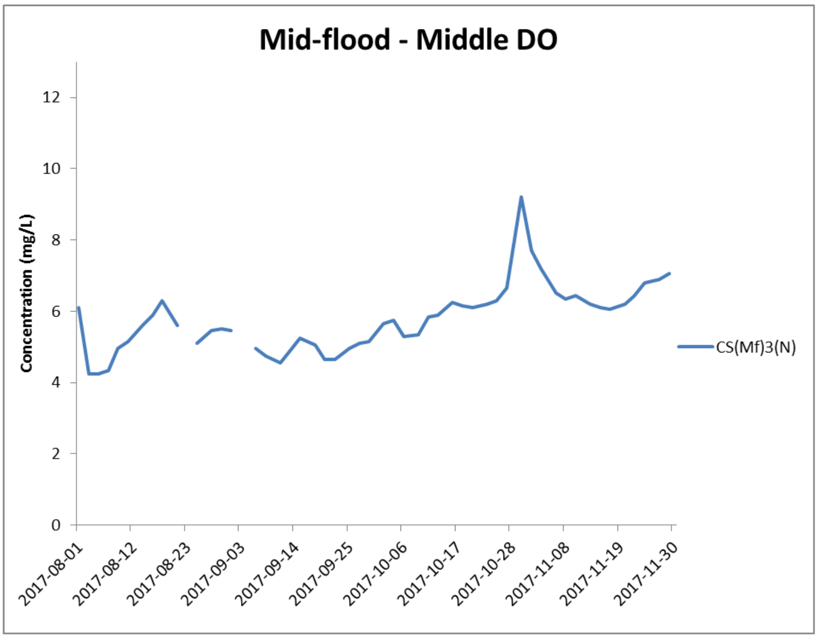



**Figure H10 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS(Mf)16.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**



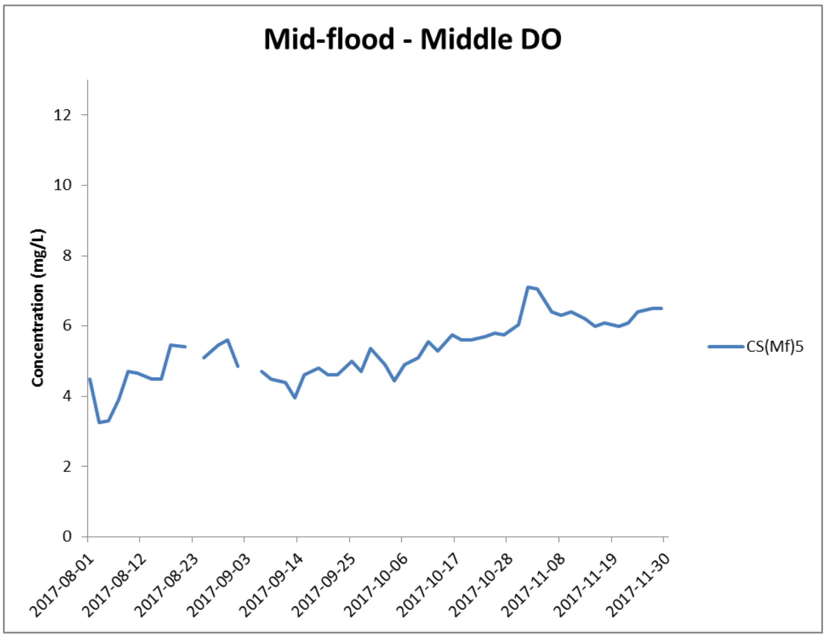
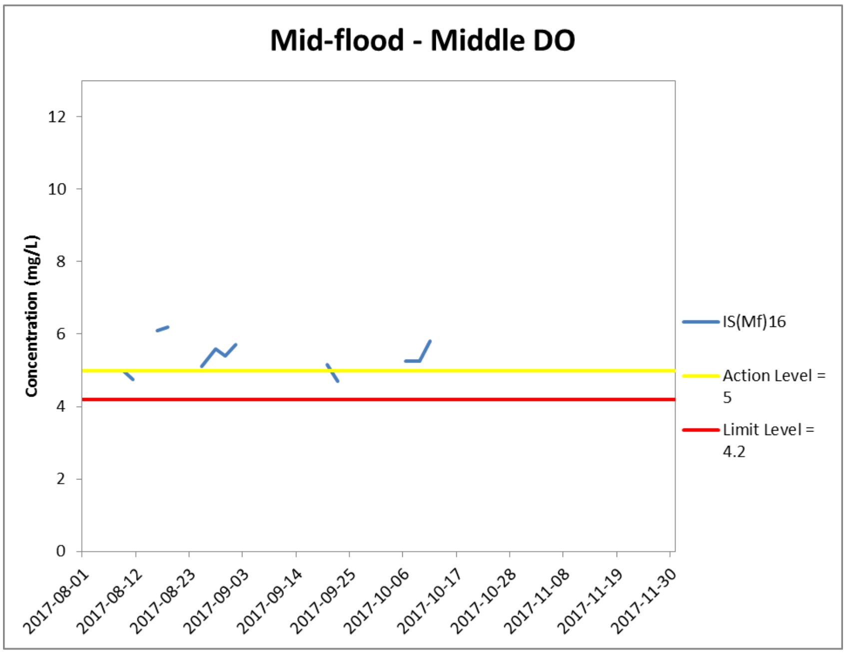




**Figure H11 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



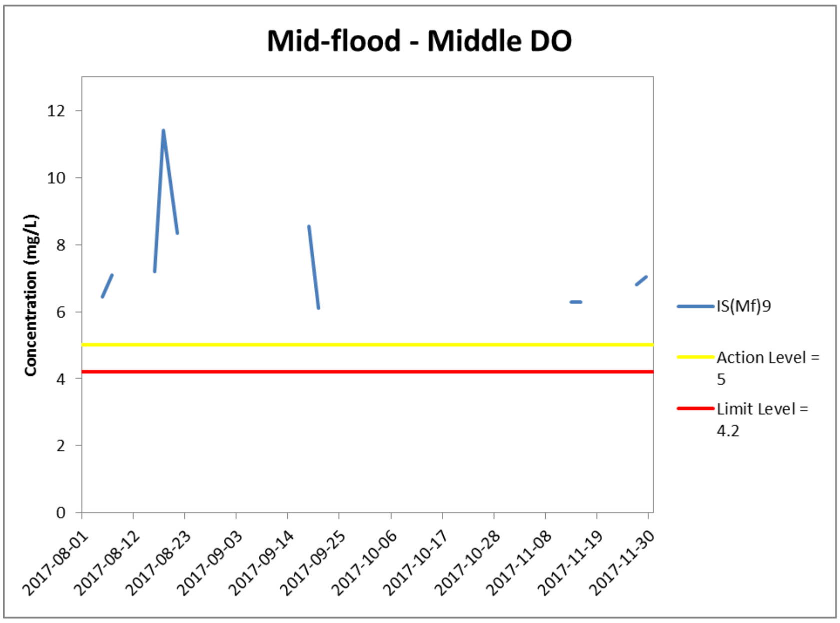
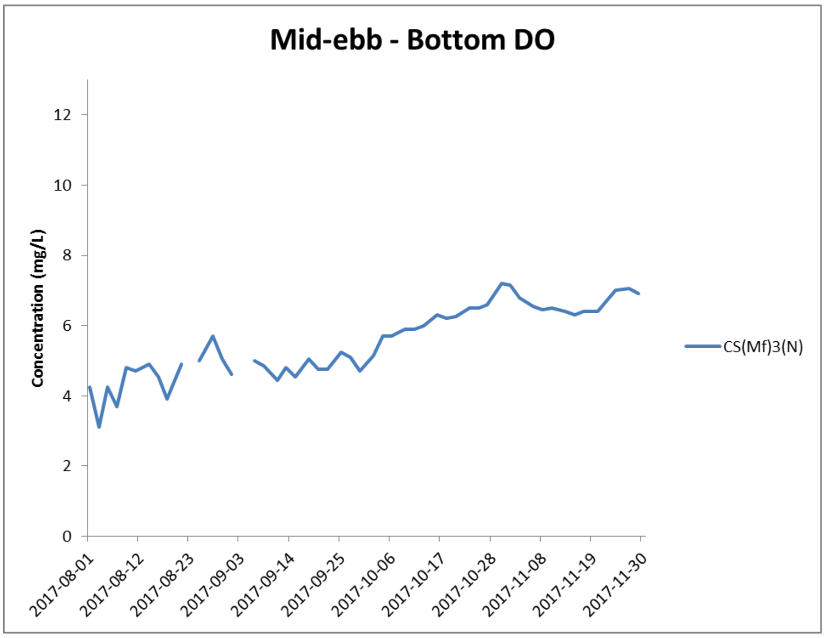




**Figure H12 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



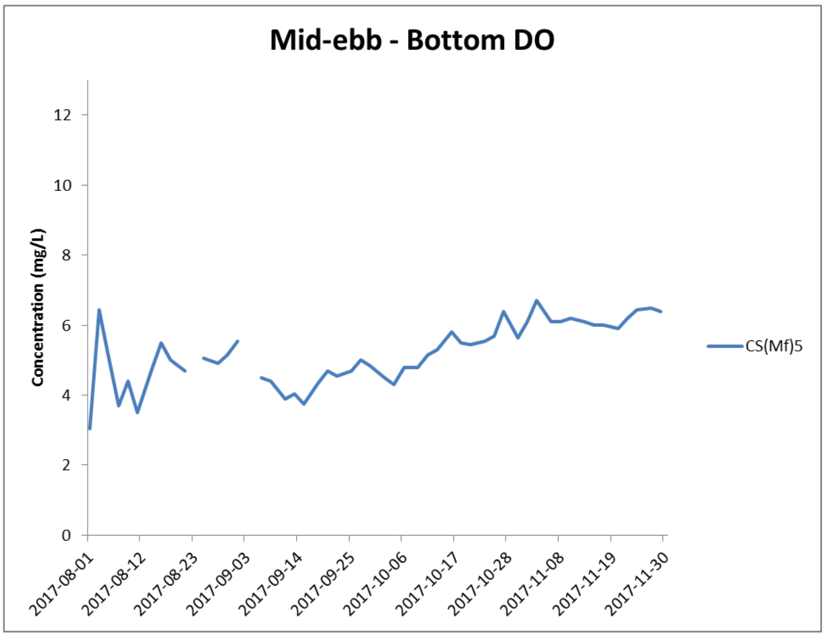
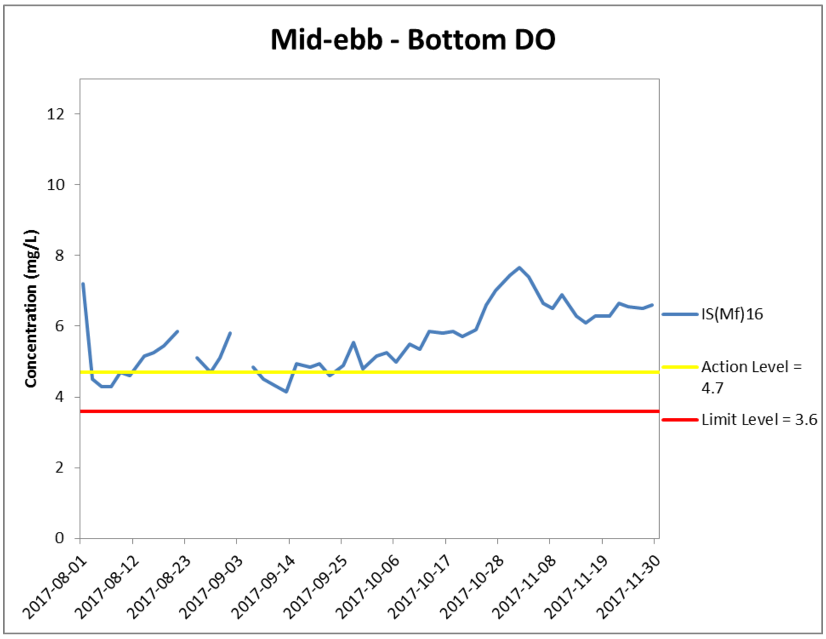




**Figure H13 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



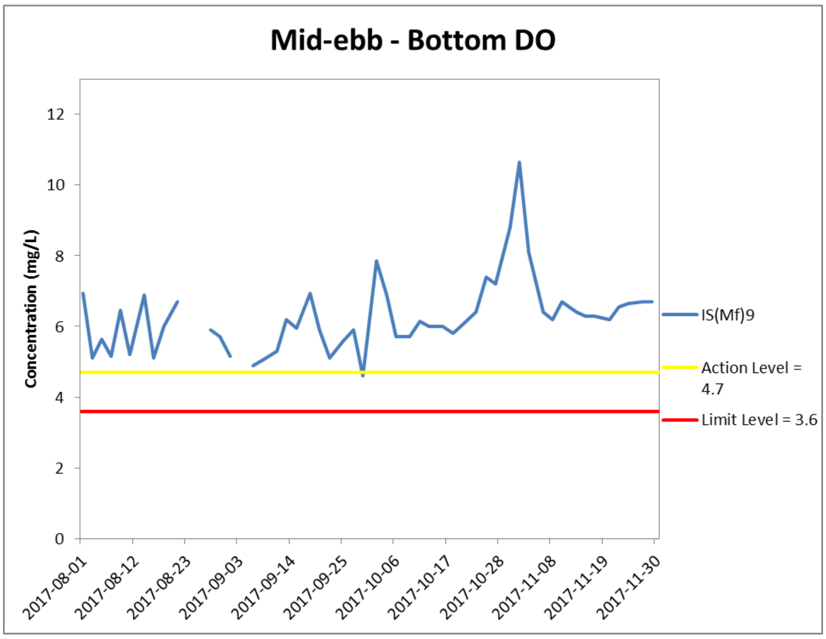
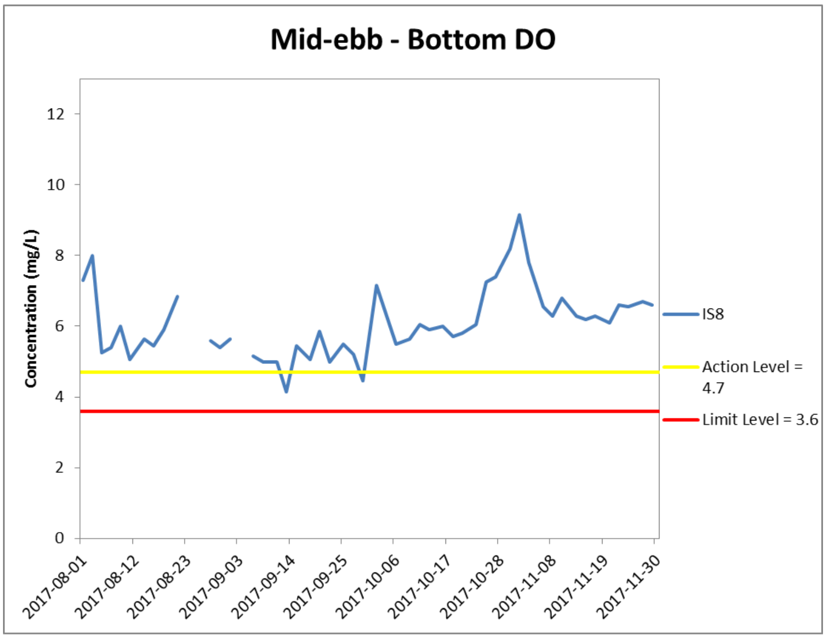




**Figure H14 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



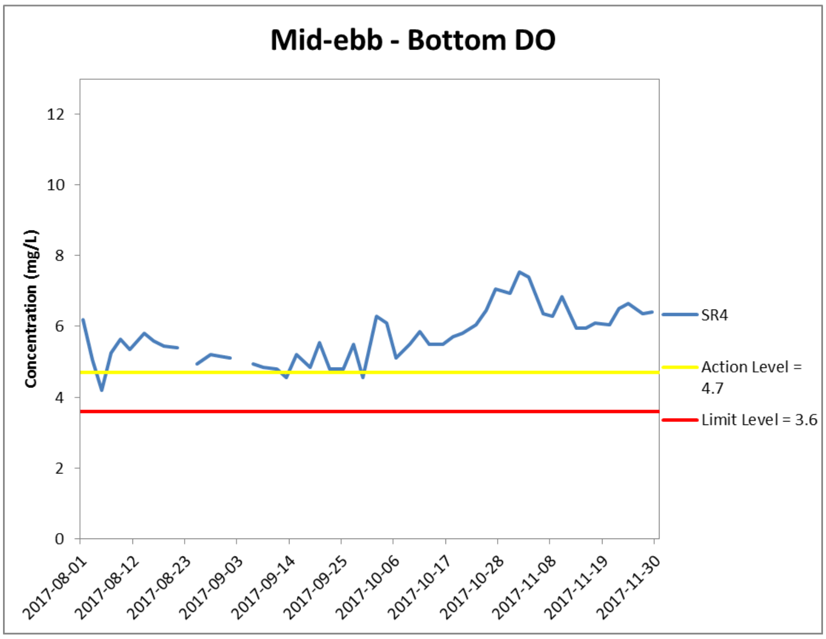




**Figure H15 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

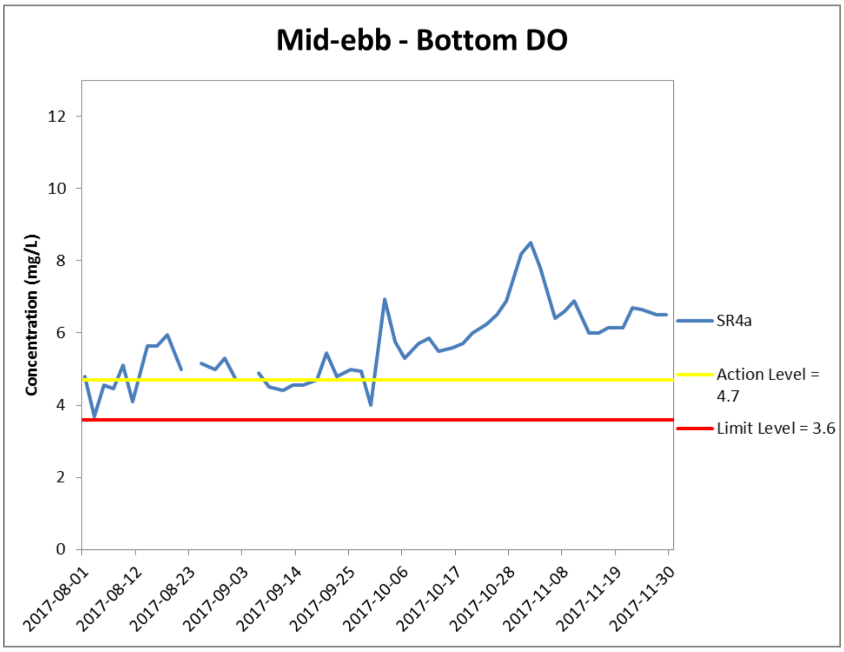
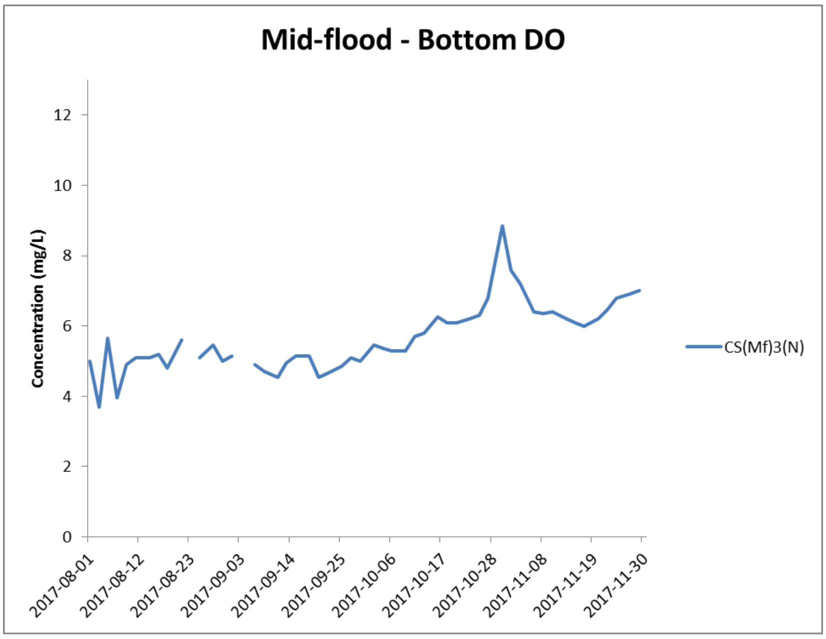



**Figure H16 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide between 1 August 2017 and 30 November 2017 at SR4a.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



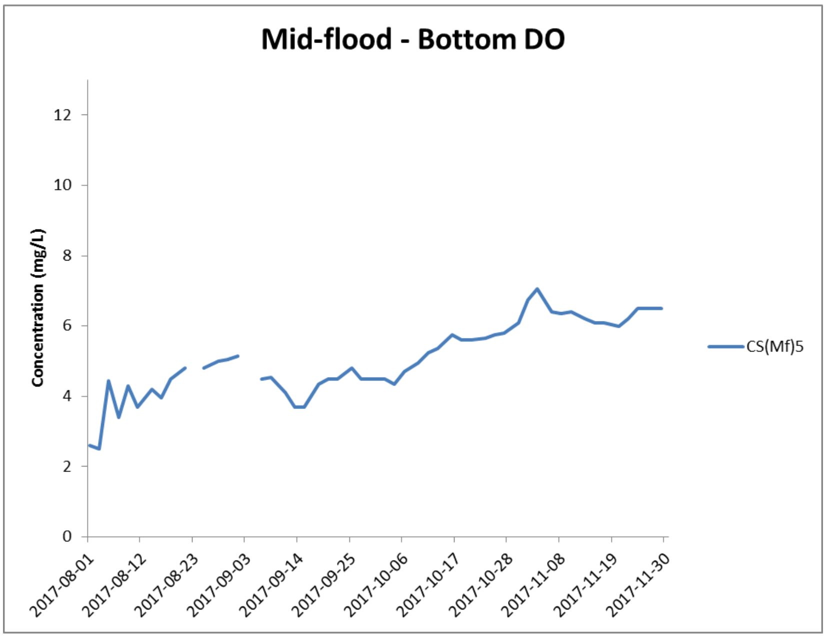
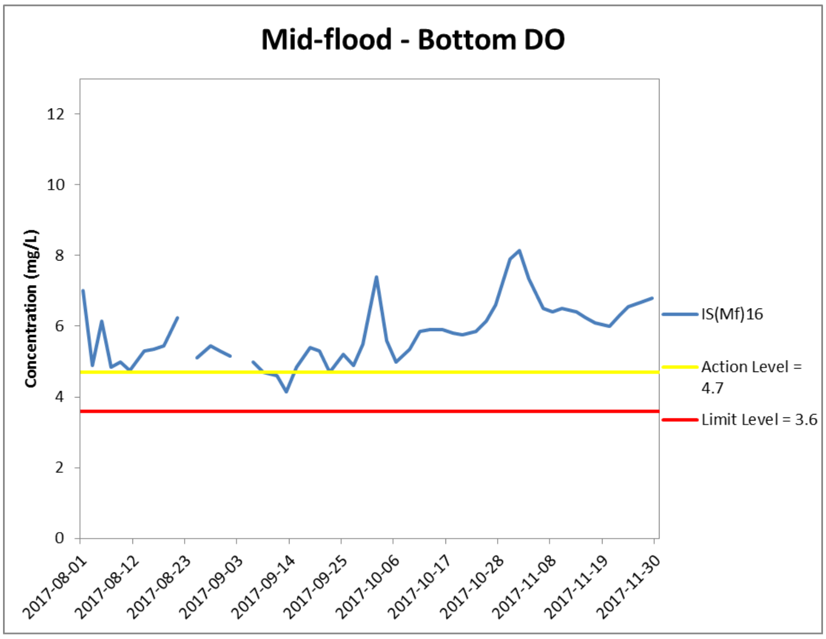




**Figure H17 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



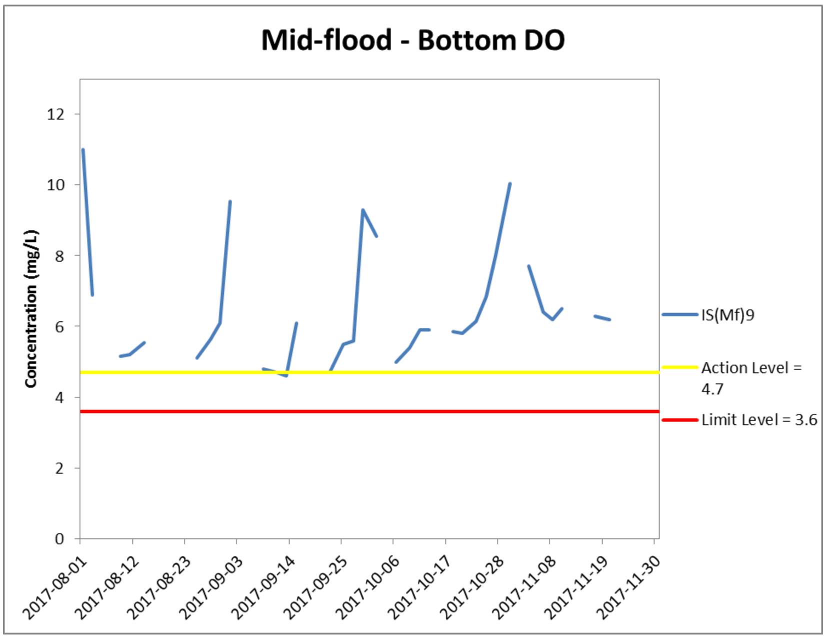
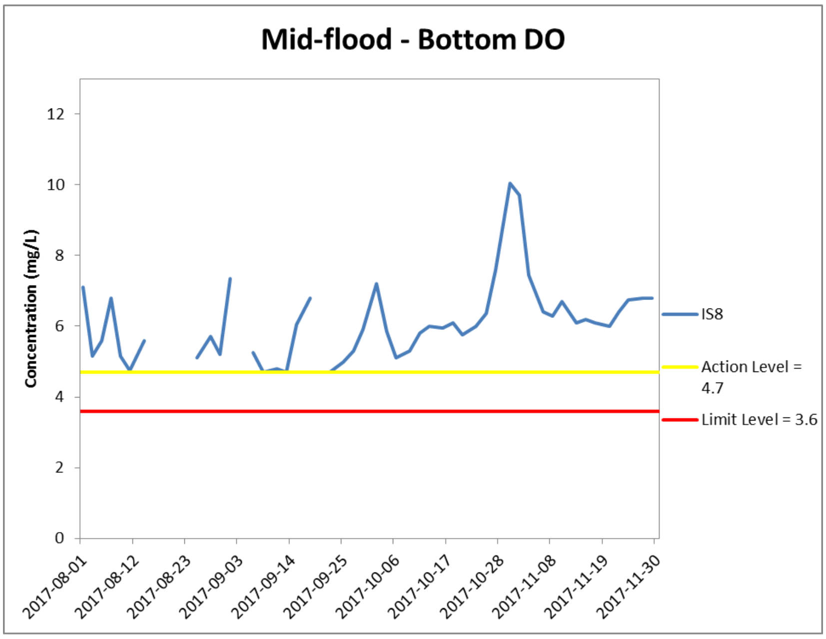




**Figure H18 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



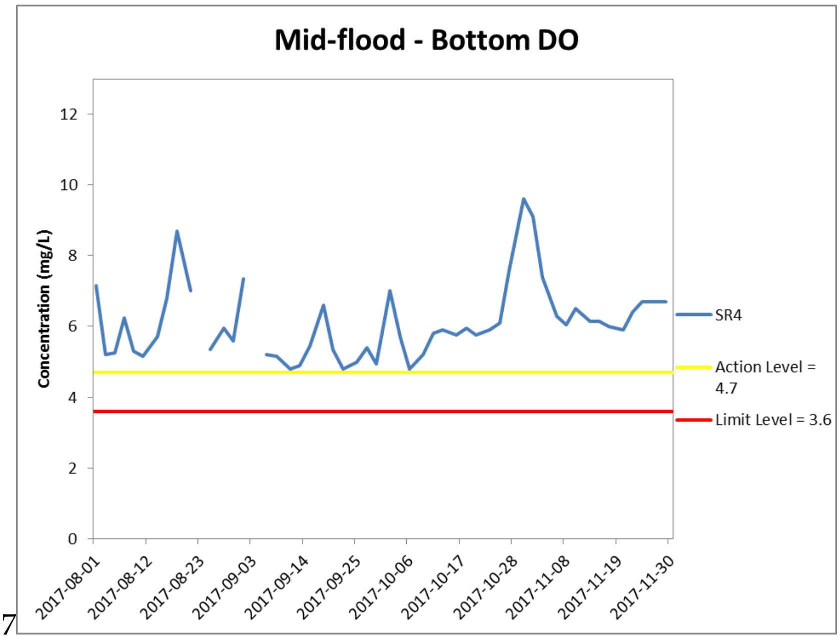




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**Figure H19 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

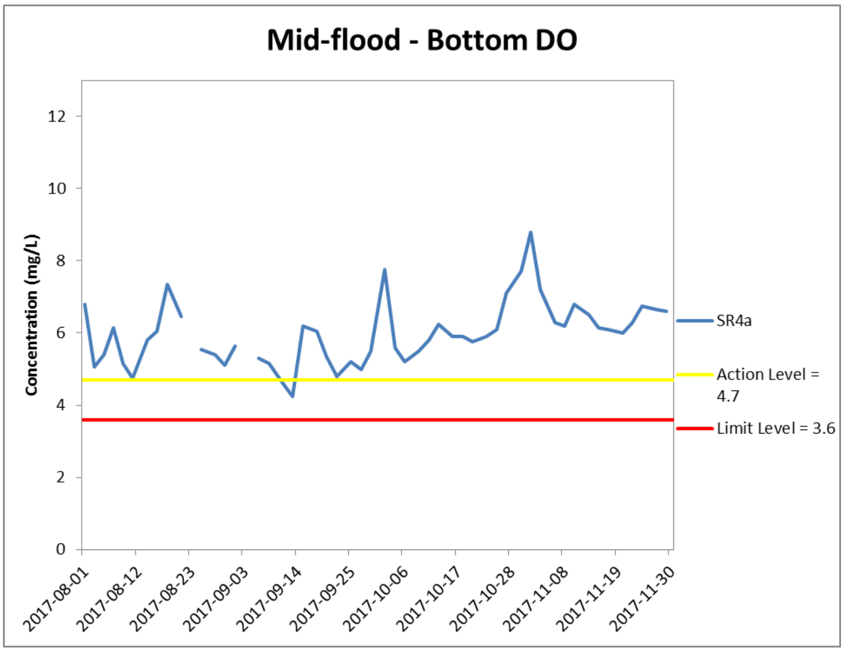
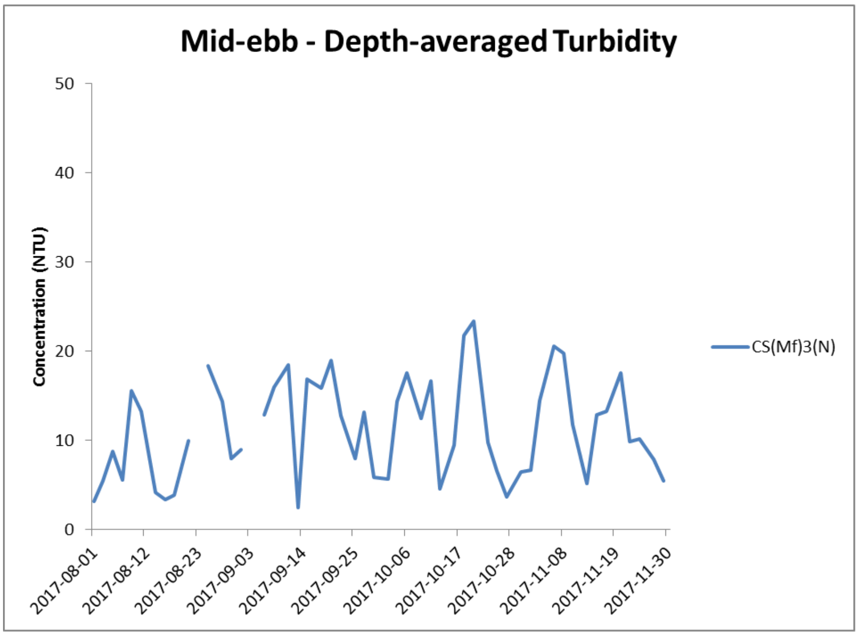



**Figure H20 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide between 1 August 2017 and 30 November 2017 at SR4a.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



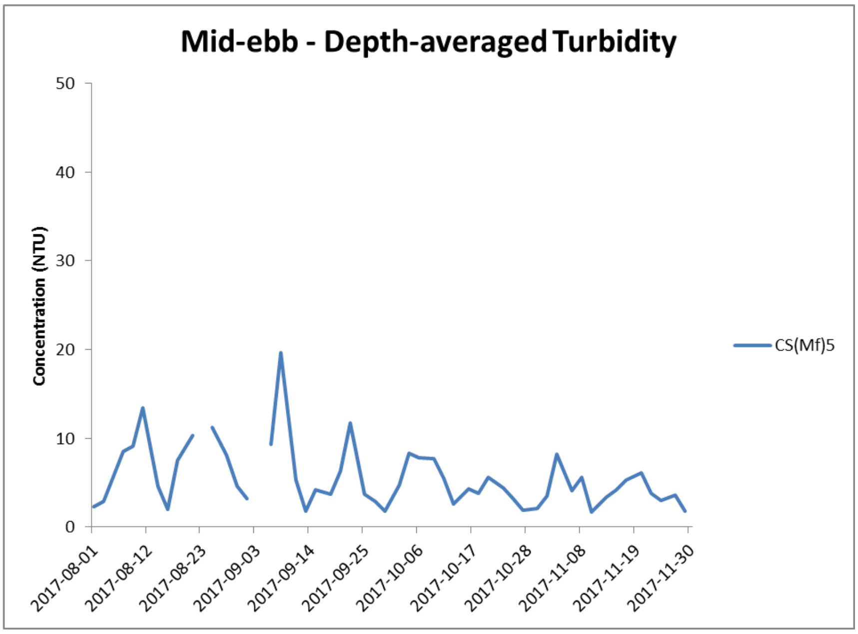
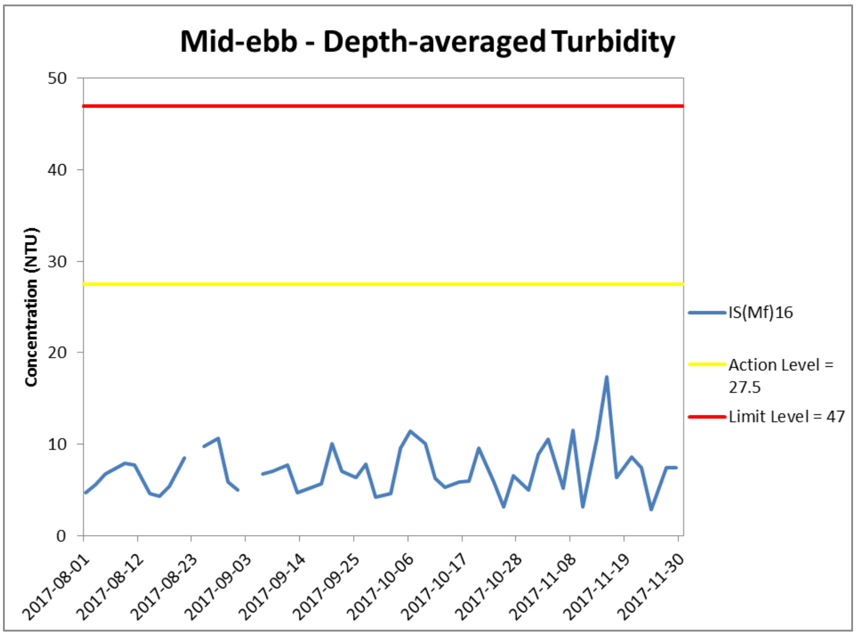




**Figure H21 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



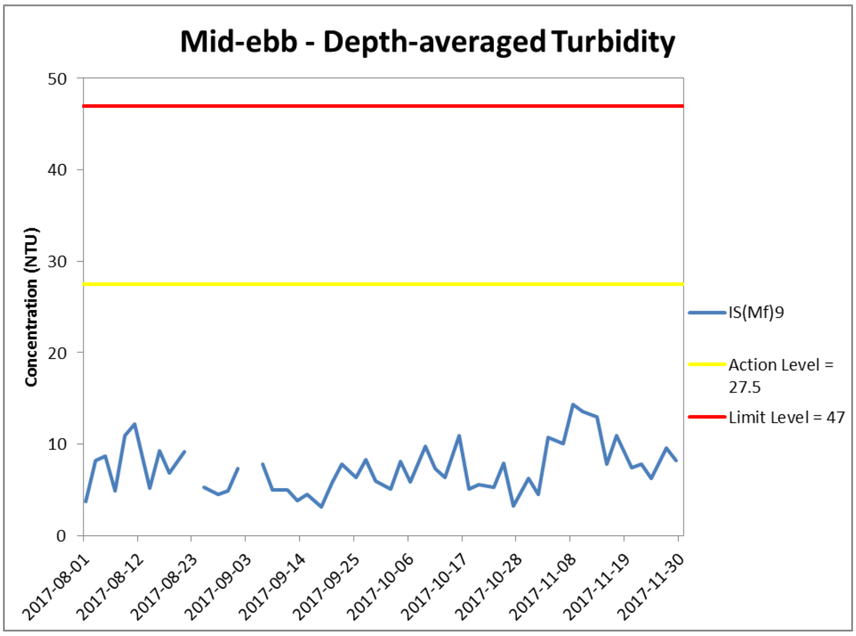
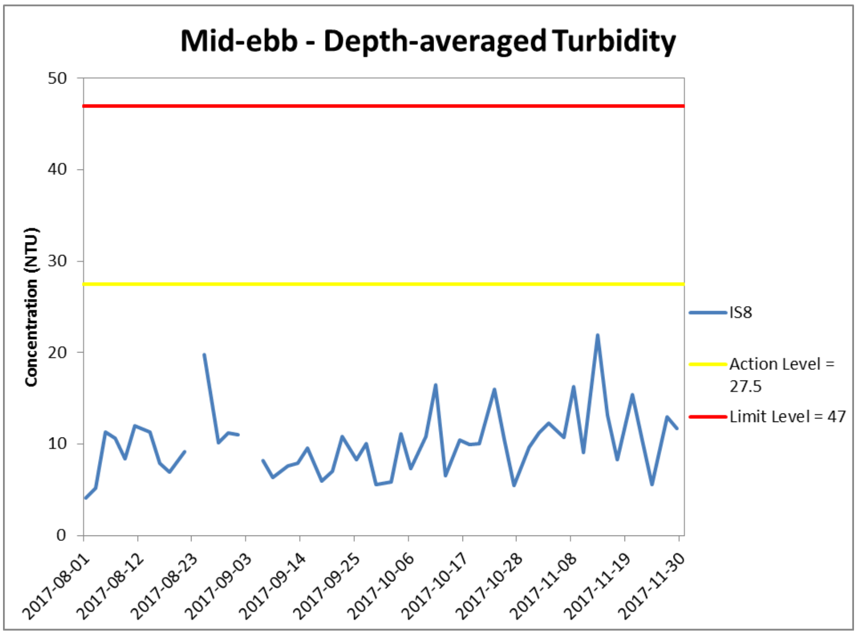




**Figure H22 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



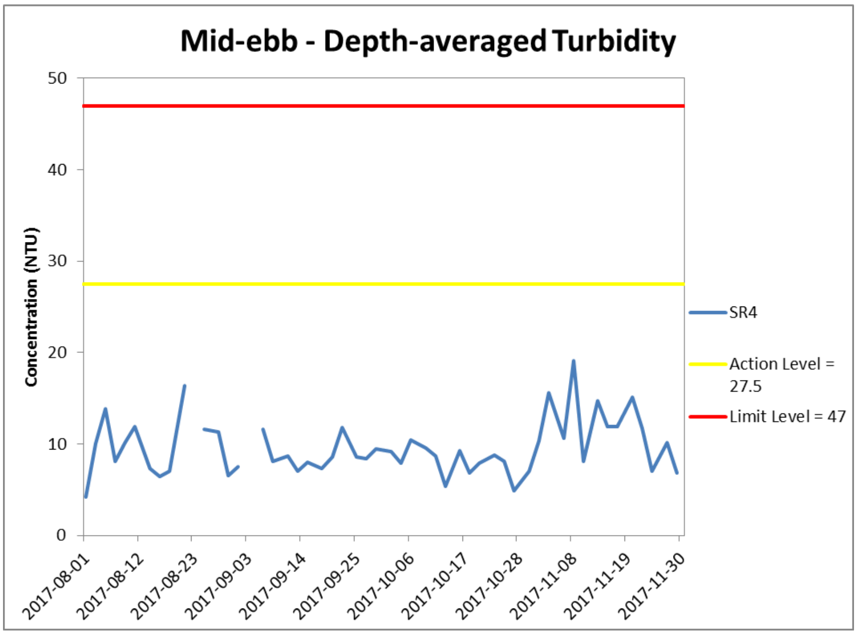




**Figure H23 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

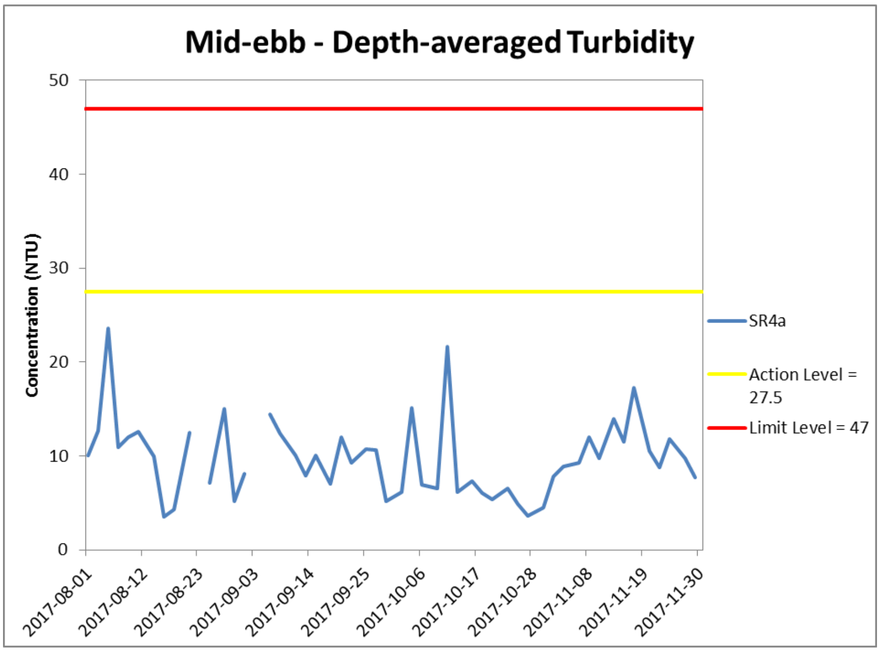
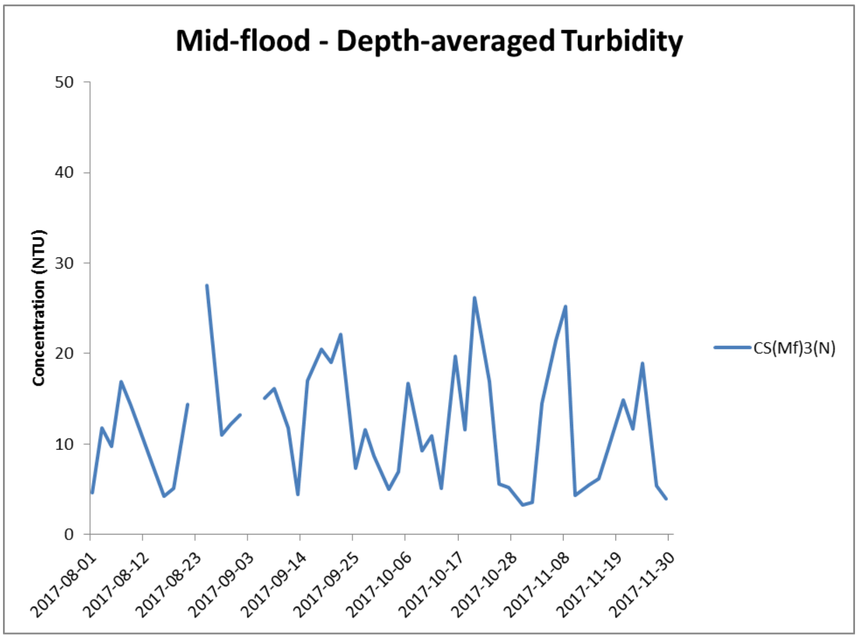



**Figure H24 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide between 1 August 2017 and 30 November 2017 at SR4a.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



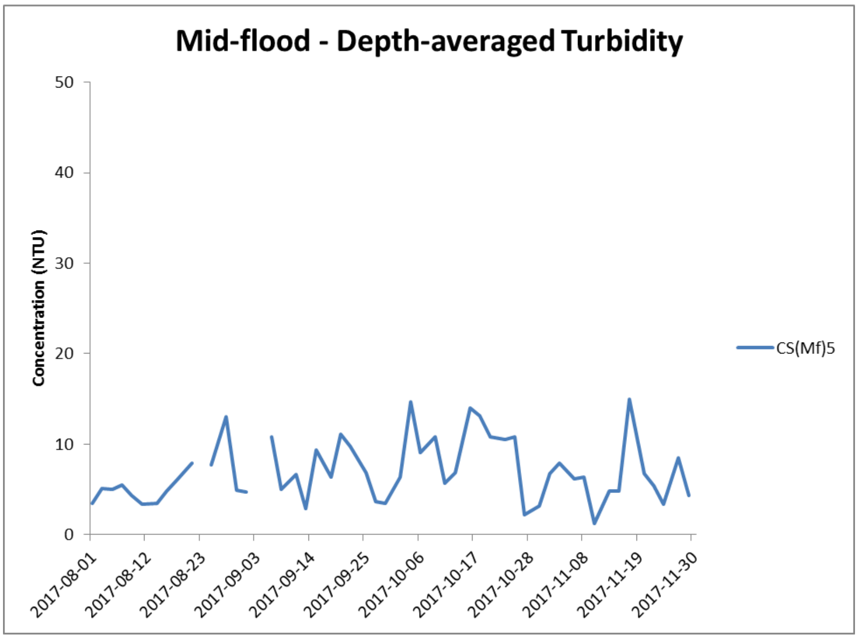
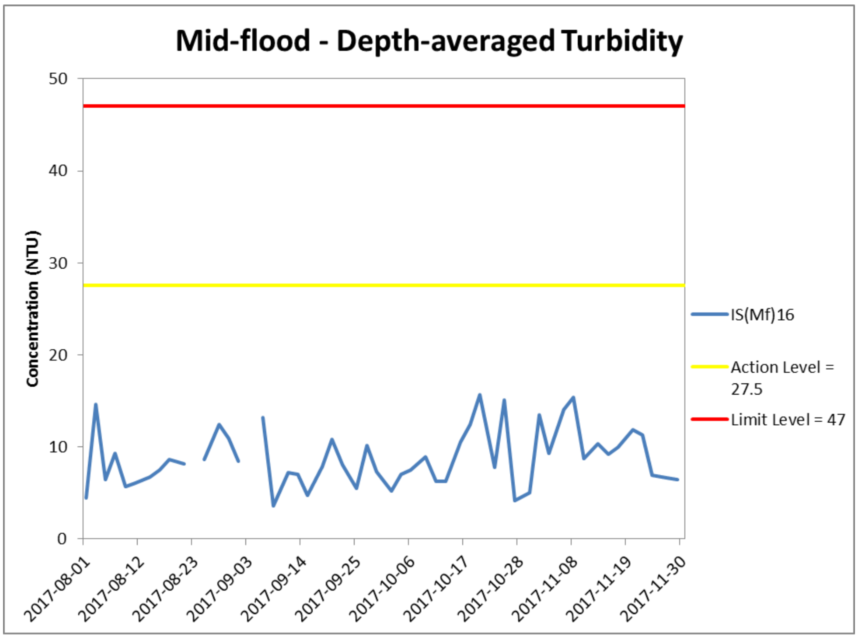




**Figure H25 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(MF)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



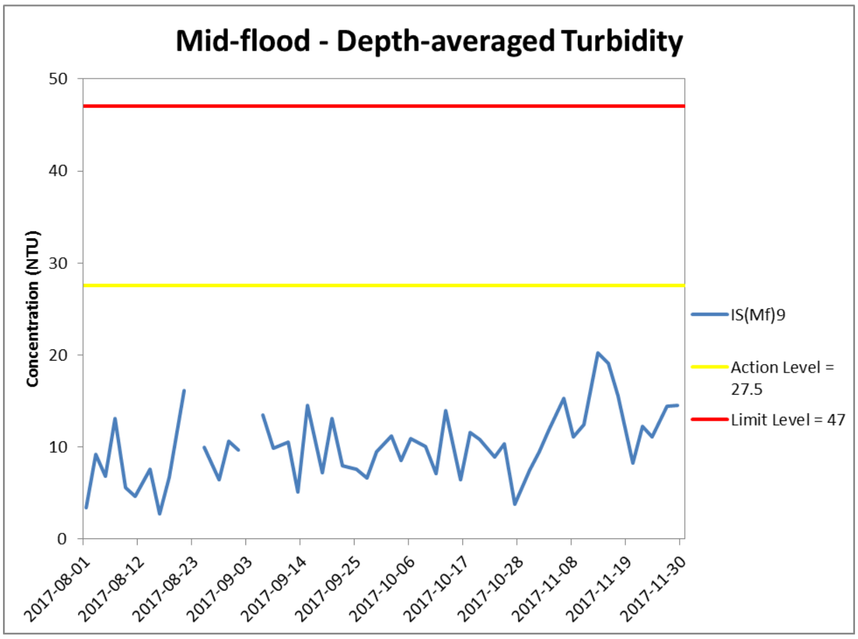
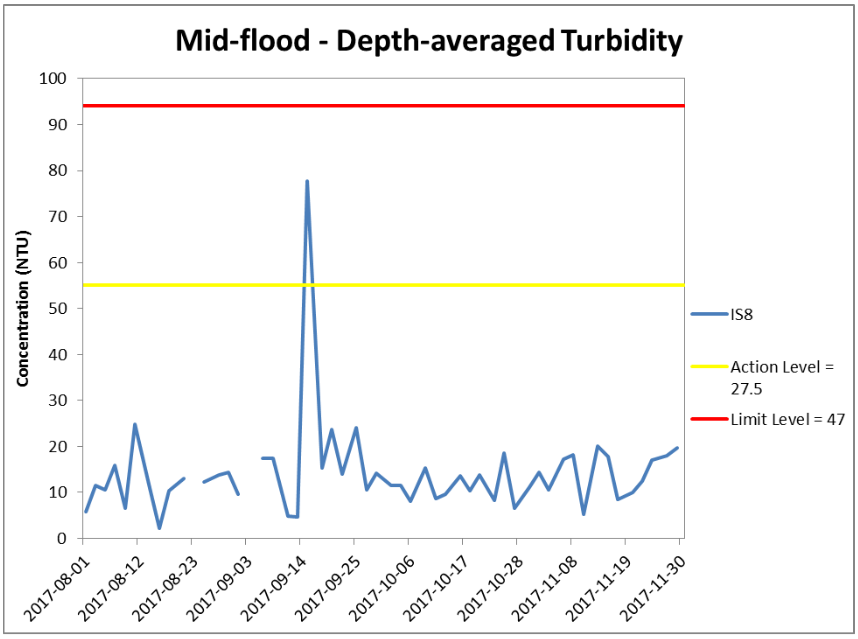



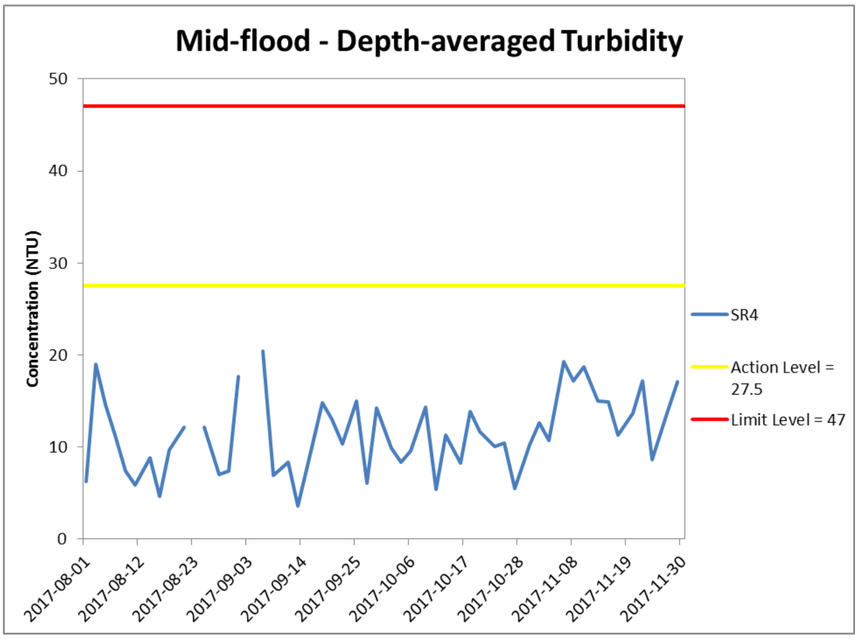

**Figure H26 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM




**`Figure H27 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

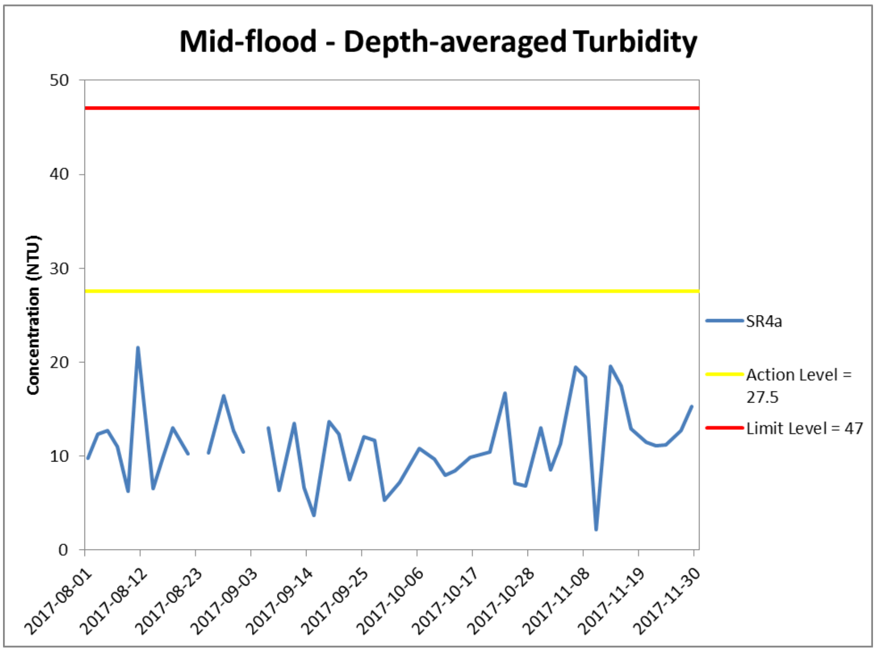
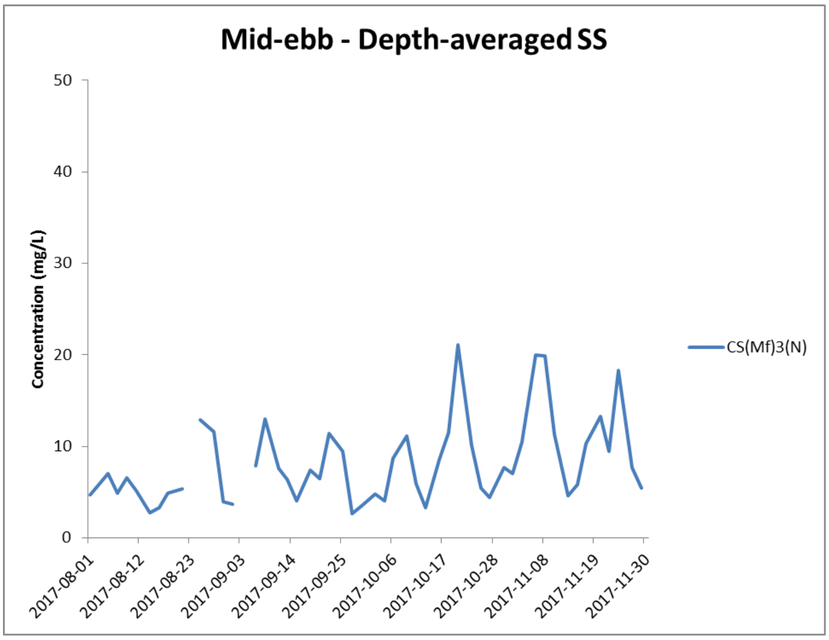



**Figure H28 Impact Monitoring – Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide between 1 August 2017 and 30 November 2017 at SR4a.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



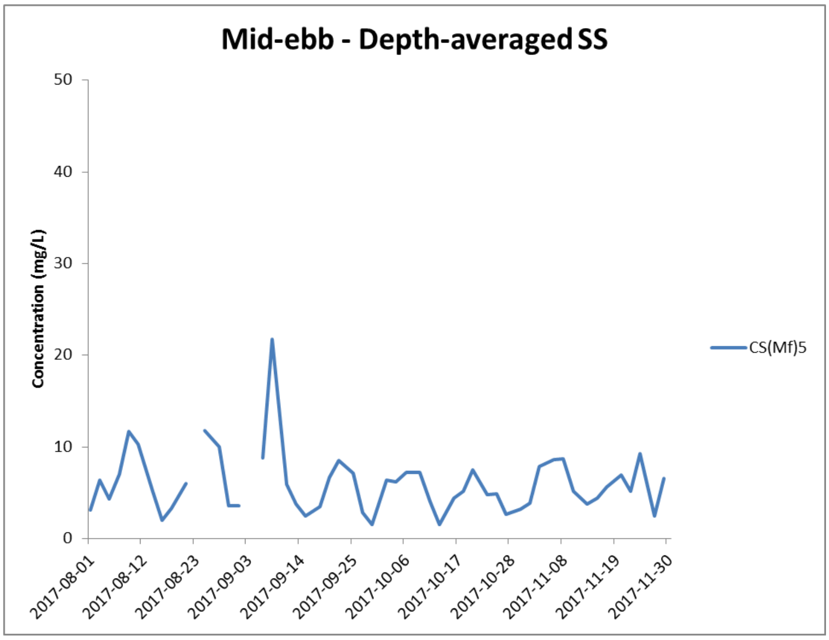
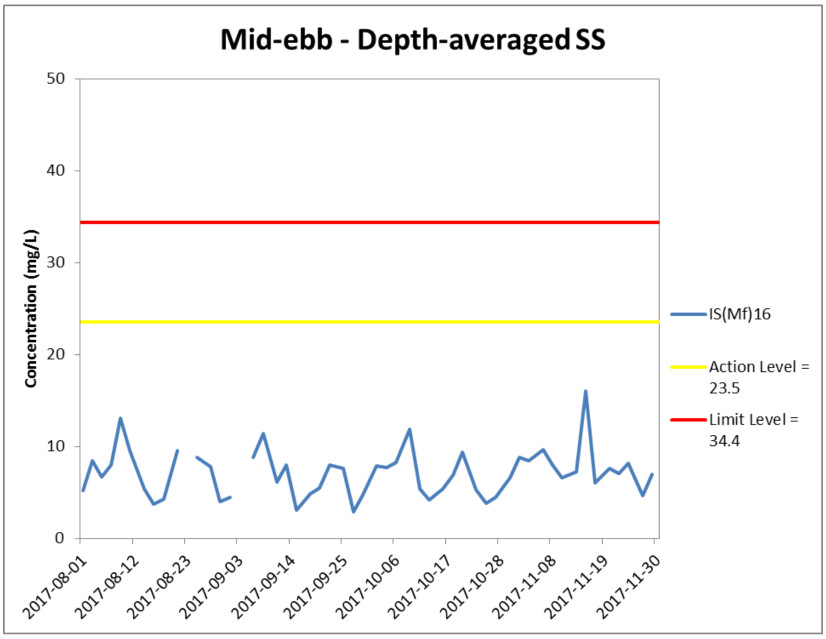




**Figure H29 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



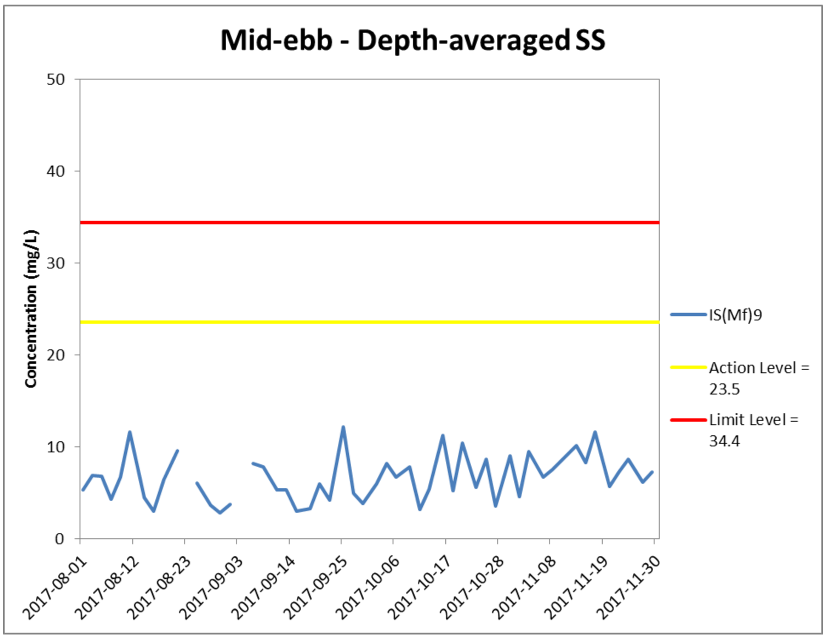
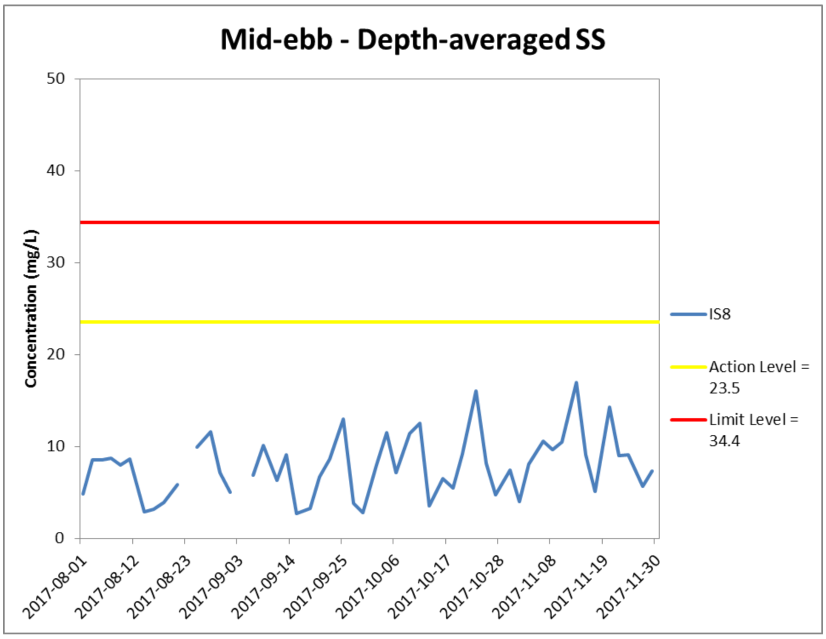




**Figure H30 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



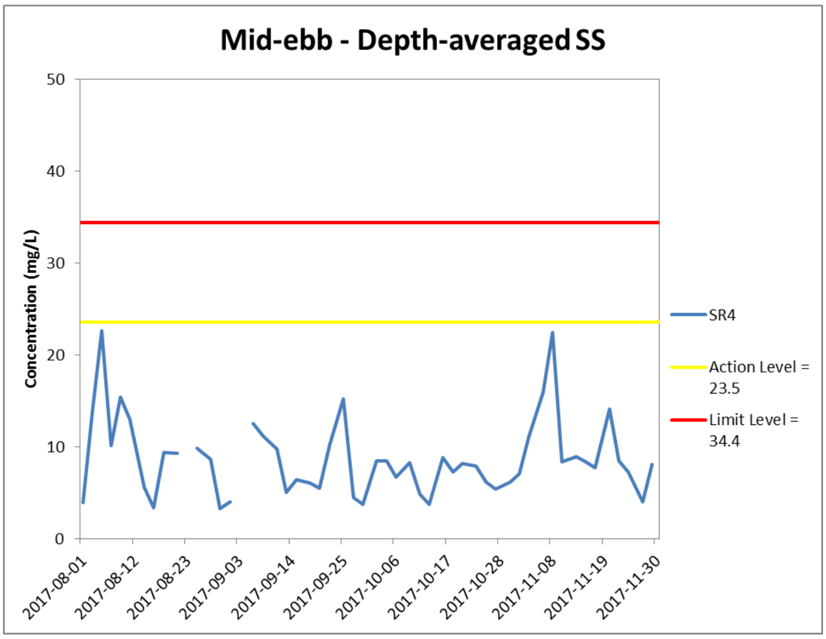
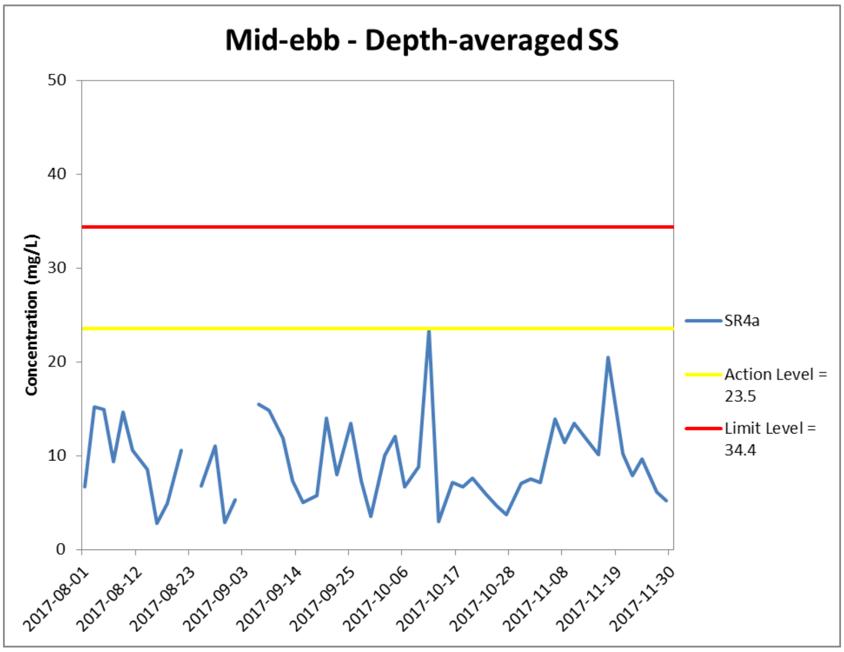




**Figure H31 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

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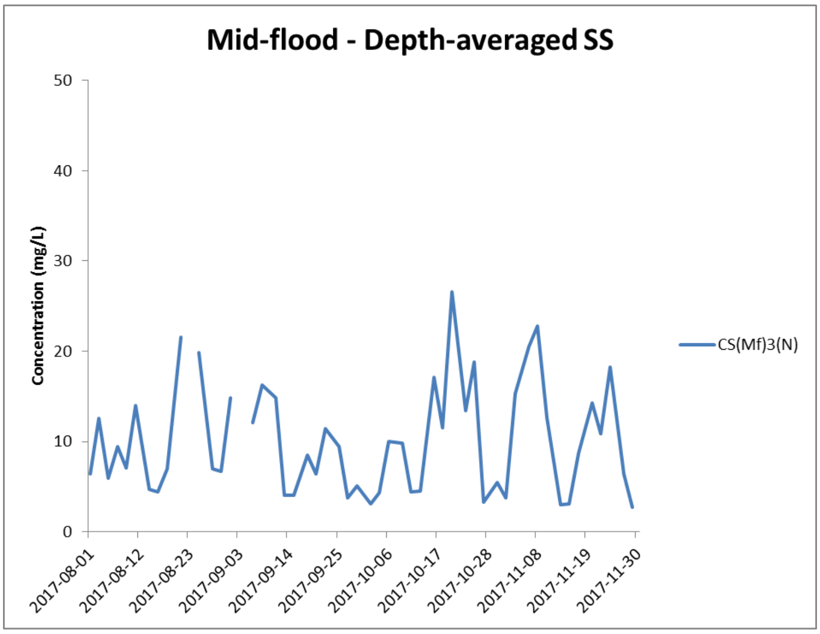
| **Figure H32 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-ebb tide between 1 August 2017 and 30 November 2017 at SR4a.**<br><br>*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.* | **Environmental Resources Management** ERM |



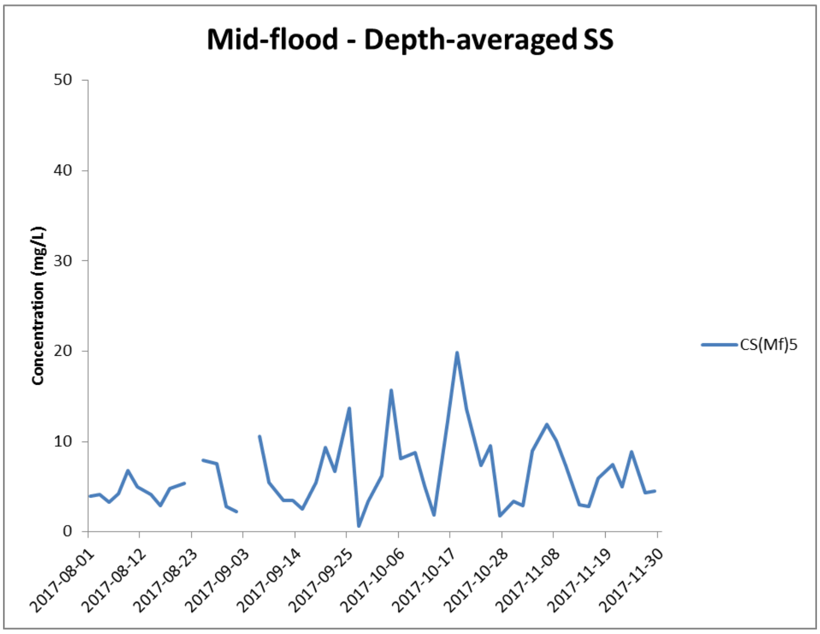
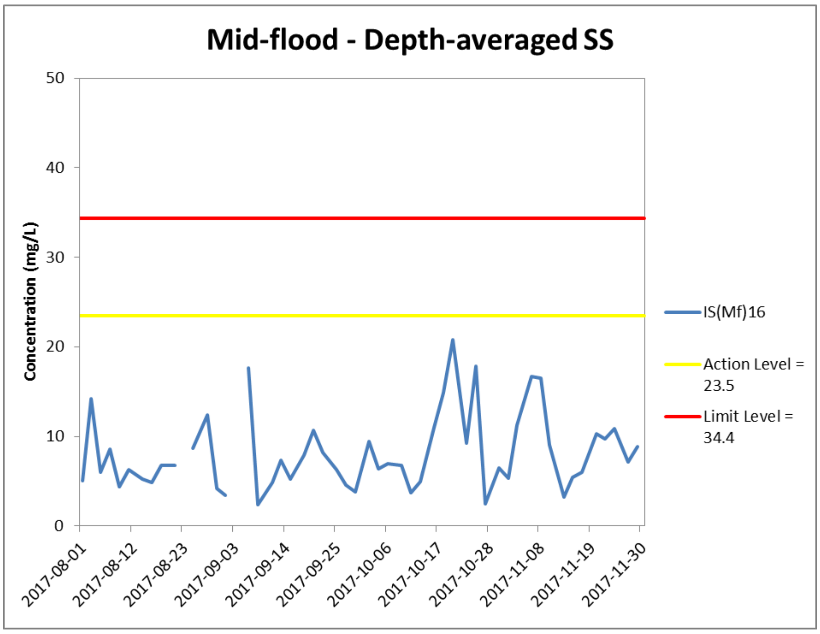




**Figure H33 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 August 2017 and 30 November 2017 at CS(Mf)3(N) and CS(Mf)5.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



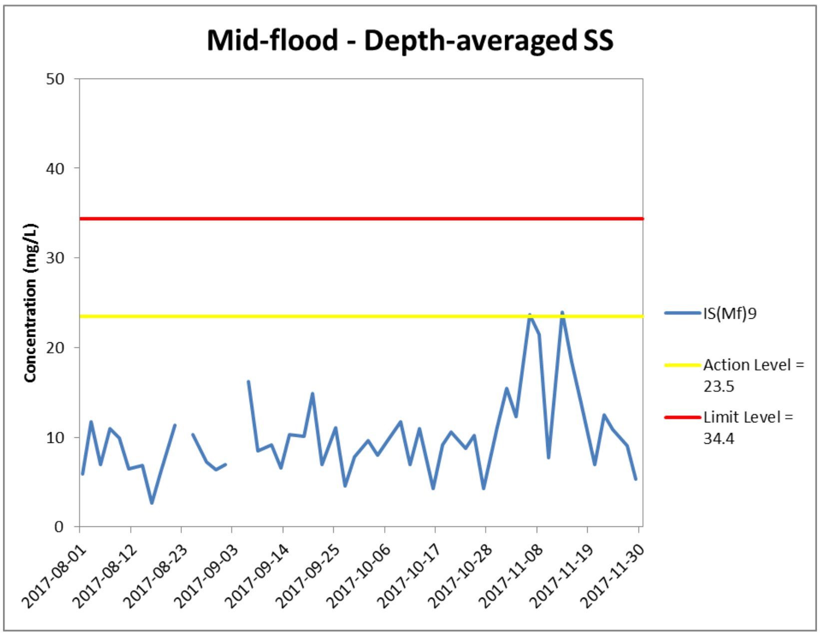
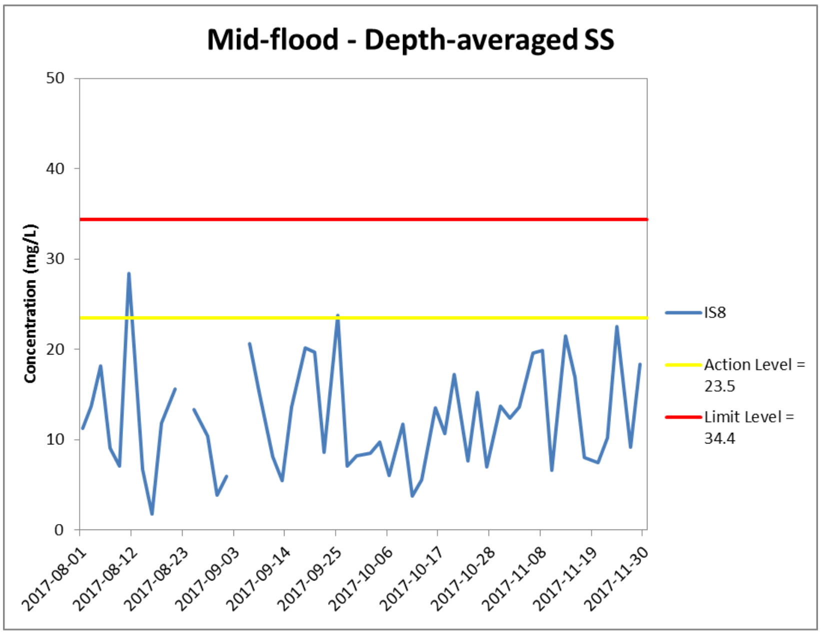




**Figure H34 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 August 2017 and 30 November 2017 at IS(Mf)16 and IS(Mf)9.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM



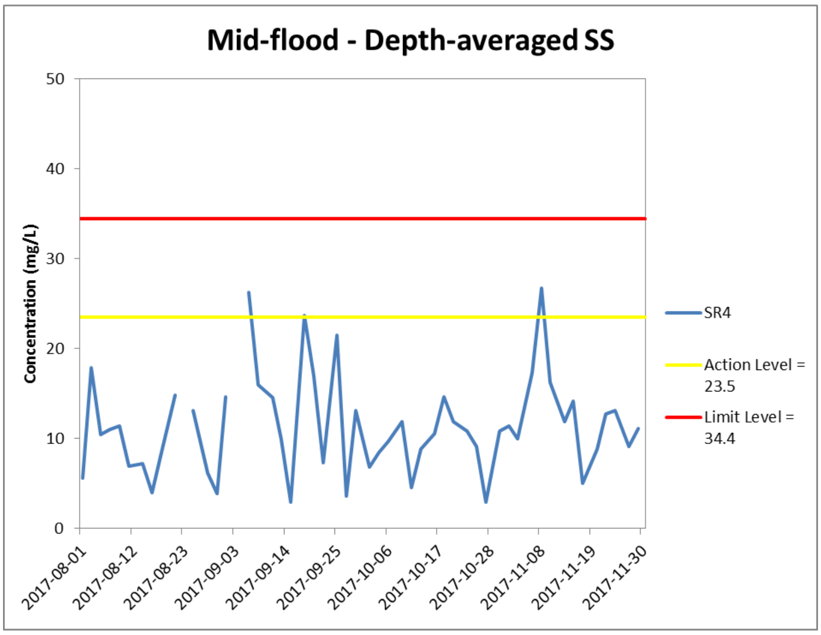
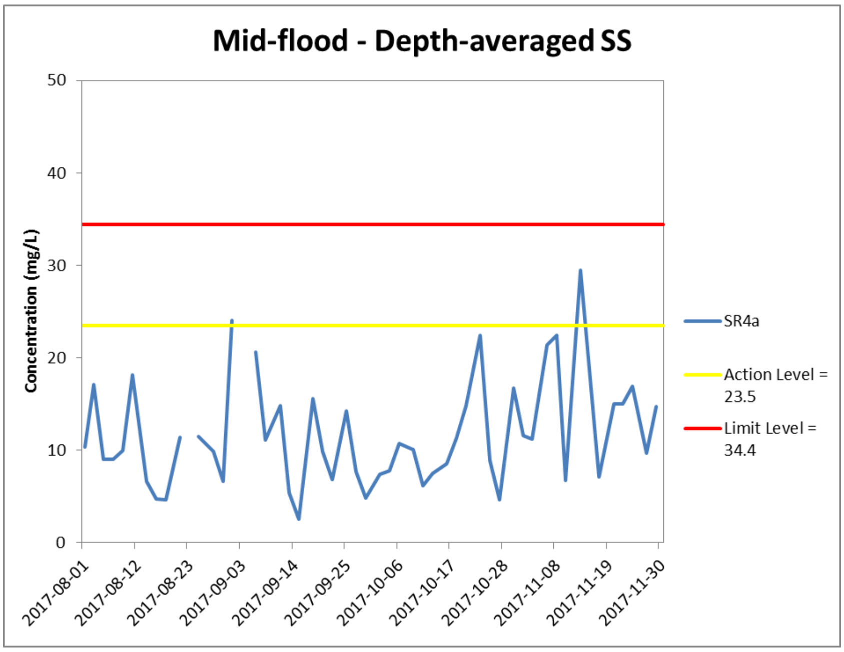




**Figure H35 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 August 2017 and 30 November 2017 at IS8 and SR4.**

*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.*

**Environmental Resources Management**

ERM

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| **Figure H36 Impact Monitoring – Mean depth-averaged level of Suspended Solids (mg/L) during mid-flood tide between 1 August 2017 and 30 November 2017 at SR4a.**<br><br>*(Weather condition varied between sunny to rainy within the reporting period.) WQM on 4 September 2017 was canceled due to adverse weather. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.* | **Environmental Resources Management** ERM |

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

*16th Quarterly Progress Report (September-November 2017)*
*submitted to Gammon Construction Limited*

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

13 March 2018

## 1. Introduction

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

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

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

1.4. During the construction period of HKLR, the dolphin specialist would be in charge of reviewing and collating information collected by the HKLR03 dolphin monitoring programme to examine any potential impacts of TM-CLKL construction works on the dolphins.

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

1.6. This report is the 16th quarterly progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Gammon Construction Limited, summarizing the results of the surveys findings during the period of September to November 2017, utilizing the survey data collected by HKLR03 impact phase monitoring project.

## 2. Monitoring Methodology

### *2.1. Vessel-based Line-transect Survey*

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

Table 1 Co-ordinates of transect lines conducted by HKLR03 project

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

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

2.1.2. The HKLR03 survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 20 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2017). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

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

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

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

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

2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as "primary" survey effort, while the survey effort conducted along the connecting lines between parallel lines was labeled as "secondary" survey effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected along primary and secondary lines were similar in NEL and NWL survey areas. Therefore, both primary and secondary survey effort were presented as on-effort survey effort in this report.

*2.2. Photo-identification Work*

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the HKLR03 survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.

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

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

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

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

*2.3. Data Analysis*

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

2.3.2. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in NEL and NWL survey areas in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collect under Beaufort 3 or below condition would be used for the encounter rate analyses. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.

Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in North Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in North Lantau).

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

2.3.3. Quantitative grid analysis on habitat use – To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly impact phase monitoring period were plotted onto 1-km$^2$ grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km$^2$) and dolphin densities (total number of dolphins from on-effort sightings per km$^2$) were then calculated for each 1 km by 1 km grid with the aid of GIS. Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).

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

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

where S = total number of on-effort sightings

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

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

2.3.5. Ranging pattern analysis – Location data of individual dolphins that occurred during the 3-month impact phase monitoring period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, was loaded as an extension with ArcView© 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

## 3. Monitoring Results

*3.1. Summary of survey effort and dolphin sightings*

3.1.1. During the period of September to November 2017, 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 802.12 km of survey effort was collected, with 96.0% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 297.00 km and 505.12 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 578.16 km, while the effort on secondary lines was 223.96 km. Survey effort conducted on both primary and secondary lines were considered as on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.4. During the six sets of HKLR03 monitoring surveys from September to November 2017, 13 groups of 50 Chinese White Dolphins were sighted. All dolphin sightings were made during on-effort search in this quarter, and 12 of the 13 on-effort dolphin sightings were made on primary lines. A summary table of dolphin sightings is shown in Appendix II.

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

*3.2. Distribution*

3.2.1. Distribution of dolphin sightings made during the HKLR03 monitoring surveys from September to November 2017 is shown in Figure 1. Almost all sightings were made at the northwest portion of the North Lantau region, mainly to the east of Lung Kwu Chau and at the mouth of Deep Bay near Black Point (Figure 1). One dolphin group was also sighted at the southwestern end of NWL survey area, or near the HKLR09 alignment. As consistently recorded in the previous monitoring quarters, the dolphins were completely absent from the central and eastern portions of North Lantau waters (Figure 1).

3.2.2. All dolphin sightings were located far away from the alignments of TM-CLKL as well as the HKBCF and HKLR03 reclamation sites (Figure 1). However, one dolphin group was sighted near the alignment of HKLR09 as mentioned above.

3.2.3. Sighting distribution of dolphins during the present impact phase monitoring period (September to November 2017) was drastically different from the one during the baseline monitoring period (Figure 1). In the present quarter, dolphins have disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands, near Shum Shui Kok and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1). The nearly complete abandonment of NEL region by the dolphins has been consistently recorded in the past 18 quarters of HKLR03 monitoring, which has resulted in zero to extremely low dolphin encounter rates in this area.

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

3.2.5. Another comparison in dolphin distribution was made between the five quarterly periods of autumn months in 2013-17 (Figure 2). Among the five autumn periods, dolphins were still sighted regularly in NWL waters in 2013 and 2014, but their usage there was progressively reduced in the three subsequent autumn periods, with the only occurrences mostly concentrated at the northwestern portion of the survey area (Figure 2).

*3.3. Encounter rate*

3.3.1. During the present quarterly period, the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) for each set of the HKLR03 surveys in NEL and NWL are shown in Table 2. The average encounter rates deduced from the six sets of HKLR03 surveys were also compared with the ones deduced from the baseline monitoring period (September – November 2011) (Table 3).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during September-November 2017

| 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 (15 & 18 Sep 2017) | 0.00 | 0.00 |
| | Set 2 (22 & 29 Sep 2017) | 0.00 | 0.00 |
| | Set 3 (4 & 9 Oct 2017) | 0.00 | 0.00 |
| | Set 4 (18 & 26 Oct 2017) | 0.00 | 0.00 |
| | Set 5 (1 & 8 Nov 2017) | 0.00 | 0.00 |
| | Set 6 (17 & 24 Nov 2017) | 0.00 | 0.00 |
| Northwest Lantau | Set 1 (15 & 18 Sep 2017) | 0.00 | 0.00 |
| | Set 2 (22 & 29 Sep 2017) | 3.63 | 16.34 |
| | Set 3 (4 & 9 Oct 2017) | 1.86 | 9.30 |
| | Set 4 (18 & 26 Oct 2017) | 4.89 | 4.89 |
| | Set 5 (1 & 8 Nov 2017) | 4.99 | 26.60 |
| | Set 6 (17 & 24 Nov 2017) | 3.33 | 5.00 |

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (September - November 2017) and baseline monitoring period (September – November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

| | **Encounter rate (STG)** (no. of on-effort dolphin sightings per 100 km of survey effort) | | **Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort) | |
|---|---|---|---|---|
| | **September – November 2017** | **September – November 2011** | **September – November 2017** | **September – November 2011** |
| **Northeast Lantau** | 0.0 | 6.00 ± 5.05 | 0.0 | 22.19 ± 26.81 |
| **Northwest Lantau** | 3.12 ± 1.91 | 9.85 ± 5.85 | 10.35 ± 9.66 | 44.66 ± 29.85 |

3.3.2. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in NWL were 2.5 sightings and 9.9 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were both nil for this quarter.

3.3.3. In NEL, the average dolphin encounter rates (both STG and ANI) in the present three-month impact monitoring period were both zero with no on-effort sighting being made, and such extremely low occurrence of dolphins in NEL have been consistently recorded in the past 18 quarters of HKLR03 monitoring (Table 4). This is a serious concern as the dolphin occurrence in NEL in the past few years (0.0-1.0 for ER(STG) and 0.0-3.9 for ER(ANI)) have remained exceptionally low when compared to the baseline period (Table 4). Dolphins have been virtually absent from NEL waters since January 2014, with only three groups of six dolphins sighted there since then despite consistent and intensive survey effort being conducted in this survey area.

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

| | **Encounter rate (STG)** (no. of on-effort dolphin sightings per 100 km of survey effort) | **Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort) |
|---|---|---|
| **September-November 2011 (Baseline)** | **6.00 ± 5.05** | **22.19 ± 26.81** |
| **December 2012-February 2013 (Impact)** | 3.14 ± 3.21 | 6.33 ± 8.64 |
| **March-May 2013 (Impact)** | 0.42 ± 1.03 | 0.42 ± 1.03 |
| **June-August 2013 (Impact)** | 0.88 ± 1.36 | 3.91 ± 8.36 |
| **September-November 2013 (Impact)** | **1.01 ± 1.59** | **3.77 ± 6.49** |
| **December 2013-February 2014 (Impact)** | 0.45 ± 1.10 | 1.34 ± 3.29 |
| **March-May 2014 (Impact)** | 0.00 | 0.00 |
| **June-August 2014 (Impact)** | 0.42 ± 1.04 | 1.69 ± 4.15 |
| **September-November 2014 (Impact)** | **0.00** | **0.00** |
| **December 2014-February 2015 (Impact)** | 0.00 | 0.00 |
| **March-May 2015 (Impact)** | 0.00 | 0.00 |
| **June-August 2015 (Impact)** | 0.44 ± 1.08 | 0.44 ± 1.08 |
| **September-November 2015 (Impact)** | **0.00** | **0.00** |
| **December 2015-February 2016 (Impact)** | 0.00 | 0.00 |
| **March-May 2016 (Impact)** | 0.00 | 0.00 |
| **June-August 2016 (Impact)** | 0.00 | 0.00 |
| **September-November 2016 (Impact)** | **0.00** | **0.00** |
| **December 2016-February 2017 (Impact)** | 0.00 | 0.00 |
| **March-May 2017 (Impact)** | 0.00 | 0.00 |
| **June-August 2017 (Impact)** | 0.00 | 0.00 |
| **September-November 2017 (Impact)** | **0.00** | **0.00** |

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 68.3% and 76.8% 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 **autumn** months were highlighted in **blue**; ± denotes the standard deviation of the average encounter rates)

| | **Encounter rate (STG)** (no. of on-effort dolphin sightings per 100 km of survey effort) | **Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort) |
|---|---|---|
| **September-November 2011 (Baseline)** | 9.85 ± 5.85 | 44.66 ± 29.85 |
| **December 2012-February 2013 (Impact)** | 8.36 ± 5.03 | 35.90 ± 23.10 |
| **March-May 2013 (Impact)** | 7.75 ± 3.96 | 24.23 ± 18.05 |
| **June-August 2013 (Impact)** | 6.56 ± 3.68 | 27.00 ± 18.71 |
| **September-November 2013 (Impact)** | 8.04 ± 1.10 | 32.48 ± 26.51 |
| **December 2013-February 2014 (Impact)** | 8.21 ± 2.21 | 32.58 ± 11.21 |
| **March-May 2014 (Impact)** | 6.51 ± 3.34 | 19.14 ± 7.19 |
| **June-August 2014 (Impact)** | 4.74 ± 3.84 | 17.52 ± 15.12 |
| **September-November 2014 (Impact)** | 5.10 ± 4.40 | 20.52 ± 15.10 |
| **December 2014-February 2015 (Impact)** | 2.91 ± 2.69 | 11.27 ± 15.19 |
| **March-May 2015 (Impact)** | 0.47 ± 0.73 | 2.36 ± 4.07 |
| **June-August 2015 (Impact)** | 2.53 ± 3.20 | 9.21 ± 11.57 |
| **September-November 2015 (Impact)** | 3.94 ± 1.57 | 21.05 ± 17.19 |
| **December 2015-February 2016 (Impact)** | 2.64 ± 1.52 | 10.98 ± 3.81 |
| **March-May 2016 (Impact)** | 0.98 ± 1.10 | 4.78 ± 6.85 |
| **June-August 2016 (Impact)** | 1.72 ± 2.17 | 7.48 ± 10.98 |
| **September-November 2016 (Impact)** | 2.86 ± 1.98 | 10.89 ± 10.98 |
| **December 2016-February 2017 (Impact)** | 3.80 ± 3.79 | 14.52 ± 17.21 |
| **March-May 2017 (Impact)** | 0.93 ± 1.03 | 5.25 ± 9.53 |
| **June-August 2017 (Impact)** | 2.20 ± 2.88 | 6.58 ± 8.12 |
| **September-November 2017 (Impact)** | 3.12 ± 1.91 | 10.35 ± 9.66 |

3.3.5. Dolphin encounter rates in NWL during autumn 2017 was similar to the previous autumn period in 2016, but was much lower than the ones in the autumn periods of 2013, 2014 and 2015 (Table 5). Such temporal trend should be closely monitored in the upcoming monitoring quarters whether the dolphin occurrence would continue to increase as the construction activities of HZMB works have been mostly completed in coming months.

3.3.6 As discussed in Hung (2017), 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. Apparently such noticeable decline has already extended to NWL waters progressively in the past few years with no sign of recovery, even though the HZMB-related construction activities have well past the peak.

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 (20$^{th}$ quarter of the HKLR03 impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0057 and 0.0278 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. the first 20 quarters of the HKLR03 impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.000000 and 0.000000 respectively. Even if the alpha value is set at 0.00001, significant differences were still detected in both the average dolphin encounter rates of STG and ANI (i.e. between the two periods and the locations).

3.3.10. 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 of the past few years.

3.3.11. The dramatic decline in dolphin usage of North Lantau region raises serious concern, as the timing of the decline in dolphin usage in North Lantau waters coincided well with the construction schedule of the HZMB-related projects (Hung 2017). Apparently there was no sign of recovery of dolphin usage even though almost all marine works associated with the HZMB construction have been completed.

*3.4. Group size*

3.4.1. Group size of Chinese White Dolphins ranged from one to 12 individuals per group in North Lantau region during September to November 2017. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in Table 6.

3.4.2. The average dolphin group size in NWL waters during September to November 2017 was only slightly higher than the one recorded during the three-month baseline period, but it should also be noted that the sample size of 13 dolphin groups in the present quarter was very small when compared to the 66 groups sighted during the baseline period (Table 6).

Table 6. Comparison of average dolphin group sizes from impact monitoring period (September – November 2017) and baseline monitoring period (September – November 2011) (Note: ± denotes the standard deviation of the average group size)

| | Average Dolphin Group Size | |
|---|---|---|
| | **September – November 2017** | **September – November 2011** |
| **Overall** | 3.85 ± 3.39 (n = 13) | 3.72 ± 3.13 (n = 66) |
| **Northeast Lantau** | --- | 3.18 ± 2.16 (n = 17) |
| **Northwest Lantau** | 3.85 ± 3.39 (n = 13) | 3.92 ± 3.40 (n = 49) |

3.4.3. Notably, 8 of these 14 dolphin groups were composed of 1-3 individuals only, while there were four medium-sized groups with 5-8 dolphins per group, and one large group of 12 dolphins (Appendix II).

3.4.4. Distribution of the larger dolphin groups with five individuals or more per group during the present quarter is shown in Figure 3, with comparison to the one in baseline period. The medium-sized group with 5-8 dolphins were scattered at the northwestern portion of the NWL survey area with no particular concentration, while the one large group of 12 dolphins was sighted at the mouth of Deep Bay (Figure 3). Such distribution pattern was very different from the baseline period, when the larger dolphin groups were frequently sighted and evenly distributed in NWL waters, and a few were also sighted in NEL waters (Figure 3).

*3.5. Habitat use*

3.5.1. From September to November 2017, four of the five grids with moderately high to high dolphin densities were located to the north of Lung Kwu Chau, while one grid to the east of Sha Chau also recorded moderately high dolphin density (Figures 4a and 4b). All grids near HKLR03/HKBCF reclamation sites as well as TMCLKL alignment did not record any presence of dolphins at all during on-effort search in the present quarterly period (Figures 4a and 4b).

3.5.2. However, it should be emphasized that the amount of survey effort collected in each grid during the three-month period was fairly low (6-12 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern should be examined when more survey effort for each grid 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 high 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, only several grids with moderately high to high dolphin densities were located near Lung Kwu Chau and Sha Chau during the present impact phase period (Figure 5).

*3.6. Mother-calf pairs*

3.6.1. During the present quarterly period, no young calf was sighted at all among the 13 groups of dolphins.

*3.7. Activities and associations with fishing boats*

3.7.1. One of the thirteen dolphin groups were engaged in feeding activity, while another two groups were engaged in socializing activity. However, none of them was engaged in traveling or milling/resting activity during the three-month study period.

3.7.2. The percentages of sightings associated with feeding activities (7.7%) was lower than the one recorded during the baseline period (11.6%), while the one for socializing activities (15.4%) was much higher than the ones recorded during the baseline period (5.4% respectively). However, it should be noted the sample sizes on total numbers of dolphin sightings were very different between the two periods.

3.7.3. Distribution of dolphins engaged in various activities during the present three-month period and baseline period is shown in Figure 6. The one dolphin group engaged in feeding activity was sighted at the southeast corner of Lung Kwu Chau, while the two dolphin groups engaged in socializing activities were both located to the north of Lung Kwu Chau (Figure 6).

3.7.4. When compared to the baseline period, distribution of various dolphin activities during the present impact phase monitoring period was drastically different with a much more restricted area of occurrences (Figure 6).

3.7.5. Notably, one group of a single dolphin was found to be associated with an operating purse-seiner adjacent to Lung Kwu Chau within the marine park during the present impact phase period.

*3.8. Summary of photo-identification works*

3.8.1. From September to November 2017, over 2,500 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 23 individuals sighted 42 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. Six individuals (i.e. CH34, NL33, NL46, NL49, NL320, NL322, NL328 and WL05) were re-sighted twice, while four other individuals (i.e. NL136, NL182, NL202 and NL286) were re-sighted 3-4 times during the three-month period (Appendix III).

3.8.3. Notably, ten of these 23 individuals (i.e. CH34, NL12, NL49, NL104, NL136, NL182, NL202, NL320, NL321 and WL05) were also sighted in Northwest Lantau during the HKBCF monitoring surveys under the same three-month period. Moreover, six individuals (i.e. CH34, NL12, NL49, NL182, NL210 and WL05) were also sighted in West Lantau waters during the HKLR09 monitoring surveys from September to November 2017, showing their extensive individual movements across different survey areas.

*3.9. Individual range use*

3.9.1. Ranging patterns of the 23 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, three individuals (i.e. NL12, NL182 and NL210) consistently utilized North Lantau waters in the past have extended their range use to WL during the present quarter.

3.9.4. In the upcoming quarters, individual range use and movements should be continuously monitored to examine whether there has been any consistent shifts of individual home ranges from North Lantau to West or Southwest Lantau, as such shift could possibly be related to the HZMB-related construction works (see Hung 2017).

## 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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- Hung, S. K. 2017. Monitoring of marine mammals in Hong Kong waters – data collection: final report (2016-17). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department of Hong Kong SAR Government, 162 pp.

- Jefferson, T. A. 2000. Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. Wildlife Monographs 144:1-65.

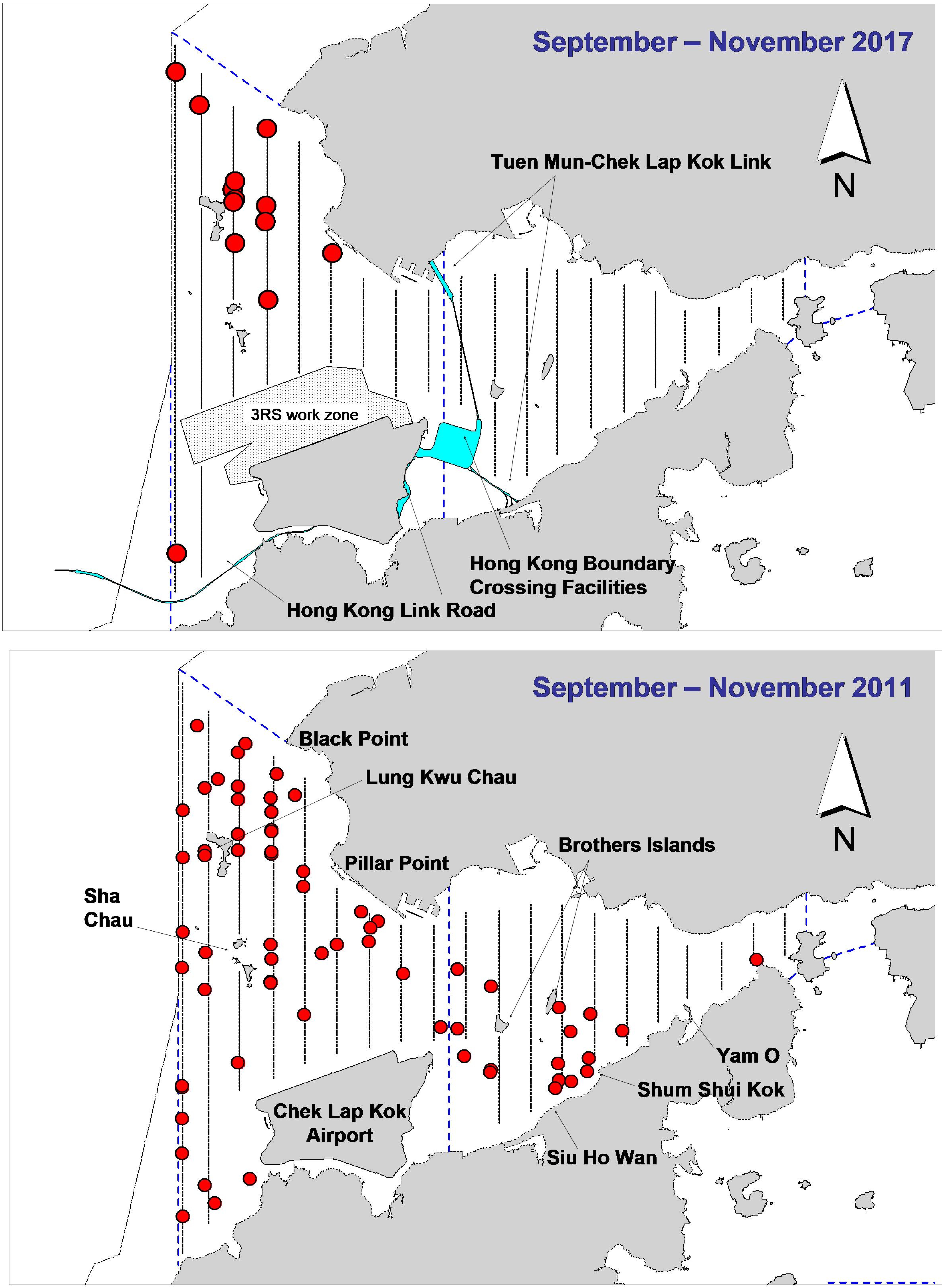
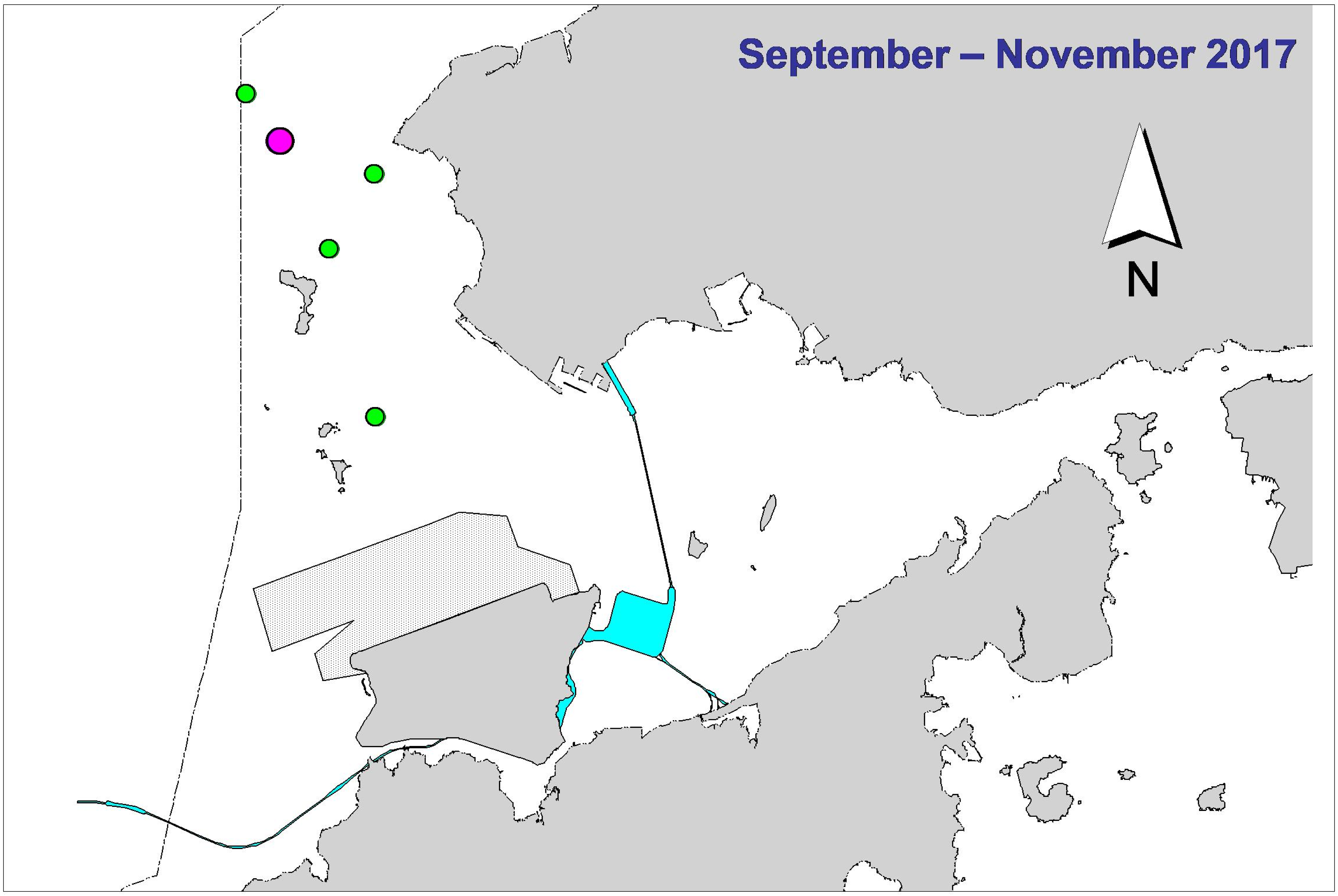



Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the past five autumn quarters (September-November) of HKLR03 impact phase in 2013-17



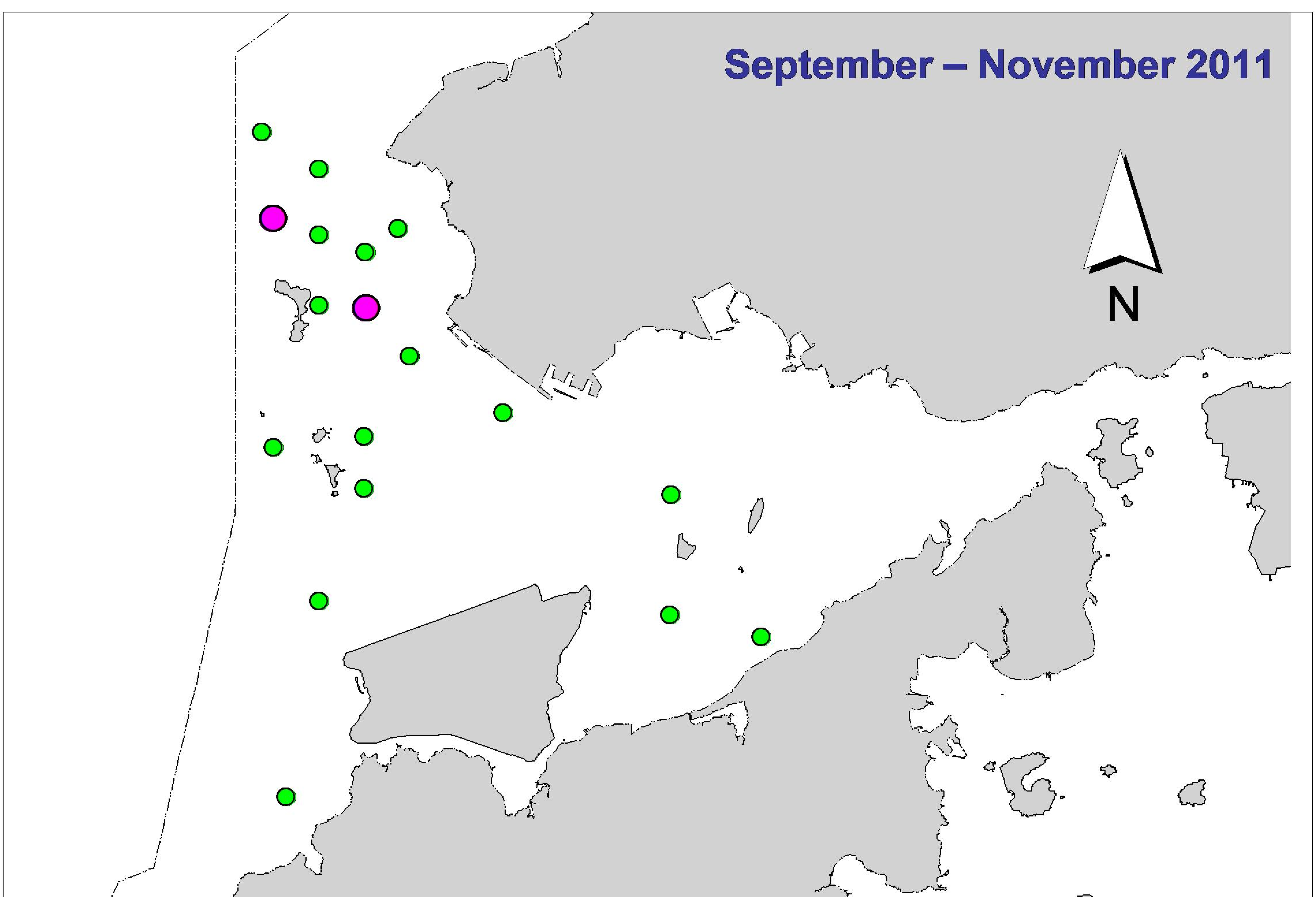




Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR03 impact phase (top) and baseline monitoring surveys (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

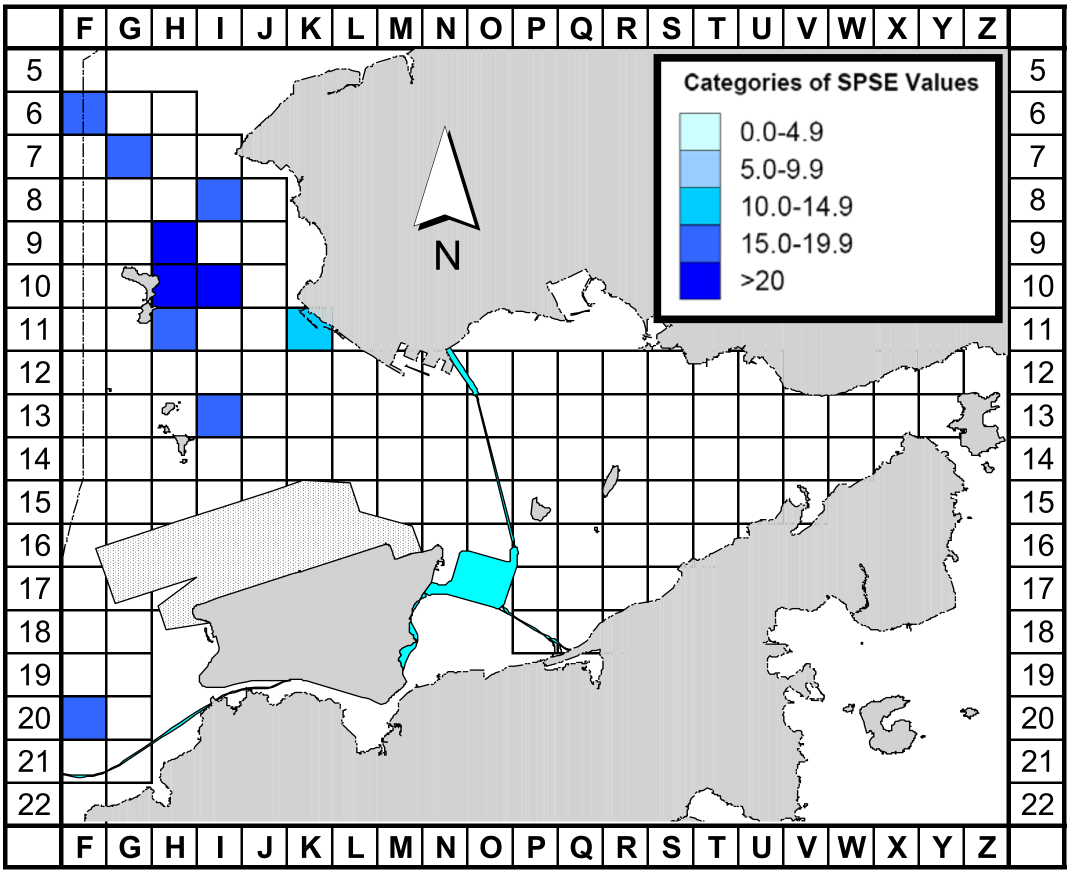



Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km$^2$ in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (Sep-Nov 17) (SPSE = no. of on-effort sightings per 100 units of survey effort)

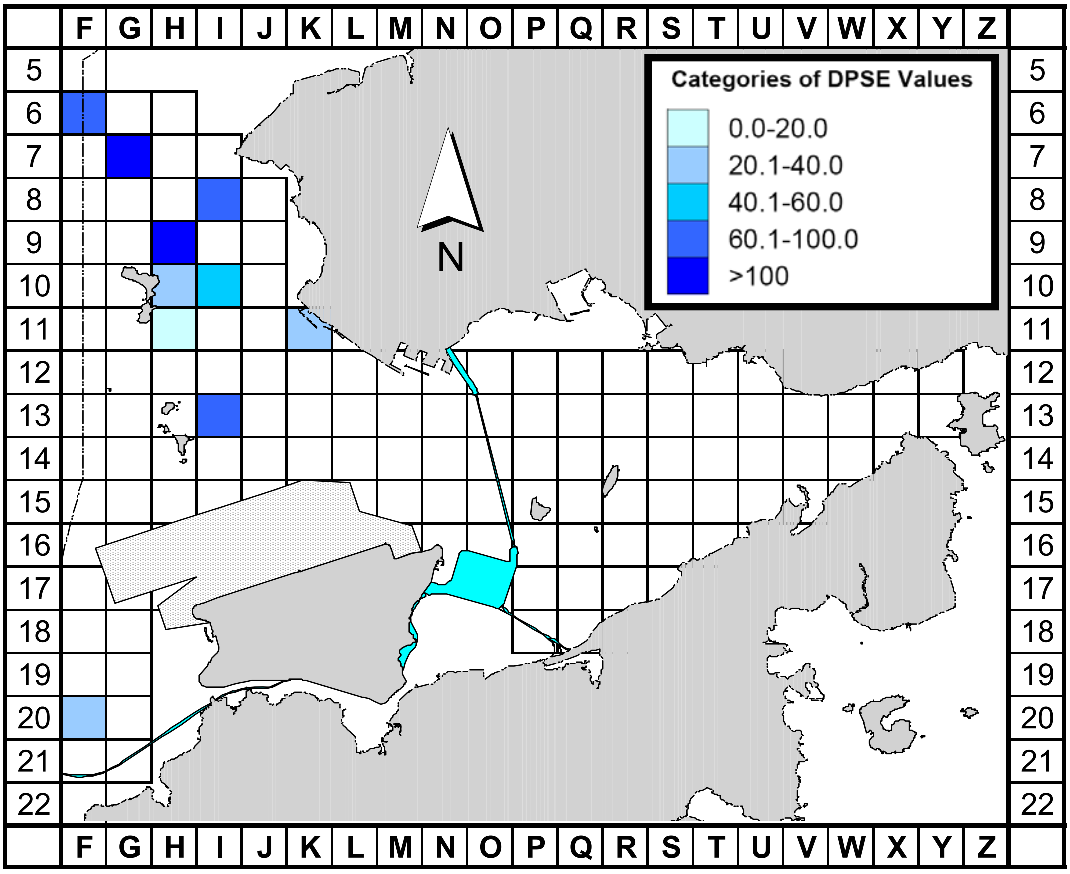



Figure 4b. Density of Chinese white dolphins with corrected survey effort per km$^2$ in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (Sep-Nov 17) (DPSE = no. of dolphins per 100 units of survey effort)

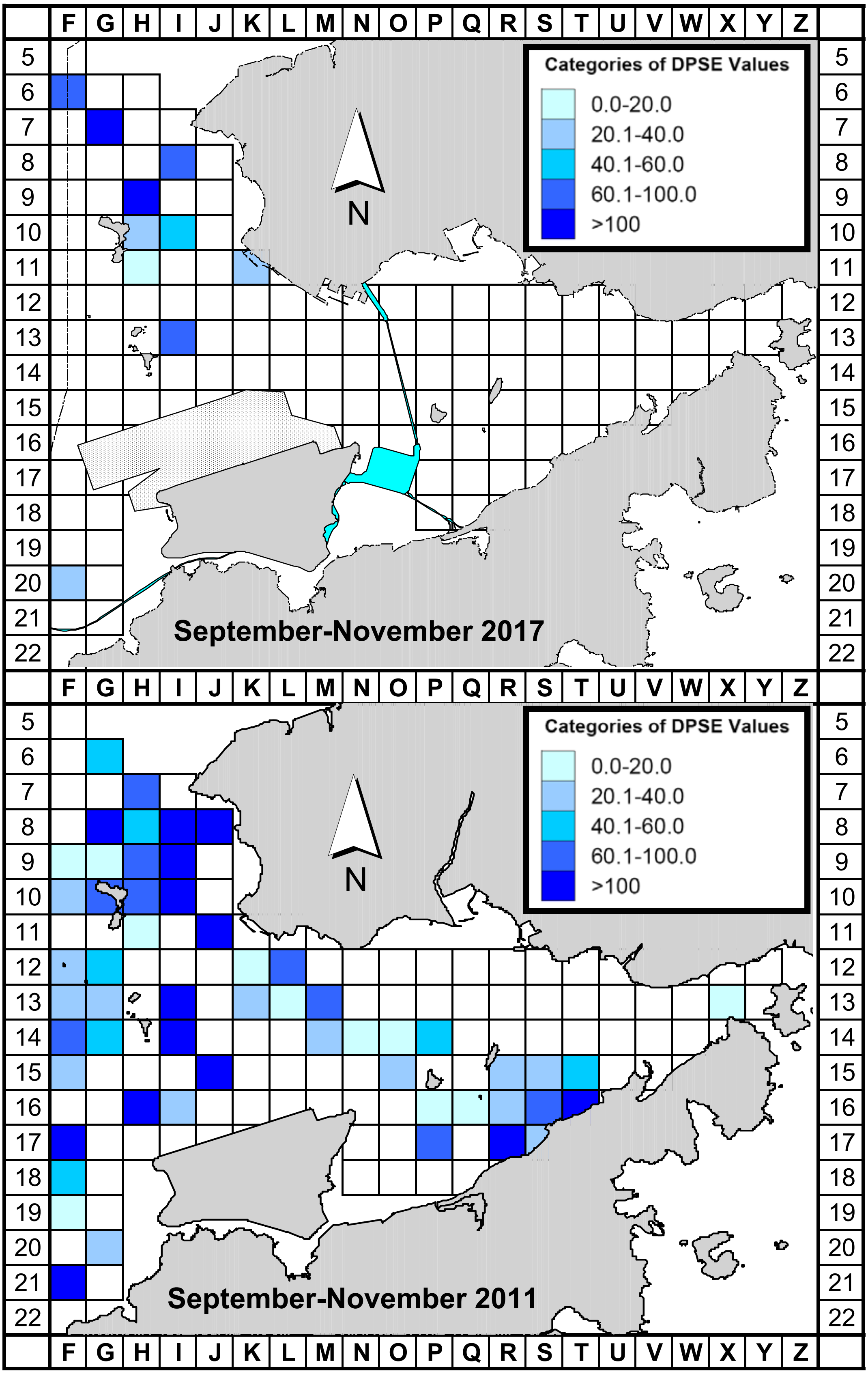
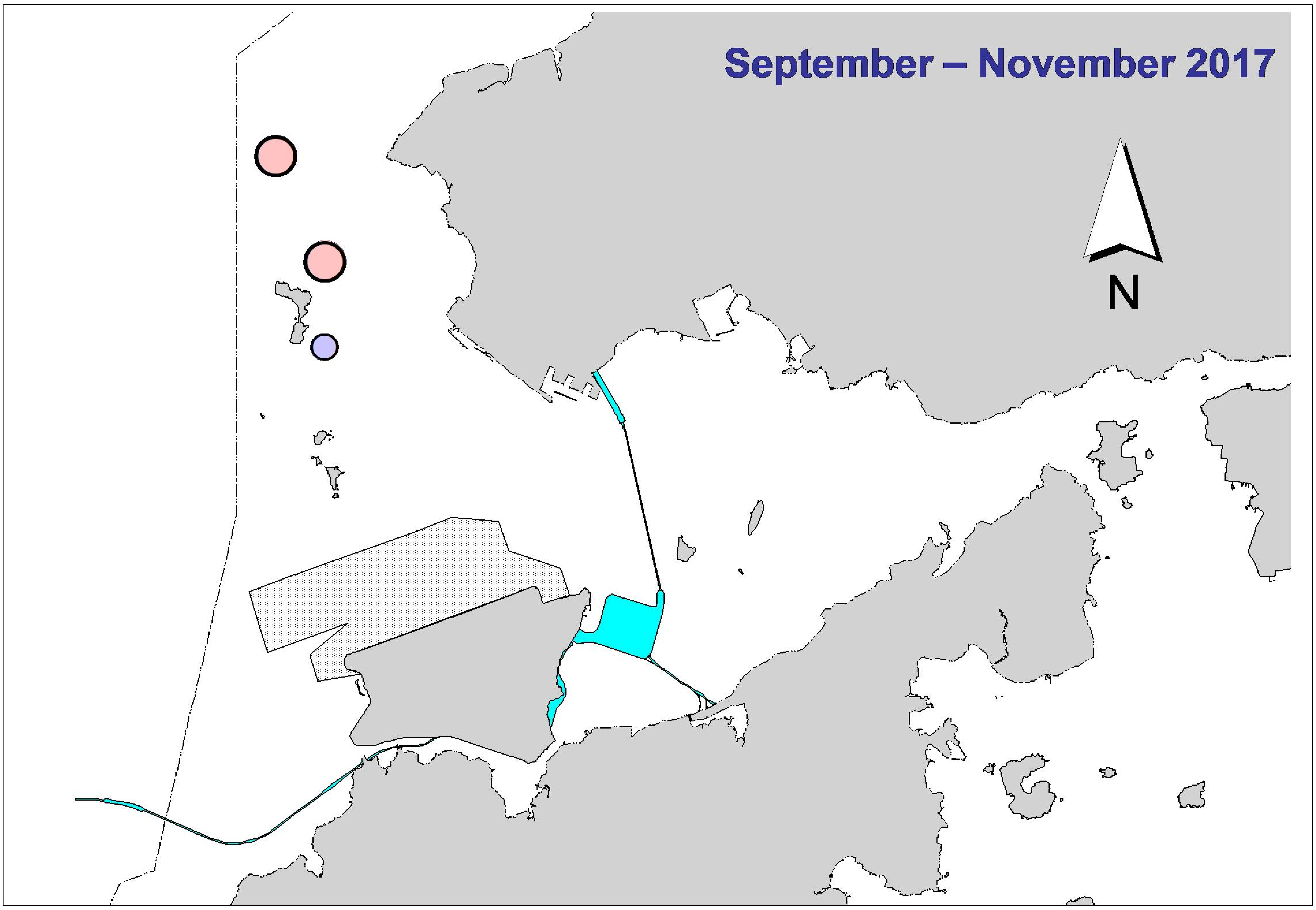



Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km$^2$ in Northwest and Northeast Lantau survey area between the impact monitoring period (September-November 2017) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)



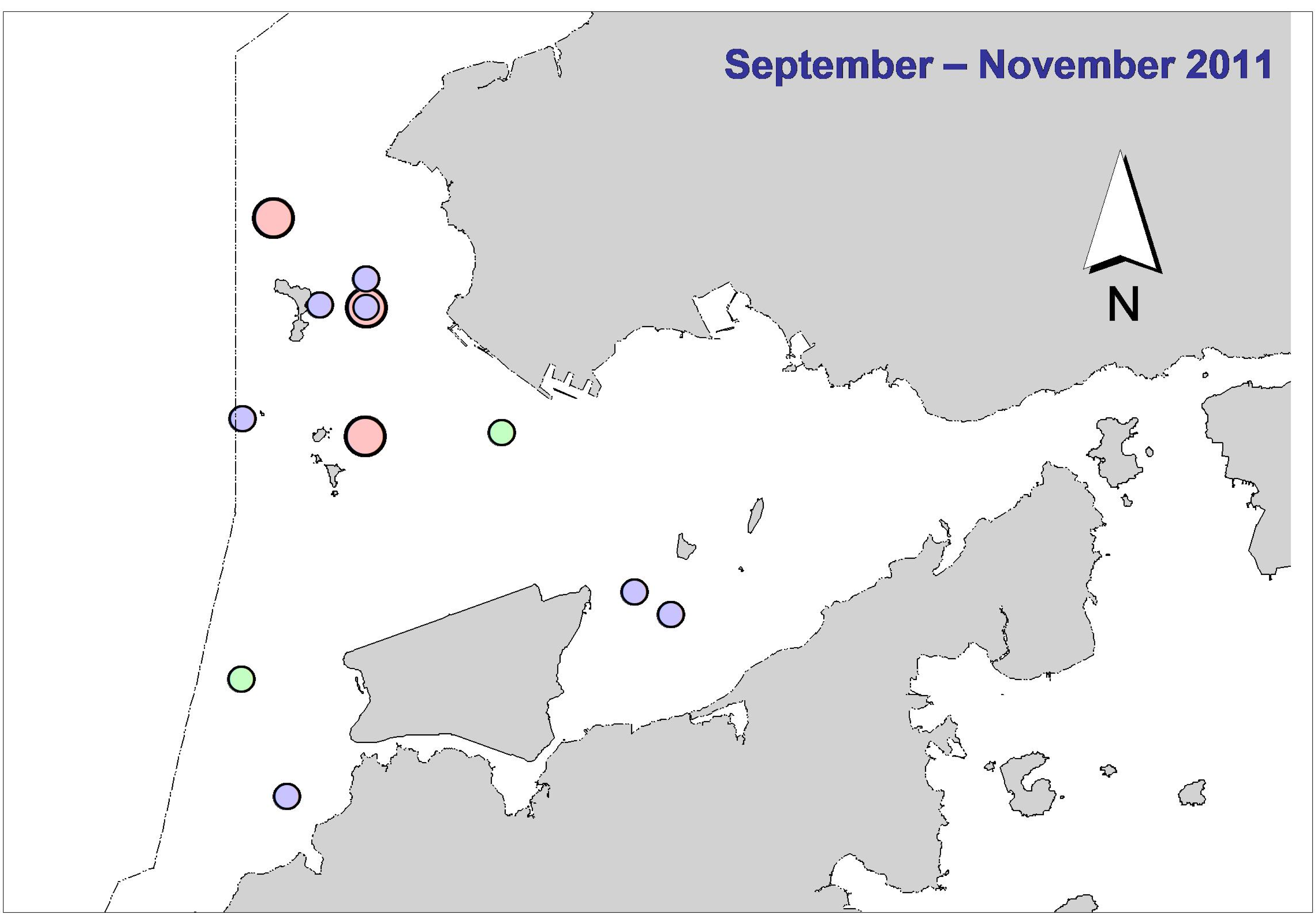




Figure 6. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

## Appendix I.  HKLR03 Survey Effort Database (September-November 2017)

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

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | TYPE | P/S |
|---|---|---|---|---|---|---|---|
| 15-Sep-17 | NW LANTAU | 2 | 26.51 | AUTUMN | STANDARD36826 | HKLR | P |
| 15-Sep-17 | NW LANTAU | 2 | 10.09 | AUTUMN | STANDARD36826 | HKLR | S |
| 15-Sep-17 | NW LANTAU | 3 | 1.20 | AUTUMN | STANDARD36826 | HKLR | S |
| 15-Sep-17 | NE LANTAU | 2 | 34.49 | AUTUMN | STANDARD36826 | HKLR | P |
| 15-Sep-17 | NE LANTAU | 3 | 2.20 | AUTUMN | STANDARD36826 | HKLR | P |
| 15-Sep-17 | NE LANTAU | 2 | 12.01 | AUTUMN | STANDARD36826 | HKLR | S |
| 18-Sep-17 | NW LANTAU | 2 | 28.84 | AUTUMN | STANDARD36826 | HKLR | P |
| 18-Sep-17 | NW LANTAU | 3 | 7.20 | AUTUMN | STANDARD36826 | HKLR | P |
| 18-Sep-17 | NW LANTAU | 2 | 12.96 | AUTUMN | STANDARD36826 | HKLR | S |
| 22-Sep-17 | NW LANTAU | 1 | 6.05 | AUTUMN | STANDARD36826 | HKLR | P |
| 22-Sep-17 | NW LANTAU | 2 | 18.48 | AUTUMN | STANDARD36826 | HKLR | P |
| 22-Sep-17 | NW LANTAU | 3 | 0.56 | AUTUMN | STANDARD36826 | HKLR | P |
| 22-Sep-17 | NW LANTAU | 1 | 1.58 | AUTUMN | STANDARD36826 | HKLR | S |
| 22-Sep-17 | NW LANTAU | 2 | 9.25 | AUTUMN | STANDARD36826 | HKLR | S |
| 22-Sep-17 | NE LANTAU | 2 | 4.68 | AUTUMN | STANDARD36826 | HKLR | P |
| 22-Sep-17 | NE LANTAU | 3 | 31.06 | AUTUMN | STANDARD36826 | HKLR | P |
| 22-Sep-17 | NE LANTAU | 2 | 3.30 | AUTUMN | STANDARD36826 | HKLR | S |
| 22-Sep-17 | NE LANTAU | 3 | 9.06 | AUTUMN | STANDARD36826 | HKLR | S |
| 29-Sep-17 | NW LANTAU | 1 | 3.40 | AUTUMN | STANDARD36826 | HKLR | P |
| 29-Sep-17 | NW LANTAU | 2 | 13.70 | AUTUMN | STANDARD36826 | HKLR | P |
| 29-Sep-17 | NW LANTAU | 3 | 12.90 | AUTUMN | STANDARD36826 | HKLR | P |
| 29-Sep-17 | NW LANTAU | 4 | 5.60 | AUTUMN | STANDARD36826 | HKLR | P |
| 29-Sep-17 | NW LANTAU | 2 | 1.15 | AUTUMN | STANDARD36826 | HKLR | S |
| 29-Sep-17 | NW LANTAU | 3 | 10.06 | AUTUMN | STANDARD36826 | HKLR | S |
| 4-Oct-17 | NW LANTAU | 2 | 0.88 | AUTUMN | STANDARD36826 | HKLR | P |
| 4-Oct-17 | NW LANTAU | 3 | 20.90 | AUTUMN | STANDARD36826 | HKLR | P |
| 4-Oct-17 | NW LANTAU | 4 | 2.00 | AUTUMN | STANDARD36826 | HKLR | P |
| 4-Oct-17 | NW LANTAU | 2 | 3.80 | AUTUMN | STANDARD36826 | HKLR | S |
| 4-Oct-17 | NW LANTAU | 3 | 5.02 | AUTUMN | STANDARD36826 | HKLR | S |
| 4-Oct-17 | NW LANTAU | 4 | 2.40 | AUTUMN | STANDARD36826 | HKLR | S |
| 4-Oct-17 | NE LANTAU | 2 | 8.22 | AUTUMN | STANDARD36826 | HKLR | P |
| 4-Oct-17 | NE LANTAU | 3 | 11.59 | AUTUMN | STANDARD36826 | HKLR | P |
| 4-Oct-17 | NE LANTAU | 2 | 9.49 | AUTUMN | STANDARD36826 | HKLR | S |
| 4-Oct-17 | NE LANTAU | 3 | 1.30 | AUTUMN | STANDARD36826 | HKLR | S |
| 9-Oct-17 | NW LANTAU | 2 | 1.68 | AUTUMN | STANDARD36826 | HKLR | P |
| 9-Oct-17 | NW LANTAU | 3 | 30.32 | AUTUMN | STANDARD36826 | HKLR | P |
| 9-Oct-17 | NW LANTAU | 4 | 2.50 | AUTUMN | STANDARD36826 | HKLR | P |
| 9-Oct-17 | NW LANTAU | 2 | 2.30 | AUTUMN | STANDARD36826 | HKLR | S |
| 9-Oct-17 | NW LANTAU | 3 | 4.90 | AUTUMN | STANDARD36826 | HKLR | S |
| 9-Oct-17 | NW LANTAU | 4 | 6.70 | AUTUMN | STANDARD36826 | HKLR | S |
| 9-Oct-17 | NE LANTAU | 3 | 6.99 | AUTUMN | STANDARD36826 | HKLR | P |
| 9-Oct-17 | NE LANTAU | 4 | 9.93 | AUTUMN | STANDARD36826 | HKLR | P |
| 9-Oct-17 | NE LANTAU | 3 | 6.79 | AUTUMN | STANDARD36826 | HKLR | S |
| 9-Oct-17 | NE LANTAU | 4 | 3.09 | AUTUMN | STANDARD36826 | HKLR | S |
| 18-Oct-17 | NW LANTAU | 2 | 11.46 | AUTUMN | STANDARD36826 | HKLR | P |
| 18-Oct-17 | NW LANTAU | 3 | 20.72 | AUTUMN | STANDARD36826 | HKLR | P |
| 18-Oct-17 | NW LANTAU | 2 | 8.55 | AUTUMN | STANDARD36826 | HKLR | S |
| 18-Oct-17 | NW LANTAU | 3 | 2.50 | AUTUMN | STANDARD36826 | HKLR | S |
| 18-Oct-17 | NE LANTAU | 1 | 2.44 | AUTUMN | STANDARD36826 | HKLR | P |
| 18-Oct-17 | NE LANTAU | 2 | 27.42 | AUTUMN | STANDARD36826 | HKLR | P |

## Appendix I. (cont'd)

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

| DATE | AREA | BEAU | EFFORT | SEASON | VESSEL | TYPE | P/S |
|---|---|---|---|---|---|---|---|
| 18-Oct-17 | NE LANTAU | 3 | 5.50 | AUTUMN | STANDARD36826 | HKLR | P |
| 18-Oct-17 | NE LANTAU | 1 | 1.70 | AUTUMN | STANDARD36826 | HKLR | S |
| 18-Oct-17 | NE LANTAU | 2 | 11.34 | AUTUMN | STANDARD36826 | HKLR | S |
| 26-Oct-17 | NW LANTAU | 2 | 24.70 | AUTUMN | STANDARD36826 | HKLR | P |
| 26-Oct-17 | NW LANTAU | 3 | 4.44 | AUTUMN | STANDARD36826 | HKLR | P |
| 26-Oct-17 | NW LANTAU | 2 | 11.91 | AUTUMN | STANDARD36826 | HKLR | S |
| 26-Oct-17 | NW LANTAU | 3 | 0.85 | AUTUMN | STANDARD36826 | HKLR | S |
| 1-Nov-17 | NW LANTAU | 2 | 17.00 | AUTUMN | STANDARD36826 | HKLR | P |
| 1-Nov-17 | NW LANTAU | 3 | 15.32 | AUTUMN | STANDARD36826 | HKLR | P |
| 1-Nov-17 | NW LANTAU | 2 | 8.38 | AUTUMN | STANDARD36826 | HKLR | S |
| 1-Nov-17 | NW LANTAU | 3 | 2.53 | AUTUMN | STANDARD36826 | HKLR | S |
| 1-Nov-17 | NE LANTAU | 2 | 29.72 | AUTUMN | STANDARD36826 | HKLR | P |
| 1-Nov-17 | NE LANTAU | 3 | 5.10 | AUTUMN | STANDARD36826 | HKLR | P |
| 1-Nov-17 | NE LANTAU | 2 | 10.07 | AUTUMN | STANDARD36826 | HKLR | S |
| 1-Nov-17 | NE LANTAU | 3 | 2.41 | AUTUMN | STANDARD36826 | HKLR | S |
| 8-Nov-17 | NW LANTAU | 2 | 13.77 | AUTUMN | STANDARD36826 | HKLR | P |
| 8-Nov-17 | NW LANTAU | 3 | 14.05 | AUTUMN | STANDARD36826 | HKLR | P |
| 8-Nov-17 | NW LANTAU | 2 | 10.58 | AUTUMN | STANDARD36826 | HKLR | S |
| 8-Nov-17 | NW LANTAU | 3 | 1.80 | AUTUMN | STANDARD36826 | HKLR | S |
| 17-Nov-17 | NW LANTAU | 2 | 8.53 | AUTUMN | STANDARD36826 | HKLR | P |
| 17-Nov-17 | NW LANTAU | 3 | 18.98 | AUTUMN | STANDARD36826 | HKLR | P |
| 17-Nov-17 | NW LANTAU | 2 | 9.37 | AUTUMN | STANDARD36826 | HKLR | S |
| 17-Nov-17 | NW LANTAU | 3 | 3.55 | AUTUMN | STANDARD36826 | HKLR | S |
| 24-Nov-17 | NW LANTAU | 2 | 3.81 | AUTUMN | STANDARD36826 | HKLR | P |
| 24-Nov-17 | NW LANTAU | 3 | 28.72 | AUTUMN | STANDARD36826 | HKLR | P |
| 24-Nov-17 | NW LANTAU | 2 | 4.40 | AUTUMN | STANDARD36826 | HKLR | S |
| 24-Nov-17 | NW LANTAU | 3 | 6.27 | AUTUMN | STANDARD36826 | HKLR | S |
| 24-Nov-17 | NE LANTAU | 2 | 30.83 | AUTUMN | STANDARD36826 | HKLR | P |
| 24-Nov-17 | NE LANTAU | 3 | 4.97 | AUTUMN | STANDARD36826 | HKLR | P |
| 24-Nov-17 | NE LANTAU | 1 | 1.20 | AUTUMN | STANDARD36826 | HKLR | S |
| 24-Nov-17 | NE LANTAU | 2 | 10.10 | AUTUMN | STANDARD36826 | HKLR | S |

**Appendix II. HKLR03 Chinese White Dolphin Sighting Database (September-November 2017)**

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

| DATE | STG # | TIME | HRD SZ | AREA | BEAU | PSD | EFFORT | TYPE | NORTHING | EASTING | SEASON | BOAT ASSOC. | P/S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Sep-17 | 1 | 1152 | 6 | NW LANTAU | 2 | 320 | ON | HKLR | 823991 | 807501 | AUTUMN | NONE | P |
| 22-Sep-17 | 2 | 1244 | 3 | NW LANTAU | 1 | 250 | ON | HKLR | 825349 | 809502 | AUTUMN | NONE | P |
| 29-Sep-17 | 1 | 1309 | 2 | NW LANTAU | 4 | 140 | ON | HKLR | 827215 | 806416 | AUTUMN | NONE | P |
| 4-Oct-17 | 1 | 1143 | 5 | NW LANTAU | 3 | 52 | ON | HKLR | 828985 | 807490 | AUTUMN | NONE | P |
| 18-Oct-17 | 1 | 1149 | 1 | NW LANTAU | 2 | 65 | ON | HKLR | 826905 | 806487 | AUTUMN | NONE | P |
| 18-Oct-17 | 2 | 1159 | 1 | NW LANTAU | 2 | 264 | ON | HKLR | 825632 | 806485 | AUTUMN | PURSE-SEINE | P |
| 26-Oct-17 | 1 | 1135 | 1 | NW LANTAU | 2 | 34 | ON | HKLR | 826737 | 807455 | AUTUMN | NONE | P |
| 1-Nov-17 | 1 | 1126 | 6 | NW LANTAU | 3 | 371 | ON | HKLR | 830641 | 804652 | AUTUMN | NONE | P |
| 1-Nov-17 | 2 | 1152 | 8 | NW LANTAU | 2 | 529 | ON | HKLR | 827437 | 806499 | AUTUMN | NONE | P |
| 8-Nov-17 | 1 | 1129 | 2 | NW LANTAU | 2 | 317 | ON | HKLR | 826272 | 807434 | AUTUMN | NONE | P |
| 17-Nov-17 | 1 | 1155 | 12 | NW LANTAU | 2 | 627 | ON | HKLR | 829665 | 805381 | AUTUMN | NONE | S |
| 24-Nov-17 | 1 | 1023 | 2 | NW LANTAU | 3 | 8 | ON | HKLR | 816588 | 804674 | AUTUMN | NONE | P |
| 24-Nov-17 | 2 | 1155 | 1 | NW LANTAU | 3 | 0 | ON | HKLR | 826850 | 806436 | AUTUMN | NONE | P |

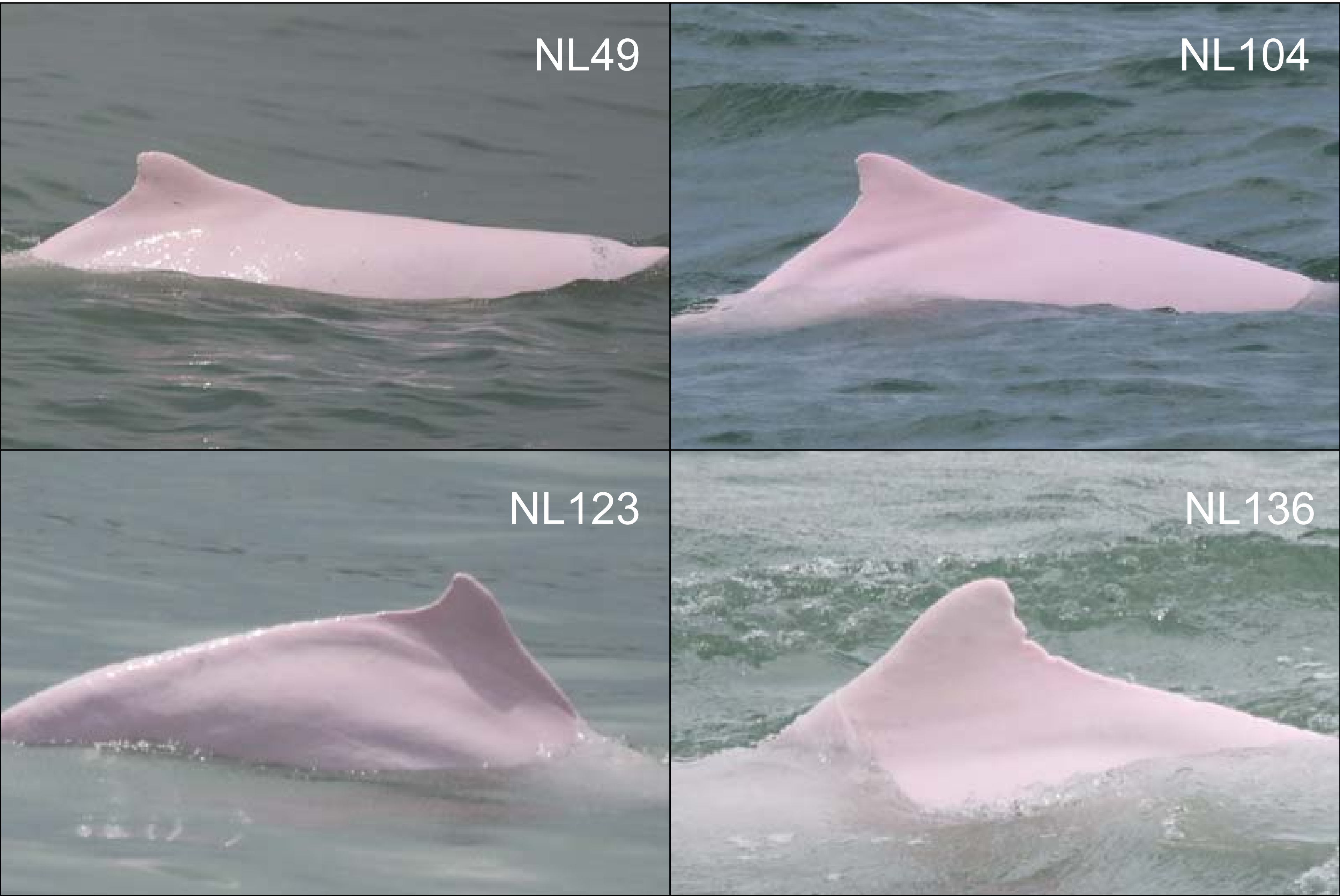
**Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in September - November 2017**

| ID# | DATE | STG# | AREA |
|---|---|---|---|
| CH34 | 01/11/17 | 2 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL12 | 04/10/17 | 1 | NW LANTAU |
| NL33 | 01/11/17 | 2 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL46 | 22/09/17 | 1 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL49 | 22/09/17 | 1 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL104 | 04/10/17 | 1 | NW LANTAU |
| NL123 | 22/09/17 | 1 | NW LANTAU |
| NL136 | 04/10/17 | 1 | NW LANTAU |
| | 18/10/17 | 2 | NW LANTAU |
| | 01/11/17 | 2 | NW LANTAU |
| | 08/11/17 | 1 | NW LANTAU |
| NL145 | 17/11/17 | 1 | NW LANTAU |
| NL182 | 04/10/17 | 1 | NW LANTAU |
| | 18/10/17 | 1 | NW LANTAU |
| | 01/11/17 | 2 | NW LANTAU |
| | 24/11/17 | 2 | NW LANTAU |
| NL202 | 22/09/17 | 2 | NW LANTAU |
| | 29/09/17 | 1 | NW LANTAU |
| | 01/11/17 | 2 | NW LANTAU |
| NL210 | 01/11/17 | 2 | NW LANTAU |
| NL242 | 22/09/17 | 1 | NW LANTAU |
| NL261 | 17/11/17 | 1 | NW LANTAU |
| NL272 | 17/11/17 | 1 | NW LANTAU |
| NL286 | 22/09/17 | 2 | NW LANTAU |
| | 29/09/17 | 1 | NW LANTAU |
| | 01/11/17 | 2 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL296 | 22/09/17 | 1 | NW LANTAU |
| NL320 | 01/11/17 | 2 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL321 | 04/10/17 | 1 | NW LANTAU |
| NL322 | 01/11/17 | 2 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| NL328 | 08/11/17 | 1 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| WL05 | 22/09/17 | 1 | NW LANTAU |
| | 17/11/17 | 1 | NW LANTAU |
| WL145 | 24/11/17 | 1 | NW LANTAU |

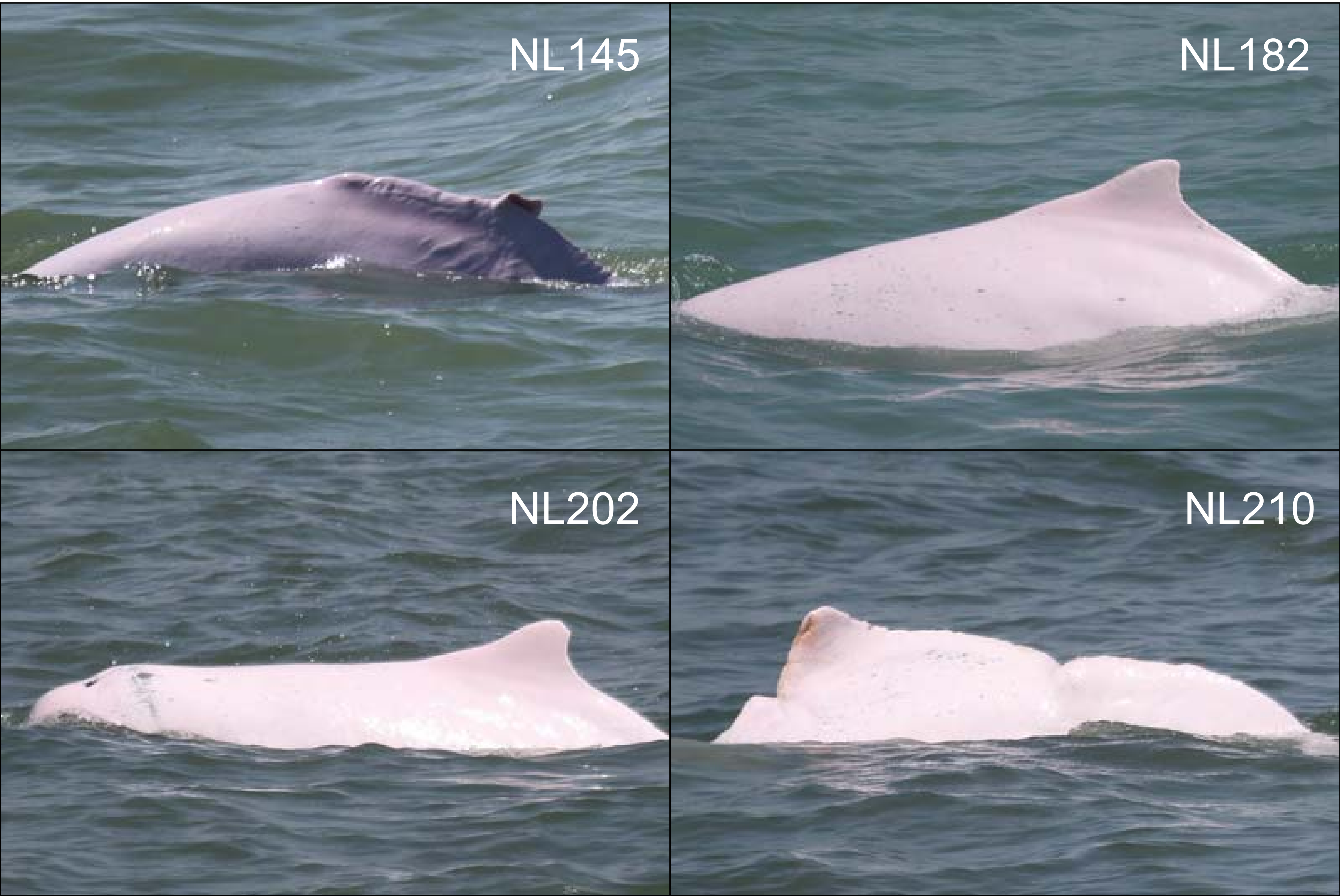
Appendix IV. Twenty-three individual dolphins that were identified during September to November 2017 under HKLR03 impact phase monitoring surveys



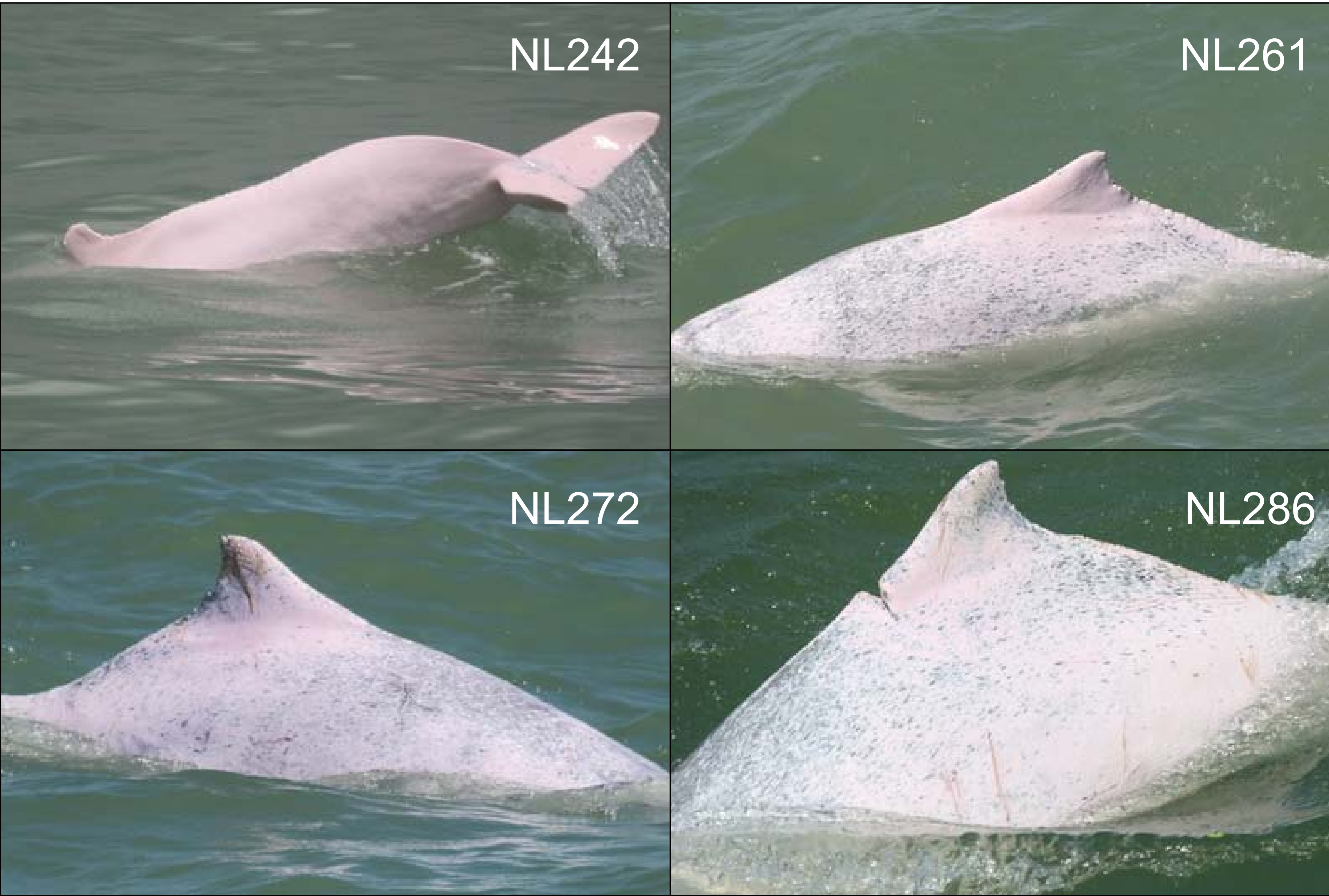

Appendix IV. (cont'd)



Appendix IV. (cont'd)

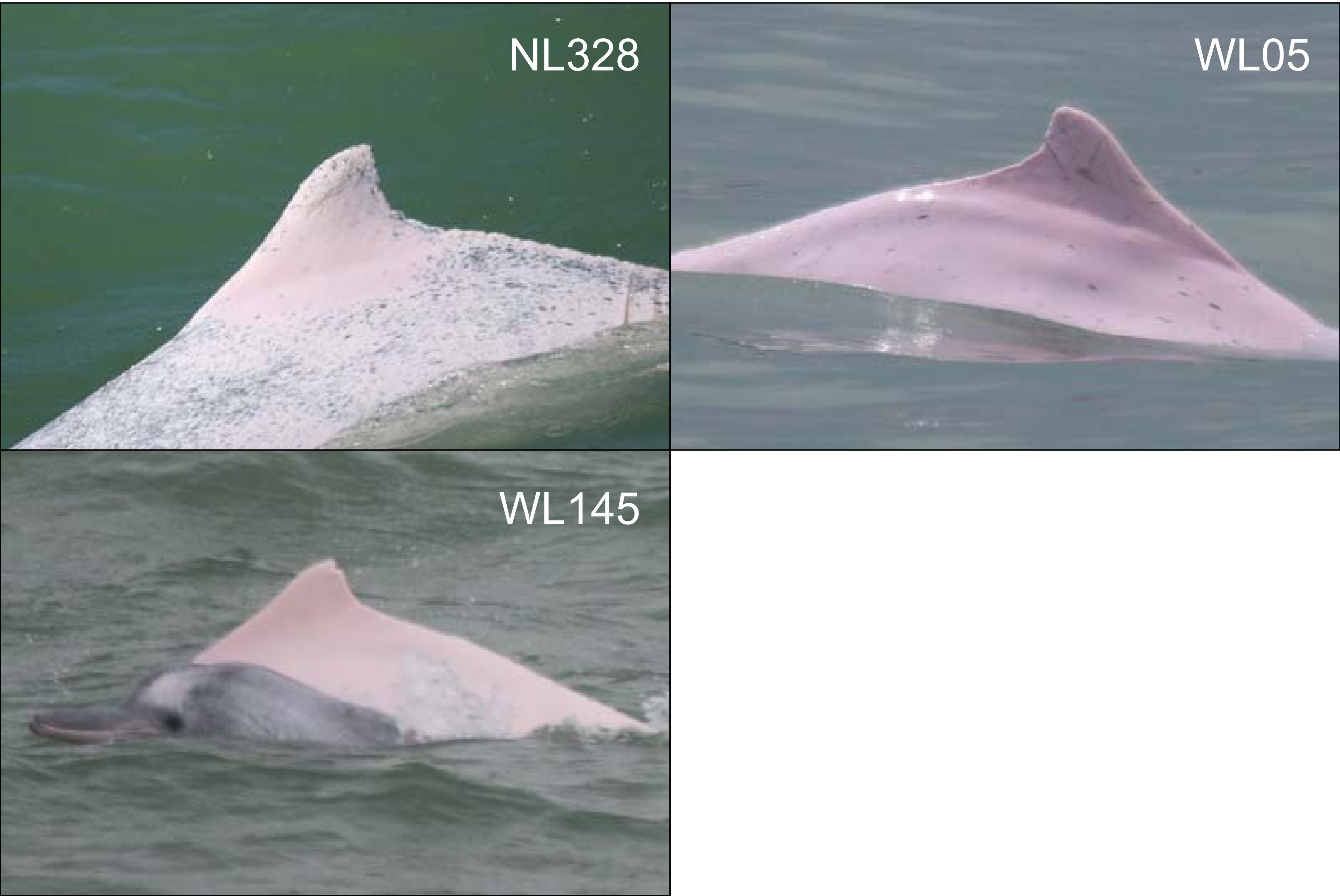


Appendix IV. (cont'd)

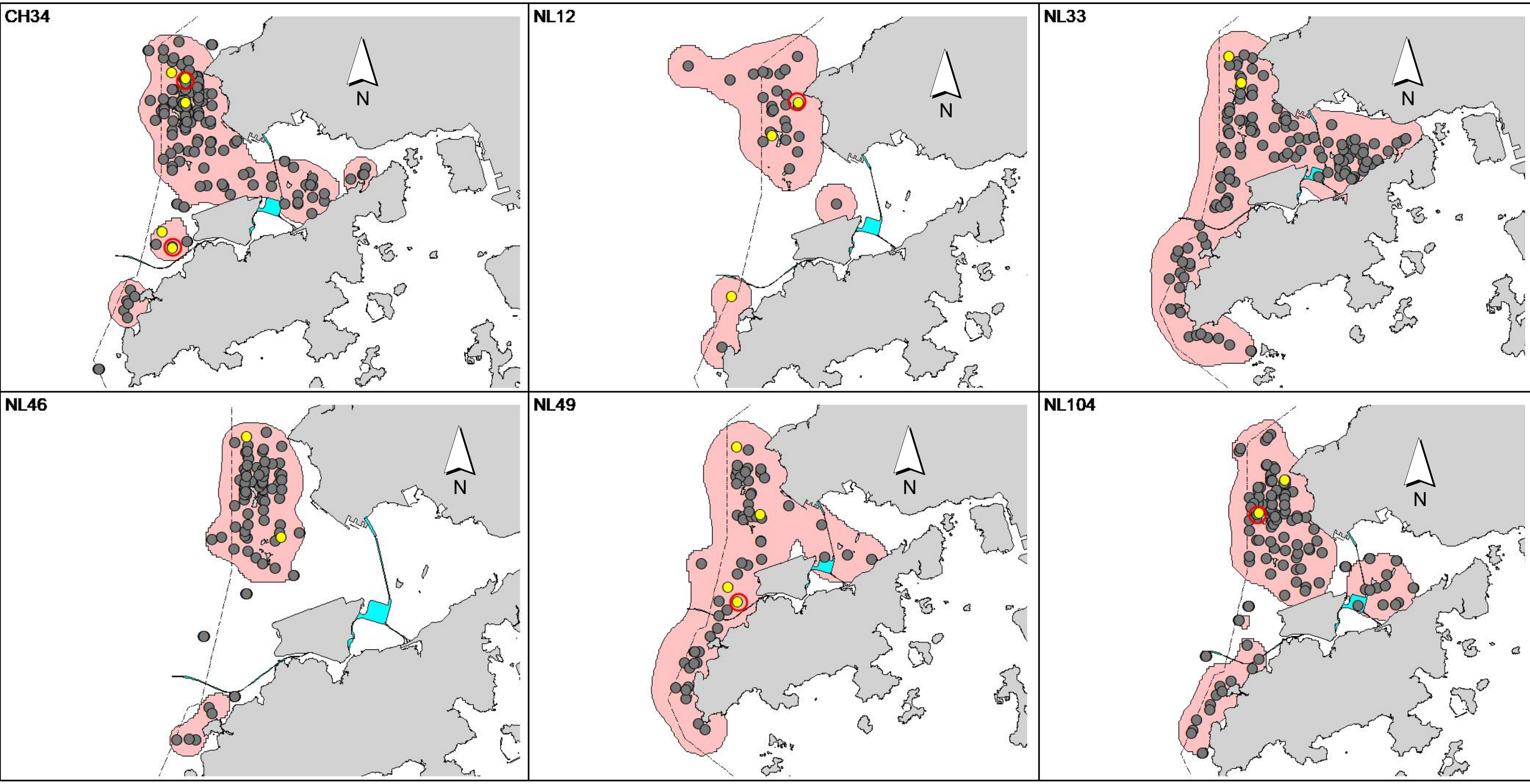


Appendix IV. (cont'd)

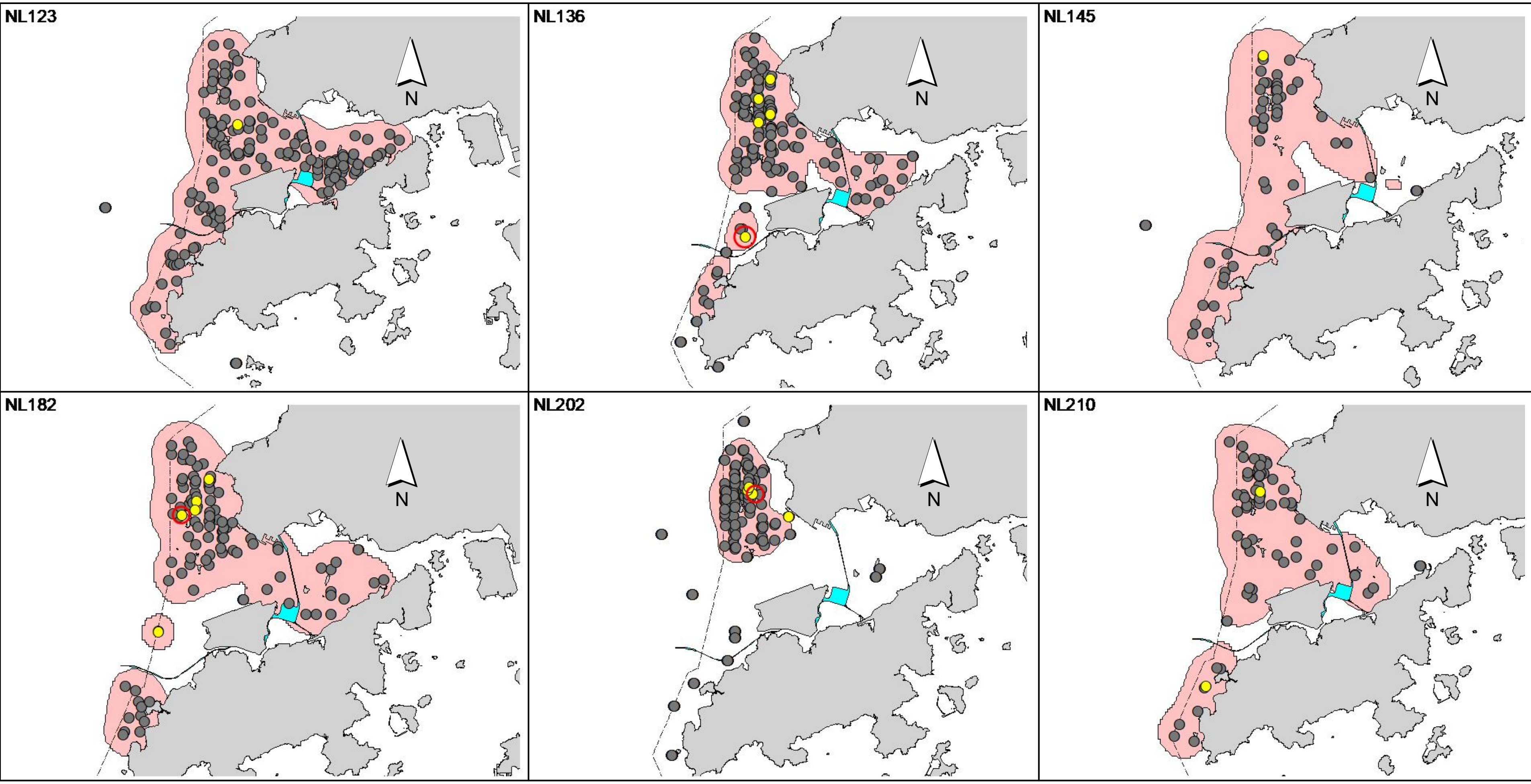
Appendix IV. (cont'd)



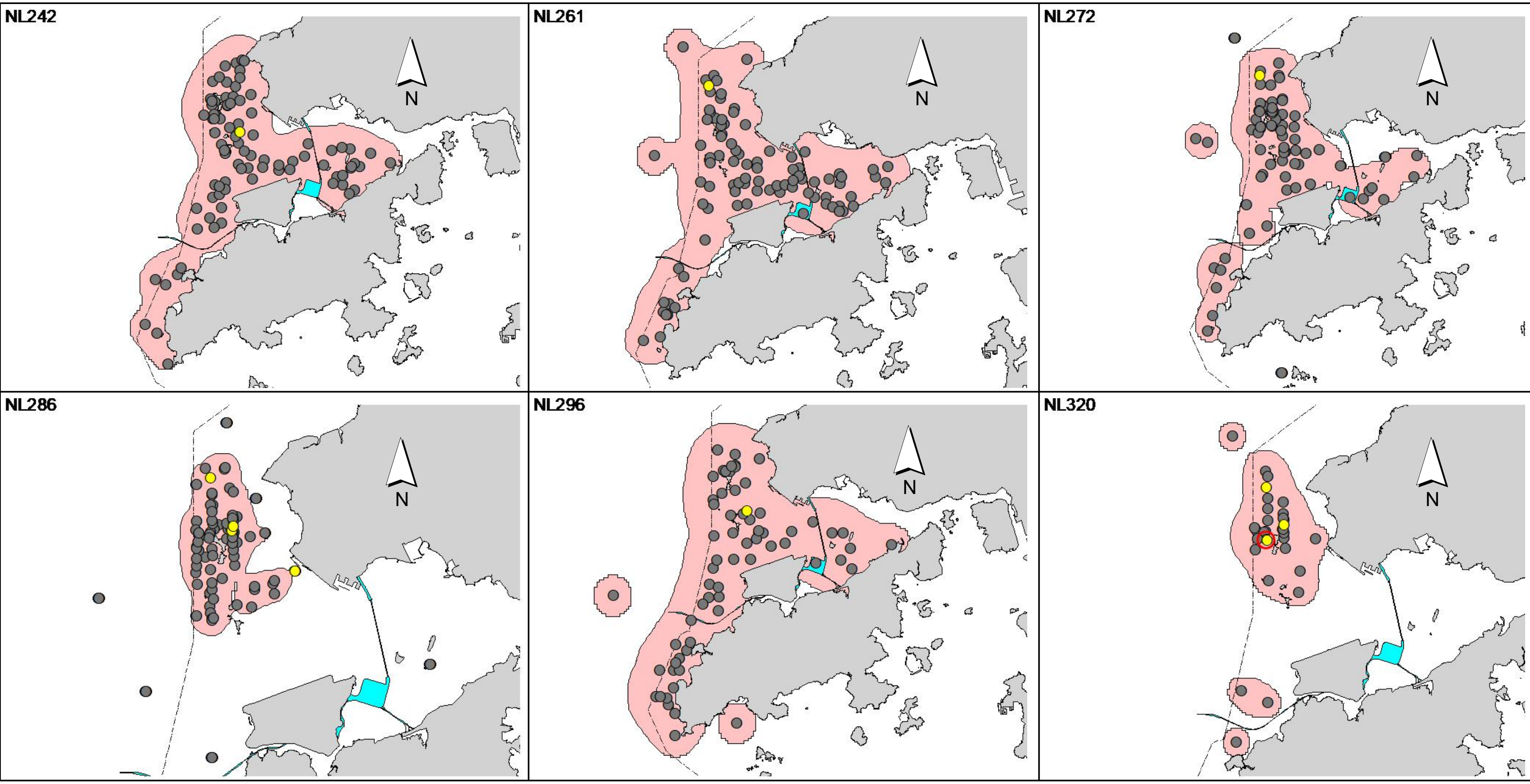
Appendix V. Ranging patterns (95% kernel ranges) of 23 individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicate sightings made in September – November 2017 during HKLR03 and HKLR09 monitoring surveys; the yellow dots with the red circles indicate the ones made during HKBCF monitoring surveys)



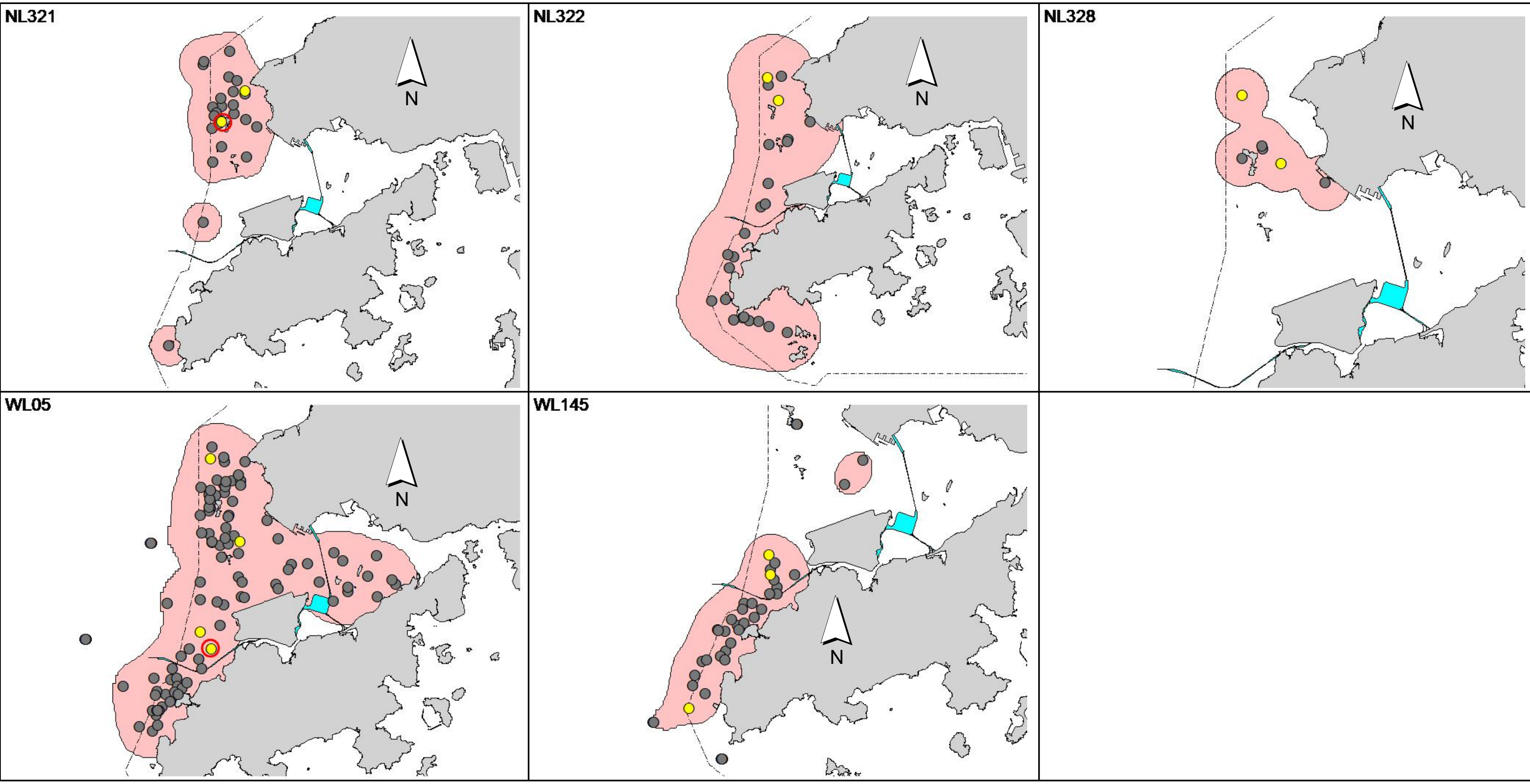
Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V.  (cont'd)



Appendix J

# Event Action Plan

*Appendix J1 Event/ Action Plan for Air Quality*

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

| EVENT | ACTION | | | |
|---|---|---|---|---|
| | ET [(1)] | IEC [(1)] | SOR[(1)] | Contractor |
| **Limit Level** | | | | |
| 1. Exceedance for one sample | 1. Identify the source.<br>2. Inform the SOR and the DEP.<br>3. Repeat measurement to confirm finding.<br>4. Increase monitoring frequency to daily.<br>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.<br>2. Check Contractor's working method.<br>3. Discuss with the ET and the Contractor on possible remedial measures.<br>4. Advise the SOR on the effectiveness of the proposed remedial measures.<br>5. Supervisor implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Ensure remedial measures are properly implemented. | 1. Take immediate action to avoid further exceedance<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification<br>3. Implement the agreed proposals<br>4. Amend proposal if appropriate |
| 2. Exceedance for two or more consecutive samples | 1. Notify the IEC, the SOR, the DEP and the Contractor.<br>2. Identify the source.<br>3. Repeat measurements to confirm findings.<br>4. Increase monitoring frequency to daily.<br>5. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented.<br>6. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken.<br>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.<br>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SOR accordingly.<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented.<br>4. Ensure remedial measures are properly implemented.<br>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.<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification.<br>3. Implement the agreed proposals.<br>4. Resubmit proposals if problem still not under control.<br>5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated. |

| | |
|---|---|
| | the SOR informed of the results.<br>8. If exceedance stops cease additional monitoring. |

*Appendix J2 Event/ Action Plan for Construction Noise*

| | ACTION | | | |
|---|---|---|---|---|
| **EVENT** | **ET** | **IEC** | **SOR** | **Contractor** |
| Action Level | 1. Notify the IEC and the Contractor.<br>2. Carry out investigation.<br>3. Report the results of investigation to the IEC and the Contractor.<br>4. Discuss with the Contractor and formulate remedial measures.<br>5. Increase monitoring frequency to check mitigation effectiveness. | 1. Review the analysed results submitted by the ET.<br>2. Review the proposed remedial measures by the Contractor and advise the SOR accordingly.<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Require the Contractor to propose remedial measures for the analysed noise problem.<br>4. Ensure remedial measures are properly implemented. | 1. Submit noise mitigation proposals to IEC<br>2. Implement noise mitigation proposals |
| Limit Level | 1. Notify the IEC, the SOR, the DEP and the Contractor.<br>2. Identify the source.<br>3. Repeat measurement to confirm findings.<br>4. Increase monitoring frequency.<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented.<br>6. Inform the IEC, the SOR and the DEP the causes & actions taken for the exceedances.<br>7. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results.<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst the SOR, the ET and the Contractor on the potential remedial actions.<br>2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the SOR accordingly.<br>3. Supervise the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing.<br>2. Notify the Contractor.<br>3. Require the Contractor to propose remedial measures for the analysed noise problem.<br>4. Ensure remedial measures are properly implemented.<br>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<br>2. Submit proposals for remedial actions to IEC within 3 working days of notification<br>3. Implement the agreed proposals<br>4. Resubmit proposals if problem still not under control<br>5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated. |

*Appendix J3 Event/ Action Plan for Water Quality*

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

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

*Appendix J4 Implementation of Event-Action Plan for Dolphin Monitoring*

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

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

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

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

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

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

Appendix K

# Quarterly Summary of Waste Flow Table

**Contract No. : HY/2012/07**
**Tuen Mun Chek Lap Kok Link – Southern Connection Viaduct Section**
**Monthly Summary Waste Flow Table for 2017 (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** | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000$m^3$) | ('000Kg) | ('000Kg) | ('000Kg) | ('000Kg) | ('000Kg) | ('000Kg) |
| Jan | 4.591 | 0.717 | 0.474 | - | 4.118 | - | - | - | - | - | 3.521 | 99.840 | - | - | 0.140 | - |
| Feb | 5.034 | 1.585 | 0.166 | - | 4.869 | - | 0.857 | - | - | - | - | 127.720 | - | - | 0.091 | - |
| Mar | 6.575 | 0.937 | 0.498 | - | 6.077 | - | 0.771 | - | - | - | 6.000 | 87.910 | - | - | 0.077 | - |
| Apr | 5.467 | 0.791 | 1.058 | - | 4.409 | - | - | - | - | - | - | 130.680 | - | 5.170 | 0.063 | - |
| May | 4.960 | 0.537 | 0.826 | - | 4.134 | - | 0.672 | - | - | - | - | 171.870 | - | - | 0.056 | - |
| Jun | 4.491 | 0.567 | 0.098 | - | 4.394 | - | - | - | - | - | - | 148.600 | - | - | 0.063 | - |
| **SUB-TOTAL** | **31.118** | **5.133** | **3.118** | **-** | **28.000** | **0.000** | **2.300** | **-** | **-** | **-** | **9.521** | **766.620** | **-** | **5.170** | **0.490** | **-** |
| Jul | 5.618 | 0.426 | 0.696 | 0.002 | 4.921 | - | 1.056 | - | - | - | 0.800 | 159.980 | - | - | 0.091 | - |
| Aug | 3.897 | 0.232 | - | - | 3.897 | - | - | - | - | - | - | 159.230 | - | - | 0.056 | - |
| Sep | 3.142 | 0.676 | - | - | 3.142 | - | 1.517 | 1.047 | - | 0.127 | - | 185.420 | - | 18.030 | 0.070 | - |
| Oct | 3.005 | 0.385 | 0.325 | - | 2.680 | - | - | - | - | - | - | 172.690 | - | - | 0.063 | - |
| Nov | 3.354 | 0.814 | 0.023 | - | 3.331 | - | - | - | - | - | 5.400 | 159.650 | - | 5.840 | 0.028 | - |
| Dec | - | 0.000 | - | - | - | - | | - | - | - | | | - | - | 0.028 | - |
| **TOTAL** | **50.134** | **7.667** | **4.161** | **0.002** | **45.971** | **-** | **4.873** | **1.047** | **-** | **0.127** | **15.721** | **1,603.590** | **-** | **29.040** | **0.826** | **-** |

**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 | 99 | 132 |
| | Limit | 1 | 15 |
| Impact Dolphin | Action | 0 | 9 |
| Monitoring | Limit | 1 | 11 |

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

| Reporting Period | Cumulative Statistics | | |
|---|---|---|---|
| | Complaints | Notifications of Summons | Successful Prosecutions |
| This quarter | 1 | 0 | 0 |
| Total No. received since project commencement | 11 | 0 | 0 |

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| ***To*** | Ramboll Environ – Hong Kong, Limited (ENPO) |
| ***From*** | ERM- Hong Kong, Limited |
| ***Ref/Project number*** | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| ***Subject*** | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| ***Date*** | 4 September 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_1 September 2017_ Bottom-depth DO_E_Station CS(Mf)3(N)**

A total of one exceedance was recorded on 1 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 11 September 2017 |

ERM

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_1 September 2017_ Depth-averaged SS_F_Station SR4a**

A total of one SS exceedance was recorded on 1 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

***Marine Water Quality Impact Monitoring***

## Notification of Exceedance

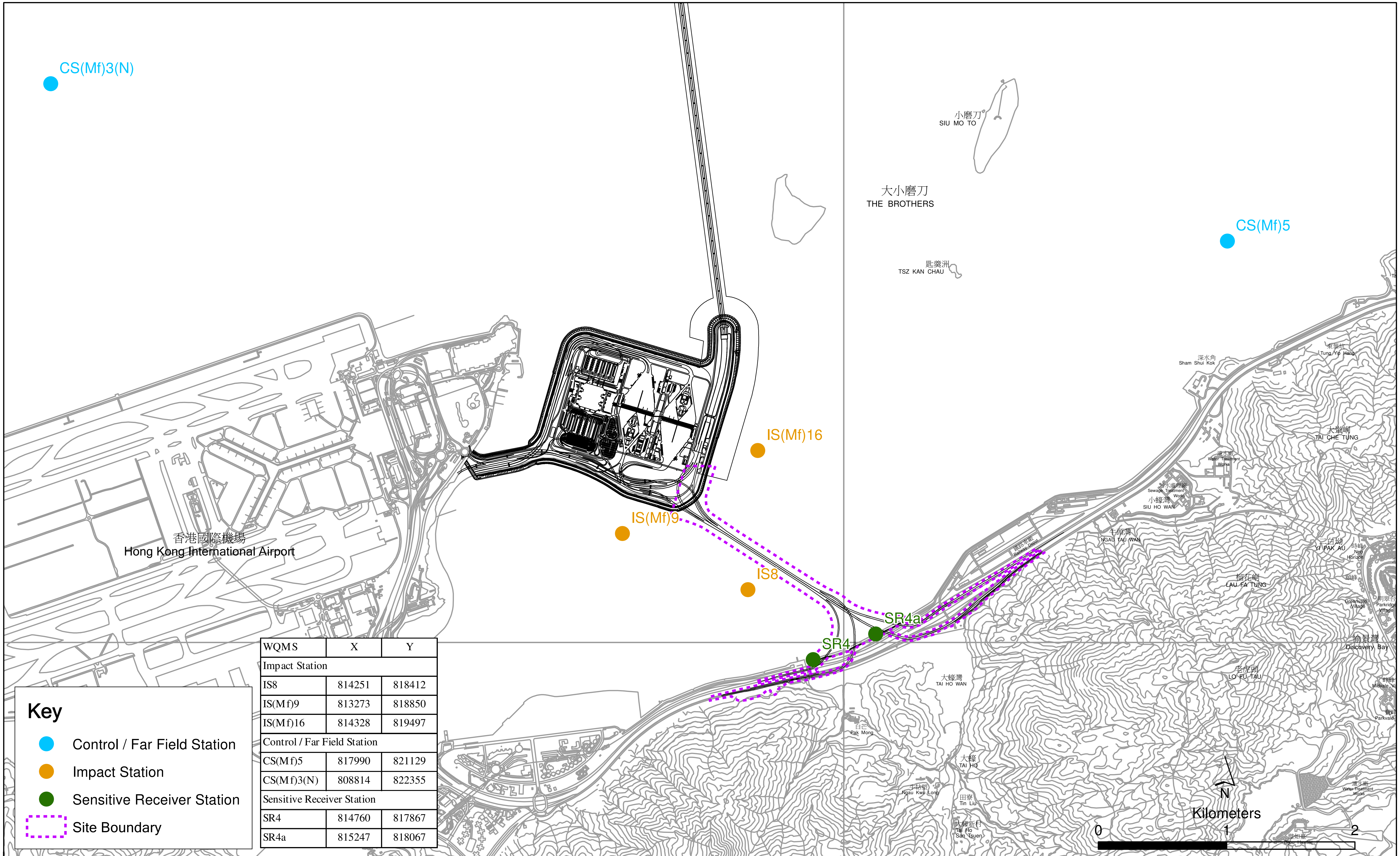
<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br>0215660_1 September 2017_ Bottom-depth DO_E_Station CS(Mf)3(N)<br>0215660_1 September 2017_ Depth-averaged SS_F_Station SR4a<br><br>[Total No. of Exceedances = 2]</td></tr>
<tr><td>Date</td><td colspan="2">1 September 2017 (Measured)<br>2 September 2017 (In situ results received by ERM)<br>8 September 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Bottom-depth Dissolved Oxygen (DO), Depth-averaged Suspended Solids (SS)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Action Levels for SS</td><td>SS</td><td>120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L).</td></tr>
<tr><td>Limit Levels for SS</td><td>SS</td><td>130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L)</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-Ebb at CS(Mf)3(N) (Bottom-depth DO = 4.6 mg/L);<br>2. Mid-Flood at SR4a (Depth-averaged SS = 24.1 mg/L)</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 1 September 2017.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="2">The exceedances of bottom-depth DO at CS(Mf)3(N) and depth-averaged SS at SR4a are unlikely to be due to the Project, in view of the following:<ul><li>No marine works was undertaken under this Contract on 1 September 2017.</li><li>CS(Mf)3(N) is distant (>5km) from the marine works area under this Contract, thus the observed exceedance should not be affected by the marine works under this Contract and it is considered to be natural fluctuation in water quality.</li><li>Apart from marginal DO exceedance at CS(Mf)3(N), levels of DO at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.</li><li>Apart from marginal SS exceedance at SR4a, levels of depth-averaged SS at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.</li><li>No observation on improper practice in construction works and discharge of construction wastes from vessels and working platforms was made nearby the monitoring stations.</li><li>The depth-averaged turbidity at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.</li></ul></td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="2">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
</table>

| | |
|---|---|
| **Remarks** | The monitoring results on 1 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 1 September is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)5 | 08:54 | Surface | 1 | 28.2 | 7.8 | 18.3 | 6.4 | 6.1 | 4.3 | 3.2 | 4.0 | 3.5 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)5 | 08:54 | Surface | 2 | 28.0 | 7.8 | 18.2 | 6.4 | | 3.4 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)5 | 08:54 | Middle | 1 | 27.5 | 7.9 | 24.7 | 5.7 | | 3.4 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)5 | 08:54 | Middle | 2 | 27.3 | 7.8 | 24.7 | 5.7 | | 2.4 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)5 | 08:54 | Bottom | 1 | 26.9 | 7.9 | 28.6 | 5.5 | 5.6 | 3.3 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)5 | 08:54 | Bottom | 2 | 26.9 | 7.8 | 28.5 | 5.6 | | 2.3 | | 3.1 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)3(N) | 10:34 | Surface | 1 | 28.5 | 7.6 | 16.1 | 5.7 | 5.2 | 9.1 | 9.0 | 4.1 | 3.7 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)3(N) | 10:34 | Surface | 2 | 28.3 | 7.6 | 16.3 | 5.7 | | 7.4 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)3(N) | 10:34 | Middle | 1 | 26.9 | 7.6 | 25.6 | 4.7 | | 8.8 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)3(N) | 10:34 | Middle | 2 | 26.7 | 7.6 | 25.6 | 4.7 | | 7.3 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)3(N) | 10:34 | Bottom | 1 | 26.4 | 7.7 | 27.9 | 4.6 | 4.6 | 11.5 | | 5.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | CS(Mf)3(N) | 10:34 | Bottom | 2 | 26.2 | 7.6 | 27.9 | 4.6 | | 9.7 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)16 | 09:31 | Surface | 1 | 28.3 | 8.0 | 20.3 | 6.9 | 6.5 | 5.2 | 5.0 | 5.0 | 4.5 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)16 | 09:31 | Surface | 2 | 28.1 | 7.9 | 20.3 | 6.9 | | 5.1 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)16 | 09:31 | Middle | 1 | 28.1 | 7.9 | 21.1 | 6.1 | | 4.7 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)16 | 09:31 | Middle | 2 | 28.0 | 7.8 | 21.0 | 6.1 | | 4.2 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)16 | 09:31 | Bottom | 1 | 27.7 | 7.9 | 23.4 | 5.8 | 5.8 | 5.7 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)16 | 09:31 | Bottom | 2 | 27.6 | 7.8 | 23.4 | 5.8 | | 4.9 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4a | 09:41 | Surface | 1 | 28.4 | 8.1 | 16.7 | 7.4 | 7.4 | 6.5 | 8.1 | 4.7 | 5.3 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4a | 09:41 | Surface | 2 | 28.3 | 8.0 | 16.6 | 7.4 | | 5.5 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4a | 09:41 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4a | 09:41 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4a | 09:41 | Bottom | 1 | 27.2 | 7.9 | 25.1 | 4.7 | 4.8 | 10.4 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4a | 09:41 | Bottom | 2 | 27.1 | 7.7 | 25.1 | 4.8 | | 10.0 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4 | 09:48 | Surface | 1 | 28.5 | 8.0 | 16.1 | 7.2 | 7.2 | 6.0 | 7.6 | 3.9 | 4.0 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4 | 09:48 | Surface | 2 | 28.3 | 8.0 | 16.1 | 7.1 | | 5.1 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4 | 09:48 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4 | 09:48 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4 | 09:48 | Bottom | 1 | 27.9 | 7.8 | 21.5 | 5.0 | 5.1 | 9.7 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | SR4 | 09:48 | Bottom | 2 | 27.8 | 7.7 | 21.4 | 5.2 | | 9.5 | | 4.1 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS8 | 09:59 | Surface | 1 | 28.6 | 8.0 | 19.2 | 7.1 | 7.1 | 7.3 | 11.1 | 5.8 | 5.1 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS8 | 09:59 | Surface | 2 | 28.4 | 7.9 | 19.1 | 7.1 | | 6.3 | | 6.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS8 | 09:59 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS8 | 09:59 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS8 | 09:59 | Bottom | 1 | 27.8 | 7.9 | 22.5 | 5.6 | 5.7 | 16.0 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS8 | 09:59 | Bottom | 2 | 27.7 | 7.8 | 22.6 | 5.7 | | 14.6 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)9 | 10:09 | Surface | 1 | 28.5 | 8.0 | 20.3 | 6.1 | 6.1 | 9.0 | 7.4 | 3.0 | 3.7 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)9 | 10:09 | Surface | 2 | 28.3 | 7.9 | 20.2 | 6.1 | | 8.5 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)9 | 10:09 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)9 | 10:09 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)9 | 10:09 | Bottom | 1 | 27.6 | 7.9 | 24.1 | 5.1 | 5.2 | 6.3 | | 4.9 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Ebb | IS(Mf)9 | 10:09 | Bottom | 2 | 27.5 | 7.8 | 23.9 | 5.2 | | 5.6 | | 4.3 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)5 | 17:26 | Surface | 1 | 28.7 | 7.9 | 19.6 | 7.4 | 6.1 | 3.9 | 4.7 | 1.7 | 2.3 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)5 | 17:26 | Surface | 2 | 28.5 | 8.0 | 19.5 | 7.3 | | 2.9 | | 1.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)5 | 17:26 | Middle | 1 | 26.5 | 7.8 | 30.4 | 4.8 | | 5.0 | | 1.8 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)5 | 17:26 | Middle | 2 | 26.4 | 7.9 | 30.3 | 4.9 | | 4.7 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)5 | 17:26 | Bottom | 1 | 26.2 | 7.8 | 33.0 | 5.0 | 5.2 | 6.1 | | 3.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)5 | 17:26 | Bottom | 2 | 26.1 | 7.9 | 32.9 | 5.3 | | 5.8 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)3(N) | 16:28 | Surface | 1 | 29.3 | 7.6 | 13.4 | 6.4 | 5.9 | 10.3 | 13.2 | 5.3 | 14.8 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)3(N) | 16:28 | Surface | 2 | 29.5 | 7.7 | 13.3 | 6.4 | | 12.3 | | 6.1 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)3(N) | 16:28 | Middle | 1 | 27.9 | 7.6 | 19.6 | 5.5 | | 12.5 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)3(N) | 16:28 | Middle | 2 | 28.1 | 7.6 | 19.4 | 5.4 | | 14.2 | | 11.1 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)3(N) | 16:28 | Bottom | 1 | 27.6 | 7.6 | 21.0 | 5.2 | 5.2 | 13.7 | | 29.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | CS(Mf)3(N) | 16:28 | Bottom | 2 | 27.8 | 7.7 | 21.0 | 5.1 | | 16.1 | | 27.6 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)16 | 16:58 | Surface | 1 | 28.8 | 8.0 | 18.4 | 8.2 | 7.0 | 4.8 | 8.4 | 2.8 | 3.4 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)16 | 16:58 | Surface | 2 | 28.7 | 8.1 | 18.4 | 8.3 | | 4.2 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)16 | 16:58 | Middle | 1 | 27.8 | 7.6 | 22.1 | 5.7 | | 8.3 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)16 | 16:58 | Middle | 2 | 27.7 | 7.8 | 22.1 | 5.7 | | 7.7 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)16 | 16:58 | Bottom | 1 | 27.3 | 7.6 | 25.1 | 5.1 | 5.2 | 13.2 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)16 | 16:58 | Bottom | 2 | 27.2 | 7.8 | 25.2 | 5.2 | | 12.2 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4a | 16:45 | Surface | 1 | 28.5 | 7.8 | 19.3 | 7.6 | 7.6 | 6.0 | 10.4 | 21.6 | 24.1 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4a | 16:45 | Surface | 2 | 28.4 | 8.0 | 19.2 | 7.6 | | 5.3 | | 21.2 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4a | 16:45 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4a | 16:45 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4a | 16:45 | Bottom | 1 | 27.5 | 7.7 | 24.2 | 5.7 | 5.7 | 16.1 | | 27.0 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4a | 16:45 | Bottom | 2 | 27.4 | 7.8 | 24.1 | 5.6 | | 14.2 | | 26.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4 | 16:40 | Surface | 1 | 28.8 | 7.8 | 18.7 | 8.2 | 8.2 | 18.4 | 17.7 | 10.5 | 14.7 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4 | 16:40 | Surface | 2 | 28.7 | 8.0 | 18.6 | 8.2 | | 18.1 | | 9.1 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4 | 16:40 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4 | 16:40 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4 | 16:40 | Bottom | 1 | 28.4 | 7.7 | 20.0 | 7.3 | 7.4 | 16.4 | | 19.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | SR4 | 16:40 | Bottom | 2 | 28.3 | 7.9 | 20.0 | 7.4 | | 17.8 | | 19.7 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS8 | 16:30 | Surface | 1 | 28.8 | 8.0 | 18.0 | 8.0 | 8.0 | 7.2 | 9.6 | 4.6 | 5.9 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS8 | 16:30 | Surface | 2 | 28.7 | 8.0 | 18.0 | 8.0 | | 6.6 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS8 | 16:30 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS8 | 16:30 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS8 | 16:30 | Bottom | 1 | 28.4 | 7.9 | 19.8 | 7.3 | 7.4 | 12.7 | | 6.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS8 | 16:30 | Bottom | 2 | 28.3 | 7.9 | 19.8 | 7.4 | | 11.9 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)9 | 16:18 | Surface | 1 | 30.3 | 8.5 | 17.3 | 14.2 | 14.2 | 7.8 | 9.6 | 6.9 | 6.9 |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)9 | 16:18 | Surface | 2 | 30.1 | 8.5 | 17.3 | 14.1 | | 6.6 | | 6.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)9 | 16:18 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)9 | 16:18 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)9 | 16:18 | Bottom | 1 | 28.3 | 8.1 | 21.2 | 9.6 | 9.6 | 12.8 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-01 | Mid-Flood | IS(Mf)9 | 16:18 | Bottom | 2 | 28.2 | 8.0 | 21.2 | 9.5 | | 11.3 | | 6.7 | |

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




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

**Key**

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

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

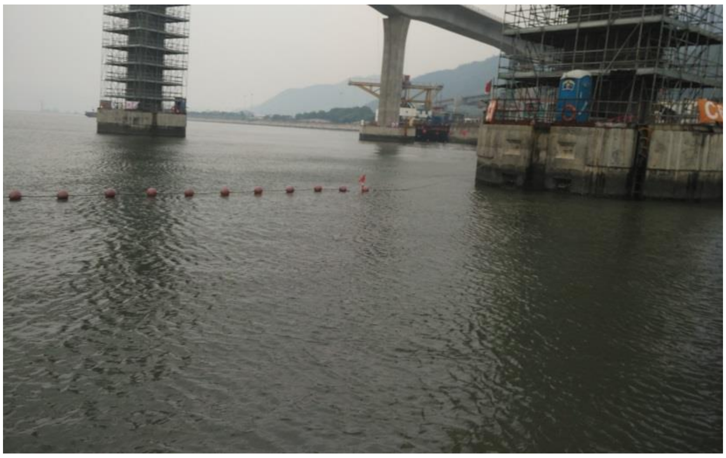
Environmental
Resources
Management

ERM

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)3(N) AND SR4A ON 1 SEPTEMBER 2017*

Photo 1 - CS(Mf)3(N) during mid-ebb tide on 1 September 2017

Photo 2 - SR4a during mid-flood tide on 1 September 2017



**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| ***To*** | Ramboll Environ – Hong Kong, Limited (ENPO) |
| ***From*** | ERM- Hong Kong, Limited |
| ***Ref/Project number*** | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| ***Subject*** | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| ***Date*** | 7 September 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_6 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**

**Limit Level Exceedance**
**0215660_6 September 2017_Bottom-depth DO_E_Station CS(Mf)5**
**0215660_6 September 2017_Bottom-depth DO_F_Station CS(Mf)5**

A total of three exceedances were recorded on 6 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| ***To*** | Ramboll Environ – Hong Kong, Limited (ENPO) |
| ***From*** | ERM- Hong Kong, Limited |
| ***Ref/Project number*** | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| ***Subject*** | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| ***Date*** | 14 September 2017 |

ERM

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Dear Sir/ Madam,

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

**<u>Action Level Exceedance</u>**
**0215660_6 September 2017_ Depth-averaged SS_F_Station SR4**

A total of three exceedances were recorded on 6 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

| | | |
|---|---|---|
| **Log No.** | **Action Level Exceedance**<br>**0215660_6 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**<br>**0215660_6 September 2017_ Depth-averaged SS_F_Station SR4**<br>**0215660_6 September 2017_Bottom-depth DO_E_Station CS(Mf)5**<br>**0215660_6 September 2017_Bottom-depth DO_F_Station CS(Mf)5**<br><br>**[Total No. of Exceedances = 4]** | |
| **Date** | 6 September 2017 (Measured)<br>7 September 2017 (*In situ* results received by ERM)<br>13 September 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Surface and Middle-depth Dissolved Oxygen (DO), Bottom-depth Dissolved Oxygen (DO) and Depth-averaged Suspended Solids (SS) | |
| **Action Levels for DO** | Surface and Middle-depth DO | 5.0 mg/L |
| | Bottom-depth DO | 4.7 mg/L |
| **Limit Levels for DO** | Surface and Middle-depth DO | 4.2 mg/L |
| | Bottom-depth DO | 3.6 mg/L |
| **Action Levels for SS** | SS | 120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L). |
| **Limit Levels for SS** | SS | 130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L) |
| **Measured Levels** | Action Level Exceedance<br>1. Mid-Flood at CS(Mf)5 (Surface and Middle-depth DO = 4.9 mg/L);<br>2. Mid-Flood at SR4 (depth-averaged SS = 26.3 mg/L);<br>3. Mid-Ebb at CS(Mf)5 (Bottom-depth DO = 4.5 mg/L);<br>4. Mid-Flood at CS(Mf)5 (Bottom-depth DO = 4.5 mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 6 September 2017. | |

| | |
|---|---|
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedances of surface and middle and bottom-depth DO at CS(Mf)5 and depth-averaged SS at SR4 are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 6 September 2017.<br>• Depth-averaged Turbidity levels at all stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• Apart from SR4, depth-averaged SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day. Depth-averaged SS levels at SR4 at mid-ebb tides were similar to those at other stations apart from the exceedance observed at mid-flood tide.<br>• All monitored parameters, except DO at CS(Mf)5 and SS at SR4, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)5 is distant (>3km) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• Apart from DO exceedances at CS(Mf)5, levels of DO at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. |
| **Remarks** | The monitoring results on 6 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 6 September 2017 is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature (°C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)5 | 12:27 | Surface | 1 | 27.9 | 7.7 | 22.0 | 5.1 | 5.0 | 5.5 | 9.3 | 7.4 | 8.8 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)5 | 12:27 | Surface | 2 | 28.0 | 7.5 | 22.0 | 5.1 | | 4.6 | | 7.0 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)5 | 12:27 | Middle | 1 | 27.2 | 7.8 | 25.7 | 4.8 | | 10.6 | | 8.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)5 | 12:27 | Middle | 2 | 27.3 | 7.6 | 25.8 | 4.8 | | 9.5 | | 10.0 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)5 | 12:27 | Bottom | 1 | 26.8 | 7.7 | 30.2 | 4.5 | 4.5 | 13.6 | | 9.9 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)5 | 12:27 | Bottom | 2 | 26.9 | 7.6 | 30.3 | 4.5 | | 12.0 | | 9.7 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)3(N) | 13:40 | Surface | 1 | 28.9 | 7.5 | 17.7 | 5.5 | 5.3 | 10.1 | 12.9 | 4.7 | 7.9 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)3(N) | 13:40 | Surface | 2 | 28.6 | 7.5 | 17.9 | 5.5 | | 9.2 | | 5.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)3(N) | 13:40 | Middle | 1 | 27.9 | 7.6 | 19.8 | 5.0 | | 13.0 | | 7.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)3(N) | 13:40 | Middle | 2 | 27.6 | 7.6 | 20.2 | 5.1 | | 13.4 | | 6.9 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)3(N) | 13:40 | Bottom | 1 | 27.7 | 7.7 | 21.8 | 5.0 | 5.0 | 16.6 | | 11.1 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | CS(Mf)3(N) | 13:40 | Bottom | 2 | 27.5 | 7.6 | 21.8 | 5.0 | | 15.1 | | 12.1 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)16 | 13:07 | Surface | 1 | 27.8 | 7.8 | 22.1 | 5.0 | 5.0 | 7.2 | 6.7 | 7.6 | 8.8 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)16 | 13:07 | Surface | 2 | 27.9 | 7.6 | 22.2 | 5.0 | | 6.8 | | 8.6 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)16 | 13:07 | Middle | 1 | 27.5 | 7.8 | 23.7 | 4.9 | | 7.3 | | 9.5 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)16 | 13:07 | Middle | 2 | 27.6 | 7.6 | 23.7 | 4.9 | | 6.7 | | 8.9 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)16 | 13:07 | Bottom | 1 | 27.3 | 7.8 | 24.7 | 4.8 | 4.9 | 6.3 | | 8.9 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)16 | 13:07 | Bottom | 2 | 27.4 | 7.6 | 24.6 | 4.9 | | 6.0 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4a | 13:18 | Surface | 1 | 27.9 | 7.7 | 21.5 | 5.1 | 5.1 | 10.9 | 14.4 | 11.4 | 15.5 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4a | 13:18 | Surface | 2 | 28.0 | 7.7 | 21.5 | 5.1 | | 9.2 | | 11.2 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4a | 13:18 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4a | 13:18 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4a | 13:18 | Bottom | 1 | 27.4 | 7.8 | 24.1 | 5.0 | 4.9 | 18.4 | | 20.1 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4a | 13:18 | Bottom | 2 | 27.5 | 7.8 | 24.2 | 4.8 | | 19.1 | | 19.4 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4 | 13:23 | Surface | 1 | 28.1 | 7.7 | 20.7 | 5.1 | 5.1 | 7.2 | 11.6 | 12.2 | 12.5 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4 | 13:23 | Surface | 2 | 28.2 | 7.7 | 20.7 | 5.1 | | 6.5 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4 | 13:23 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4 | 13:23 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4 | 13:23 | Bottom | 1 | 27.8 | 7.7 | 21.7 | 5.0 | 5.0 | 17.0 | | 13.1 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | SR4 | 13:23 | Bottom | 2 | 27.9 | 7.7 | 21.7 | 4.9 | | 15.6 | | 13.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS8 | 13:33 | Surface | 1 | 28.9 | 7.8 | 20.8 | 5.5 | 5.5 | 4.9 | 8.2 | 7.4 | 6.9 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS8 | 13:33 | Surface | 2 | 29.0 | 7.7 | 20.9 | 5.5 | | 4.2 | | 7.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS8 | 13:33 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS8 | 13:33 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS8 | 13:33 | Bottom | 1 | 27.9 | 7.8 | 21.9 | 5.2 | 5.2 | 12.1 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS8 | 13:33 | Bottom | 2 | 28.1 | 7.7 | 22.0 | 5.1 | | 11.5 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)9 | 13:42 | Surface | 1 | 28.0 | 7.8 | 21.0 | 5.2 | 5.3 | 4.6 | 7.8 | 5.9 | 8.2 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)9 | 13:42 | Surface | 2 | 28.2 | 7.7 | 21.1 | 5.3 | | 4.4 | | 5.0 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)9 | 13:42 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)9 | 13:42 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)9 | 13:42 | Bottom | 1 | 27.7 | 7.7 | 22.4 | 4.9 | 4.9 | 11.7 | | 11.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Ebb | IS(Mf)9 | 13:42 | Bottom | 2 | 27.8 | 7.7 | 22.5 | 4.9 | | 10.6 | | 10.4 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)5 | 19:49 | Surface | 1 | 27.6 | 7.8 | 23.4 | 5.1 | 4.9 | 4.7 | 10.8 | 5.8 | 10.6 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)5 | 19:49 | Surface | 2 | 27.7 | 7.8 | 23.6 | 5.1 | | 4.3 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)5 | 19:49 | Middle | 1 | 27.0 | 7.9 | 28.4 | 4.8 | | 10.3 | | 11.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)5 | 19:49 | Middle | 2 | 27.1 | 7.9 | 28.5 | 4.6 | | 9.3 | | 11.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)5 | 19:49 | Bottom | 1 | 26.9 | 7.9 | 28.8 | 4.5 | 4.5 | 17.2 | | 13.7 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)5 | 19:49 | Bottom | 2 | 27.0 | 7.9 | 28.9 | 4.5 | | 18.9 | | 14.5 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)3(N) | 18:23 | Surface | 1 | 29.1 | 7.4 | 14.1 | 5.0 | 5.0 | 12.9 | 15.1 | 8.8 | 12.1 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)3(N) | 18:23 | Surface | 2 | 28.8 | 7.4 | 13.6 | 5.1 | | 12.1 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)3(N) | 18:23 | Middle | 1 | 28.6 | 7.5 | 16.6 | 4.9 | | 15.8 | | 10.6 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)3(N) | 18:23 | Middle | 2 | 28.4 | 7.4 | 16.8 | 5.0 | | 15.5 | | 11.6 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)3(N) | 18:23 | Bottom | 1 | 28.4 | 7.5 | 17.9 | 4.9 | 4.9 | 17.2 | | 16.7 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | CS(Mf)3(N) | 18:23 | Bottom | 2 | 28.2 | 7.5 | 18.1 | 4.9 | | 16.9 | | 17.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)16 | 19:09 | Surface | 1 | 28.2 | 7.8 | 21.4 | 5.0 | 5.0 | 13.3 | 13.2 | 12.1 | 17.7 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)16 | 19:09 | Surface | 2 | 28.3 | 7.8 | 21.4 | 5.0 | | 12.7 | | 13.1 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)16 | 19:09 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)16 | 19:09 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)16 | 19:09 | Bottom | 1 | 28.2 | 7.8 | 21.5 | 5.0 | 5.0 | 13.4 | | 23.0 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)16 | 19:09 | Bottom | 2 | 28.3 | 7.8 | 21.6 | 5.0 | | 13.4 | | 22.4 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4a | 18:56 | Surface | 1 | 28.4 | 7.7 | 20.2 | 5.2 | 5.2 | 12.3 | 13.0 | 19.7 | 20.6 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4a | 18:56 | Surface | 2 | 28.5 | 7.8 | 20.3 | 5.2 | | 12.0 | | 20.7 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4a | 18:56 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4a | 18:56 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4a | 18:56 | Bottom | 1 | 28.4 | 7.7 | 20.3 | 5.3 | 5.3 | 14.2 | | 21.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4a | 18:56 | Bottom | 2 | 28.5 | 7.8 | 20.3 | 5.3 | | 13.4 | | 20.6 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4 | 18:51 | Surface | 1 | 28.4 | 7.7 | 20.7 | 5.2 | 5.2 | 17.0 | 20.4 | 24.5 | 26.3 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4 | 18:51 | Surface | 2 | 28.5 | 7.8 | 20.7 | 5.2 | | 15.9 | | 24.4 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4 | 18:51 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4 | 18:51 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4 | 18:51 | Bottom | 1 | 28.4 | 7.7 | 20.8 | 5.2 | 5.2 | 24.6 | | 27.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | SR4 | 18:51 | Bottom | 2 | 28.5 | 7.8 | 20.8 | 5.2 | | 24.0 | | 28.3 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS8 | 18:41 | Surface | 1 | 28.3 | 7.8 | 20.8 | 5.2 | 5.2 | 11.6 | 17.4 | 21.3 | 20.6 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS8 | 18:41 | Surface | 2 | 28.4 | 7.7 | 20.8 | 5.2 | | 11.4 | | 20.7 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS8 | 18:41 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS8 | 18:41 | Middle | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS8 | 18:41 | Bottom | 1 | 28.3 | 7.7 | 21.1 | 5.3 | 5.3 | 22.6 | | 19.8 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS8 | 18:41 | Bottom | 2 | 28.4 | 7.7 | 21.2 | 5.2 | | 23.8 | | 20.7 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)9 | 18:31 | Surface | | | | | | 5.3 | | 13.5 | | 16.3 |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)9 | 18:31 | Surface | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)9 | 18:31 | Middle | 1 | 28.3 | 7.8 | 21.8 | 5.3 | | 13.4 | | 16.5 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)9 | 18:31 | Middle | 2 | 28.4 | 7.8 | 21.9 | 5.2 | | 13.6 | | 16.0 | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)9 | 18:31 | Bottom | | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/06 | Mid-Flood | IS(Mf)9 | 18:31 | Bottom | | | | | | | | | | |

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5 AND SR4 ON 6 SEPTEMBER 2017*

Photo 1 - Mid-Flood at CS(Mf)5 on 6 September 2017

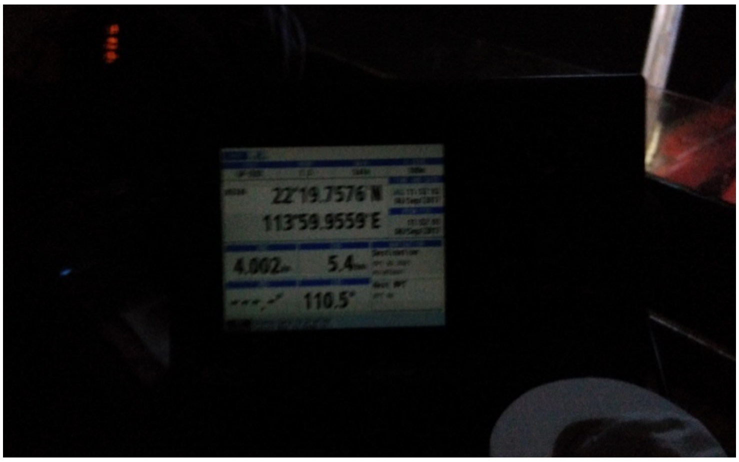


Photo 2 - Mid-Flood at SR4 on 6 September 2017

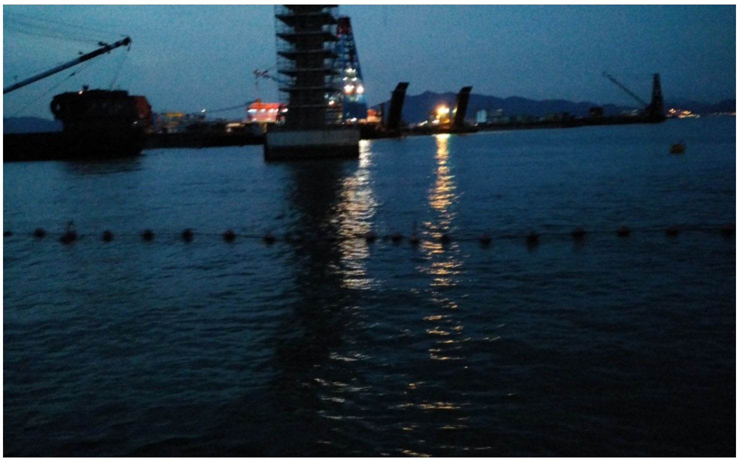

Photo 3 - Mid-Ebb at CS(Mf)5 on 6 September 2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 9 September 2017 |

ERM

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_8 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**
**0215660_8 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_8 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**
**0215660_8 September 2017_ Surface and Middle-depth DO_E_Station IS(Mf)16**
**0215660_8 September 2017_ Bottom-depth DO_E_Station IS(Mf)16**
**0215660_8 September 2017_ Surface and Middle-depth DO_E_Station SR4a**
**0215660_8 September 2017_Bottom-depth DO_E_Station SR4a**
**0215660_8 September 2017_ Surface and Middle-depth DO_E_Station SR4**
**0215660_8 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**
**0215660_8 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**
**0215660_8 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)**
**0215660_8 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)16**
**0215660_8 September 2017_ Surface and Middle-depth DO_F_Station SR4a**
**0215660_8 September 2017_ Surface and Middle-depth DO_F_Station IS8**
**0215660_8 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)9**

A total of fifteen exceedances were recorded on 8 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

**Notification of Exceedance**

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br>0215660_8 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5<br>0215660_8 September 2017_ Bottom-depth DO_E_Station CS(Mf)5<br>0215660_8 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)<br>0215660_8 September 2017_ Surface and Middle-depth DO_E_Station IS(Mf)16<br>0215660_8 September 2017_ Bottom-depth DO_E_Station IS(Mf)16<br>0215660_8 September 2017_ Surface and Middle-depth DO_E_Station SR4a<br>0215660_8 September 2017_Bottom-depth DO_E_Station SR4a<br>0215660_8 September 2017_ Surface and Middle-depth DO_E_Station SR4<br>0215660_8 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5<br>0215660_8 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br>0215660_8 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)<br>0215660_8 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)16<br>0215660_8 September 2017_ Surface and Middle-depth DO_F_Station SR4a<br>0215660_8 September 2017_ Surface and Middle-depth DO_F_Station IS8<br>0215660_8 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)9<br><br>[Total No. of Exceedances = 15]</td></tr>
<tr><td>Date</td><td colspan="2">8 September 2017 (Measured)<br>9 September 2017 (In situ results received by ERM)<br>18 September 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth Dissolved Oxygen (DO), Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-Ebb at CS(Mf)5 (Surface and Middle-depth DO = 4.8 mg/L);<br>2. Mid-Ebb at CS(Mf)5 (Bottom-depth DO = 4.4 mg/L);<br>3. Mid-Ebb at CS(Mf)3(N) (Surface and Middle-depth DO = 4.9 mg/L);<br>4. Mid-Ebb at IS(Mf)16 (Surface and Middle-depth DO = 4.7 mg/L);<br>5. Mid-Ebb at IS(Mf)16 (Bottom-depth DO = 4.5 mg/L);<br>6. Mid-Ebb at SR4a (Surface and Middle-depth DO = 4.7 mg/L);<br>7. Mid-Ebb at SR4a (Bottom-depth DO = 4.5 mg/L);<br>8. Mid-Ebb at SR4 (Surface and Middle-depth DO = 4.7 mg/L);<br>9. Mid-Flood at CS(Mf)5 (Surface and Middle-depth DO = 4.7 mg/L);<br>10. Mid-Flood at CS(Mf)5 (Bottom-depth DO = 4.6 mg/L);<br>11. Mid-Flood at CS(Mf)3(N) (Surface and Middle-depth DO = 4.8 mg/L);<br>12. Mid-Flood at IS(Mf)16 (Surface and Middle-depth DO = 4.8 mg/L);<br>13. Mid-Flood at SR4a (Surface and Middle-depth DO = 4.9 mg/L);<br>14. Mid-Flood at IS8 (Surface and Middle-depth DO = 4.8 mg/L);<br>15. Mid-Flood at IS(Mf)9 (Surface and Middle-depth DO = 4.8 mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 8 September 2017.</td></tr>
</table>

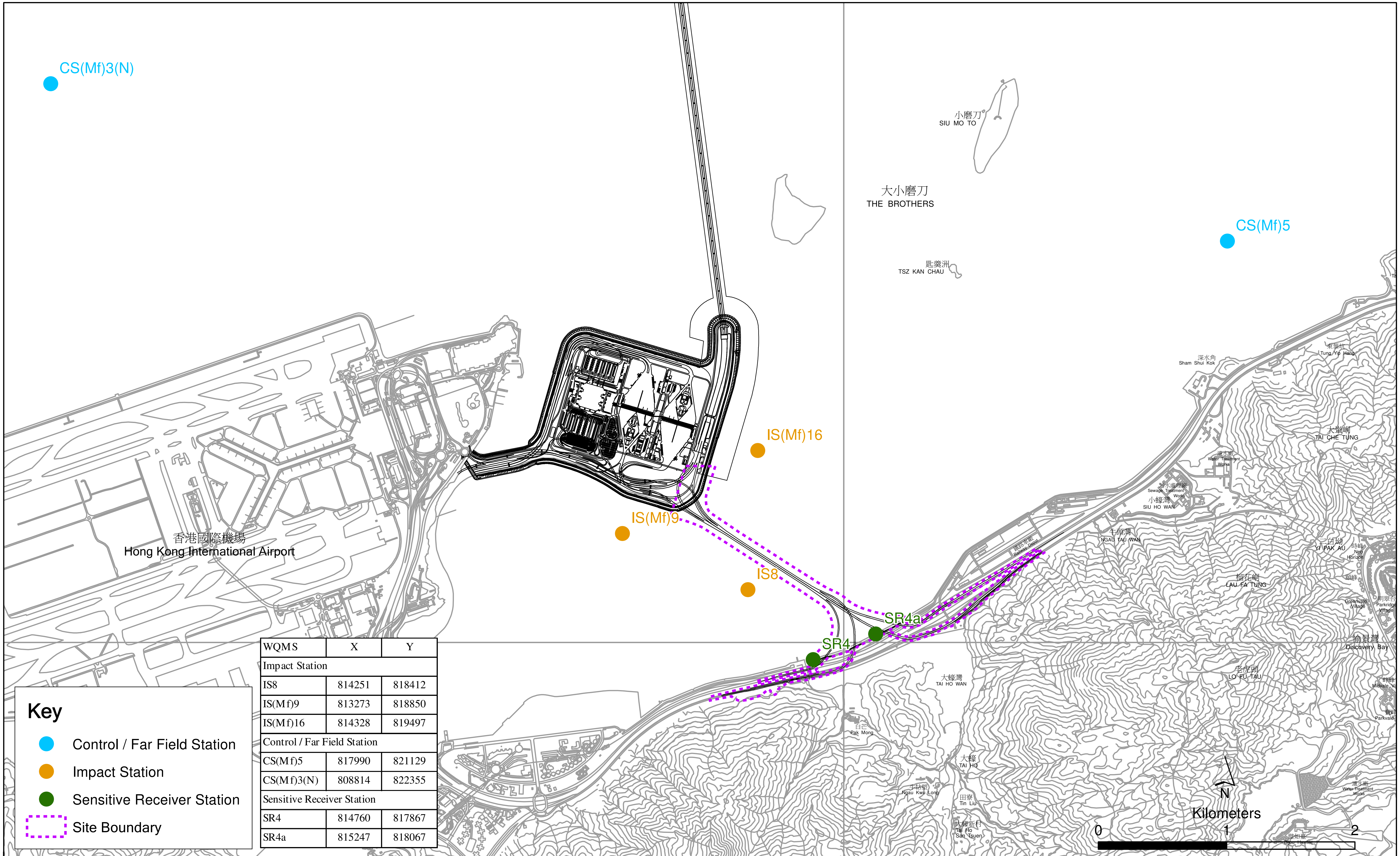
| | |
|---|---|
| **Possible Reason for Action or Limit Level Exceedance(s)** | The DO exceedances at the monitoring stations are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 6 September 2017.<br>• CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• DO patterns at IS(Mf)16, SR4a and SR4 during mid-ebb had similar DO pattern as the control station CS(Mf)3(N), in which action level exceedance was observed on the same day and at the same tide.<br>• Marginal DO exceedances were observed at the surface and middle-depth at IS(Mf)16, SR4a, IS8 and IS(Mf)9 during mid-flood. The DO patterns at these monitoring stations followed similar DO pattern as the control station CS(Mf)5, in which action level exceedance was observed on the same day and at the same tide. |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. |
| **Remarks** | The monitoring results on 8 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 8 September 2017 is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)5 | 14:37 | Surface | 1 | 28.6 | 7.7 | 20.5 | 4.8 | 4.8 | 5.7 | 19.7 | 9.2 | 21.7 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)5 | 14:37 | Surface | 2 | 28.6 | 7.7 | 20.4 | 4.9 | | 5.8 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)5 | 14:37 | Middle | 1 | 28.2 | 7.7 | 22.1 | 4.7 | | 11.2 | | 19.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)5 | 14:37 | Middle | 2 | 28.1 | 7.8 | 22.0 | 4.7 | | 11.3 | | 21.2 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)5 | 14:37 | Bottom | 1 | 27.7 | 7.8 | 24.4 | 4.4 | 4.4 | 41.1 | | 36.8 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)5 | 14:37 | Bottom | 2 | 27.6 | 7.7 | 24.3 | 4.4 | | 42.9 | | 34.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)3(N) | 12:51 | Surface | 1 | 28.3 | 7.6 | 19.8 | 5.0 | 4.9 | 10.6 | 16.0 | 7.3 | 13.0 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)3(N) | 12:51 | Surface | 2 | 28.5 | 7.6 | 19.6 | 4.9 | | 10.6 | | 6.0 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)3(N) | 12:51 | Middle | 1 | 27.9 | 7.7 | 22.3 | 4.8 | | 18.9 | | 14.0 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)3(N) | 12:51 | Middle | 2 | 28.1 | 7.7 | 22.1 | 4.8 | | 18.7 | | 15.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)3(N) | 12:51 | Bottom | 1 | 27.8 | 7.7 | 23.3 | 4.9 | 4.9 | 17.0 | | 17.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | CS(Mf)3(N) | 12:51 | Bottom | 2 | 28.0 | 7.7 | 23.1 | 4.8 | | 19.9 | | 17.9 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)16 | 13:56 | Surface | 1 | 28.3 | 7.7 | 21.5 | 4.9 | 4.7 | 5.7 | 7.0 | 8.8 | 11.4 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)16 | 13:56 | Surface | 2 | 28.1 | 7.7 | 21.5 | 4.9 | | 6.1 | | 7.0 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)16 | 13:56 | Middle | 1 | 27.9 | 7.8 | 23.0 | 4.5 | | 9.5 | | 14.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)16 | 13:56 | Middle | 2 | 27.8 | 7.7 | 22.9 | 4.5 | | 10.3 | | 12.7 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)16 | 13:56 | Bottom | 1 | 27.7 | 7.8 | 24.4 | 4.5 | 4.5 | 5.2 | | 13.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)16 | 13:56 | Bottom | 2 | 27.6 | 7.7 | 24.3 | 4.5 | | 5.4 | | 12.1 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4a | 13:38 | Surface | 1 | 28.3 | 7.6 | 20.7 | 4.7 | 4.7 | 7.5 | 12.4 | 13.9 | 14.8 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4a | 13:38 | Surface | 2 | 28.2 | 7.7 | 20.6 | 4.7 | | 7.9 | | 12.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4a | 13:38 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4a | 13:38 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4a | 13:38 | Bottom | 1 | 28.1 | 7.6 | 21.9 | 4.5 | 4.5 | 16.6 | | 16.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4a | 13:38 | Bottom | 2 | 27.9 | 7.7 | 21.8 | 4.5 | | 17.6 | | 16.6 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4 | 13:32 | Surface | 1 | 28.3 | 7.7 | 20.3 | 4.7 | 4.7 | 8.1 | 8.2 | 9.7 | 11.2 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4 | 13:32 | Surface | 2 | 28.2 | 7.6 | 20.2 | 4.7 | | 8.6 | | 10.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4 | 13:32 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4 | 13:32 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4 | 13:32 | Bottom | 1 | 28.3 | 7.7 | 21.0 | 4.8 | 4.9 | 7.7 | | 11.9 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | SR4 | 13:32 | Bottom | 2 | 28.1 | 7.7 | 20.9 | 4.9 | | 8.2 | | 12.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS8 | 13:20 | Surface | 1 | 28.9 | 7.8 | 20.2 | 5.2 | 5.2 | 3.9 | 6.4 | 7.6 | 10.1 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS8 | 13:20 | Surface | 2 | 28.8 | 7.7 | 20.1 | 5.2 | | 4.4 | | 9.0 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS8 | 13:20 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS8 | 13:20 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS8 | 13:20 | Bottom | 1 | 28.3 | 7.9 | 21.0 | 5.0 | 5.0 | 8.4 | | 11.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS8 | 13:20 | Bottom | 2 | 28.2 | 7.7 | 20.9 | 5.0 | | 8.9 | | 12.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)9 | 13:09 | Surface | 1 | 29.0 | 7.9 | 20.1 | 5.4 | 5.4 | 4.3 | 5.0 | 4.0 | 7.8 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)9 | 13:09 | Surface | 2 | 28.9 | 7.7 | 20.0 | 5.3 | | 4.7 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)9 | 13:09 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)9 | 13:09 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)9 | 13:09 | Bottom | 1 | 28.3 | 7.9 | 20.7 | 5.0 | 5.1 | 5.3 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Ebb | IS(Mf)9 | 13:09 | Bottom | 2 | 28.2 | 7.7 | 20.7 | 5.1 | | 5.6 | | 10.0 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)5 | 7:07 | Surface | 1 | 28.1 | 7.8 | 21.3 | 4.8 | 4.7 | 4.2 | 5.0 | 2.2 | 5.4 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)5 | 7:07 | Surface | 2 | 28.0 | 7.8 | 21.3 | 4.8 | | 4.9 | | 2.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)5 | 7:07 | Middle | 1 | 27.7 | 7.8 | 24.9 | 4.5 | | 4.8 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)5 | 7:07 | Middle | 2 | 27.6 | 7.9 | 25.2 | 4.5 | | 5.3 | | 5.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)5 | 7:07 | Bottom | 1 | 27.6 | 7.8 | 26.6 | 4.5 | 4.6 | 5.2 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)5 | 7:07 | Bottom | 2 | 27.5 | 7.9 | 26.5 | 4.6 | | 5.5 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)3(N) | 8:22 | Surface | 1 | 28.4 | 7.5 | 16.9 | 4.9 | 4.8 | 11.1 | 16.2 | 10.0 | 16.3 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)3(N) | 8:22 | Surface | 2 | 28.2 | 7.5 | 17.1 | 4.9 | | 11.2 | | 10.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)3(N) | 8:22 | Middle | 1 | 28.3 | 7.6 | 18.7 | 4.7 | | 17.0 | | 17.0 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)3(N) | 8:22 | Middle | 2 | 28.1 | 7.6 | 18.8 | 4.8 | | 16.8 | | 16.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)3(N) | 8:22 | Bottom | 1 | 28.3 | 7.6 | 18.9 | 4.7 | 4.7 | 19.8 | | 22.7 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | CS(Mf)3(N) | 8:22 | Bottom | 2 | 28.0 | 7.6 | 19.0 | 4.7 | | 21.0 | | 21.1 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)16 | 7:33 | Surface | 1 | 28.1 | 7.7 | 20.8 | 4.9 | 4.8 | 2.6 | 3.6 | 2.3 | 2.3 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)16 | 7:33 | Surface | 2 | 28.0 | 7.8 | 20.8 | 4.8 | | 2.2 | | 2.2 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)16 | 7:33 | Middle | 1 | 28.1 | 7.7 | 21.1 | 4.8 | | 3.2 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)16 | 7:33 | Middle | 2 | 28.0 | 7.8 | 21.2 | 4.7 | | 2.8 | | 2.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)16 | 7:33 | Bottom | 1 | 28.1 | 7.8 | 22.2 | 4.7 | 4.7 | 5.8 | | 2.4 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)16 | 7:33 | Bottom | 2 | 27.9 | 7.8 | 22.1 | 4.7 | | 5.1 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4a | 7:44 | Surface | 1 | 28.1 | 7.8 | 20.7 | 4.9 | 4.9 | 6.0 | 6.3 | 10.3 | 11.1 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4a | 7:44 | Surface | 2 | 28.0 | 7.8 | 20.6 | 4.9 | | 5.0 | | 11.6 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4a | 7:44 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4a | 7:44 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4a | 7:44 | Bottom | 1 | 28.1 | 7.8 | 20.8 | 5.1 | 5.2 | 7.6 | | 11.8 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4a | 7:44 | Bottom | 2 | 27.9 | 7.8 | 20.7 | 5.2 | | 6.6 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4 | 7:49 | Surface | 1 | 28.1 | 7.8 | 20.8 | 4.9 | 5.0 | 7.2 | 6.9 | 15.0 | 16.0 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4 | 7:49 | Surface | 2 | 28.0 | 7.8 | 20.7 | 5.0 | | 6.5 | | 14.3 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4 | 7:49 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4 | 7:49 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4 | 7:49 | Bottom | 1 | 28.1 | 7.8 | 20.8 | 5.1 | 5.2 | 7.4 | | 17.2 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | SR4 | 7:49 | Bottom | 2 | 28.0 | 7.8 | 20.7 | 5.2 | | 6.6 | | 17.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS8 | 7:58 | Surface | 1 | 28.1 | 7.8 | 20.8 | 4.8 | 4.8 | 13.8 | 17.4 | 11.5 | 15.4 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS8 | 7:58 | Surface | 2 | 28.0 | 7.8 | 20.7 | 4.8 | | 14.0 | | 11.6 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS8 | 7:58 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS8 | 7:58 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS8 | 7:58 | Bottom | 1 | 28.1 | 7.8 | 21.0 | 4.7 | 4.7 | 20.8 | | 18.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS8 | 7:58 | Bottom | 2 | 28.0 | 7.8 | 21.0 | 4.7 | | 20.9 | | 19.9 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)9 | 8:07 | Surface | 1 | 28.1 | 7.8 | 21.8 | 4.8 | 4.8 | 5.9 | 9.9 | 6.5 | 8.5 |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)9 | 8:07 | Surface | 2 | 28.0 | 7.8 | 21.7 | 4.8 | | 5.2 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)9 | 8:07 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)9 | 8:07 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)9 | 8:07 | Bottom | 1 | 28.1 | 7.8 | 22.6 | 4.8 | 4.8 | 14.9 | | 10.1 | |
| TMCLKL | HY/2012/07 | 2017-09-08 | Mid-Flood | IS(Mf)9 | 8:07 | Bottom | 2 | 27.9 | 7.8 | 22.5 | 4.8 | | 13.4 | | 9.9 | |

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

**Key**

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

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, SR4A, SR4, IS8 AND IS(MF)9 ON 8 SEPTEMBER 2017*

Photo 1 - Mid-Ebb at CS(Mf)5 on 8 September 2017

Photo 2 - Mid-Ebb at CS(Mf)3(N) on 8 September 2017

Photo 3 - Mid-Ebb at IS(Mf)16 on 8 September 2017

Photo 4 - Mid-Ebb at SR4a on 8 September 2017

Photo 5 - Mid-Ebb at SR4 on 8 September 2017

Photo 6 - Mid-Flood at CS(Mf)5 on 8 September 2017

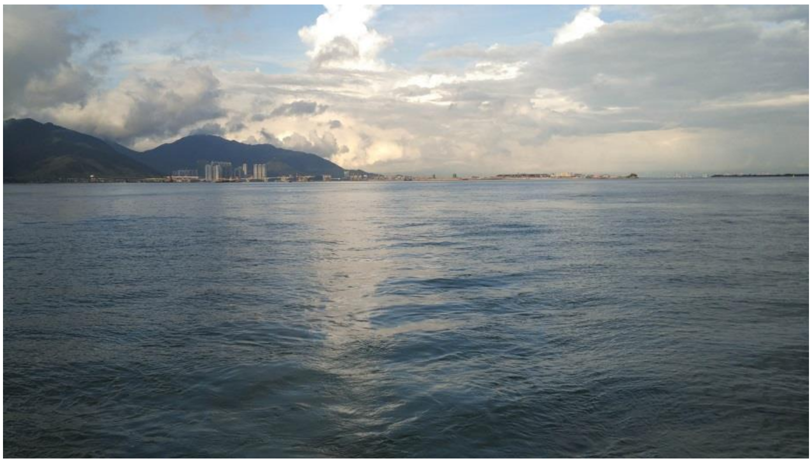


Photo 7 - Mid-Flood at CS(Mf)3(N) on 8 September 2017

Photo 8 - Mid-Flood at IS(Mf)16 on 8 September 2017

Photo 9 - Mid-Flood at SR4a on 8 September 2017

Photo 10 - Mid-Flood at IS8 on 8 September 2017

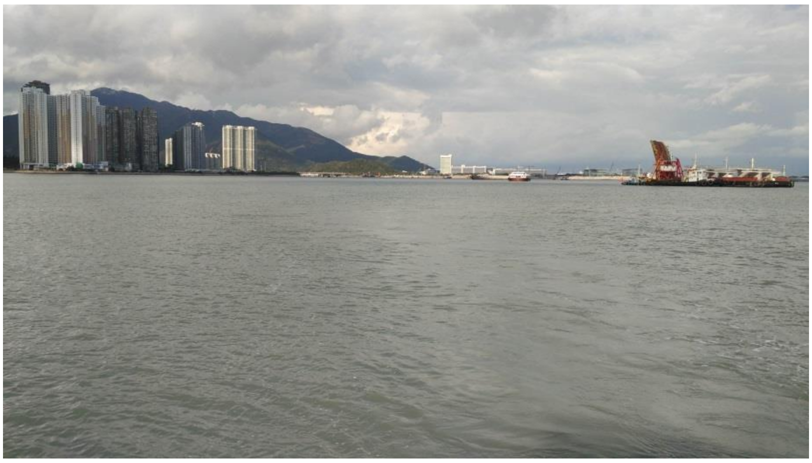
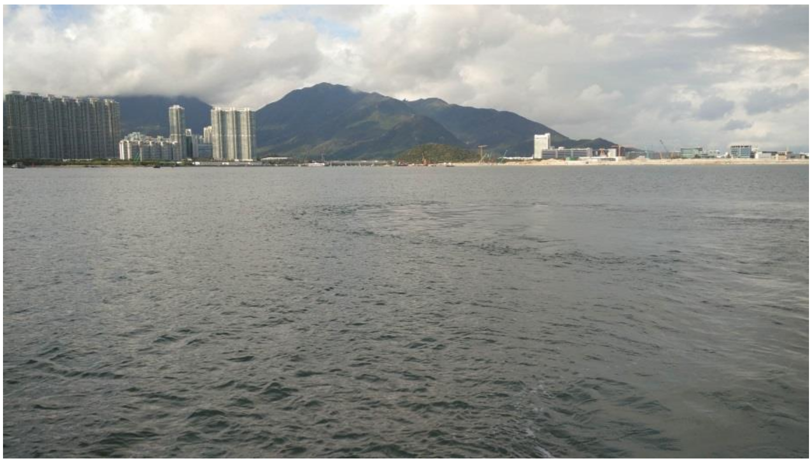


Photo 11 - Mid-Flood at IS(Mf)9 on 8 September 2017



**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 12 September 2017 |

ERM

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_11 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**
**0215660_11 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_11 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**
**0215660_11 September 2017_ Bottom-depth DO_E_Station CS(Mf)3(N)**
**0215660_11 September 2017_ Bottom-depth DO_E_Station IS(Mf)16**
**0215660_11 September 2017_ Surface and Middle-depth DO_E_Station SR4a**
**0215660_11 September 2017_ Bottom-depth DO_E_Station SR4a**
**0215660_11 September 2017_ Surface and Middle-depth DO_E_Station SR4**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**
**0215660_11 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)**
**0215660_11 September 2017_ Bottom-depth DO_F_Station CS(Mf)3(N)**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)16**
**0215660_11 September 2017_Bottom-depth DO_F_Station IS(Mf)16**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station SR4a**
**0215660_11 September 2017_Bottom-depth DO_F_Station SR4a**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station SR4**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station IS8**
**0215660_11 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)9**

A total of nineteen exceedances were recorded on 11 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

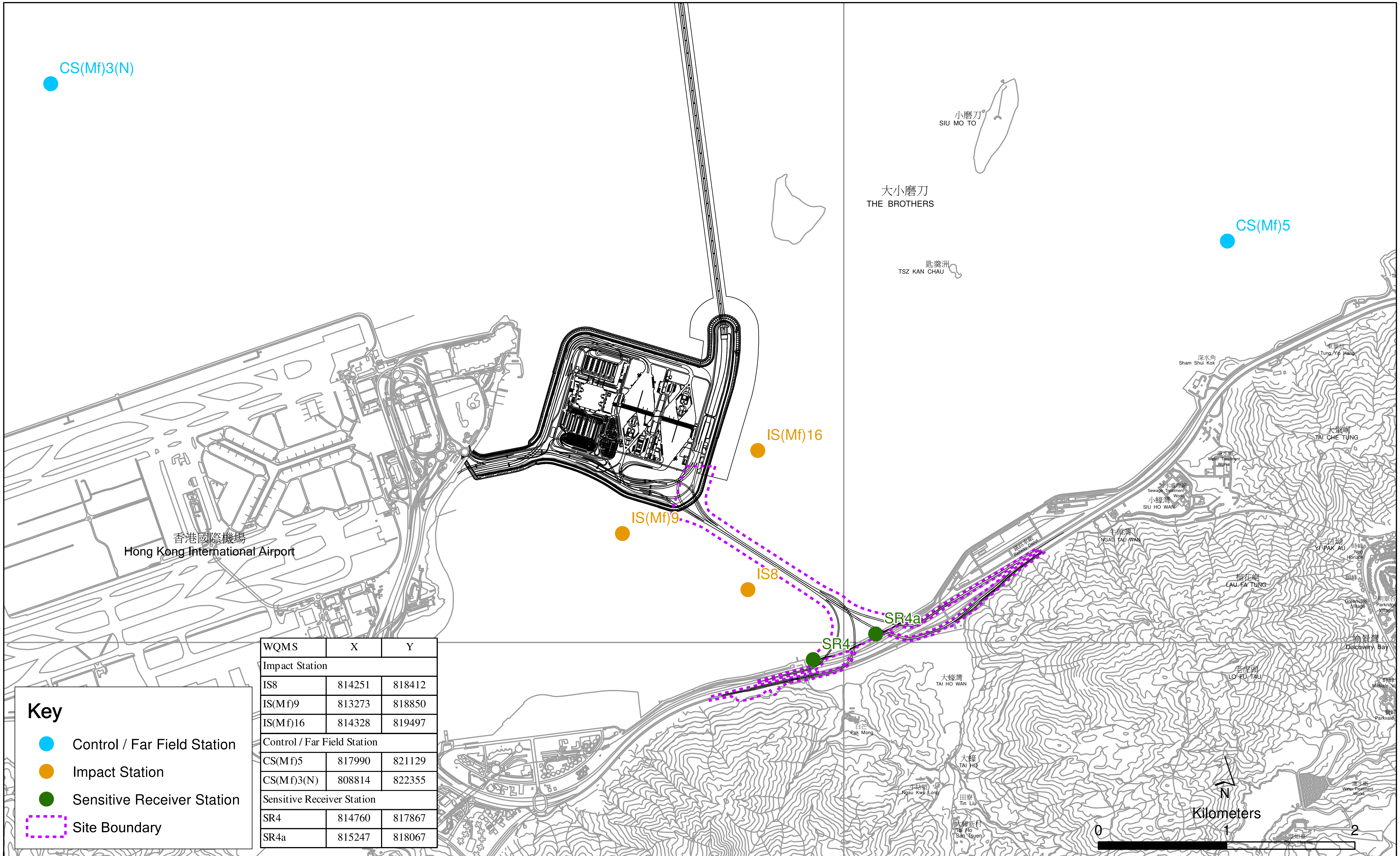
<table>
<tr><td rowspan="1">Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br><br>0215660_11 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5<br>0215660_11 September 2017_ Bottom-depth DO_E_Station CS(Mf)5<br>0215660_11 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)<br>0215660_11 September 2017_ Bottom-depth DO_E_Station CS(Mf)3(N)<br>0215660_11 September 2017_ Bottom-depth DO_E_Station IS(Mf)16<br>0215660_11 September 2017_ Surface and Middle-depth DO_E_Station SR4a<br>0215660_11 September 2017_ Bottom-depth DO_E_Station SR4a<br>0215660_11 September 2017_ Surface and Middle-depth DO_E_Station SR4<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5<br>0215660_11 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)<br>0215660_11 September 2017_ Bottom-depth DO_F_Station CS(Mf)3(N)<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)16<br>0215660_11 September 2017_Bottom-depth DO_F_Station IS(Mf)16<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station SR4a<br>0215660_11 September 2017_Bottom-depth DO_F_Station SR4a<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station SR4<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station IS8<br>0215660_11 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)9<br><br>[Total No. of Exceedances = 19]</td></tr>
<tr><td>Date</td><td colspan="2">11 September 2017 (Measured)<br>12 September 2017 (In situ results received by ERM)<br>19 September 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
</table>

| | |
|---|---|
| **Measured Levels** | <u>Action Level Exceedance</u><br>1. Mid-Ebb at CS(Mf)5 (Surface and Middle-depth DO = 4.6 mg/L);<br>2. Mid-Ebb at CS(Mf)5 (Bottom-depth DO = 3.9 mg/L);<br>3. Mid-Ebb at CS(Mf)3(N) (Surface and Middle-depth DO = 4.6 mg/L);<br>4. Mid-Ebb at CS(Mf)3(N) (Bottom-depth DO = 4.5 mg/L);<br>5. Mid-Ebb at IS(Mf)16 (Bottom-depth DO = 4.3 mg/L);<br>6. Mid-Ebb at SR4a (Surface and Middle-depth DO = 4.8 mg/L);<br>7. Mid-Ebb at SR4a (Bottom-depth DO = 4.4 mg/L);<br>8. Mid-Ebb at SR4 (Surface and Middle-depth DO = 4.9 mg/L);<br>9. Mid-Flood at CS(Mf)5 (Surface and Middle-depth DO = 4.6 mg/L);<br>10. Mid-Flood at CS(Mf)5 (Bottom-depth DO = 4.1 mg/L);<br>11. Mid-Flood at CS(Mf)3(N) (Surface and Middle-depth DO = 4.6 mg/L);<br>12. Mid-Flood at CS(Mf)3(N) (Bottom-depth DO = 4.6 mg/L);<br>13. Mid-Flood at IS(Mf)16 (Surface and Middle-depth DO = 4.7 mg/L);<br>14. Mid-Flood at IS(Mf)16 (Bottom-depth DO = 4.6 mg/L);<br>15. Mid-Flood at SR4a (Surface and Middle-depth DO = 4.7 mg/L);<br>16. Mid-Flood at SR4a (Bottom-depth DO = 4.6 mg/L);<br>17. Mid-Flood at SR4 (Surface and Middle-depth DO = 4.8 mg/L);<br>18. Mid-Flood at IS8 (Surface and Middle-depth DO = 4.8 mg/L);<br>19. Mid-Flood at IS(Mf)9 (Surface and Middle-depth DO = 4.8 mg/L). |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 11 September 2017. |
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 11 September 2017.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• Marginal DO exceedances were observed at IS(Mf)16, SR4a and SR4 during mid-ebb tide. The DO patterns at surface and middle and bottom levels at these stations followed similar DO pattern as the upstream control station, CS(Mf)3(N), in which action level exceedances were observed during mid-ebb tide. Consequently the observed DO exceedances are considered within the natural range and are not considered to be caused by the Project.<br>• DO patterns at IS(Mf)16, IS(Mf)9, IS8, SR4a and SR4 during mid-flood tide followed similar DO pattern as the upstream control station, CS(Mf)5, in which action level exceedances were observed during the same tide. Therefore, the observed DO exceedances are considered within the natural range and are not considered to be caused by the Project. |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. |
| **Remarks** | The monitoring results on 11 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 11 September 2017 is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^oC$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)5 | 16:17 | Surface | 1 | 29.3 | 7.7 | 18.3 | 4.7 | 4.6 | 4.4 | 5.3 | 6.4 | 5.9 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)5 | 16:17 | Surface | 2 | 29.4 | 7.7 | 18.4 | 4.7 | | 4.0 | | 5.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)5 | 16:17 | Middle | 1 | 28.8 | 7.7 | 20.2 | 4.5 | | 5.1 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)5 | 16:17 | Middle | 2 | 29.0 | 7.7 | 20.3 | 4.5 | | 4.8 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)5 | 16:17 | Bottom | 1 | 27.7 | 7.7 | 26.5 | 3.9 | 3.9 | 6.8 | | 6.9 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)5 | 16:17 | Bottom | 2 | 27.9 | 7.7 | 26.6 | 3.9 | | 6.4 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)3(N) | 14:56 | Surface | 1 | 29.7 | 7.4 | 13.6 | 4.6 | 4.6 | 14.1 | 18.5 | 3.8 | 7.6 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)3(N) | 14:56 | Surface | 2 | 29.5 | 7.4 | 13.8 | 4.7 | | 14.4 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)3(N) | 14:56 | Middle | 1 | 28.7 | 7.5 | 19.9 | 4.4 | | 17.5 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)3(N) | 14:56 | Middle | 2 | 28.5 | 7.6 | 20.1 | 4.5 | | 14.1 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)3(N) | 14:56 | Bottom | 1 | 28.7 | 7.6 | 21.1 | 4.4 | 4.5 | 25.8 | | 14.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | CS(Mf)3(N) | 14:56 | Bottom | 2 | 28.4 | 7.6 | 21.2 | 4.5 | | 25.3 | | 15.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)16 | 15:51 | Surface | 1 | 29.0 | 7.7 | 20.1 | 5.1 | 5.2 | 5.6 | 7.7 | 6.8 | 6.2 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)16 | 15:51 | Surface | 2 | 29.2 | 7.7 | 20.2 | 5.2 | | 4.9 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)16 | 15:51 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)16 | 15:51 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)16 | 15:51 | Bottom | 1 | 28.1 | 7.7 | 23.4 | 4.3 | 4.3 | 10.8 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)16 | 15:51 | Bottom | 2 | 28.3 | 7.7 | 23.5 | 4.3 | | 9.6 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4a | 15:37 | Surface | 1 | 29.0 | 7.6 | 18.9 | 4.7 | 4.8 | 8.0 | 10.1 | 12.2 | 11.8 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4a | 15:37 | Surface | 2 | 29.2 | 7.6 | 19.0 | 4.8 | | 7.5 | | 12.5 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4a | 15:37 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4a | 15:37 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4a | 15:37 | Bottom | 1 | 28.6 | 7.6 | 19.9 | 4.4 | 4.4 | 12.4 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4a | 15:37 | Bottom | 2 | 28.8 | 7.6 | 20.0 | 4.4 | | 12.3 | | 11.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4 | 15:33 | Surface | 1 | 28.9 | 7.6 | 19.0 | 4.9 | 4.9 | 7.5 | 8.7 | 8.2 | 9.7 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4 | 15:33 | Surface | 2 | 29.1 | 7.6 | 19.1 | 4.9 | | 7.3 | | 9.7 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4 | 15:33 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4 | 15:33 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4 | 15:33 | Bottom | 1 | 28.9 | 7.6 | 19.8 | 4.8 | 4.8 | 10.2 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | SR4 | 15:33 | Bottom | 2 | 29.0 | 7.6 | 19.9 | 4.8 | | 9.8 | | 10.2 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS8 | 15:25 | Surface | 1 | 29.3 | 7.7 | 18.9 | 5.2 | 5.2 | 6.7 | 7.7 | 7.2 | 6.3 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS8 | 15:25 | Surface | 2 | 29.5 | 7.7 | 18.9 | 5.2 | | 6.3 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS8 | 15:25 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS8 | 15:25 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS8 | 15:25 | Bottom | 1 | 28.7 | 7.7 | 20.0 | 5.0 | 5.0 | 9.0 | | 5.7 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS8 | 15:25 | Bottom | 2 | 28.9 | 7.7 | 20.1 | 5.0 | | 8.6 | | 6.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)9 | 15:16 | Surface | 1 | 29.0 | 7.7 | 19.1 | 5.3 | 5.3 | 5.3 | 5.0 | 5.1 | 5.3 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)9 | 15:16 | Surface | 2 | 29.2 | 7.7 | 19.2 | 5.3 | | 4.9 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)9 | 15:16 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)9 | 15:16 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)9 | 15:16 | Bottom | 1 | 29.0 | 7.7 | 19.4 | 5.3 | 5.3 | 5.0 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Ebb | IS(Mf)9 | 15:16 | Bottom | 2 | 29.2 | 7.7 | 19.4 | 5.3 | | 4.6 | | 6.0 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^oC$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)5 | 09:37 | Surface | 1 | 28.7 | 7.7 | 18.6 | 4.8 | 4.6 | 2.7 | 6.7 | 3.1 | 3.5 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)5 | 09:37 | Surface | 2 | 28.9 | 7.7 | 18.7 | 4.8 | | 2.7 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)5 | 09:37 | Middle | 1 | 28.3 | 7.7 | 21.1 | 4.4 | | 3.6 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)5 | 09:37 | Middle | 2 | 28.5 | 7.7 | 21.2 | 4.4 | | 3.5 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)5 | 09:37 | Bottom | 1 | 27.9 | 7.7 | 24.6 | 4.1 | 4.1 | 14.2 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)5 | 09:37 | Bottom | 2 | 28.1 | 7.7 | 24.7 | 4.1 | | 13.3 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)3(N) | 11:04 | Surface | 1 | 29.4 | 7.4 | 13.9 | 4.6 | 4.6 | 9.6 | 11.8 | 9.0 | 14.8 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)3(N) | 11:04 | Surface | 2 | 29.1 | 7.5 | 14.0 | 4.7 | | 9.5 | | 9.1 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)3(N) | 11:04 | Middle | 1 | 29.0 | 7.6 | 16.8 | 4.5 | | 10.1 | | 14.9 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)3(N) | 11:04 | Middle | 2 | 28.8 | 7.6 | 16.8 | 4.6 | | 10.5 | | 14.5 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)3(N) | 11:04 | Bottom | 1 | 28.9 | 7.5 | 18.0 | 4.5 | 4.6 | 15.4 | | 19.7 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | CS(Mf)3(N) | 11:04 | Bottom | 2 | 28.7 | 7.6 | 18.0 | 4.6 | | 15.7 | | 21.6 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)16 | 10:08 | Surface | 1 | 28.8 | 7.6 | 18.4 | 4.7 | 4.7 | 3.3 | 7.2 | 2.3 | 4.9 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)16 | 10:08 | Surface | 2 | 28.9 | 7.6 | 18.4 | 4.7 | | 3.1 | | 2.4 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)16 | 10:08 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)16 | 10:08 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)16 | 10:08 | Bottom | 1 | 28.5 | 7.6 | 19.6 | 4.6 | 4.6 | 11.4 | | 7.3 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)16 | 10:08 | Bottom | 2 | 28.7 | 7.6 | 19.6 | 4.6 | | 10.8 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4a | 10:17 | Surface | 1 | 28.7 | 7.6 | 18.5 | 4.7 | 4.7 | 13.0 | 13.5 | 14.5 | 14.9 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4a | 10:17 | Surface | 2 | 28.9 | 7.6 | 18.5 | 4.7 | | 13.4 | | 15.2 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4a | 10:17 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4a | 10:17 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4a | 10:17 | Bottom | 1 | 28.6 | 7.6 | 18.9 | 4.6 | 4.6 | 14.2 | | 14.7 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4a | 10:17 | Bottom | 2 | 28.8 | 7.6 | 18.9 | 4.6 | | 13.3 | | 15.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4 | 10:23 | Surface | 1 | 28.8 | 7.6 | 18.0 | 4.8 | 4.8 | 7.3 | 8.3 | 15.6 | 14.6 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4 | 10:23 | Surface | 2 | 29.0 | 7.6 | 18.1 | 4.8 | | 7.9 | | 13.9 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4 | 10:23 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4 | 10:23 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4 | 10:23 | Bottom | 1 | 28.8 | 7.6 | 18.0 | 4.8 | 4.8 | 9.9 | | 14.6 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | SR4 | 10:23 | Bottom | 2 | 29.0 | 7.6 | 18.1 | 4.8 | | 8.1 | | 14.2 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS8 | 10:35 | Surface | 1 | 29.0 | 7.6 | 18.1 | 4.8 | 4.8 | 4.7 | 4.9 | 6.6 | 8.2 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS8 | 10:35 | Surface | 2 | 29.2 | 7.6 | 18.2 | 4.8 | | 4.5 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS8 | 10:35 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS8 | 10:35 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS8 | 10:35 | Bottom | 1 | 28.8 | 7.6 | 18.2 | 4.8 | 4.8 | 5.2 | | 9.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS8 | 10:35 | Bottom | 2 | 29.0 | 7.6 | 18.3 | 4.8 | | 5.0 | | 9.0 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)9 | 10:47 | Surface | 1 | 28.7 | 7.6 | 19.3 | 4.8 | 4.8 | 9.4 | 10.5 | 9.1 | 9.2 |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)9 | 10:47 | Surface | 2 | 28.9 | 7.6 | 19.4 | 4.8 | | 9.2 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)9 | 10:47 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)9 | 10:47 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)9 | 10:47 | Bottom | 1 | 28.6 | 7.7 | 20.0 | 4.7 | 4.7 | 12.1 | | 8.8 | |
| TMCLKL | HY/2012/07 | 2017-09-11 | Mid-Flood | IS(Mf)9 | 10:47 | Bottom | 2 | 28.8 | 7.7 | 20.1 | 4.7 | | 11.3 | | 9.4 | |

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




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

**Key**

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

Locations of Water Quality Monitoring Stations

Environmental Resources Management

ERM

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, SR4, SR4A AND IS8 ON 11 SEPTEMBER 2017*

Photo 1 - Mid-Ebb at CS(Mf)5 on 11 September 2017

Photo 2 - Mid-Ebb at CS(Mf)3(N) on 11 September 2017

Photo 3 - Mid-Ebb at IS(Mf)16 on 11 September 2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, SR4, SR4A AND IS8 ON 11 SEPTEMBER 2017*

Photo 4 - Mid-Ebb at SR4a on 11 September 2017

Photo 5 - Mid-Ebb at SR4 on 11 September 2017

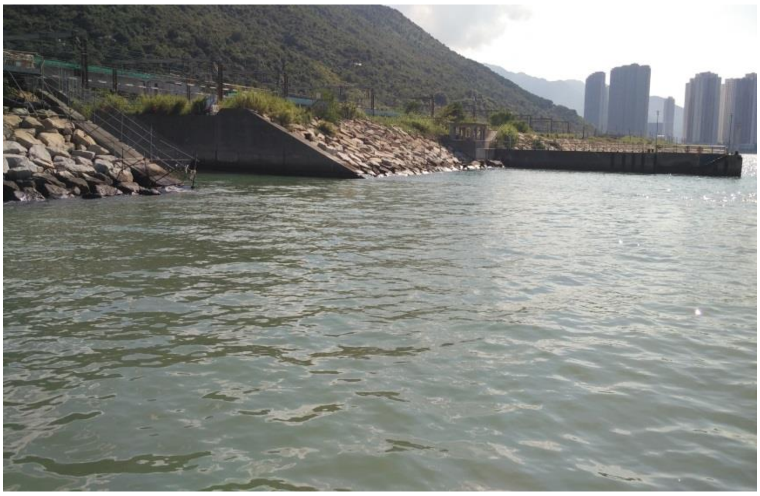


Photo 6 - Mid-Flood at CS(Mf)5 on 11 September 2017

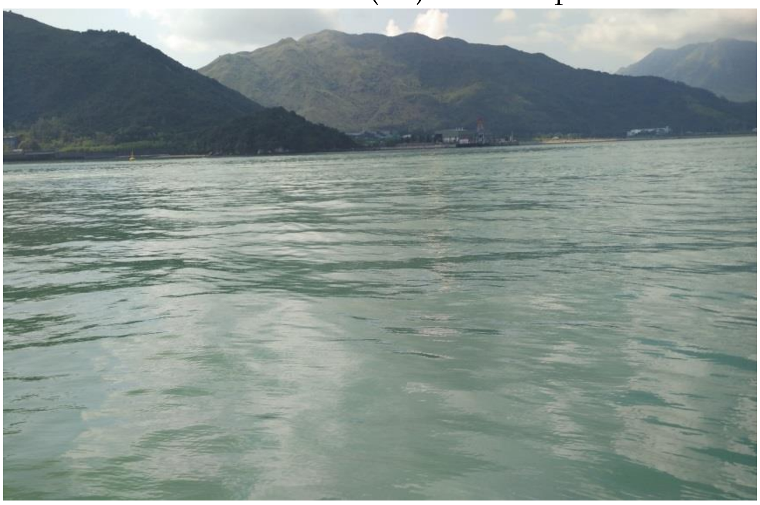


Photo 7 - Mid-Flood at CS(Mf)3(N) on 11 September 2017

Photo 8 - Mid-Flood at IS(Mf)16 on 11 September 2017

Photo 9 - Mid-Flood at SR4 on 11 September 2017

Photo 10 - Mid-Flood at IS8 on 11 September 2017

Photo 11 - Mid-Flood at IS(Mf)9 on 11 September 2017

**Email message**

**Environmental Resources Management**

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

ERM

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 14 September 2017 |

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Dear Sir/ Madam,

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

**<u>Action Level Exceedance</u>**
**0215660_13 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_13 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**
**0215660_13 September 2017_ Bottom-depth DO_E_Station IS(Mf)16**
**0215660_13 September 2017_ Bottom-depth DO_E_Station SR4a**
**0215660_13 September 2017_ Bottom-depth DO_E_Station SR4**
**0215660_13 September 2017_ Bottom-depth DO_E_Station IS8**
**0215660_13 September 2017_ Surface and Middle DO-depth_F_Station CS(Mf)5**
**0215660_13 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**
**0215660_13 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)**
**0215660_13 September 2017_ Bottom-depth DO_F_Station IS(Mf)16**
**0215660_13 September 2017_ Surface and Middle-depth DO_F_Station SR4a**
**0215660_13 September 2017_ Bottom-depth DO_F_Station SR4a**
**0215660_13 September 2017_ Bottom-depth DO_F_Station IS(Mf)9**

A total of thirteen exceedances were recorded on 13 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

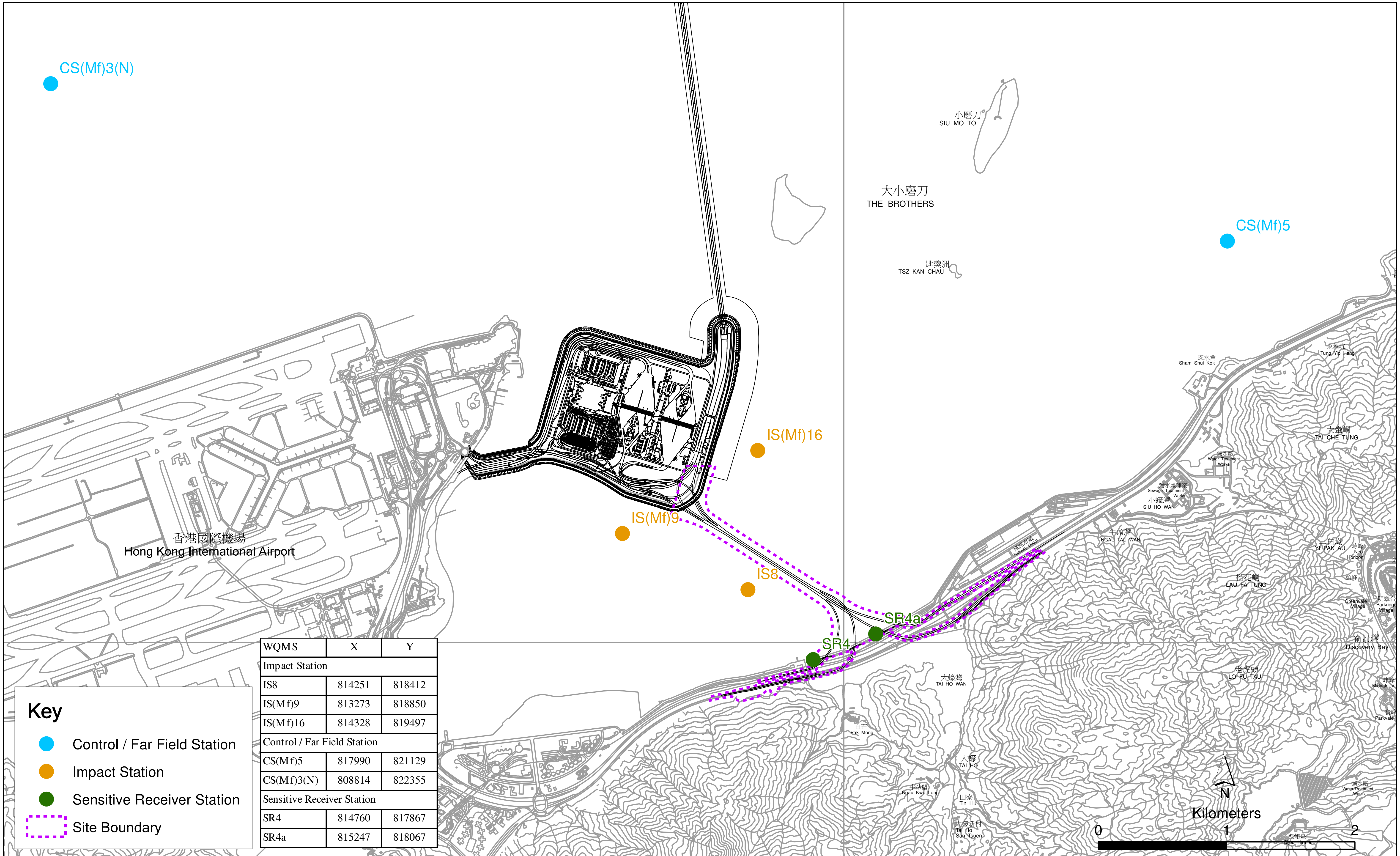
<table>
<tr><td rowspan="1">Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br><br>0215660_13 September 2017_ Bottom-depth DO_E_Station CS(Mf)5<br>0215660_13 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)<br>0215660_13 September 2017_ Bottom-depth DO_E_Station IS(Mf)16<br>0215660_13 September 2017_ Bottom-depth DO_E_Station SR4a<br>0215660_13 September 2017_ Bottom-depth DO_E_Station SR4<br>0215660_13 September 2017_ Bottom-depth DO_E_Station IS8<br>0215660_13 September 2017_ Surface and Middle DO-depth_F_Station CS(Mf)5<br>0215660_13 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br>0215660_13 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)<br>0215660_13 September 2017_ Bottom-depth DO_F_Station IS(Mf)16<br>0215660_13 September 2017_ Surface and Middle-depth DO_F_Station SR4a<br>0215660_13 September 2017_ Bottom-depth DO_F_Station SR4a<br>0215660_13 September 2017_ Bottom-depth DO_F_Station IS(Mf)9<br><br>[Total No. of Exceedances = 13]</td></tr>
<tr><td>Date</td><td colspan="2">13 September 2017 (Measured)<br>14 September 2017 (In situ results received by ERM)<br>19 September 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-Ebb at CS(Mf)5 (Bottom-depth DO = 4.1 mg/L);<br>2. Mid-Ebb at CS(Mf)3(N) (Surface and Middle-depth DO = 4.9 mg/L);<br>3. Mid-Ebb at IS(Mf)16 (Bottom-depth DO = 4.2 mg/L);<br>4. Mid-Ebb at SR4a (Bottom-depth DO = 4.6 mg/L);<br>5. Mid-Ebb at SR4 (Bottom-depth DO = 4.6 mg/L);<br>6. Mid-Ebb at IS8 (Bottom-depth DO = 4.2 mg/L);<br>7. Mid-Flood at CS(Mf)5 (Surface and Middle-depth DO = 4.6 mg/L);<br>8. Mid-Flood at CS(Mf)5 (Bottom-depth DO = 3.7 mg/L);<br>9. Mid-Flood at CS(Mf)3(N) (Surface and Middle-depth DO = 4.9 mg/L);<br>10. Mid-Flood at IS(Mf)16 (Bottom-depth DO = 4.2 mg/L);<br>11. Mid-Flood at SR4a (Surface and Middle-depth DO = 4.9 mg/L);<br>12. Mid-Flood at SR4a (Bottom-depth DO = 4.3 mg/L);<br>13. Mid-Flood at IS(Mf)9 (Bottom-depth DO = 4.6 mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 13 September 2017.</td></tr>
</table>

<table>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td>The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 13 September 2017.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• DO levels were generally lower at water quality monitoring stations due to two possible reasons of natural variation:<br>1. Natural ability for water to hold dissolved oxygen is reduced due to higher water temperature in summer months.<br>2. The higher Salinity recorded at the bottom level of the deeper CS(Mf)5 and IS(Mf)16 monitoring stations was possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level as the DO exceedances recorded at the bottom level showed higher levels of Salinity than the middle and surface levels.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td>No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td>The monitoring results on 13 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 13 September 2017 is attached.</td></tr>
</table>

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)5 | 19:05 | Surface | 1 | 29.3 | 7.9 | 20.9 | 5.6 | 5.2 | 1.5 | 1.8 | 4.1 | 3.8 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)5 | 19:05 | Surface | 2 | 29.4 | 7.9 | 21.1 | 5.7 | | 1.6 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)5 | 19:05 | Middle | 1 | 28.3 | 7.9 | 26.3 | 4.7 | | 1.2 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)5 | 19:05 | Middle | 2 | 28.5 | 7.9 | 26.5 | 4.7 | | 1.2 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)5 | 19:05 | Bottom | 1 | 27.7 | 7.9 | 28.9 | 4.1 | 4.1 | 2.5 | | 4.1 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)5 | 19:05 | Bottom | 2 | 27.9 | 7.9 | 29.3 | 4.0 | | 2.7 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)3(N) | 17:10 | Surface | 1 | 29.3 | 7.8 | 18.4 | 4.8 | 4.9 | 2.0 | 2.5 | 6.1 | 6.4 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)3(N) | 17:10 | Surface | 2 | 29.1 | 7.8 | 18.6 | 4.9 | | 1.9 | | 6.3 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)3(N) | 17:10 | Middle | 1 | 29.4 | 7.9 | 21.0 | 4.9 | | 2.6 | | 6.5 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)3(N) | 17:10 | Middle | 2 | 29.2 | 7.9 | 21.1 | 5.0 | | 2.5 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)3(N) | 17:10 | Bottom | 1 | 29.2 | 7.9 | 21.9 | 4.7 | 4.8 | 3.1 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | CS(Mf)3(N) | 17:10 | Bottom | 2 | 28.9 | 7.9 | 22.0 | 4.9 | | 3.1 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)16 | 18:33 | Surface | 1 | 29.6 | 7.9 | 19.8 | 6.2 | 5.3 | 3.5 | 4.7 | 7.5 | 8.0 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)16 | 18:33 | Surface | 2 | 29.8 | 8.0 | 20.0 | 6.3 | | 3.5 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)16 | 18:33 | Middle | 1 | 28.3 | 7.9 | 25.4 | 4.4 | | 5.7 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)16 | 18:33 | Middle | 2 | 28.5 | 7.9 | 25.7 | 4.4 | | 5.8 | | 7.0 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)16 | 18:33 | Bottom | 1 | 28.0 | 7.9 | 26.6 | 4.2 | 4.2 | 5.0 | | 9.6 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)16 | 18:33 | Bottom | 2 | 28.2 | 7.9 | 26.8 | 4.1 | | 4.9 | | 9.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4a | 18:21 | Surface | 1 | 29.3 | 7.9 | 20.1 | 5.6 | 5.6 | 3.7 | 8.0 | 6.8 | 7.4 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4a | 18:21 | Surface | 2 | 29.4 | 7.9 | 20.3 | 5.6 | | 3.7 | | 5.0 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4a | 18:21 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4a | 18:21 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4a | 18:21 | Bottom | 1 | 28.9 | 7.8 | 21.3 | 4.6 | 4.6 | 12.0 | | 9.5 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4a | 18:21 | Bottom | 2 | 29.1 | 7.8 | 21.5 | 4.5 | | 12.4 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4 | 18:16 | Surface | 1 | 29.4 | 7.9 | 19.9 | 5.8 | 5.8 | 3.6 | 7.1 | 5.3 | 5.0 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4 | 18:16 | Surface | 2 | 29.5 | 7.9 | 20.1 | 5.8 | | 3.8 | | 4.1 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4 | 18:16 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4 | 18:16 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4 | 18:16 | Bottom | 1 | 29.0 | 7.8 | 21.1 | 4.6 | 4.6 | 10.0 | | 5.3 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | SR4 | 18:16 | Bottom | 2 | 29.2 | 7.8 | 21.3 | 4.5 | | 10.8 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS8 | 18:09 | Surface | 1 | 29.8 | 7.9 | 19.5 | 6.2 | 6.3 | 3.7 | 8.0 | 6.2 | 9.1 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS8 | 18:09 | Surface | 2 | 29.9 | 8.0 | 19.7 | 6.3 | | 4.1 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS8 | 18:09 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS8 | 18:09 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS8 | 18:09 | Bottom | 1 | 28.8 | 7.8 | 22.0 | 4.2 | 4.2 | 11.8 | | 11.7 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS8 | 18:09 | Bottom | 2 | 29.0 | 7.8 | 22.7 | 4.1 | | 12.2 | | 11.0 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)9 | 18:01 | Surface | 1 | 30.1 | 7.9 | 19.1 | 6.8 | 6.8 | 2.9 | 3.8 | 3.8 | 5.3 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)9 | 18:01 | Surface | 2 | 30.3 | 8.0 | 19.3 | 6.8 | | 3.1 | | 2.8 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)9 | 18:01 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)9 | 18:01 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)9 | 18:01 | Bottom | 1 | 29.6 | 7.9 | 19.4 | 6.2 | 6.2 | 4.4 | | 7.7 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Ebb | IS(Mf)9 | 18:01 | Bottom | 2 | 29.7 | 7.9 | 19.6 | 6.2 | | 4.8 | | 6.9 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^oC$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)5 | 12:12 | Surface | 1 | 29.1 | 7.8 | 20.0 | 5.3 | 4.6 | 1.5 | 2.9 | 2.9 | 3.5 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)5 | 12:12 | Surface | 2 | 29.3 | 7.9 | 20.2 | 5.3 | | 1.3 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)5 | 12:12 | Middle | 1 | 28.2 | 7.8 | 25.1 | 4.0 | | 2.5 | | 2.8 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)5 | 12:12 | Middle | 2 | 28.3 | 7.9 | 25.4 | 3.9 | | 2.4 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)5 | 12:12 | Bottom | 1 | 27.7 | 7.9 | 28.3 | 3.7 | 3.7 | 4.9 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)5 | 12:12 | Bottom | 2 | 27.9 | 7.9 | 28.6 | 3.7 | | 4.9 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)3(N) | 13:16 | Surface | 1 | 29.4 | 7.7 | 14.6 | 4.9 | 4.9 | 1.4 | 4.5 | 2.8 | 4.1 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)3(N) | 13:16 | Surface | 2 | 29.7 | 7.7 | 14.5 | 4.8 | | 1.5 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)3(N) | 13:16 | Middle | 1 | 28.9 | 7.8 | 18.8 | 4.9 | | 5.4 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)3(N) | 13:16 | Middle | 2 | 29.1 | 7.8 | 18.7 | 4.9 | | 5.4 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)3(N) | 13:16 | Bottom | 1 | 28.8 | 7.8 | 20.4 | 5.0 | 5.0 | 6.5 | | 5.5 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | CS(Mf)3(N) | 13:16 | Bottom | 2 | 29.0 | 7.8 | 20.4 | 4.9 | | 6.6 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)16 | 12:41 | Surface | 1 | 29.2 | 7.8 | 19.5 | 5.4 | 5.4 | 3.4 | 7.0 | 5.2 | 7.3 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)16 | 12:41 | Surface | 2 | 29.4 | 7.9 | 19.7 | 5.4 | | 3.2 | | 5.5 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)16 | 12:41 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)16 | 12:41 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)16 | 12:41 | Bottom | 1 | 28.6 | 7.8 | 22.2 | 4.2 | 4.2 | 10.5 | | 9.4 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)16 | 12:41 | Bottom | 2 | 28.8 | 7.8 | 22.4 | 4.1 | | 10.9 | | 9.1 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4a | 12:53 | Surface | 1 | 29.0 | 7.8 | 20.2 | 4.9 | 4.9 | 3.4 | 6.7 | 4.1 | 5.4 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4a | 12:53 | Surface | 2 | 29.2 | 7.9 | 20.3 | 4.9 | | 3.5 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4a | 12:53 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4a | 12:53 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4a | 12:53 | Bottom | 1 | 28.7 | 7.8 | 21.8 | 4.3 | 4.3 | 9.8 | | 6.0 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4a | 12:53 | Bottom | 2 | 28.9 | 7.8 | 22.0 | 4.2 | | 9.9 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4 | 12:59 | Surface | 1 | 29.3 | 7.8 | 19.6 | 5.3 | 5.3 | 2.8 | 3.5 | 7.7 | 9.8 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4 | 12:59 | Surface | 2 | 29.4 | 7.9 | 19.8 | 5.3 | | 2.7 | | 8.6 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4 | 12:59 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4 | 12:59 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4 | 12:59 | Bottom | 1 | 29.0 | 7.8 | 20.3 | 4.9 | 4.9 | 4.2 | | 11.6 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | SR4 | 12:59 | Bottom | 2 | 29.1 | 7.8 | 20.6 | 4.9 | | 4.4 | | 11.4 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS8 | 13:14 | Surface | 1 | 29.3 | 7.8 | 19.7 | 5.3 | 5.3 | 4.0 | 4.7 | 3.2 | 5.5 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS8 | 13:14 | Surface | 2 | 29.4 | 7.9 | 19.9 | 5.3 | | 4.0 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS8 | 13:14 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS8 | 13:14 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS8 | 13:14 | Bottom | 1 | 28.9 | 7.8 | 20.8 | 4.7 | 4.7 | 5.4 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS8 | 13:14 | Bottom | 2 | 29.1 | 7.9 | 21.0 | 4.7 | | 5.4 | | 7.0 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)9 | 13:23 | Surface | 1 | 29.6 | 7.8 | 19.1 | 5.6 | 5.7 | 3.3 | 5.1 | 3.5 | 6.5 |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)9 | 13:23 | Surface | 2 | 29.8 | 7.9 | 19.3 | 5.7 | | 3.1 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)9 | 13:23 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)9 | 13:23 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)9 | 13:23 | Bottom | 1 | 28.9 | 7.8 | 21.2 | 4.6 | 4.6 | 6.9 | | 10.1 | |
| TMCLKL | HY/2012/07 | 2017-09-13 | Mid-Flood | IS(Mf)9 | 13:23 | Bottom | 2 | 29.1 | 7.8 | 21.4 | 4.6 | | 7.1 | | 8.7 | |

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




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management
ERM

***CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, IS(MF)9, SR4, SR4A AND IS8 ON 13 SEPTEMBER 2017***

Photo 1 - Mid-Ebb at CS(Mf)5 on 13 September 2017

Photo 2 - Mid-Ebb at CS(Mf)3(N) on 13 September 2017

Photo 3 - Mid-Ebb at IS(Mf)16 on 13 September 2017

Photo 4 - Mid-Ebb at SR4a on 13 September 2017

Photo 5 - Mid-Ebb at SR4 on 13 September 2017

Photo 6 - Mid-Ebb at IS8 on 13 September 2017

Photo 7 - Mid-Flood at CS(Mf)5 on 13 September 2017

Photo 8 - Mid-Flood at CS(Mf)3(N) on 13 September 2017

Photo 9 - Mid-Flood at IS(Mf)16 on 13 September 2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, IS(MF)9, SR4, SR4A AND IS8 ON 13 SEPTEMBER 2017*

Photo 10 - Mid-Flood at SR4a on 13 September 2017

Photo 11 - Mid-Flood at IS(Mf)9 on 13 September 2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 18 September 2017 |

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_15 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**
**0215660_15 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_15 September 2017_ Bottom-depth DO_E_Station CS(Mf)3(N)**
**0215660_15 September 2017_ Bottom-depth DO_E_Station SR4a**
**0215660_15 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**

**Limit Level Exceedance**
**0215660_15 September 2017_ Depth-averaged turbidity_F_Station IS8**

A total of six exceedances were recorded on 15 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

| | | |
|---|---|---|
| **Log No.** | **Action Level Exceedance**<br>**0215660_15 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**<br>**0215660_15 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**<br>**0215660_15 September 2017_ Bottom-depth DO_E_Station CS(Mf)3(N)**<br>**0215660_15 September 2017_ Bottom-depth DO_E_Station SR4a**<br>**0215660_15 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**<br><br>**Limit Level Exceedance**<br>**0215660_15 September 2017_ Depth-averaged turbidity_F_Station IS8**<br><br>**[Total No. of Exceedances = 6]** | |
| **Date** | 15 September 2017 (Measured)<br>16 September 2017 (*In situ* results received by ERM)<br>25 September 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO), Depth-averaged Turbidity | |
| **Action Levels for DO** | Surface and Middle-depth DO | 5.0 mg/L |
| | Bottom-depth DO | 4.7 mg/L |
| **Limit Levels for DO** | Surface and Middle-depth DO | 4.2 mg/L |
| | Bottom-depth DO | 3.6 mg/L |
| **Action Levels for Turbidity** | 120% of upstream control station at the same tide of the same day and 95%-ile of baseline data i.e. 27.5 NTU | |
| **Limit Levels for Turbidity** | 130% of upstream control station at the same tide of the same day and 99%-ile of baseline data i.e. 47.0 NTU | |
| **Measured Levels** | Action Level Exceedance<br>1. Mid-ebb at CS(Mf)5 (Surface and Middle-depth DO = 4.9mg/L);<br>2. Mid-ebb at CS(Mf)5 (Bottom -depth DO = 3.8mg/L);<br>3. Mid-ebb at CS(Mf)3(N) (Bottom-depth DO = 4.6mg/L);<br>4. Mid-ebb at SR4a (Bottom-depth DO = 4.6mg/L);<br>5. Mid-flood at CS(Mf)5 (Bottom-depth DO = 3.7mg/L);<br>Limit Level Exceedance<br>6. Mid-flood at IS8 (Depth-averaged turbidity = 77.8mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 15 September 2017. | |

| | |
|---|---|
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 15 September 2017.<br>• CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• Marginal exceedance at bottom level at SR4a during mid-ebb tide had a similar DO pattern with the upstream control station, CS(Mf)3(N), in which action level exceedance was observed at the bottom level at the same tide.<br>• DO levels were generally lower at water quality monitoring stations due to two possible reasons of natural variation:<br>1. Natural ability for water to hold dissolved oxygen is reduced due to higher water temperature in summer months.<br>2. The higher Salinity recorded at the bottom level of the deeper CS(Mf)5 and CS(Mf)3(N) monitoring stations was possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level as the DO exceedances recorded at the bottom level showed higher levels of Salinity than the middle and surface levels.<br>• Levels of depth-averaged Turbidity at all monitoring stations, except Mid-flood at IS8, were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• Levels of depth-averaged Suspended Solids at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• No construction vessels under this Contract associated with muddy plumes or discharges of muddy waters from platforms. |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. |
| **Remarks** | The monitoring results on 15 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 15 September 2017 is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)5 | 7:55 | Surface | 1 | 28.6 | 7.9 | 21.0 | 5.2 | 4.9 | 3.2 | 4.2 | 2.6 | 2.4 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)5 | 7:55 | Surface | 2 | 28.4 | 7.9 | 20.7 | 5.2 | | 3.2 | | 2.2 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)5 | 7:55 | Middle | 1 | 28.6 | 8.0 | 23.8 | 4.6 | | 3.4 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)5 | 7:55 | Middle | 2 | 28.4 | 7.9 | 23.5 | 4.6 | | 3.4 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)5 | 7:55 | Bottom | 1 | 27.8 | 8.0 | 29.4 | 3.7 | 3.8 | 6.2 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)5 | 7:55 | Bottom | 2 | 27.7 | 7.9 | 28.9 | 3.8 | | 5.5 | | 2.1 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)3(N) | 9:37 | Surface | 1 | 28.9 | 7.9 | 17.3 | 5.2 | 5.0 | 15.3 | 16.9 | 3.7 | 4.0 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)3(N) | 9:37 | Surface | 2 | 28.6 | 7.7 | 17.4 | 5.3 | | 14.4 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)3(N) | 9:37 | Middle | 1 | 28.7 | 8.0 | 21.8 | 4.6 | | 17.7 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)3(N) | 9:37 | Middle | 2 | 28.5 | 7.9 | 21.8 | 4.7 | | 16.8 | | 4 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)3(N) | 9:37 | Bottom | 1 | 28.7 | 8.0 | 22.6 | 4.5 | 4.6 | 19.0 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | CS(Mf)3(N) | 9:37 | Bottom | 2 | 28.4 | 7.8 | 22.6 | 4.6 | | 18.1 | | 3.1 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)16 | 8:28 | Surface | 1 | 28.7 | 8.1 | 21.7 | 6.2 | 6.2 | 4.8 | 5.1 | 2.3 | 3.1 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)16 | 8:28 | Surface | 2 | 28.6 | 8.0 | 21.5 | 6.2 | | 4.9 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)16 | 8:28 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)16 | 8:28 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)16 | 8:28 | Bottom | 1 | 28.7 | 8.0 | 23.2 | 4.9 | 5.0 | 5.4 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)16 | 8:28 | Bottom | 2 | 28.6 | 7.9 | 22.9 | 5.0 | | 5.4 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4a | 8:40 | Surface | 1 | 28.8 | 8.0 | 22.0 | 5.5 | 5.5 | 7.8 | 10.1 | 4.2 | 5.0 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4a | 8:40 | Surface | 2 | 28.6 | 7.9 | 21.7 | 5.4 | | 7.3 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4a | 8:40 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4a | 8:40 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4a | 8:40 | Bottom | 1 | 28.6 | 7.9 | 23.2 | 4.5 | 4.6 | 12.5 | | 6.3 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4a | 8:40 | Bottom | 2 | 28.5 | 7.9 | 22.9 | 4.6 | | 12.7 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4 | 8:45 | Surface | 1 | 28.8 | 8.0 | 21.7 | 5.4 | 5.4 | 7.2 | 8.0 | 6.7 | 6.4 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4 | 8:45 | Surface | 2 | 28.7 | 7.9 | 21.5 | 5.4 | | 7.1 | | 5 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4 | 8:45 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4 | 8:45 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4 | 8:45 | Bottom | 1 | 28.9 | 8.0 | 21.9 | 5.2 | 5.2 | 9.7 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | SR4 | 8:45 | Bottom | 2 | 28.7 | 7.9 | 21.6 | 5.2 | | 7.9 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS8 | 8:56 | Surface | 1 | 28.7 | 8.1 | 21.5 | 6.3 | 6.3 | 4.4 | 9.6 | 2.8 | 2.7 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS8 | 8:56 | Surface | 2 | 28.6 | 8.0 | 21.3 | 6.3 | | 4.5 | | 2.1 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS8 | 8:56 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS8 | 8:56 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS8 | 8:56 | Bottom | 1 | 28.8 | 8.0 | 22.2 | 5.4 | 5.5 | 14.9 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS8 | 8:56 | Bottom | 2 | 28.7 | 7.9 | 22.0 | 5.5 | | 14.6 | | 3.4 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)9 | 9:10 | Surface | 1 | 28.7 | 8.1 | 21.4 | 6.6 | 6.6 | 4.6 | 4.6 | 3.6 | 3.0 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)9 | 9:10 | Surface | 2 | 28.6 | 8.0 | 21.2 | 6.6 | | 4.6 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)9 | 9:10 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)9 | 9:10 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)9 | 9:10 | Bottom | 1 | 28.8 | 8.0 | 21.7 | 5.9 | 6.0 | 4.4 | | 2.2 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Ebb | IS(Mf)9 | 9:10 | Bottom | 2 | 28.6 | 8.0 | 21.5 | 6.0 | | 4.6 | | 3.1 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)5 | 16:29 | Surface | 1 | 29.5 | 7.8 | 20.9 | 5.8 | 5.2 | 4.1 | 9.3 | 1.6 | 2.6 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)5 | 16:29 | Surface | 2 | 29.3 | 7.9 | 21.1 | 5.8 | | 4.3 | | 1.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)5 | 16:29 | Middle | 1 | 28.2 | 7.8 | 26.1 | 4.6 | | 7.8 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)5 | 16:29 | Middle | 2 | 28.1 | 7.8 | 26.4 | 4.6 | | 7.6 | | 3.4 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)5 | 16:29 | Bottom | 1 | 27.8 | 7.8 | 28.8 | 3.7 | 3.7 | 15.5 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)5 | 16:29 | Bottom | 2 | 27.6 | 7.8 | 29.0 | 3.7 | | 16.7 | | 2.5 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)3(N) | 15:09 | Surface | 1 | 30.4 | 7.6 | 12.2 | 5.2 | 5.3 | 18.4 | 17.0 | 3.8 | 4.1 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)3(N) | 15:09 | Surface | 2 | 30.2 | 7.5 | 12.1 | 5.3 | | 17.8 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)3(N) | 15:09 | Middle | 1 | 29.7 | 7.6 | 15.5 | 5.2 | | 16.9 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)3(N) | 15:09 | Middle | 2 | 29.4 | 7.6 | 15.6 | 5.3 | | 16.0 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)3(N) | 15:09 | Bottom | 1 | 29.5 | 7.6 | 16.6 | 5.1 | 5.2 | 16.6 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | CS(Mf)3(N) | 15:09 | Bottom | 2 | 29.3 | 7.6 | 16.7 | 5.2 | | 16.1 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)16 | 15:57 | Surface | 1 | 29.1 | 7.8 | 20.1 | 6.5 | 6.3 | 3.0 | 4.8 | 3.2 | 5.2 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)16 | 15:57 | Surface | 2 | 28.9 | 7.9 | 20.3 | 6.4 | | 3.3 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)16 | 15:57 | Middle | 1 | 28.9 | 7.8 | 21.0 | 6.1 | | 3.3 | | 7.1 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)16 | 15:57 | Middle | 2 | 28.8 | 7.9 | 21.2 | 6.0 | | 3.7 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)16 | 15:57 | Bottom | 1 | 28.6 | 7.8 | 22.8 | 4.8 | 4.9 | 7.8 | | 5.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)16 | 15:57 | Bottom | 2 | 28.5 | 7.8 | 22.9 | 4.9 | | 7.4 | | 5.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4a | 15:44 | Surface | 1 | 29.5 | 7.8 | 19.2 | 6.4 | 6.4 | 2.0 | 3.7 | 2.1 | 2.5 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4a | 15:44 | Surface | 2 | 29.3 | 7.9 | 19.3 | 6.4 | | 1.9 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4a | 15:44 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4a | 15:44 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4a | 15:44 | Bottom | 1 | 29.2 | 7.8 | 19.6 | 6.2 | 6.2 | 5.5 | | 2.8 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4a | 15:44 | Bottom | 2 | 29.0 | 7.9 | 19.8 | 6.2 | | 5.2 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4 | 15:39 | Surface | 1 | 29.4 | 7.8 | 19.5 | 6.5 | 6.5 | 2.9 | 7.9 | 2.2 | 2.9 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4 | 15:39 | Surface | 2 | 29.3 | 7.9 | 19.7 | 6.4 | | 3.1 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4 | 15:39 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4 | 15:39 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4 | 15:39 | Bottom | 1 | 29.0 | 7.8 | 21.2 | 5.4 | 5.5 | 12.4 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | SR4 | 15:39 | Bottom | 2 | 28.8 | 7.8 | 21.4 | 5.5 | | 13.2 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS8 | 15:26 | Surface | 1 | 29.4 | 7.8 | 19.6 | 6.5 | 6.5 | 17.3 | 77.8 | 6.6 | 13.6 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS8 | 15:26 | Surface | 2 | 29.2 | 7.9 | 19.8 | 6.4 | | 16.0 | | 5.3 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS8 | 15:26 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS8 | 15:26 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS8 | 15:26 | Bottom | 1 | 29.2 | 7.8 | 20.2 | 6.0 | 6.1 | 143.7 | | 21.8 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS8 | 15:26 | Bottom | 2 | 29.0 | 7.9 | 20.4 | 6.1 | | 134.0 | | 20.7 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)9 | 15:14 | Surface | 1 | 29.4 | 7.9 | 21.1 | 6.6 | 6.6 | 8.6 | 14.5 | 8.3 | 10.3 |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)9 | 15:14 | Surface | 2 | 29.2 | 7.9 | 21.3 | 6.6 | | 8.7 | | 9.8 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)9 | 15:14 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)9 | 15:14 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)9 | 15:14 | Bottom | 1 | 29.2 | 7.8 | 21.8 | 6.1 | 6.1 | 19.8 | | 12 | |
| TMCLKL | HY/2012/07 | 2017/09/15 | Mid-Flood | IS(Mf)9 | 15:14 | Bottom | 2 | 29.0 | 7.9 | 22.0 | 6.1 | | 20.9 | | 10.9 | |

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

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), SR4A AND IS8 ON 15 SEPTEMBER 2017*

Photo 1 - Mid-Ebb at CS(Mf)5 on 15 September 2017

Photo 2 - Mid-Ebb at CS(Mf)3(N) on 15 September 2017

Photo 3 - Mid-Ebb at SR4a on 15 September 2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), SR4A AND IS8 ON 15 SEPTEMBER 2017*

Photo 4 - Mid-Flood at CS(Mf)5 on 15 September 2017

Photo 5 - Mid-Flood at IS8 on 15 September 2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 19 September 2017 |

ERM

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_18 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_18 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**
**0215660_18 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**
**0215660_18 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**

A total of four exceedances were recorded on 18 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 27 September 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_18 September 2017_ Depth-averaged SS_F_Station SR4**

A total of one exceedance was recorded on 18 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

***Marine Water Quality Impact Monitoring***

**Notification of Exceedance**

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br>0215660_18 September 2017_ Bottom-depth DO_E_Station CS(Mf)5<br>0215660_18 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)<br>0215660_18 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5<br>0215660_18 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br>0215660_18 September 2017_ Depth-averaged SS_F_Station SR4<br><br>[Total No. of Exceedances = 5]</td></tr>
<tr><td>Date</td><td colspan="2">18 September 2017 (Measured)<br>19 September 2017 (In situ results received by ERM)<br>26 September 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Action Levels for SS</td><td>SS</td><td>120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L).</td></tr>
<tr><td>Limit Levels for SS</td><td>SS</td><td>130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L)</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-ebb at CS(Mf)5 (Bottom-depth DO = 4.4mg/L);<br>2. Mid-ebb at CS(Mf)3(N) (Surface and Middle-depth DO = 4.9mg/L);<br>3. Mid-flood at CS(Mf)5 (Surface and Middle-depth DO = 4.9mg/L);<br>4. Mid-flood at CS(Mf)5 (Bottom-depth DO = 4.4mg/L).<br>5. Mid-flood at SR4 (depth-averaged SS = 23.7 mg/L);</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 18 September 2017.</td></tr>
</table>

<table>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td>The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:
<ul>
<li>No marine works was undertaken under this Contract on 18 September 2017.</li>
<li>CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.</li>
<li>Apart from SR4, depth-averaged SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day. Depth-averaged SS levels at SR4 at mid-ebb tides were similar to those at other stations apart from the marginal exceedance observed at mid-flood tide.</li>
<li>All monitored parameters, except DO at CS(Mf)5, CS(Mf)3(N) and SS at SR4, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.</li>
<li>DO levels were generally lower at water quality monitoring stations due to two possible reasons of natural variation:
<ol>
<li>Natural ability for water to hold dissolved oxygen is reduced due to higher water temperature in summer months.</li>
<li>The higher Salinity recorded at the bottom level of the deeper CS(Mf)5 and CS(Mf)3(N) monitoring stations was possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level as the DO exceedances recorded at the bottom level showed higher levels of Salinity than the middle and surface levels.</li>
</ol></li>
</ul></td></tr>
<tr><td>Actions Taken / To Be Taken</td><td>No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td>The monitoring results on 18 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 18 September 2017 is attached.</td></tr>
</table>

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)5 | 11:15 | Surface | 1 | 29.3 | 7.9 | 21.9 | 5.6 | 5.2 | 3.1 | 3.7 | 3.1 | 3.5 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)5 | 11:15 | Surface | 2 | 29.3 | 7.9 | 21.9 | 5.7 | | 2.9 | | 3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)5 | 11:15 | Middle | 1 | 28.3 | 7.9 | 26.1 | 4.7 | | 2.7 | | 3.3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)5 | 11:15 | Middle | 2 | 28.4 | 7.9 | 25.9 | 4.7 | | 2.7 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)5 | 11:15 | Bottom | 1 | 27.8 | 7.9 | 28.9 | 4.4 | 4.4 | 5.5 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)5 | 11:15 | Bottom | 2 | 28.1 | 7.9 | 28.6 | 4.3 | | 5.2 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)3(N) | 12:36 | Surface | 1 | 29.9 | 7.8 | 18.8 | 5.5 | 4.9 | 9.3 | 15.9 | 2.7 | 7.4 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)3(N) | 12:36 | Surface | 2 | 30.1 | 7.8 | 18.8 | 5.4 | | 9.3 | | 2.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)3(N) | 12:36 | Middle | 1 | 28.7 | 7.8 | 24.3 | 4.3 | | 16.8 | | 2 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)3(N) | 12:36 | Middle | 2 | 28.9 | 7.8 | 24.3 | 4.2 | | 16.6 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)3(N) | 12:36 | Bottom | 1 | 28.8 | 7.8 | 25.4 | 5.1 | 5.1 | 21.7 | | 17.4 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | CS(Mf)3(N) | 12:36 | Bottom | 2 | 29.1 | 7.8 | 25.5 | 5.0 | | 21.7 | | 16 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)16 | 11:48 | Surface | 1 | 29.3 | 8.0 | 21.3 | 6.3 | 5.9 | 4.3 | 5.7 | 4.6 | 4.9 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)16 | 11:48 | Surface | 2 | 29.4 | 8.0 | 21.3 | 6.3 | | 4.0 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)16 | 11:48 | Middle | 1 | 29.1 | 7.9 | 22.8 | 5.5 | | 6.6 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)16 | 11:48 | Middle | 2 | 29.3 | 7.9 | 22.5 | 5.6 | | 6.0 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)16 | 11:48 | Bottom | 1 | 28.6 | 7.9 | 24.5 | 4.9 | 4.9 | 6.7 | | 6 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)16 | 11:48 | Bottom | 2 | 28.7 | 7.9 | 24.4 | 4.8 | | 6.4 | | 5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4a | 11:58 | Surface | 1 | 29.4 | 8.0 | 21.0 | 5.8 | 5.9 | 4.9 | 7.0 | 5.1 | 5.8 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4a | 11:58 | Surface | 2 | 29.6 | 7.9 | 20.8 | 5.9 | | 4.5 | | 5.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4a | 11:58 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4a | 11:58 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4a | 11:58 | Bottom | 1 | 28.9 | 7.8 | 23.1 | 4.8 | 4.7 | 9.9 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4a | 11:58 | Bottom | 2 | 29.1 | 7.8 | 22.8 | 4.6 | | 8.7 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4 | 12:03 | Surface | 1 | 29.6 | 8.0 | 20.6 | 6.3 | 6.4 | 4.5 | 7.3 | 5.8 | 6.1 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4 | 12:03 | Surface | 2 | 29.7 | 7.9 | 20.4 | 6.4 | | 4.0 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4 | 12:03 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4 | 12:03 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4 | 12:03 | Bottom | 1 | 29.0 | 7.8 | 22.7 | 4.9 | 4.9 | 10.7 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | SR4 | 12:03 | Bottom | 2 | 29.2 | 7.8 | 22.5 | 4.8 | | 10.0 | | 5.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS8 | 12:15 | Surface | 1 | 29.8 | 8.1 | 20.2 | 7.8 | 7.9 | 3.0 | 5.9 | 3.3 | 3.3 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS8 | 12:15 | Surface | 2 | 30.0 | 8.1 | 20.0 | 7.9 | | 2.5 | | 3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS8 | 12:15 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS8 | 12:15 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS8 | 12:15 | Bottom | 1 | 28.9 | 7.9 | 23.5 | 5.1 | 5.1 | 9.5 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS8 | 12:15 | Bottom | 2 | 29.1 | 7.9 | 23.3 | 5.0 | | 8.7 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)9 | 12:24 | Surface | 1 | 29.8 | 8.1 | 19.7 | 7.9 | 8.0 | 3.1 | 3.2 | 3.3 | 3.3 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)9 | 12:24 | Surface | 2 | 29.9 | 8.1 | 19.5 | 8.0 | | 2.8 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)9 | 12:24 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)9 | 12:24 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)9 | 12:24 | Bottom | 1 | 29.3 | 8.0 | 21.3 | 7.0 | 7.0 | 3.5 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Ebb | IS(Mf)9 | 12:24 | Bottom | 2 | 29.6 | 7.9 | 21.1 | 6.9 | | 3.2 | | 3.9 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)5 | 18:38 | Surface | 1 | 28.8 | 7.9 | 24.3 | 4.9 | 4.9 | 4.5 | 6.4 | 4.3 | 5.5 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)5 | 18:38 | Surface | 2 | 29.0 | 7.9 | 24.1 | 5.0 | | 4.1 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)5 | 18:38 | Middle | 1 | 28.4 | 7.9 | 27.1 | 4.8 | | 5.8 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)5 | 18:38 | Middle | 2 | 28.5 | 7.9 | 26.9 | 4.8 | | 5.2 | | 5.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)5 | 18:38 | Bottom | 1 | 28.1 | 7.9 | 27.9 | 4.4 | 4.4 | 9.5 | | 6.7 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)5 | 18:38 | Bottom | 2 | 28.3 | 7.9 | 27.6 | 4.3 | | 9.0 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)3(N) | 17:22 | Surface | 1 | 30.1 | 7.7 | 16.6 | 5.7 | 5.4 | 16.1 | 20.5 | 8.7 | 8.5 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)3(N) | 17:22 | Surface | 2 | 30.4 | 7.9 | 16.6 | 5.7 | | 16.1 | | 9 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)3(N) | 17:22 | Middle | 1 | 29.6 | 7.7 | 19.3 | 5.1 | | 18.8 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)3(N) | 17:22 | Middle | 2 | 29.9 | 7.9 | 19.3 | 5.0 | | 18.8 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)3(N) | 17:22 | Bottom | 1 | 29.5 | 7.7 | 20.1 | 5.2 | 5.2 | 26.6 | | 7.7 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | CS(Mf)3(N) | 17:22 | Bottom | 2 | 29.7 | 7.9 | 20.1 | 5.1 | | 26.6 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)16 | 18:04 | Surface | 1 | 29.4 | 8.1 | 22.1 | 7.3 | 7.4 | 4.1 | 7.9 | 5.9 | 7.9 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)16 | 18:04 | Surface | 2 | 29.6 | 8.0 | 21.9 | 7.4 | | 3.7 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)16 | 18:04 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)16 | 18:04 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)16 | 18:04 | Bottom | 1 | 29.0 | 7.9 | 23.4 | 5.4 | 5.4 | 12.2 | | 9.4 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)16 | 18:04 | Bottom | 2 | 29.2 | 7.9 | 23.2 | 5.4 | | 11.5 | | 10.5 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4a | 17:51 | Surface | 1 | 29.3 | 8.0 | 22.4 | 6.1 | 6.1 | 11.1 | 13.6 | 13.3 | 16.4 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4a | 17:51 | Surface | 2 | 29.4 | 7.9 | 22.2 | 6.1 | | 10.5 | | 13 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4a | 17:51 | Middle | 1 | | | | | | | | 18.3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4a | 17:51 | Middle | 2 | | | | | | | | 17.8 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4a | 17:51 | Bottom | 1 | 29.3 | 8.0 | 22.6 | 6.1 | 6.1 | 17.0 | | 18.3 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4a | 17:51 | Bottom | 2 | 29.4 | 7.9 | 22.4 | 6.0 | | 15.9 | | 17.8 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4 | 17:46 | Surface | 1 | 29.3 | 8.0 | 22.3 | 6.8 | 6.8 | 15.6 | 14.8 | 23.9 | 23.7 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4 | 17:46 | Surface | 2 | 29.4 | 8.0 | 22.1 | 6.7 | | 14.4 | | 22.6 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4 | 17:46 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4 | 17:46 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4 | 17:46 | Bottom | 1 | 29.2 | 8.0 | 22.4 | 6.6 | 6.6 | 14.7 | | 23.4 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | SR4 | 17:46 | Bottom | 2 | 29.4 | 7.9 | 22.2 | 6.6 | | 14.6 | | 24.7 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS8 | 17:35 | Surface | 1 | 29.4 | 8.0 | 22.3 | 6.9 | 6.9 | 13.7 | 15.3 | 16.8 | 20.2 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS8 | 17:35 | Surface | 2 | 29.5 | 8.0 | 22.0 | 6.9 | | 14.7 | | 17.1 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS8 | 17:35 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS8 | 17:35 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS8 | 17:35 | Bottom | 1 | 29.3 | 8.0 | 22.4 | 6.8 | 6.8 | 17.4 | | 22.6 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS8 | 17:35 | Bottom | 2 | 29.5 | 8.0 | 22.1 | 6.8 | | 15.4 | | 24.1 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)9 | 17:25 | Surface | 1 | | | | | 8.6 | | 7.2 | | 10.1 |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)9 | 17:25 | Surface | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)9 | 17:25 | Middle | 1 | 29.8 | 8.1 | 21.8 | 8.6 | | 7.6 | | 10.2 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)9 | 17:25 | Middle | 2 | 29.9 | 8.1 | 21.6 | 8.5 | | 6.7 | | 10 | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)9 | 17:25 | Bottom | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017/09/18 | Mid-Flood | IS(Mf)9 | 17:25 | Bottom | 2 | | | | | | | | | |

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5 , CS(MF)3(N) AND SR4 ON 18 SEPTEMBER 2017*

Photo 1 - Mid-Flood at CS(Mf)5 on 18 September 2017

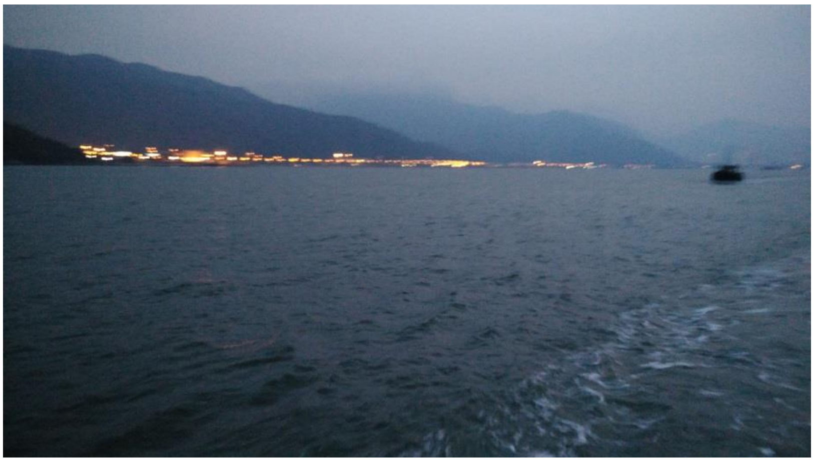


Photo 2 - Mid-Flood at SR4 on 18 September 2017

Photo 3 - Mid-Ebb at CS(Mf)5 on 18 September 2017

Photo 4 - Mid-Ebb at CS(Mf)3(N) on 18 September 2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| ***To*** | Ramboll Environ – Hong Kong, Limited (ENPO) |
| ***From*** | ERM- Hong Kong, Limited |
| ***Ref/Project number*** | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| ***Subject*** | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| ***Date*** | 21 September 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_20 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**
**0215660_20 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**
**0215660_20 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**
**0215660_20 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**
**0215660_20 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)**
**0215660_20 September 2017_ Bottom-depth DO_F_Station CS(Mf)3(N)**

A total of six exceedances were recorded on 20 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

**Notification of Exceedance**

| | | |
|---|---|---|
| **Log No.** | **Action Level Exceedance**<br>**0215660_20 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**<br>**0215660_20 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**<br>**0215660_20 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)5**<br>**0215660_20 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**<br>**0215660_20 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)**<br>**0215660_20 September 2017_ Bottom-depth DO_F_Station CS(Mf)3(N)**<br><br>**[Total No. of Exceedances = 6]** | |
| **Date** | 20 September 2017 (Measured)<br>21 September 2017 (*In situ* results received by ERM)<br>27 September 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO) | |
| **Action Levels for DO** | Surface and Middle-depth DO | 5.0 mg/L |
| | Bottom-depth DO | 4.7 mg/L |
| **Limit Levels for DO** | Surface and Middle-depth DO | 4.2 mg/L |
| | Bottom-depth DO | 3.6 mg/L |
| **Measured Levels** | Action Level Exceedance<br>1. Mid-ebb at CS(Mf)5 (Surface and Middle-depth DO = 4.9mg/L);<br>2. Mid-ebb at CS(Mf)3(N) (Surface and Middle-depth DO = 4.7mg/L);<br>3. Mid-flood at CS(Mf)5 (Surface and Middle-depth DO = 4.8mg/L);<br>4. Mid-flood at CS(Mf)5 (Bottom-depth DO = 4.5mg/L);<br>5. Mid-flood at CS(Mf)3(N) (Surface and Middle-depth DO = 4.7mg/L);<br>6. Mid-flood at CS(Mf)3(N) (Bottom-depth DO = 4.6mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 20 September 2017. | |

| | |
|---|---|
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 20 September 2017.<br>• CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• DO levels were generally lower at water quality monitoring stations due to two possible reasons of natural variation:<br>1. Natural ability for water to hold dissolved oxygen is reduced due to higher water temperature in summer months.<br>2. The higher Salinity recorded at the bottom level of the deeper CS(Mf)5 and CS(Mf)3(N) monitoring stations was possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level as the DO exceedances recorded at the bottom level showed higher levels of Salinity than the middle and surface levels. |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. |
| **Remarks** | The monitoring results on 20 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 20 September 2017 is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)5 | 12:16 | Surface | 1 | 29.4 | 7.9 | 24.1 | 5.0 | 4.9 | 4.2 | 6.3 | 5.8 | 6.6 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)5 | 12:16 | Surface | 2 | 29.3 | 7.9 | 24.3 | 5.0 | | 5.0 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)5 | 12:16 | Middle | 1 | 29.0 | 7.9 | 24.9 | 4.7 | | 6.7 | | 6 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)5 | 12:16 | Middle | 2 | 28.8 | 7.9 | 25.1 | 4.7 | | 7.3 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)5 | 12:16 | Bottom | 1 | 28.9 | 7.9 | 25.0 | 4.7 | 4.7 | 6.9 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)5 | 12:16 | Bottom | 2 | 28.8 | 7.9 | 25.2 | 4.7 | | 7.6 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)3(N) | 14:18 | Surface | 1 | 29.7 | 7.7 | 20.8 | 4.7 | 4.7 | 15.2 | 19.0 | 5.7 | 6.4 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)3(N) | 14:18 | Surface | 2 | 29.4 | 7.7 | 20.8 | 4.8 | | 14.1 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)3(N) | 14:18 | Middle | 1 | 29.4 | 7.8 | 21.9 | 4.6 | | 18.2 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)3(N) | 14:18 | Middle | 2 | 29.1 | 7.8 | 21.8 | 4.7 | | 17.4 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)3(N) | 14:18 | Bottom | 1 | 29.3 | 7.8 | 23.0 | 4.7 | 4.8 | 24.3 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | CS(Mf)3(N) | 14:18 | Bottom | 2 | 29.0 | 7.8 | 22.8 | 4.8 | | 24.6 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)16 | 12:54 | Surface | 1 | 29.3 | 7.9 | 23.0 | 5.7 | 5.5 | 7.7 | 10.1 | 5.7 | 5.1 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)16 | 12:54 | Surface | 2 | 29.2 | 7.9 | 23.2 | 5.7 | | 8.3 | | 4.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)16 | 12:54 | Middle | 1 | 29.1 | 7.9 | 23.7 | 5.2 | | 9.5 | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)16 | 12:54 | Middle | 2 | 29.0 | 7.9 | 24.0 | 5.2 | | 10.3 | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)16 | 12:54 | Bottom | 1 | 29.0 | 7.9 | 24.9 | 4.9 | 5.0 | 12.0 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)16 | 12:54 | Bottom | 2 | 28.8 | 7.9 | 25.2 | 5.0 | | 12.7 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4a | 13:12 | Surface | 1 | 29.3 | 7.9 | 22.8 | 5.4 | 5.5 | 12.0 | 12.1 | 13.5 | 14.0 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4a | 13:12 | Surface | 2 | 29.2 | 7.9 | 23.1 | 5.5 | | 12.4 | | 14.1 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4a | 13:12 | Bottom | 1 | 29.3 | 7.9 | 22.9 | 5.4 | 5.5 | 11.8 | | 13.4 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4a | 13:12 | Bottom | 2 | 29.1 | 7.9 | 23.1 | 5.5 | | 12.0 | | 14.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4 | 13:18 | Surface | 1 | 29.6 | 7.9 | 22.4 | 5.5 | 5.5 | 6.0 | 8.7 | 4.6 | 5.5 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4 | 13:18 | Surface | 2 | 29.4 | 7.9 | 22.6 | 5.5 | | 6.4 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4 | 13:18 | Bottom | 1 | 29.3 | 7.9 | 22.9 | 5.5 | 5.6 | 11.1 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | SR4 | 13:18 | Bottom | 2 | 29.1 | 7.9 | 23.2 | 5.6 | | 11.1 | | 6.1 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS8 | 13:29 | Surface | 1 | 29.6 | 7.9 | 22.8 | 5.9 | 6.0 | 6.0 | 7.1 | 6.7 | 6.7 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS8 | 13:29 | Surface | 2 | 29.4 | 7.9 | 23.0 | 6.0 | | 6.2 | | 5.7 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS8 | 13:29 | Bottom | 1 | 29.4 | 7.9 | 23.0 | 5.8 | 5.9 | 8.0 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS8 | 13:29 | Bottom | 2 | 29.2 | 7.9 | 23.2 | 5.9 | | 8.1 | | 7 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)9 | 13:38 | Surface | 1 | 29.6 | 7.9 | 22.8 | 5.9 | 5.9 | 4.1 | 5.8 | 5.3 | 6.0 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)9 | 13:38 | Surface | 2 | 29.4 | 7.9 | 23.0 | 5.9 | | 4.5 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)9 | 13:38 | Bottom | 1 | 29.4 | 7.9 | 23.0 | 5.9 | 5.9 | 7.0 | | 8.4 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Ebb | IS(Mf)9 | 13:38 | Bottom | 2 | 29.2 | 7.9 | 23.2 | 5.9 | | 7.5 | | 6.6 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^oC$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)5 | 19:45 | Surface | 1 | 29.4 | 7.9 | 23.2 | 4.9 | 4.8 | 4.7 | 11.1 | 6.2 | 9.4 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)5 | 19:45 | Surface | 2 | 29.2 | 7.9 | 23.4 | 4.9 | | 5.1 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)5 | 19:45 | Middle | 1 | 29.0 | 7.9 | 25.5 | 4.6 | | 10.5 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)5 | 19:45 | Middle | 2 | 28.8 | 7.9 | 25.8 | 4.6 | | 11.0 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)5 | 19:45 | Bottom | 1 | 28.9 | 7.9 | 25.9 | 4.5 | 4.5 | 17.2 | | 14.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)5 | 19:45 | Bottom | 2 | 28.7 | 7.9 | 26.2 | 4.5 | | 18.2 | | 15 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)3(N) | 18:07 | Surface | 1 | 29.9 | 7.6 | 18.4 | 4.8 | 4.7 | 16.2 | 19.0 | 5.7 | 6.4 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)3(N) | 18:07 | Surface | 2 | 30.1 | 7.6 | 18.3 | 4.7 | | 17.0 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)3(N) | 18:07 | Middle | 1 | 29.5 | 7.7 | 20.4 | 4.7 | | 19.1 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)3(N) | 18:07 | Middle | 2 | 29.8 | 7.7 | 20.4 | 4.6 | | 20.0 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)3(N) | 18:07 | Bottom | 1 | 29.4 | 7.7 | 21.1 | 4.6 | 4.6 | 20.5 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | CS(Mf)3(N) | 18:07 | Bottom | 2 | 29.7 | 7.7 | 21.1 | 4.5 | | 21.3 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)16 | 19:06 | Surface | 1 | 29.6 | 7.8 | 21.7 | 5.0 | 5.1 | 6.2 | 10.8 | 8.2 | 10.7 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)16 | 19:06 | Surface | 2 | 29.4 | 7.8 | 21.9 | 5.0 | | 6.8 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)16 | 19:06 | Middle | 1 | 29.6 | 7.9 | 22.4 | 5.1 | | 12.4 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)16 | 19:06 | Middle | 2 | 29.4 | 7.9 | 22.6 | 5.2 | | 13.2 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)16 | 19:06 | Bottom | 1 | 29.6 | 7.9 | 22.8 | 5.3 | 5.3 | 12.6 | | 16.3 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)16 | 19:06 | Bottom | 2 | 29.4 | 7.9 | 23.0 | 5.3 | | 13.8 | | 13.7 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4a | 18:53 | Surface | 1 | 29.7 | 7.8 | 21.8 | 5.3 | 5.3 | 10.4 | 12.3 | 10.4 | 9.9 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4a | 18:53 | Surface | 2 | 29.5 | 7.9 | 22.0 | 5.3 | | 10.4 | | 8.6 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4a | 18:53 | Bottom | 1 | 29.7 | 7.8 | 22.0 | 5.3 | 5.4 | 14.2 | | 9.5 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4a | 18:53 | Bottom | 2 | 29.5 | 7.9 | 22.2 | 5.4 | | 14.3 | | 11 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4 | 18:47 | Surface | 1 | 29.6 | 7.9 | 22.6 | 5.3 | 5.3 | 12.5 | 13.0 | 13.9 | 16.9 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4 | 18:47 | Surface | 2 | 29.4 | 7.9 | 22.9 | 5.3 | | 13.2 | | 15 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4 | 18:47 | Bottom | 1 | 29.5 | 7.9 | 22.7 | 5.3 | 5.4 | 13.2 | | 18.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | SR4 | 18:47 | Bottom | 2 | 29.4 | 7.9 | 22.9 | 5.4 | | 13.0 | | 19.9 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS8 | | Surface | 1 | | | | | 5.5 | | 23.7 | | 19.7 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS8 | | Surface | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS8 | 18:30 | Middle | 1 | 29.6 | 7.9 | 22.8 | 5.5 | | 22.3 | | 19.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS8 | 18:30 | Middle | 2 | 29.4 | 7.9 | 23.0 | 5.5 | | 25.1 | | 20.2 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS8 | | Bottom | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS8 | | Bottom | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)9 | | Surface | 1 | | | | | 6.1 | | 13.1 | | 14.9 |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)9 | | Surface | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)9 | 18:21 | Middle | 1 | 29.7 | 7.9 | 23.0 | 6.1 | | 12.8 | | 15.8 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)9 | 18:21 | Middle | 2 | 29.5 | 8.0 | 23.2 | 6.1 | | 13.4 | | 14 | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)9 | | Bottom | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-20 | Mid-Flood | IS(Mf)9 | | Bottom | 2 | | | | | | | | | |

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

***CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5 AND CS(MF)3(N) ON 20 SEPTEMBER 2017***

Photo 1 - Mid-Ebb at CS(Mf)5 on 20 September 2017

Photo 2 - Mid-Ebb at CS(Mf)3(N) on 20 September 2017

Photo 3 - Mid-Flood at CS(Mf)5 on 20 September 2017

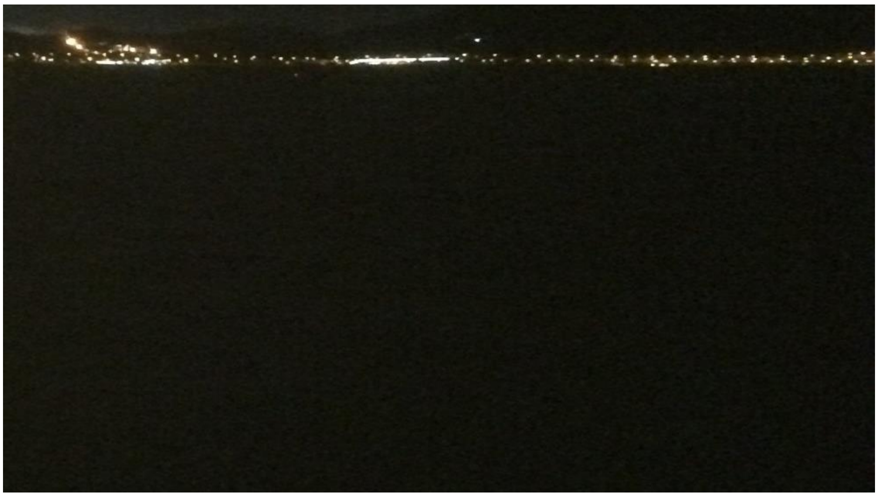
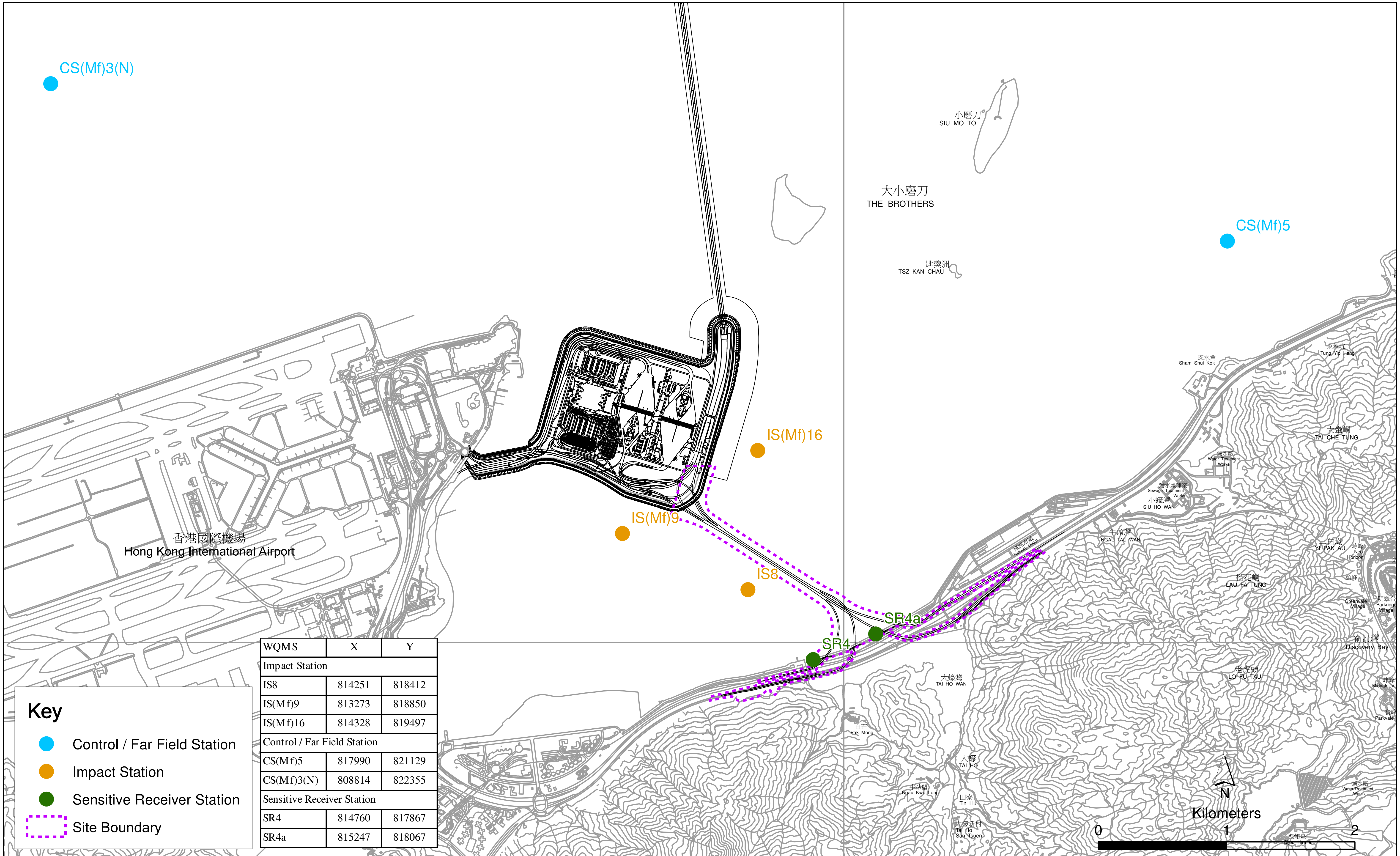


Photo 4 - Mid-Flood at CS(Mf)3(N) on 20 September 2017




## Key

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

| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

Environmental Resources Management

ERM

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 23 September 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_22 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5**
**0215660_22 September 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_22 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)**
**0215660_22 September 2017_ Bottom-depth DO_E_Station IS(Mf)16**
**0215660_22 September 2017_ Surface and Middle-depth DO_E_Station SR4a**
**0215660_22 September 2017_ Surface and Middle-depth DO_E_Station SR4**
**0215660_22 September 2017_ Surface and Middle DO-depth_F_Station CS(Mf)5**
**0215660_22 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**
**0215660_22 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)**
**0215660_22 September 2017_ Bottom-depth DO_F_Station IS(Mf)16**
**0215660_22 September 2017_ Surface and Middle-depth DO_F_Station SR4a**
**0215660_22 September 2017_ Surface and Middle-depth DO_F_Station SR4**
**0215660_22 September 2017_ Surface and Middle-depth DO_F_Station IS8**
**0215660_22 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)9**

A total of fourteen exceedances were recorded on 22 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br><br>0215660_22 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)5<br>0215660_22 September 2017_ Bottom-depth DO_E_Station CS(Mf)5<br>0215660_22 September 2017_ Surface and Middle-depth DO_E_Station CS(Mf)3(N)<br>0215660_22 September 2017_ Bottom-depth DO_E_Station IS(Mf)16<br>0215660_22 September 2017_ Surface and Middle-depth DO_E_Station SR4a<br>0215660_22 September 2017_ Surface and Middle-depth DO_E_Station SR4<br>0215660_22 September 2017_ Surface and Middle DO-depth_F_Station CS(Mf)5<br>0215660_22 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br>0215660_22 September 2017_ Surface and Middle-depth DO_F_Station CS(Mf)3(N)<br>0215660_22 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)16<br>0215660_22 September 2017_ Surface and Middle-depth DO_F_Station SR4a<br>0215660_22 September 2017_ Surface and Middle-depth DO_F_Station SR4<br>0215660_22 September 2017_ Surface and Middle-depth DO_F_Station IS8<br>0215660_22 September 2017_ Surface and Middle-depth DO_F_Station IS(Mf)9<br><br>[Total No. of Exceedances = 14]</td></tr>
<tr><td>Date</td><td colspan="2">22 September 2017 (Measured)<br>23 September 2017 (In situ results received by ERM)<br>29 September 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-Ebb at CS(Mf)5 (Surface and Middle-depth DO = 4.8 mg/L);<br>2. Mid-Ebb at CS(Mf)5 (Bottom-depth DO = 4.6 mg/L);<br>3. Mid-Ebb at CS(Mf)3(N) (Surface and Middle-depth DO = 4.7 mg/L);<br>4. Mid-Ebb at IS(Mf)16 (Bottom-depth DO = 4.6 mg/L);<br>5. Mid-Ebb at SR4a (Surface and Middle-depth DO = 4.8 mg/L);<br>6. Mid-Ebb at SR4 (Surface and Middle-depth DO = 4.8 mg/L);<br>7. Mid-Flood at CS(Mf)5 (Surface and Middle-depth DO = 4.8 mg/L);<br>8. Mid-Flood at CS(Mf)5 (Bottom-depth DO = 4.5 mg/L);<br>9. Mid-Flood at CS(Mf)3(N) (Surface and Middle-depth DO = 4.7 mg/L);<br>10. Mid-Flood at IS(Mf)16 (Surface and Middle-depth DO = 4.7 mg/L);<br>11. Mid-Flood at SR4a (Surface and Middle-depth DO = 4.8 mg/L);<br>12. Mid-Flood at SR4a (Surface and Middle-depth DO = 4.9 mg/L);<br>13. Mid-Flood at IS8 (Surface and Middle-depth DO = 4.7 mg/L);<br>14. Mid-Flood at IS(Mf)9 (Surface and Middle-depth DO = 4.9 mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 22 September 2017.</td></tr>
</table>

| | |
|---|---|
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 22 September 2017.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)3(N) and CS(Mf)5 are distant (>5km and >3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality. |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. |
| **Remarks** | The monitoring results on 22 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 22 September 2017 is attached. |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)5 | 14:48 | Surface | 1 | 30.1 | 7.9 | 22.1 | 5.1 | 4.8 | 5.9 | 11.7 | 5.9 | 8.5 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)5 | 14:48 | Surface | 2 | 30.3 | 7.8 | 21.9 | 5.1 | | 6.2 | | 6.3 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)5 | 14:48 | Middle | 1 | 29.2 | 7.9 | 24.1 | 4.5 | | 9.8 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)5 | 14:48 | Middle | 2 | 29.3 | 7.8 | 23.9 | 4.6 | | 10.6 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)5 | 14:48 | Bottom | 1 | 29.1 | 7.9 | 24.3 | 4.6 | 4.6 | 19.1 | | 13.2 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)5 | 14:48 | Bottom | 2 | 29.3 | 7.8 | 24.0 | 4.5 | | 18.6 | | 11.7 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)3(N) | 13:01 | Surface | 1 | 29.6 | 7.9 | 21.6 | 4.7 | 4.7 | 8.7 | 12.8 | 5.5 | 11.4 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)3(N) | 13:01 | Surface | 2 | 29.9 | 7.9 | 21.5 | 4.7 | | 8.8 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)3(N) | 13:01 | Middle | 1 | 29.2 | 8.0 | 22.7 | 4.8 | | 12.0 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)3(N) | 13:01 | Middle | 2 | 29.5 | 7.9 | 22.6 | 4.7 | | 12.4 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)3(N) | 13:01 | Bottom | 1 | 29.1 | 8.0 | 24.1 | 4.8 | 4.8 | 17.0 | | 22.3 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | CS(Mf)3(N) | 13:01 | Bottom | 2 | 29.4 | 8.0 | 24.1 | 4.7 | | 17.8 | | 20.9 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)16 | 14:08 | Surface | 1 | 29.5 | 7.8 | 22.8 | 5.2 | 5.2 | 6.1 | 7.1 | 7 | 8.0 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)16 | 14:08 | Surface | 2 | 29.7 | 7.8 | 22.6 | 5.3 | | 6.5 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)16 | 14:08 | Middle | 1 | 29.4 | 7.8 | 22.9 | 5.0 | | 7.5 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)16 | 14:08 | Middle | 2 | 29.5 | 7.8 | 22.7 | 5.1 | | 7.8 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)16 | 14:08 | Bottom | 1 | 29.2 | 7.9 | 24.0 | 4.6 | 4.6 | 6.9 | | 11.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)16 | 14:08 | Bottom | 2 | 29.3 | 7.8 | 23.7 | 4.6 | | 7.7 | | 11.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4a | 13:51 | Surface | 1 | 29.3 | 7.8 | 22.7 | 4.8 | 4.8 | 8.0 | 9.3 | 7.3 | 8.0 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4a | 13:51 | Surface | 2 | 29.5 | 7.8 | 22.5 | 4.8 | | 8.8 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4a | 13:51 | Bottom | 1 | 29.3 | 7.8 | 23.0 | 4.8 | 4.8 | 10.0 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4a | 13:51 | Bottom | 2 | 29.5 | 7.8 | 22.8 | 4.8 | | 10.5 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4 | 13:45 | Surface | 1 | 29.4 | 7.8 | 22.4 | 4.8 | 4.8 | 11.4 | 11.8 | 6.5 | 10.2 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4 | 13:45 | Surface | 2 | 29.6 | 7.8 | 22.2 | 4.8 | | 11.7 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4 | 13:45 | Bottom | 1 | 29.3 | 7.8 | 23.0 | 4.8 | 4.8 | 11.9 | | 12.7 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | SR4 | 13:45 | Bottom | 2 | 29.5 | 7.8 | 22.8 | 4.8 | | 12.3 | | 13.9 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS8 | 13:35 | Surface | 1 | 29.6 | 7.8 | 22.5 | 5.1 | 5.2 | 6.0 | 10.8 | 5.3 | 8.7 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS8 | 13:35 | Surface | 2 | 29.8 | 7.8 | 22.3 | 5.2 | | 6.7 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS8 | 13:35 | Bottom | 1 | 29.2 | 7.8 | 23.2 | 5.0 | 5.0 | 15.0 | | 11.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS8 | 13:35 | Bottom | 2 | 29.4 | 7.8 | 22.9 | 5.0 | | 15.6 | | 12.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)9 | 13:22 | Surface | 1 | 29.8 | 7.8 | 22.5 | 5.3 | 5.3 | 4.4 | 7.8 | 4.5 | 4.2 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)9 | 13:22 | Surface | 2 | 30.0 | 7.8 | 22.3 | 5.3 | | 5.1 | | 4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)9 | 13:22 | Bottom | 1 | 29.2 | 7.8 | 23.1 | 5.1 | 5.1 | 10.8 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Ebb | IS(Mf)9 | 13:22 | Bottom | 2 | 29.4 | 7.8 | 22.8 | 5.1 | | 10.9 | | 3.7 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)5 | 07:11 | Surface | 1 | 29.5 | 7.8 | 21.5 | 4.9 | 4.8 | 5.5 | 9.8 | 5.2 | 6.7 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)5 | 07:11 | Surface | 2 | 29.3 | 7.8 | 21.7 | 4.9 | | 5.9 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)5 | 07:11 | Middle | 1 | 29.5 | 7.9 | 22.7 | 4.6 | | 6.9 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)5 | 07:11 | Middle | 2 | 29.3 | 7.9 | 22.9 | 4.6 | | 7.3 | | 5.1 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)5 | 07:11 | Bottom | 1 | 29.4 | 7.9 | 23.5 | 4.5 | 4.5 | 15.5 | | 9.6 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)5 | 07:11 | Bottom | 2 | 29.2 | 7.9 | 23.8 | 4.5 | | 17.5 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)3(N) | 08:36 | Surface | 1 | 29.3 | 7.9 | 19.8 | 4.7 | 4.7 | 14.1 | 22.1 | 5.5 | 11.4 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)3(N) | 08:36 | Surface | 2 | 29.6 | 7.8 | 19.7 | 4.6 | | 15.6 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)3(N) | 08:36 | Middle | 1 | 29.4 | 7.9 | 20.5 | 4.7 | | 22.2 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)3(N) | 08:36 | Middle | 2 | 29.6 | 7.8 | 20.5 | 4.6 | | 22.6 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)3(N) | 08:36 | Bottom | 1 | 29.4 | 7.9 | 20.9 | 4.7 | 4.7 | 29.5 | | 22.3 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | CS(Mf)3(N) | 08:36 | Bottom | 2 | 29.6 | 7.9 | 20.9 | 4.6 | | 28.7 | | 20.9 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)16 | 07:58 | Surface | 1 | 29.5 | 7.8 | 22.2 | 4.7 | 4.7 | 7.1 | 8.0 | 6.1 | 8.2 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)16 | 07:58 | Surface | 2 | 29.3 | 7.8 | 22.4 | 4.7 | | 8.0 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)16 | 07:58 | Middle | 1 | 29.4 | 7.8 | 22.4 | 4.7 | | 8.3 | | 8.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)16 | 07:58 | Middle | 2 | 29.3 | 7.8 | 22.7 | 4.7 | | 8.5 | | 9.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)16 | 07:58 | Bottom | 1 | 29.4 | 7.8 | 22.5 | 4.7 | 4.7 | 8.2 | | 8.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)16 | 07:58 | Bottom | 2 | 29.2 | 7.8 | 22.7 | 4.7 | | 8.0 | | 9.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4a | 08:11 | Surface | 1 | 29.4 | 7.8 | 21.5 | 4.8 | 4.8 | 6.6 | 7.5 | 5.9 | 6.8 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4a | 08:11 | Surface | 2 | 29.2 | 7.8 | 21.8 | 4.8 | | 7.2 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4a | 08:11 | Bottom | 1 | 29.4 | 7.8 | 21.6 | 4.8 | 4.8 | 7.8 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4a | 08:11 | Bottom | 2 | 29.3 | 7.8 | 21.8 | 4.8 | | 8.4 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4 | 08:16 | Surface | 1 | 29.4 | 7.8 | 21.4 | 4.9 | 4.9 | 6.8 | 10.3 | 7.3 | 7.3 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4 | 08:16 | Surface | 2 | 29.2 | 7.8 | 21.6 | 4.9 | | 7.2 | | 8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4 | 08:16 | Bottom | 1 | 29.4 | 7.8 | 21.8 | 4.8 | 4.8 | 12.7 | | 7 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | SR4 | 08:16 | Bottom | 2 | 29.2 | 7.8 | 22.1 | 4.8 | | 14.5 | | 6.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS8 | 08:28 | Surface | 1 | 29.4 | 7.8 | 22.0 | 4.7 | 4.7 | 10.8 | 14.0 | 7.7 | 8.6 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS8 | 08:28 | Surface | 2 | 29.2 | 7.8 | 22.2 | 4.7 | | 11.6 | | 6.5 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS8 | 08:28 | Bottom | 1 | 29.4 | 7.8 | 22.5 | 4.7 | 4.7 | 16.2 | | 9.9 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS8 | 08:28 | Bottom | 2 | 29.2 | 7.8 | 22.7 | 4.7 | | 17.4 | | 10.2 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)9 | 08:37 | Surface | 1 | 29.3 | 7.8 | 22.4 | 4.9 | 4.9 | 6.2 | 7.9 | 6 | 7.0 |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)9 | 08:37 | Surface | 2 | 29.1 | 7.8 | 22.6 | 4.9 | | 6.5 | | 6.1 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)9 | 08:37 | Bottom | 1 | 29.3 | 7.8 | 23.2 | 4.7 | 4.7 | 9.2 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-09-22 | Mid-Flood | IS(Mf)9 | 08:37 | Bottom | 2 | 29.2 | 7.8 | 23.4 | 4.7 | | 9.8 | | 7.9 | |

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

***CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, IS(MF)9, SR4, SR4A AND IS8 ON 22 SEPTEMBER 2017***

Photo 1 - Mid-Ebb at CS(Mf)5 on 22 September 2017

Photo 2 - Mid-Ebb at CS(Mf)3(N) on 22 September 2017

Photo 3 - Mid-Ebb at IS(Mf)16 on 22 September 2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, IS(MF)9, SR4, SR4A AND IS8 ON 22 SEPTEMBER 2017*

Photo 4 - Mid-Ebb at SR4a on 22 September 2017

Photo 5 - Mid-Ebb at SR4 on 22 September 2017

Photo 6 - Mid-Flood at CS(Mf)5 on 22 September 2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, IS(MF)9, SR4, SR4A AND IS8 ON 22 SEPTEMBER 2017*

Photo 7 - Mid-Flood at CS(Mf)3(N) on 22 September 2017

Photo 8 - Mid-Flood at IS(Mf)16 on 22 September 2017

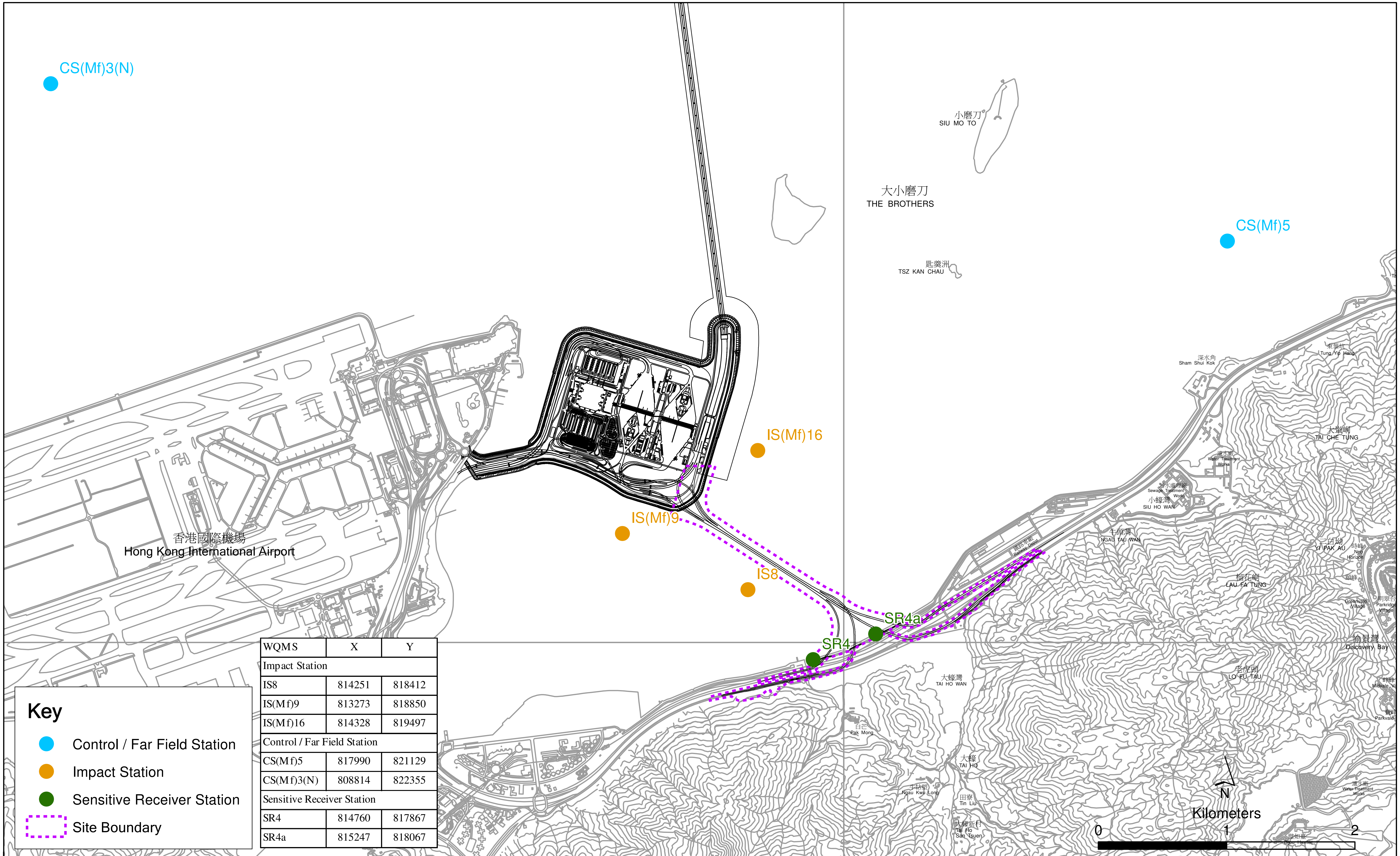
Photo 9 - Mid-Flood at SR4a on 22 September 2017

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5, CS(MF)3(N), IS(MF)16, IS(MF)9, SR4, SR4A AND IS8 ON 22 SEPTEMBER 2017*

Photo 10 - Mid-Flood at SR4 on 22 September 2017

Photo 11 - Mid-Flood at IS8 on 22 September 2017

Photo 12 - Mid-Flood at IS(Mf)9 on 22 September 2017




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 12 October 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_25 September 2017_ Depth-averaged SS_F_Station IS8**

A total of one exceedance was recorded on 25 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

**Notification of Exceedance**

| | | |
|---|---|---|
| **Log No.** | **Action Level Exceedance**<br>**0215660_25 September 2017_ Depth-averaged SS_F_Station IS8**<br><br>**[Total No. of Exceedances = 1]** | |
| **Date** | 25 September 2017 (Measured)<br>26 September 2017 (*In situ* results received by ERM)<br>30 September 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Depth-averaged Suspended Solids (SS) | |
| **Action Levels for SS** | SS | 120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L). |
| **Limit Levels for SS** | SS | 130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L) |
| **Measured Levels** | Action Level Exceedance<br>1. Mid-flood at IS8 (Depth-averaged SS = 23.7mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 25 September 2017. | |
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedance of depth-averaged SS is unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 25 September 2017.<br>• Apart from IS8, depth-averaged SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day. Depth-averaged SS levels at IS8 at mid-ebb tides were similar to those at other stations apart from the marginal exceedance observed at mid-flood tide.<br>• Depth-averaged Turbidity levels and average DO levels at all stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. | |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. | |
| **Remarks** | The monitoring results on 25 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 25 September 2017 is attached. | |

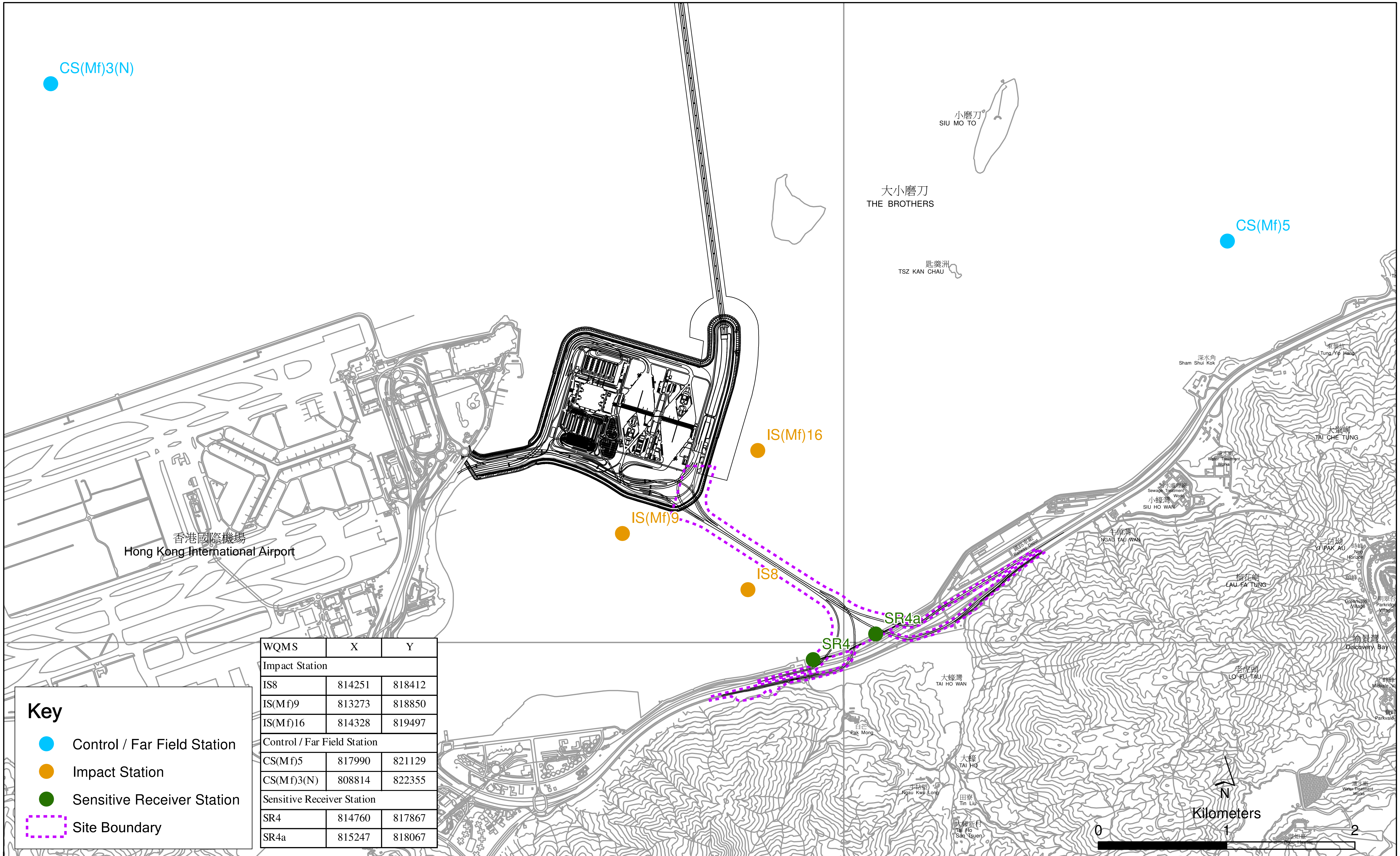
| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)5 | 15:58 | Surface | 1 | 29.9 | 7.9 | 23.6 | 5.7 | 5.3 | 4.1 | 3.7 | 5.4 | 7.2 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)5 | 15:58 | Surface | 2 | 29.7 | 7.9 | 23.8 | 5.6 | | 3.9 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)5 | 15:58 | Middle | 1 | 29.2 | 7.9 | 25.4 | 4.9 | | 2.3 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)5 | 15:58 | Middle | 2 | 29.1 | 7.9 | 25.6 | 4.8 | | 3.3 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)5 | 15:58 | Bottom | 1 | 29.2 | 7.9 | 26.5 | 4.7 | 4.7 | 4.3 | | 10.6 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)5 | 15:58 | Bottom | 2 | 29.0 | 7.9 | 26.7 | 4.7 | | 4.4 | | 8.9 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)3(N) | 14:35 | Surface | 1 | 29.7 | 7.8 | 20.9 | 5.0 | 5.2 | 6.3 | 8.0 | 3.7 | 9.5 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)3(N) | 14:35 | Surface | 2 | 29.5 | 7.9 | 20.8 | 5.1 | | 5.9 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)3(N) | 14:35 | Middle | 1 | 29.6 | 7.9 | 22.5 | 5.2 | | 7.5 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)3(N) | 14:35 | Middle | 2 | 29.3 | 8.0 | 22.5 | 5.3 | | 6.1 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)3(N) | 14:35 | Bottom | 1 | 29.4 | 7.9 | 24.1 | 5.2 | 5.3 | 12.0 | | 15.1 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | CS(Mf)3(N) | 14:35 | Bottom | 2 | 29.2 | 8.0 | 24.1 | 5.3 | | 10.1 | | 13.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)16 | 15:31 | Surface | 1 | 29.7 | 7.9 | 23.5 | 5.5 | 5.5 | 6.8 | 6.3 | 7.0 | 7.6 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)16 | 15:31 | Surface | 2 | 29.5 | 7.9 | 23.8 | 5.4 | | 7.0 | | 6.9 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)16 | 15:31 | Bottom | 1 | 29.2 | 7.9 | 24.6 | 4.9 | 4.9 | 6.3 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)16 | 15:31 | Bottom | 2 | 29.1 | 7.9 | 24.8 | 4.9 | | 5.2 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4a | 15:18 | Surface | 1 | 29.5 | 7.9 | 23.7 | 5.1 | 5.1 | 8.3 | 10.8 | 13.2 | 13.4 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4a | 15:18 | Surface | 2 | 29.3 | 7.9 | 24.0 | 5.1 | | 10.1 | | 14.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4a | 15:18 | Bottom | 1 | 29.5 | 7.9 | 23.8 | 5.0 | 5.0 | 11.9 | | 12.7 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4a | 15:18 | Bottom | 2 | 29.3 | 7.9 | 24.0 | 5.0 | | 12.8 | | 13.5 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4 | 15:13 | Surface | 1 | 29.7 | 7.9 | 23.5 | 5.3 | 5.3 | 5.7 | 8.6 | 13.7 | 15.2 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4 | 15:13 | Surface | 2 | 29.5 | 7.9 | 23.7 | 5.2 | | 6.2 | | 15.0 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4 | 15:13 | Bottom | 1 | 29.4 | 7.8 | 23.8 | 4.8 | 4.8 | 10.5 | | 16.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | SR4 | 15:13 | Bottom | 2 | 29.3 | 7.8 | 24.1 | 4.8 | | 12.1 | | 15.9 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS8 | 15:05 | Surface | 1 | 29.7 | 7.9 | 23.5 | 5.6 | 5.6 | 6.9 | 8.3 | 10.7 | 13.0 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS8 | 15:05 | Surface | 2 | 29.5 | 7.9 | 23.7 | 5.5 | | 8.3 | | 11.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS8 | 15:05 | Bottom | 1 | 29.6 | 7.9 | 23.6 | 5.5 | 5.5 | 8.7 | | 15.0 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS8 | 15:05 | Bottom | 2 | 29.5 | 7.9 | 23.8 | 5.5 | | 9.2 | | 14.7 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)9 | 14:56 | Surface | 1 | 29.8 | 7.9 | 23.6 | 5.8 | 5.8 | 4.3 | 6.4 | 12.6 | 12.2 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)9 | 14:56 | Surface | 2 | 29.6 | 7.9 | 23.8 | 5.7 | | 5.0 | | 12.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)9 | 14:56 | Bottom | 1 | 29.7 | 7.9 | 23.6 | 5.6 | 5.6 | 7.6 | | 11.0 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Ebb | IS(Mf)9 | 14:56 | Bottom | 2 | 29.5 | 7.9 | 23.9 | 5.6 | | 8.6 | | 12.9 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)5 | 09:35 | Surface | 1 | 29.4 | 7.9 | 23.2 | 5.5 | 5.2 | 4.6 | 6.8 | 11.4 | 13.7 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)5 | 09:35 | Surface | 2 | 29.2 | 7.9 | 23.4 | 5.4 | | 4.4 | | 10.7 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)5 | 09:35 | Middle | 1 | 29.2 | 7.9 | 24.2 | 5.0 | | 5.5 | | 13.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)5 | 09:35 | Middle | 2 | 29.0 | 7.9 | 24.5 | 5.0 | | 5.3 | | 12.1 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)5 | 09:35 | Bottom | 1 | 29.2 | 7.9 | 24.9 | 4.8 | 4.8 | 10.9 | | 17.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)5 | 09:35 | Bottom | 2 | 29.0 | 7.9 | 25.2 | 4.8 | | 10.3 | | 17.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)3(N) | 10:51 | Surface | 1 | 29.9 | 7.8 | 19.0 | 5.2 | 5.1 | 6.4 | 7.3 | 3.7 | 9.5 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)3(N) | 10:51 | Surface | 2 | 29.7 | 7.9 | 19.0 | 5.3 | | 6.1 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)3(N) | 10:51 | Middle | 1 | 29.6 | 7.8 | 19.9 | 4.9 | | 6.6 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)3(N) | 10:51 | Middle | 2 | 29.3 | 7.8 | 19.9 | 5.0 | | 5.7 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)3(N) | 10:51 | Bottom | 1 | 29.5 | 7.8 | 21.4 | 4.8 | 4.9 | 10.0 | | 15.1 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | CS(Mf)3(N) | 10:51 | Bottom | 2 | 29.3 | 7.9 | 21.3 | 4.9 | | 9.1 | | 13.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)16 | 10:04 | Surface | 1 | 29.4 | 7.9 | 23.3 | 5.4 | 5.4 | 5.1 | 5.5 | 6.0 | 6.3 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)16 | 10:04 | Surface | 2 | 29.2 | 7.9 | 23.5 | 5.4 | | 5.0 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)16 | 10:04 | Bottom | 1 | 29.2 | 7.9 | 23.7 | 5.2 | 5.2 | 5.9 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)16 | 10:04 | Bottom | 2 | 29.1 | 7.9 | 24.0 | 5.2 | | 5.9 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4a | 10:14 | Surface | 1 | 29.4 | 7.9 | 23.3 | 5.2 | 5.2 | 11.8 | 12.0 | 14.6 | 14.2 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4a | 10:14 | Surface | 2 | 29.2 | 7.9 | 23.5 | 5.2 | | 11.6 | | 14.0 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4a | 10:14 | Bottom | 1 | 29.4 | 7.9 | 23.3 | 5.2 | 5.2 | 12.5 | | 14.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4a | 10:14 | Bottom | 2 | 29.2 | 7.9 | 23.6 | 5.2 | | 12.1 | | 13.9 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4 | 10:19 | Surface | 1 | 29.4 | 7.9 | 23.7 | 5.1 | 5.1 | 15.3 | 15.0 | 21.0 | 21.5 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4 | 10:19 | Surface | 2 | 29.2 | 7.9 | 23.9 | 5.0 | | 15.8 | | 21.6 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4 | 10:19 | Bottom | 1 | 29.4 | 7.9 | 23.9 | 5.0 | 5.0 | 14.2 | | 21.8 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | SR4 | 10:19 | Bottom | 2 | 29.2 | 7.9 | 24.1 | 5.0 | | 14.6 | | 21.5 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS8 | 10:31 | Surface | 1 | 29.3 | 7.9 | 23.9 | 5.0 | 5.0 | 21.8 | 24.0 | 20.9 | 23.7 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS8 | 10:31 | Surface | 2 | 29.1 | 7.9 | 24.1 | 5.0 | | 22.2 | | 20.1 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS8 | 10:31 | Bottom | 1 | 29.3 | 7.9 | 23.9 | 5.0 | | 26.0 | | 26.4 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS8 | 10:31 | Bottom | 2 | 29.1 | 7.9 | 24.2 | 5.0 | | 26.0 | | 27.5 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)9 | 10:38 | Surface | 1 | 29.3 | 7.9 | 23.5 | 5.6 | 5.6 | 6.7 | 7.5 | 10.9 | 11.1 |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)9 | 10:38 | Surface | 2 | 29.1 | 7.9 | 23.7 | 5.6 | | 6.6 | | 11.7 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)9 | 10:38 | Bottom | 1 | 29.3 | 7.9 | 23.7 | 5.5 | | 8.3 | | 11.6 | |
| TMCLKL | HY/2012/07 | 2017-09-25 | Mid-Flood | IS(Mf)9 | 10:38 | Bottom | 2 | 29.1 | 7.9 | 23.9 | 5.5 | | 8.5 | | 10.1 | |

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

***CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT IS8 ON 25 SEPTEMBER 2017***

Photo 1 - Mid-Flood at IS8 on 25 September 2017




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 28 September 2017 |

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_27 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**

A total of one exceedance was recorded on 27 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br>0215660_27 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br><br>[Total No. of Exceedances = 1]</td></tr>
<tr><td>Date</td><td colspan="2">27 September 2017 (Measured)<br>28 September 2017 (In situ results received by ERM)<br>9 October 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-flood at CS(Mf)5 (Bottom-depth DO = 4.5mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 27 September 2017.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="2">The exceedance of bottom-depth DO is unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 27 September 2017.<br>• CS(Mf)5 is distant (>3km respectively) from the marine works area under this Contract, thus the observed exceedance should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.<br>• DO levels were generally lower at water quality monitoring stations due to two possible reasons of natural variation:<br>1. Natural ability for water to hold dissolved oxygen is reduced due to higher water temperature in summer months.<br>2. The higher Salinity recorded at the bottom level of the deeper CS(Mf)5 monitoring station was possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level as the DO exceedance recorded at the bottom level showed higher levels of Salinity than the middle and surface levels.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="2">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="2">The monitoring results on 27 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 27 September 2017 is attached.</td></tr>
</table>

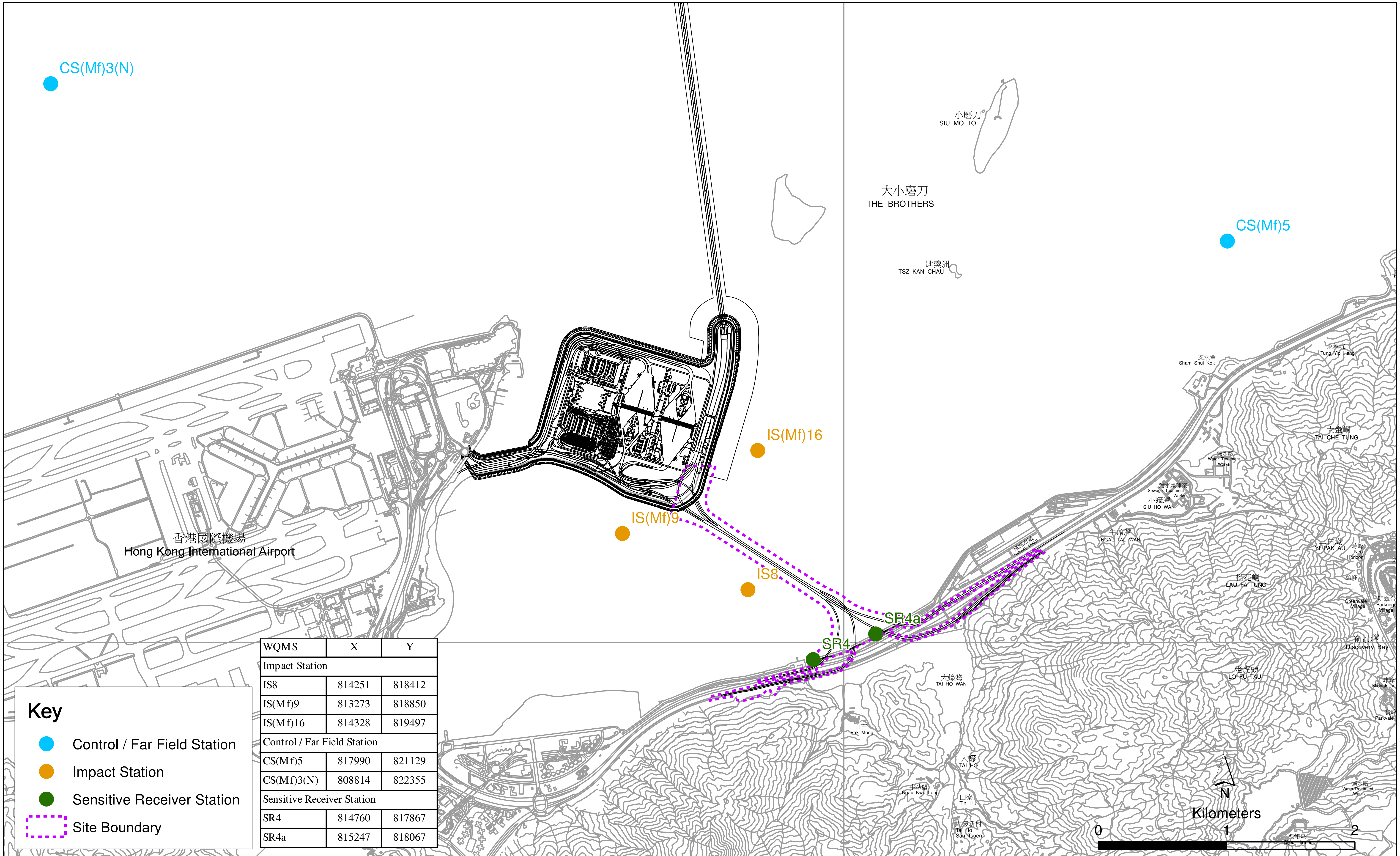
| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)5 | 17:46 | Surface | 1.0 | 30.9 | 7.9 | 18.0 | 6.2 | 5.6 | 3.4 | 2.9 | 3.0 | 2.8 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)5 | 17:46 | Surface | 2.0 | 30.8 | 7.9 | 18.2 | 6.1 | | 2.9 | | 2.8 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)5 | 17:46 | Middle | 1.0 | 30.0 | 7.9 | 22.9 | 5.0 | | 2.7 | | 3.1 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)5 | 17:46 | Middle | 2.0 | 29.8 | 7.9 | 23.1 | 5.0 | | 2.7 | | 2.4 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)5 | 17:46 | Bottom | 1 | 29.7 | 7.9 | 25.4 | 5.0 | 5.0 | 3.1 | | 2.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)5 | 17:46 | Bottom | 2 | 29.5 | 7.9 | 25.8 | 5.0 | | 2.6 | | 3.3 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)3(N) | 16:35 | Surface | 1.0 | 30.6 | 7.7 | 15.1 | 5.5 | 5.4 | 7.4 | 13.2 | 1.2 | 2.6 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)3(N) | 16:35 | Surface | 2.0 | 30.9 | 7.8 | 15.2 | 5.7 | | 6.9 | | 1.1 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)3(N) | 16:35 | Middle | 1.0 | 29.8 | 7.7 | 19.2 | 5.2 | | 11.8 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)3(N) | 16:35 | Middle | 2.0 | 30.1 | 7.9 | 19.0 | 5.3 | | 12.8 | | 2.1 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)3(N) | 16:35 | Bottom | 1 | 29.5 | 7.8 | 22.0 | 5.0 | 5.1 | 20.4 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | CS(Mf)3(N) | 16:35 | Bottom | 2 | 29.8 | 7.9 | 22.1 | 5.2 | | 19.7 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)16 | 17:20 | Surface | 1.0 | 31.1 | 7.9 | 19.1 | 6.4 | 6.4 | 5.4 | 7.8 | 3.5 | 2.9 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)16 | 17:20 | Surface | 2.0 | 30.9 | 7.9 | 19.3 | 6.3 | | 5.0 | | 3.4 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)16 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)16 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)16 | 17:20 | Bottom | 1 | 30.4 | 7.9 | 21.1 | 5.5 | 5.6 | 10.4 | | 2.1 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)16 | 17:20 | Bottom | 2 | 30.2 | 7.9 | 21.4 | 5.6 | | 10.4 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4a | 17:09 | Surface | 1.0 | 30.7 | 7.9 | 19.6 | 5.5 | 5.6 | 8.8 | 10.6 | 6.8 | 7.4 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4a | 17:09 | Surface | 2.0 | 30.5 | 7.9 | 19.8 | 5.6 | | 8.5 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4a | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4a | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4a | 17:09 | Bottom | 1 | 30.1 | 7.9 | 21.2 | 5.0 | 5.0 | 12.8 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4a | 17:09 | Bottom | 2 | 29.9 | 7.8 | 21.4 | 4.9 | | 12.3 | | 7.0 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4 | 17:05 | Surface | 1.0 | 30.6 | 7.9 | 20.2 | 5.8 | 5.8 | 8.1 | 8.5 | 4.5 | 4.5 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4 | 17:05 | Surface | 2.0 | 30.4 | 7.9 | 20.4 | 5.8 | | 7.8 | | 5.0 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4 | 17:05 | Bottom | 1 | 30.4 | 7.9 | 20.6 | 5.5 | 5.5 | 9.3 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | SR4 | 17:05 | Bottom | 2 | 30.2 | 7.9 | 20.8 | 5.5 | | 8.6 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS8 | 16:55 | Surface | 1.0 | 30.6 | 7.9 | 20.0 | 6.1 | 6.1 | 6.5 | 10.0 | 4.6 | 3.8 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS8 | 16:55 | Surface | 2.0 | 30.4 | 7.9 | 20.2 | 6.0 | | 6.2 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS8 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS8 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS8 | 16:55 | Bottom | 1 | 30.1 | 7.9 | 21.6 | 5.2 | 5.2 | 13.8 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS8 | 16:55 | Bottom | 2 | 29.9 | 7.8 | 21.8 | 5.2 | | 13.6 | | 3.3 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)9 | 16:46 | Surface | 1.0 | 30.9 | 7.9 | 20.7 | 6.4 | 6.4 | 7.4 | 8.3 | 3.2 | 5.0 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)9 | 16:46 | Surface | 2.0 | 30.8 | 7.9 | 20.1 | 6.4 | | 7.0 | | 4.9 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)9 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)9 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)9 | 16:46 | Bottom | 1 | 30.7 | 7.9 | 21.6 | 5.9 | 5.9 | 9.3 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Ebb | IS(Mf)9 | 16:46 | Bottom | 2 | 30.5 | 7.9 | 21.9 | 5.9 | | 9.6 | | 5.1 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)5 | 11:31 | Surface | 1.0 | 30.4 | 7.9 | 19.6 | 5.4 | 5.1 | 3.5 | 3.7 | 0.9 | 0.7 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)5 | 11:31 | Surface | 2.0 | 30.3 | 7.9 | 19.8 | 5.4 | | 3.0 | | 0.6 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)5 | 11:31 | Middle | 1.0 | 29.8 | 7.9 | 22.2 | 4.7 | | 3.6 | | 0.5 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)5 | 11:31 | Middle | 2.0 | 29.6 | 7.8 | 22.4 | 4.7 | | 3.1 | | 0.7 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)5 | 11:31 | Bottom | 1 | 29.5 | 7.9 | 25.0 | 4.5 | 4.5 | 4.6 | | <0.5 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)5 | 11:31 | Bottom | 2 | 29.3 | 7.9 | 25.2 | 4.5 | | 4.1 | | <0.5 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)3(N) | 13:02 | Surface | 1.0 | 30.8 | 7.6 | 12.0 | 5.8 | 5.5 | 6.6 | 11.6 | 2.7 | 3.8 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)3(N) | 13:02 | Surface | 2.0 | 30.8 | 7.6 | 12.0 | 5.8 | | 6.6 | | 2.4 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)3(N) | 13:02 | Middle | 1.0 | 29.9 | 7.7 | 17.6 | 5.1 | | 12.5 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)3(N) | 13:02 | Middle | 2.0 | 29.9 | 7.7 | 17.6 | 5.1 | | 12.5 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)3(N) | 13:02 | Bottom | 1 | 29.7 | 7.7 | 20.5 | 5.1 | 5.1 | 15.6 | | 5.7 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | CS(Mf)3(N) | 13:02 | Bottom | 2 | 29.7 | 7.7 | 20.5 | 5.1 | | 15.8 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)16 | 11:58 | Surface | 1.0 | 30.2 | 7.9 | 19.6 | 5.3 | 5.3 | 6.2 | 10.2 | 2.6 | 4.6 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)16 | 11:58 | Surface | 2.0 | 30.0 | 7.8 | 19.9 | 5.3 | | 5.9 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)16 | 11:58 | Middle | 1.0 | 30.0 | 7.9 | 20.3 | 5.2 | | 9.0 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)16 | 11:58 | Middle | 2.0 | 29.9 | 7.8 | 20.5 | 5.2 | | 9.0 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)16 | 11:58 | Bottom | 1 | 29.9 | 7.9 | 22.6 | 4.9 | 4.9 | 15.6 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)16 | 11:58 | Bottom | 2 | 29.7 | 7.8 | 22.8 | 4.9 | | 15.3 | | 6.9 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4a | 12:09 | Surface | 1.0 | 30.3 | 7.9 | 18.2 | 5.4 | 5.4 | 8.3 | 11.6 | 7.6 | 7.7 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4a | 12:09 | Surface | 2.0 | 30.1 | 7.8 | 18.4 | 5.4 | | 7.8 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4a | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4a | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4a | 12:09 | Bottom | 1 | 30.0 | 7.9 | 19.8 | 5.0 | 5.0 | 15.5 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4a | 12:09 | Bottom | 2 | 29.9 | 7.8 | 20.0 | 5.0 | | 14.9 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4 | 12:13 | Surface | 1.0 | 30.7 | 7.9 | 17.5 | 5.8 | 5.8 | 4.6 | 6.0 | 3.0 | 3.6 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4 | 12:13 | Surface | 2.0 | 30.5 | 7.8 | 17.6 | 5.8 | | 4.1 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4 | 12:13 | Bottom | 1 | 30.3 | 7.9 | 18.7 | 5.4 | 5.4 | 7.8 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | SR4 | 12:13 | Bottom | 2 | 30.1 | 7.8 | 18.9 | 5.4 | | 7.6 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS8 | 12:26 | Surface | 1.0 | 30.6 | 7.9 | 18.3 | 5.6 | 5.6 | 9.1 | 10.6 | 6.5 | 7.1 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS8 | 12:26 | Surface | 2.0 | 30.4 | 7.8 | 18.5 | 5.5 | | 8.5 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS8 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS8 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS8 | 12:26 | Bottom | 1 | 30.2 | 7.9 | 19.5 | 5.3 | 5.3 | 12.0 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS8 | 12:26 | Bottom | 2 | 30.0 | 7.8 | 19.7 | 5.3 | | 12.7 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)9 | 12:34 | Surface | 1.0 | 30.5 | 7.9 | 19.8 | 5.6 | 5.6 | 6.4 | 6.6 | 5.1 | 4.5 |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)9 | 12:34 | Surface | 2.0 | 30.3 | 7.9 | 20.0 | 5.6 | | 5.9 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)9 | | Middle | 1.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)9 | | Middle | 2.0 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)9 | 12:34 | Bottom | 1 | 30.4 | 7.9 | 20.4 | 5.6 | 5.6 | 7.4 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-27 | Mid-Flood | IS(Mf)9 | 12:34 | Bottom | 2 | 30.2 | 7.9 | 20.6 | 5.6 | | 6.7 | | 3.9 | |

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

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5 ON 27 SEPTEMBER 2017*

Photo 1 - Mid-Flood at CS(Mf)5 on 27 September 2017




## Key

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

| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 30 September 2017 |

ERM

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_29 September 2017_ Bottom-depth DO_E_Station IS8**
**0215660_29 September 2017_ Bottom-depth DO_E_Station IS(Mf)9**
**0215660_29 September 2017_ Bottom-depth DO_E_Station SR4a**
**0215660_29 September 2017_ Bottom-depth DO_E_Station SR4**
**0215660_29 September 2017_ Bottom-depth DO_F_Station CS(Mf)5**

A total of five exceedances were recorded on 29 September 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

**Notification of Exceedance**

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br><br>0215660_30 September 2017_ Bottom-depth DO_E_Station IS8<br>0215660_30 September 2017_ Bottom-depth DO_E_Station IS(Mf)9<br>0215660_30 September 2017_ Bottom-depth DO_E_Station SR4a<br>0215660_30 September 2017_ Bottom-depth DO_E_Station SR4<br>0215660_30 September 2017_ Bottom-depth DO_F_Station CS(Mf)5<br><br>[Total No. of Exceedances = 5]</td></tr>
<tr><td>Date</td><td colspan="2">29 September 2017 (Measured)<br>30 September 2017 (In situ results received by ERM)<br>11 October 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-ebb at IS8 (Bottom-depth DO = 4.5mg/L);<br>2. Mid-ebb at IS(Mf)9 (Bottom-depth DO = 4.6mg/L);<br>3. Mid-ebb at SR4a (Bottom-depth DO = 4.0mg/L);<br>4. Mid-ebb at SR4 (Bottom-depth DO = 4.6mg/L); and<br>5. Mid-flood at CS(Mf)5 (Bottom-depth DO = 4.5mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 29 September 2017.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="2">The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 29 September 2017.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)5 are distant (>3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="2">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="2">The monitoring results on 29 September 2017 and locations of water quality monitoring stations are attached. Site photo record on 29 September 2017 is attached.</td></tr>
</table>

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)5 | 06:43 | Surface | 1 | 30.1 | 7.8 | 19.5 | 5.9 | 5.5 | 1.8 | 1.7 | 1.2 | 1.5 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)5 | 06:43 | Surface | 2 | 29.8 | 7.9 | 19.8 | 5.8 | | 1.8 | | 1.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)5 | 06:43 | Middle | 1 | 30.2 | 7.8 | 22.1 | 5.1 | | 1.7 | | 1.5 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)5 | 06:43 | Middle | 2 | 29.9 | 7.9 | 22.4 | 5.0 | | 1.7 | | 1.8 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)5 | 06:43 | Bottom | 1 | 29.9 | 7.8 | 25.3 | 4.9 | 4.9 | 1.7 | | 1.4 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)5 | 06:43 | Bottom | 2 | 29.6 | 7.9 | 25.6 | 4.8 | | 1.7 | | 1.5 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)3(N) | 08:06 | Surface | 1 | 30.2 | 7.8 | 16.9 | 6.0 | 5.7 | 5.0 | 5.9 | 3.2 | 3.5 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)3(N) | 08:06 | Surface | 2 | 30.4 | 7.8 | 16.9 | 6.1 | | 5.5 | | 2.1 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)3(N) | 08:06 | Middle | 1 | 30.1 | 7.8 | 20.5 | 5.2 | | 4.7 | | 3.1 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)3(N) | 08:06 | Middle | 2 | 30.4 | 7.7 | 20.3 | 5.3 | | 4.7 | | 3.3 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)3(N) | 08:06 | Bottom | 1 | 29.4 | 7.8 | 25.4 | 4.6 | 4.7 | 7.6 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | CS(Mf)3(N) | 08:06 | Bottom | 2 | 29.7 | 7.8 | 25.5 | 4.8 | | 8.1 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)16 | 07:12 | Surface | 1 | 30.0 | 7.8 | 18.5 | 6.2 | 6.2 | 3.2 | 4.3 | 1.7 | 4.7 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)16 | 07:12 | Surface | 2 | 29.8 | 8.0 | 18.8 | 6.1 | | 2.8 | | 1.4 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)16 | 07:12 | Bottom | 1 | 29.9 | 7.8 | 23.2 | 4.8 | 4.8 | 5.8 | | 8.0 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)16 | 07:12 | Bottom | 2 | 29.6 | 7.9 | 24.0 | 4.8 | | 5.2 | | 7.7 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4a | 07:24 | Surface | 1 | 30.6 | 7.8 | 20.1 | 6.0 | 6.0 | 4.1 | 5.2 | 2.1 | 3.6 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4a | 07:24 | Surface | 2 | 30.3 | 7.9 | 20.4 | 5.9 | | 3.7 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4a | 07:24 | Bottom | 1 | 29.9 | 7.7 | 23.0 | 4.0 | 4.0 | 6.6 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4a | 07:24 | Bottom | 2 | 29.6 | 7.8 | 23.3 | 4.0 | | 6.3 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4 | 07:28 | Surface | 1 | 30.3 | 7.7 | 20.7 | 5.1 | 5.1 | 6.2 | 9.5 | 4.5 | 3.7 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4 | 07:28 | Surface | 2 | 30.0 | 7.9 | 21.0 | 5.1 | | 5.9 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4 | 07:28 | Bottom | 1 | 30.1 | 7.7 | 22.1 | 4.6 | 4.6 | 12.5 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | SR4 | 07:28 | Bottom | 2 | 29.8 | 7.8 | 22.4 | 4.5 | | 13.5 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS8 | 07:41 | Surface | 1 | 30.5 | 7.9 | 18.7 | 7.1 | 7.1 | 2.8 | 5.6 | 2.1 | 2.8 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS8 | 07:41 | Surface | 2 | 30.2 | 8.0 | 18.9 | 7.0 | | 2.3 | | 2.2 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS8 | 07:41 | Bottom | 1 | 30.2 | 7.7 | 22.1 | 4.4 | 4.5 | 8.7 | | 4.1 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS8 | 07:41 | Bottom | 2 | 30.0 | 7.8 | 22.3 | 4.5 | | 8.4 | | 2.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)9 | 07:51 | Surface | 1 | 30.2 | 7.9 | 18.4 | 6.9 | 6.9 | 2.9 | 6.0 | 2.3 | 3.8 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)9 | 07:51 | Surface | 2 | 29.9 | 8.1 | 18.6 | 6.8 | | 2.6 | | 2.5 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)9 | 07:51 | Bottom | 1 | 30.2 | 7.7 | 21.3 | 4.5 | 4.6 | 9.3 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Ebb | IS(Mf)9 | 07:51 | Bottom | 2 | 30.0 | 7.8 | 21.4 | 4.7 | | 9.0 | | 4.7 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^oC$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)5 | 16:37 | Surface | 1 | 30.0 | 8.0 | 24.0 | 5.6 | 5.5 | 1.9 | 3.5 | 2.1 | 3.3 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)5 | 16:37 | Surface | 2 | 30.2 | 7.9 | 23.7 | 5.7 | | 1.8 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)5 | 16:37 | Middle | 1 | 29.6 | 8.0 | 27.4 | 5.3 | | 2.2 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)5 | 16:37 | Middle | 2 | 29.9 | 7.9 | 27.1 | 5.4 | | 2.1 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)5 | 16:37 | Bottom | 1 | 29.1 | 8.0 | 30.0 | 4.5 | 4.5 | 6.4 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)5 | 16:37 | Bottom | 2 | 29.4 | 7.9 | 29.7 | 4.5 | | 6.5 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)3(N) | 15:00 | Surface | 1 | 31.1 | 7.8 | 15.2 | 6.2 | 5.7 | 6.6 | 8.6 | 4.6 | 5.1 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)3(N) | 15:00 | Surface | 2 | 31.4 | 7.8 | 15.2 | 6.3 | | 6.8 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)3(N) | 15:00 | Middle | 1 | 30.3 | 7.7 | 19.7 | 5.1 | | 10.4 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)3(N) | 15:00 | Middle | 2 | 30.5 | 7.7 | 19.8 | 5.2 | | 11.1 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)3(N) | 15:00 | Bottom | 1 | 30.0 | 7.7 | 21.6 | 4.9 | 5.0 | 8.5 | | 6.1 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | CS(Mf)3(N) | 15:00 | Bottom | 2 | 30.2 | 7.7 | 21.6 | 5.1 | | 8.4 | | 4.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)16 | 15:56 | Surface | 1 | 30.9 | 8.2 | 19.9 | 9.4 | 9.4 | 2.7 | 7.3 | 3.7 | 3.8 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)16 | 15:56 | Surface | 2 | 31.2 | 8.1 | 19.7 | 9.3 | | 2.7 | | 3.0 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)16 | 15:56 | Bottom | 1 | 30.0 | 7.8 | 22.6 | 5.5 | 5.5 | 11.8 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)16 | 15:56 | Bottom | 2 | 30.2 | 7.8 | 22.4 | 5.5 | | 11.8 | | 4.1 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4a | 15:41 | Surface | 1 | 30.3 | 7.9 | 21.4 | 6.4 | 6.4 | 5.6 | 5.3 | 5.1 | 4.9 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4a | 15:41 | Surface | 2 | 30.6 | 7.9 | 21.2 | 6.4 | | 6.4 | | 4.9 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4a | 15:41 | Bottom | 1 | 30.1 | 7.9 | 22.3 | 5.5 | 5.5 | 4.4 | | 4.3 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4a | 15:41 | Bottom | 2 | 30.3 | 7.8 | 22.1 | 5.5 | | 4.9 | | 5.1 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4 | 15:37 | Surface | 1 | 30.7 | 8.0 | 20.9 | 6.8 | 7.0 | 14.3 | 14.2 | 13.6 | 13.1 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4 | 15:37 | Surface | 2 | 31.0 | 7.9 | 20.6 | 7.1 | | 15.1 | | 12.8 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4 | 15:37 | Bottom | 1 | 30.0 | 7.8 | 22.5 | 4.9 | 5.0 | 13.8 | | 12.8 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | SR4 | 15:37 | Bottom | 2 | 30.3 | 7.8 | 22.1 | 5.0 | | 13.6 | | 13.3 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS8 | 15:25 | Surface | 1 | 30.7 | 8.0 | 20.9 | 7.3 | 7.4 | 10.2 | 14.2 | 8.3 | 8.3 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS8 | 15:25 | Surface | 2 | 31.0 | 8.0 | 20.7 | 7.5 | | 11.6 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS8 | 15:25 | Bottom | 1 | 30.2 | 7.9 | 21.8 | 5.9 | 5.9 | 18.9 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS8 | 15:25 | Bottom | 2 | 30.5 | 7.8 | 21.6 | 5.9 | | 16.0 | | 9.0 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)9 | 15:13 | Surface | 1 | 31.2 | 8.3 | 20.0 | 11.8 | 11.8 | 7.7 | 9.5 | 6.9 | 7.8 |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)9 | 15:13 | Surface | 2 | 31.4 | 8.3 | 19.8 | 11.7 | | 9.0 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)9 | 15:13 | Bottom | 1 | 31.2 | 8.2 | 20.5 | 9.2 | 9.3 | 10.1 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-09-29 | Mid-Flood | IS(Mf)9 | 15:13 | Bottom | 2 | 31.5 | 8.2 | 20.3 | 9.4 | | 11.2 | | 8.6 | |

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

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT IS8, IS(MF)9, SR4A, SR4 AND CS(MF)5 ON 29 SEPTEMBER 2017*

Photo 1 - Mid-Ebb at IS8 on 29 September 2017

Photo 2 - Mid-Ebb at IS(Mf)9 on 29 September 2017

Photo 3 - Mid-Ebb at SR4a on 29 September 2017

Photo 4 - Mid-Ebb at SR4 on 29 September 2017

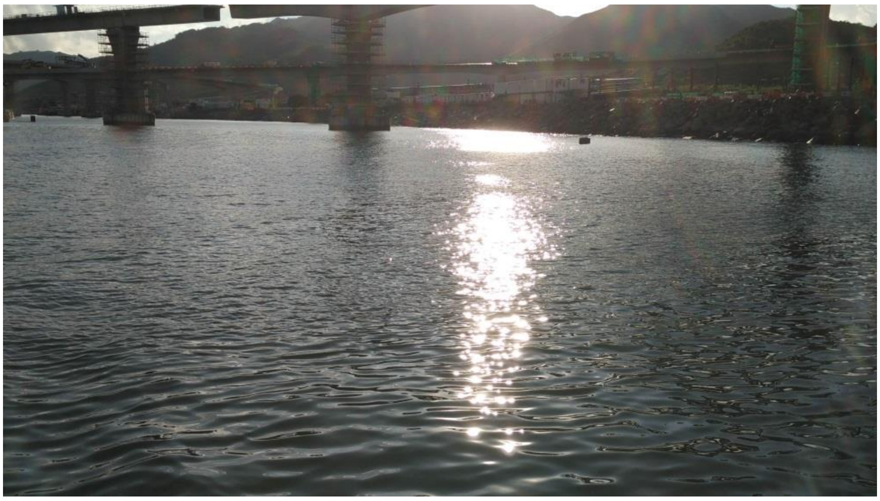
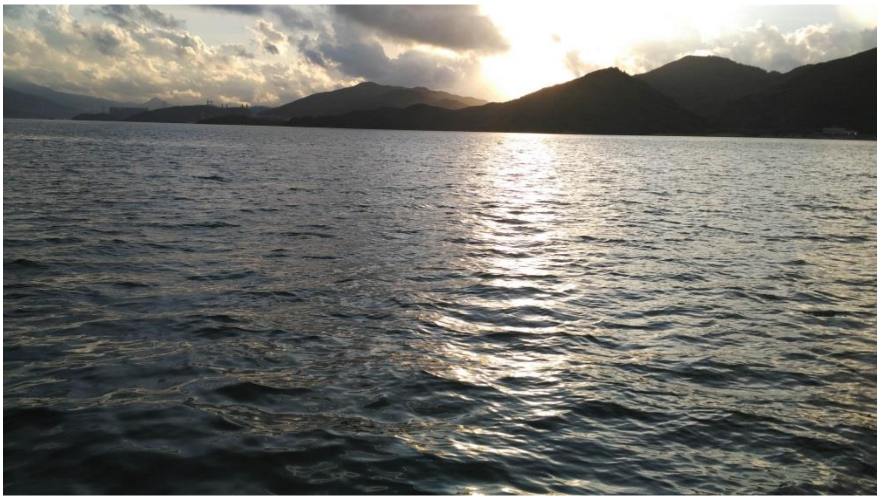
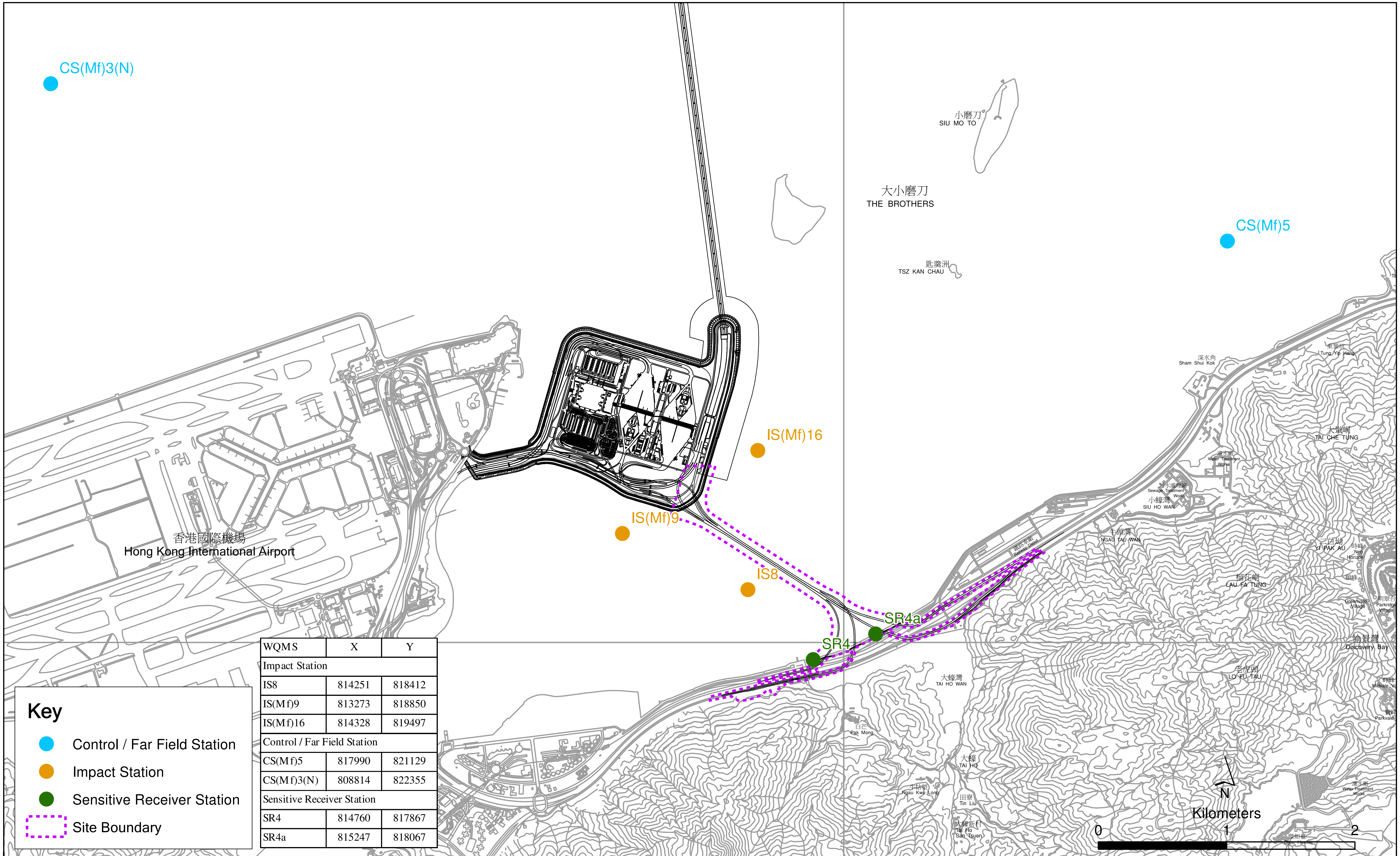


Photo 5 - Mid-Flood at CS(Mf)5 on 29 September 2017






| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

Environmental Resources Management

ERM

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 2 October 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_2 October 2017_ Bottom-depth DO_E_Station CS(Mf)5**
**0215660_2 October 2017_ Bottom-depth DO_F_Station CS(Mf)5**

A total of two exceedances were recorded on 2 October 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

ERM-Hong Kong, Limited

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br><br>0215660_2 October 2017_ Bottom-depth DO_E_Station CS(Mf)5<br>0215660_2 October 2017_ Bottom-depth DO_F_Station CS(Mf)5<br><br>[Total No. of Exceedances = 2]</td></tr>
<tr><td>Date</td><td colspan="2">2 October 2017 (Measured)<br>2 October 2017 (In situ results received by ERM)<br>12 October 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td>Action Levels for DO</td><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td>Limit Levels for DO</td><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-ebb at CS(Mf)5 (Bottom-depth DO = 4.5mg/L);<br>2. Mid-flood at CS(Mf)5 (Bottom-depth DO = 4.5mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 2 October 2017.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="2">The exceedances of bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 2 October 2017.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)5 are distant (>3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="2">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="2">The monitoring results on 2 October 2017 and locations of water quality monitoring stations are attached. Site photo record on 2 October 2017 is attached.</td></tr>
</table>

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)5 | 9:56 | Surface | 1 | 29.9 | 8.0 | 23.5 | 6.0 | 5.3 | 3.8 | 4.7 | 6.0 | 6.3 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)5 | 9:56 | Surface | 2 | 29.6 | 8.0 | 23.7 | 5.9 | | 3.8 | | 4.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)5 | 9:56 | Middle | 1 | 29.5 | 7.9 | 27.6 | 4.7 | | 4.5 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)5 | 9:56 | Middle | 2 | 29.3 | 8.0 | 27.9 | 4.7 | | 3.6 | | 5.3 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)5 | 9:56 | Bottom | 1 | 29.4 | 7.9 | 28.5 | 4.5 | 4.5 | 6.7 | | 8.4 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)5 | 9:56 | Bottom | 2 | 29.1 | 8.0 | 28.8 | 4.5 | | 5.9 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)3(N) | 11:07 | Surface | 1 | 30.3 | 7.9 | 20.2 | 6.1 | 5.6 | 2.8 | 5.7 | 3.6 | 4.8 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)3(N) | 11:07 | Surface | 2 | 30.1 | 7.9 | 20.1 | 6.0 | | 2.5 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)3(N) | 11:07 | Middle | 1 | 29.9 | 7.9 | 23.7 | 5.2 | | 6.1 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)3(N) | 11:07 | Middle | 2 | 29.7 | 7.9 | 23.5 | 5.1 | | 6.0 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)3(N) | 11:07 | Bottom | 1 | 29.8 | 7.9 | 24.6 | 5.2 | 5.2 | 8.9 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | CS(Mf)3(N) | 11:07 | Bottom | 2 | 29.5 | 7.9 | 24.4 | 5.1 | | 7.9 | | 6.3 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)16 | 10:35 | Surface | 1 | 30.0 | 8.2 | 23.4 | 8.5 | 8.5 | 6.0 | 4.7 | 7.4 | 7.9 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)16 | 10:35 | Surface | 2 | 29.7 | 8.2 | 23.7 | 8.4 | | 5.1 | | 8.0 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)16 | 10:35 | Bottom | 1 | 29.6 | 7.9 | 26.7 | 5.1 | 5.2 | 3.8 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)16 | 10:35 | Bottom | 2 | 29.3 | 8.0 | 27.0 | 5.2 | | 3.7 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4a | 10:45 | Surface | 1 | 29.8 | 8.1 | 23.2 | 7.2 | 7.2 | 6.3 | 6.2 | 8.3 | 10.0 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4a | 10:45 | Surface | 2 | 29.6 | 8.1 | 23.5 | 7.2 | | 5.3 | | 9.1 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4a | 10:45 | Bottom | 1 | 29.8 | 8.1 | 23.3 | 7.0 | 7.0 | 6.9 | | 11.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4a | 10:45 | Bottom | 2 | 29.6 | 8.1 | 23.6 | 6.9 | | 6.1 | | 10.7 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4 | 10:50 | Surface | 1 | 29.9 | 8.0 | 23.0 | 6.9 | 6.9 | 6.2 | 9.2 | 8.9 | 8.5 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4 | 10:50 | Surface | 2 | 29.7 | 8.1 | 23.3 | 6.9 | | 5.7 | | 7.3 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4 | 10:50 | Bottom | 1 | 29.9 | 8.0 | 23.8 | 6.3 | 6.3 | 12.5 | | 9.5 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | SR4 | 10:50 | Bottom | 2 | 29.6 | 8.1 | 24.0 | 6.3 | | 12.5 | | 8.1 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS8 | 11:05 | Surface | 1 | 30.0 | 8.2 | 23.2 | 8.8 | 8.8 | 4.2 | 5.9 | 7.0 | 8.0 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS8 | 11:05 | Surface | 2 | 29.8 | 8.3 | 23.4 | 8.8 | | 4.3 | | 6.1 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS8 | 11:05 | Bottom | 1 | 29.9 | 8.1 | 23.7 | 7.1 | 7.2 | 7.5 | | 9.1 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS8 | 11:05 | Bottom | 2 | 29.6 | 8.2 | 24.0 | 7.2 | | 7.4 | | 9.7 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)9 | 11:16 | Surface | 1 | 30.0 | 8.3 | 23.2 | 9.1 | 9.1 | 4.9 | 5.1 | 6.4 | 6.0 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)9 | 11:16 | Surface | 2 | 29.8 | 8.3 | 23.4 | 9.1 | | 4.9 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)9 | 11:16 | Bottom | 1 | 29.9 | 8.1 | 23.5 | 7.9 | 7.9 | 5.6 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Ebb | IS(Mf)9 | 11:16 | Bottom | 2 | 29.6 | 8.2 | 23.8 | 7.8 | | 4.8 | | 5.8 | |

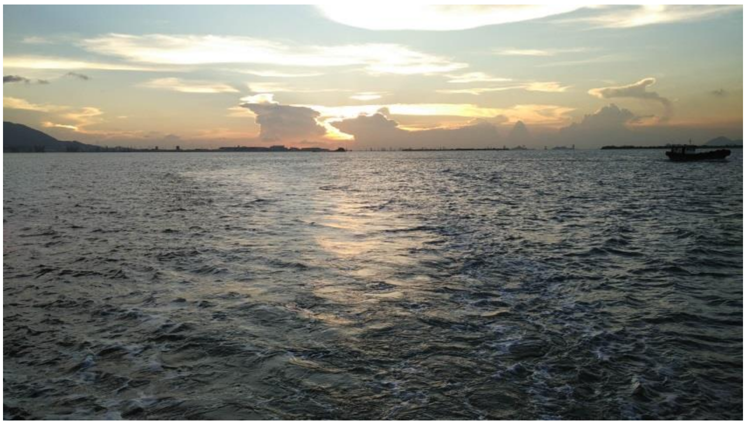
| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)5 | 18:00 | Surface | 1 | 30.0 | 8.0 | 24.8 | 6.1 | 5.5 | 3.2 | 6.4 | 6.1 | 6.2 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)5 | 18:00 | Surface | 2 | 29.7 | 8.0 | 25.0 | 6.0 | | 2.6 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)5 | 18:00 | Middle | 1 | 29.6 | 7.9 | 27.2 | 4.9 | | 5.6 | | 6.6 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)5 | 18:00 | Middle | 2 | 29.3 | 8.0 | 27.5 | 4.9 | | 5.3 | | 6.1 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)5 | 18:00 | Bottom | 1 | 29.5 | 7.9 | 28.0 | 4.5 | 4.5 | 10.9 | | 5.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)5 | 18:00 | Bottom | 2 | 29.2 | 8.0 | 28.3 | 4.5 | | 10.5 | | 6.0 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)3(N) | 16:23 | Surface | 1 | 30.7 | 7.7 | 17.6 | 5.8 | 5.7 | 5.0 | 5.0 | 2.3 | 3.1 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)3(N) | 16:23 | Surface | 2 | 30.4 | 7.7 | 17.4 | 5.7 | | 4.5 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)3(N) | 16:23 | Middle | 1 | 30.4 | 7.8 | 19.7 | 5.7 | | 5.2 | | 4.4 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)3(N) | 16:23 | Middle | 2 | 30.2 | 7.8 | 19.6 | 5.6 | | 4.8 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)3(N) | 16:23 | Bottom | 1 | 30.3 | 7.8 | 20.8 | 5.5 | 5.5 | 5.4 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | CS(Mf)3(N) | 16:23 | Bottom | 2 | 30.0 | 7.8 | 20.8 | 5.4 | | 5.0 | | 2.3 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)16 | 17:26 | Surface | 1 | 30.5 | 8.1 | 22.1 | 8.8 | 8.8 | 2.9 | 5.2 | 6.1 | 9.4 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)16 | 17:26 | Surface | 2 | 30.3 | 8.2 | 22.4 | 8.8 | | 2.4 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)16 | 17:26 | Bottom | 1 | 30.2 | 8.1 | 23.5 | 7.4 | 7.4 | 7.8 | | 13.7 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)16 | 17:26 | Bottom | 2 | 29.9 | 8.1 | 23.8 | 7.4 | | 7.5 | | 12.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4a | 17:11 | Surface | 1 | 30.6 | 8.1 | 22.2 | 8.0 | 8.1 | 6.4 | 7.2 | 5.6 | 7.4 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4a | 17:11 | Surface | 2 | 30.3 | 8.1 | 22.4 | 8.1 | | 5.9 | | 6.3 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4a | 17:11 | Bottom | 1 | 30.5 | 8.1 | 22.5 | 7.7 | 7.8 | 8.7 | | 8.6 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4a | 17:11 | Bottom | 2 | 30.2 | 8.1 | 22.7 | 7.8 | | 7.8 | | 8.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4 | 17:06 | Surface | 1 | 30.7 | 8.1 | 22.1 | 8.1 | 8.1 | 5.0 | 9.9 | 6.5 | 6.8 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4 | 17:06 | Surface | 2 | 30.4 | 8.1 | 22.3 | 8.1 | | 4.5 | | 6.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4 | 17:06 | Bottom | 1 | 30.3 | 8.0 | 23.8 | 7.0 | 7.0 | 15.4 | | 7.3 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | SR4 | 17:06 | Bottom | 2 | 30.0 | 8.1 | 24.0 | 7.0 | | 14.5 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS8 | 16:55 | Surface | 1 | 30.5 | 8.1 | 22.5 | 8.6 | 8.6 | 7.1 | 11.6 | 6.5 | 8.5 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS8 | 16:55 | Surface | 2 | 30.2 | 8.2 | 22.7 | 8.5 | | 6.2 | | 5.8 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS8 | 16:55 | Bottom | 1 | 30.1 | 8.1 | 24.0 | 7.2 | 7.2 | 16.9 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS8 | 16:55 | Bottom | 2 | 29.8 | 8.1 | 24.2 | 7.2 | | 16.1 | | 10.9 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)9 | 16:44 | Surface | 1 | 30.7 | 8.2 | 23.3 | 9.7 | 9.7 | 8.2 | 11.2 | 8.5 | 9.6 |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)9 | 16:44 | Surface | 2 | 30.4 | 8.3 | 23.5 | 9.6 | | 7.6 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)9 | 16:44 | Bottom | 1 | 30.4 | 8.2 | 23.9 | 8.6 | 8.6 | 14.5 | | 10.4 | |
| TMCLKL | HY/2012/07 | 2017-10-02 | Mid-Flood | IS(Mf)9 | 16:44 | Bottom | 2 | 30.1 | 8.2 | 24.1 | 8.5 | | 14.4 | | 11.1 | |

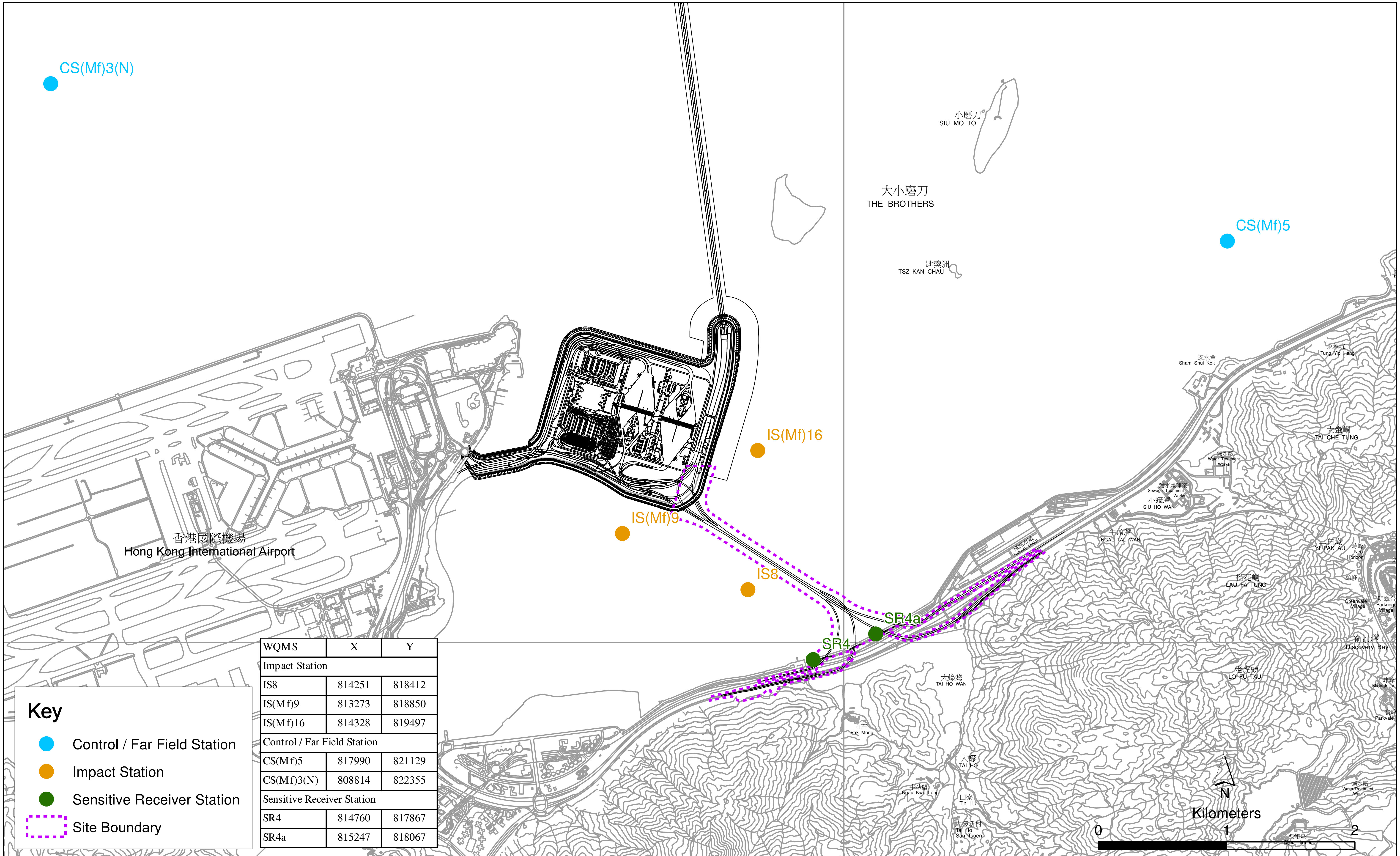
Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level

***CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5 ON 2 OCTOBER 2017***

Photo 1 - Mid-Ebb at CS(Mf)5 on 2 October 2017

Photo 2 - Mid-Flood at CS(Mf)5 on 2 October 2017






## Key

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

| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management
ERM

**Email**
**message**

**Environmental**
**Resources**
**Management**

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

| | |
|---|---|
| ***To*** | Ramboll Environ – Hong Kong, Limited (ENPO) |
| ***From*** | ERM- Hong Kong, Limited |
| ***Ref/Project number*** | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| ***Subject*** | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| ***Date*** | 6 October 2017 |

ERM

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_4 October 2017_Bottom-depth DO_E_Station CS(Mf)5**
**0215660_4 October 2017_Surface and Middle-depth DO_F_Station CS(Mf)5**
**0215660_4 October 2017_Bottom-depth DO_F_Station CS(Mf)5**

A total of three exceedances were recorded on 4 October 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

**Notification of Exceedance**

<table>
<tr><td>Log No.</td><td colspan="2"><u>Action Level Exceedance</u><br><br>0215660_4 October 2017_Bottom-depth DO_E_Station CS(Mf)5<br>0215660_4 October 2017_Surface and Middle-depth DO_F_Station CS(Mf)5<br>0215660_4 October 2017_Bottom-depth DO_F_Station CS(Mf)5<br><br>[Total No. of Exceedances = 3]</td></tr>
<tr><td>Date</td><td colspan="2">4 October 2017 (Measured)<br>5 October 2017 (In situ results received by ERM)<br>17 October 2017 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="2">CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Surface and Middle-depth DO, Bottom-depth Dissolved Oxygen (DO)</td></tr>
<tr><td rowspan="2">Action Levels for DO</td><td>Surface and Middle-depth DO</td><td>5.0 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>4.7 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels for DO</td><td>Surface and Middle-depth DO</td><td>4.2 mg/L</td></tr>
<tr><td>Bottom-depth DO</td><td>3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="2"><u>Action Level Exceedance</u><br>1. Mid-ebb at CS(Mf)5 (Bottom-depth DO = 4.3mg/L);<br>2. Mid-flood at CS(Mf)5 (Surface and Middle-depth DO = 4.9mg/L);<br>3. Mid-flood at CS(Mf)5 (Bottom-depth DO = 4.4mg/L).</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="2">No major marine works was undertaken under this Contract on 4 October 2017.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="2">The exceedances of surface and middle and bottom-depth DO are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 4 October 2017.<br>• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.<br>• CS(Mf)5 are distant (>3km respectively) from the marine works area under this Contract, thus the observed exceedances should not be affected by the marine works under this Contract and they are considered to be natural fluctuation in water quality.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="2">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="2">The monitoring results on 4 October 2017 and locations of water quality monitoring stations are attached. Site photo record on 4 October 2017 is attached.</td></tr>
</table>

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature (°C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)5 | 11:32 | Surface | 1 | 30.2 | 8.0 | 23.9 | 5.8 | 5.3 | 5.7 | 8.3 | 5.0 | 6.2 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)5 | 11:32 | Surface | 2 | 30.0 | 8.0 | 24.2 | 5.7 | | 4.6 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)5 | 11:32 | Middle | 1 | 29.9 | 8.0 | 25.7 | 4.8 | | 8.7 | | 4.8 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)5 | 11:32 | Middle | 2 | 29.6 | 8.0 | 26.0 | 4.8 | | 7.9 | | 5.0 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)5 | 11:32 | Bottom | 1 | 29.6 | 7.9 | 27.7 | 4.3 | 4.3 | 11.9 | | 9.0 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)5 | 11:32 | Bottom | 2 | 29.3 | 8.0 | 28.0 | 4.3 | | 10.8 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)3(N) | 13:03 | Surface | 1 | 30.3 | 7.8 | 21.5 | 5.8 | 5.9 | 7.8 | 14.4 | 2.6 | 4.1 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)3(N) | 13:03 | Surface | 2 | 30.1 | 7.9 | 21.6 | 6.1 | | 7.3 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)3(N) | 13:03 | Middle | 1 | 30.2 | 7.9 | 23.7 | 5.9 | | 13.5 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)3(N) | 13:03 | Middle | 2 | 30.0 | 7.9 | 22.3 | 5.9 | | 13.7 | | 4.1 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)3(N) | 13:03 | Bottom | 1 | 30.1 | 7.9 | 25.2 | 5.6 | 5.7 | 21.8 | | 5.1 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | CS(Mf)3(N) | 13:03 | Bottom | 2 | 29.8 | 7.9 | 25.3 | 5.8 | | 22.1 | | 4.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)16 | 12:05 | Surface | 1 | 30.2 | 8.0 | 23.7 | 6.4 | 6.4 | 7.4 | 9.6 | 7.9 | 7.7 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)16 | 12:05 | Surface | 2 | 29.9 | 8.1 | 24.0 | 6.4 | | 6.5 | | 6.7 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)16 | 12:05 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)16 | 12:05 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)16 | 12:05 | Bottom | 1 | 30.0 | 8.0 | 24.9 | 5.2 | 5.3 | 12.9 | | 7.7 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)16 | 12:05 | Bottom | 2 | 29.7 | 8.0 | 25.2 | 5.3 | | 11.5 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4a | 12:16 | Surface | 1 | 30.2 | 8.0 | 23.7 | 5.9 | 5.9 | 12.5 | 15.1 | 12.3 | 12.1 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4a | 12:16 | Surface | 2 | 29.9 | 8.0 | 24.0 | 5.9 | | 11.2 | | 12.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4a | 12:16 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4a | 12:16 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4a | 12:16 | Bottom | 1 | 30.2 | 8.0 | 23.9 | 5.8 | 5.8 | 18.5 | | 11.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4a | 12:16 | Bottom | 2 | 29.9 | 8.0 | 24.1 | 5.7 | | 18.2 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4 | 12:20 | Surface | 1 | 30.3 | 8.0 | 23.4 | 6.1 | 6.1 | 8.6 | 8.0 | 8.3 | 8.4 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4 | 12:20 | Surface | 2 | 30.0 | 8.0 | 23.6 | 6.1 | | 7.5 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4 | 12:20 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4 | 12:20 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4 | 12:20 | Bottom | 1 | 30.3 | 8.0 | 23.4 | 6.1 | 6.1 | 8.3 | | 8.0 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | SR4 | 12:20 | Bottom | 2 | 30.0 | 8.0 | 23.7 | 6.1 | | 7.4 | | 8.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS8 | 12:31 | Surface | 1 | 30.5 | 8.1 | 23.8 | 6.6 | 6.6 | 10.3 | 11.2 | 10.8 | 11.5 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS8 | 12:31 | Surface | 2 | 30.2 | 8.1 | 24.1 | 6.6 | | 8.9 | | 12.4 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS8 | 12:31 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS8 | 12:31 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS8 | 12:31 | Bottom | 1 | 30.4 | 8.0 | 23.8 | 6.3 | 6.3 | 13.4 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS8 | 12:31 | Bottom | 2 | 30.1 | 8.1 | 24.1 | 6.3 | | 12.1 | | 11.3 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)9 | 12:41 | Surface | 1 | 30.4 | 8.1 | 23.7 | 7.1 | 7.1 | 8.2 | 8.1 | 7.6 | 8.2 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)9 | 12:41 | Surface | 2 | 30.2 | 8.1 | 24.0 | 7.1 | | 7.0 | | 9.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)9 | 12:41 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)9 | 12:41 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)9 | 12:41 | Bottom | 1 | 30.4 | 8.1 | 23.7 | 6.9 | 6.9 | 9.3 | | 7.8 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Ebb | IS(Mf)9 | 12:41 | Bottom | 2 | 30.1 | 8.1 | 24.0 | 6.9 | | 7.8 | | 7.8 | |

| Project | Works | Date (yyyy-mm-dd | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}$C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)5 | 18:26 | Surface | 1 | 29.8 | 8.0 | 25.0 | 5.3 | 4.9 | 4.1 | 14.6 | 6.1 | 15.7 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)5 | 18:26 | Surface | 2 | 30.0 | 7.9 | 24.8 | 5.3 | | 4.1 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)5 | 18:26 | Middle | 1 | 29.4 | 8.0 | 27.6 | 4.4 | | 13.5 | | 10.2 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)5 | 18:26 | Middle | 2 | 29.7 | 7.9 | 27.3 | 4.5 | | 13.8 | | 9.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)5 | 18:26 | Bottom | 1 | 29.4 | 8.0 | 27.8 | 4.3 | 4.4 | 23.9 | | 30.4 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)5 | 18:26 | Bottom | 2 | 29.6 | 7.9 | 27.5 | 4.4 | | 28.4 | | 33.0 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)3(N) | 17:10 | Surface | 1 | 30.4 | 7.8 | 21.0 | 5.6 | 5.7 | 6.2 | 7.0 | 3.7 | 4.3 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)3(N) | 17:10 | Surface | 2 | 30.2 | 7.8 | 21.3 | 5.6 | | 6.0 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)3(N) | 17:10 | Middle | 1 | 30.4 | 7.8 | 21.0 | 5.8 | | 5.7 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)3(N) | 17:10 | Middle | 2 | 30.2 | 7.8 | 21.3 | 5.7 | | 6.0 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)3(N) | 17:10 | Bottom | 1 | 30.2 | 7.8 | 23.3 | 5.4 | 5.4 | 9.6 | | 5.6 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | CS(Mf)3(N) | 17:10 | Bottom | 2 | 30.0 | 7.8 | 23.5 | 5.3 | | 8.3 | | 4.7 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)16 | 17:53 | Surface | 1 | 29.9 | 8.0 | 24.0 | 5.8 | 5.8 | 5.7 | 7.0 | 5.9 | 6.4 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)16 | 17:53 | Surface | 2 | 30.1 | 8.0 | 23.7 | 5.8 | | 5.6 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)16 | 17:53 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)16 | 17:53 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)16 | 17:53 | Bottom | 1 | 29.8 | 8.0 | 24.6 | 5.6 | 5.6 | 8.6 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)16 | 17:53 | Bottom | 2 | 30.1 | 8.0 | 24.3 | 5.6 | | 8.2 | | 6.4 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4a | 17:41 | Surface | 1 | 29.9 | 8.0 | 24.0 | 5.8 | 5.8 | 7.4 | 9.0 | 7.8 | 7.8 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4a | 17:41 | Surface | 2 | 30.1 | 8.0 | 23.7 | 5.8 | | 8.8 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4a | 17:41 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4a | 17:41 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4a | 17:41 | Bottom | 1 | 29.8 | 8.0 | 24.5 | 5.6 | 5.6 | 9.6 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4a | 17:41 | Bottom | 2 | 30.1 | 8.0 | 24.3 | 5.6 | | 10.1 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4 | 17:36 | Surface | 1 | 29.9 | 8.0 | 24.1 | 5.8 | 5.8 | 7.9 | 8.3 | 8.0 | 8.4 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4 | 17:36 | Surface | 2 | 30.1 | 8.0 | 23.9 | 5.8 | | 7.7 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4 | 17:36 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4 | 17:36 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4 | 17:36 | Bottom | 1 | 29.8 | 8.0 | 24.6 | 5.7 | 5.7 | 8.9 | | 9.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | SR4 | 17:36 | Bottom | 2 | 30.1 | 8.0 | 24.3 | 5.7 | | 8.8 | | 8.6 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS8 | 17:28 | Surface | 1 | 29.8 | 8.0 | 24.2 | 5.9 | 5.9 | 10.6 | 11.6 | 9.6 | 9.7 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS8 | 17:28 | Surface | 2 | 30.1 | 8.0 | 23.9 | 5.9 | | 10.5 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS8 | 17:28 | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS8 | 17:28 | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS8 | 17:28 | Bottom | 1 | 29.8 | 8.0 | 24.3 | 5.8 | 5.9 | 12.4 | | 9.8 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS8 | 17:28 | Bottom | 2 | 30.1 | 8.0 | 24.1 | 5.9 | | 12.7 | | 10.9 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)9 | 17:19 | Surface | 1 | | | | | 6.7 | | 8.5 | | 8.0 |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)9 | 17:19 | Surface | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)9 | 17:19 | Middle | 1 | 30.0 | 8.1 | 24.2 | 6.6 | | 8.5 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)9 | 17:19 | Middle | 2 | 30.2 | 8.0 | 23.9 | 6.7 | | 8.5 | | 7.5 | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)9 | 17:19 | Bottom | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-10-04 | Mid-Flood | IS(Mf)9 | 17:19 | Bottom | 2 | | | | | | | | | |

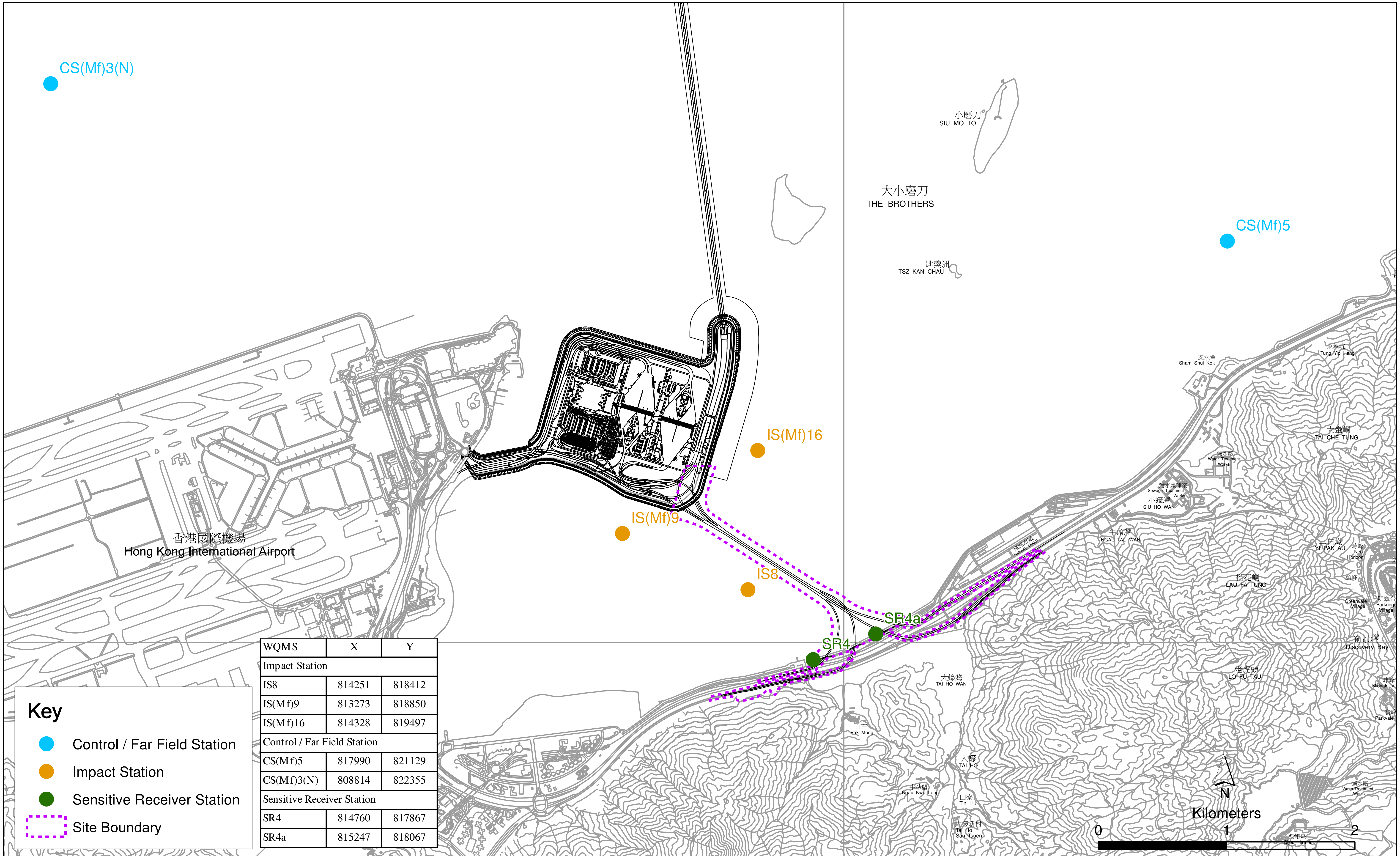
Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

*CONTRACT NO. HY/2012/07 – WQM SITE PHOTOS AT CS(MF)5 ON 4 OCTOBER 2017*

Photo 1 - Mid-Ebb at CS(Mf)5 on 4 October 2017

Photo 2 - Mid-Flood at CS(Mf)5 on 4 October 2017




## Key

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

| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

# Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 14 November 2017 |

ERM

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_6 November 2017_Depth-averaged SS_F_Station IS(Mf)9**

A total of one (1) exceedance was recorded on 14 November 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

| | | |
|---|---|---|
| **Log No.** | **Action Level Exceedance**<br>**0215660_6 November 2017_Depth-averaged SS_F_Station IS(Mf)9**<br><br>**[Total No. of Exceedances = 1]** | |
| **Date** | 6 November 2017 (Measured)<br>7 November 2017 (*In situ* results received by ERM)<br>14 November 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Depth-averaged Suspended Solids (SS) | |
| **Action Levels for SS** | SS | 120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L). |
| **Limit Levels for SS** | SS | 130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L) |
| **Measured Levels** | Action Level Exceedance<br>1. Mid-flood at IS(Mf)9 (Depth-averaged SS = 23.7mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 6 November 2017. | |
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedance of depth-averaged SS is unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 6 November 2017.<br>• Apart from IS(Mf)9, depth-averaged SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day. Depth-averaged SS levels at IS(Mf)9 at mid-ebb tides were similar to those at other stations apart from the marginal exceedance observed at mid-flood tide.<br>• Depth-averaged Turbidity levels and average DO levels at all stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. | |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. | |
| **Remarks** | The monitoring results on 6 November 2017 and locations of water quality monitoring stations are attached. Site photo record on 6 November 2017 is attached. | |

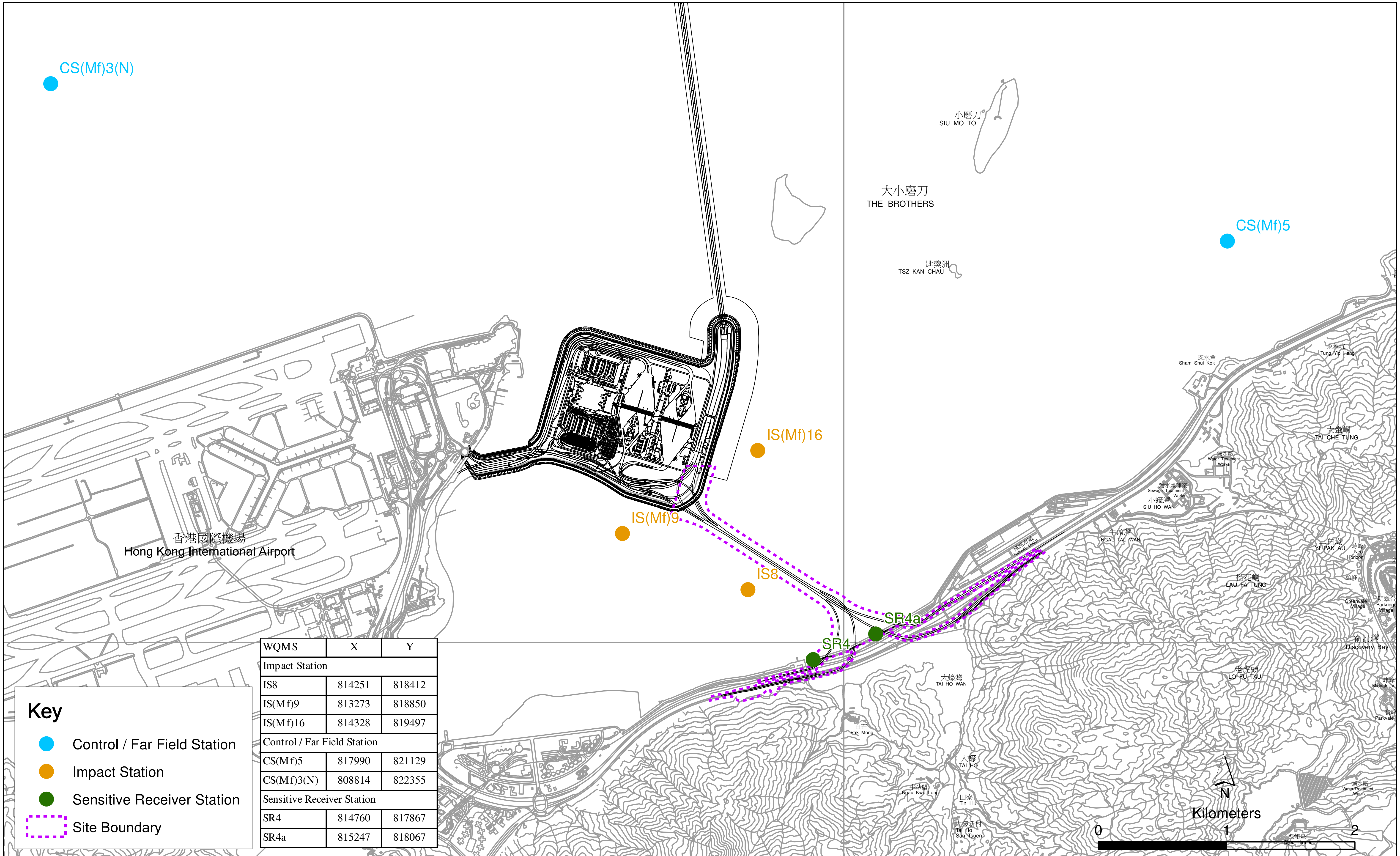
| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature (°C) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)5 | 14:01 | Surface | 1 | 25.2 | 8 | 32.6 | 6.1 | 6.1 | 3.5 | 4.1 | 8.6 | 8.6 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)5 | 14:01 | Surface | 2 | 25.4 | 7.9 | 32.4 | 6.1 | | 3.5 | | 8.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)5 | 14:01 | Middle | 1 | 25.1 | 8 | 32.6 | 6.1 | | 4.4 | | 8.6 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)5 | 14:01 | Middle | 2 | 25.3 | 7.9 | 32.4 | 6.1 | | 4.4 | | 8.9 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)5 | 14:01 | Bottom | 1 | 25.1 | 8 | 32.6 | 6.1 | 6.1 | 4.4 | | 8 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)5 | 14:01 | Bottom | 2 | 25.3 | 7.9 | 32.4 | 6.1 | | 4.3 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)3(N) | 12:57 | Surface | 1 | 24.4 | 8.1 | 32.4 | 6.5 | 6.6 | 19.9 | 20.6 | 15.7 | 20.0 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)3(N) | 12:57 | Surface | 2 | 24.6 | 8 | 32.5 | 6.6 | | 20.9 | | 16.3 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)3(N) | 12:57 | Middle | 1 | 24.3 | 8.1 | 32.4 | 6.5 | | 20.9 | | 21.2 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)3(N) | 12:57 | Middle | 2 | 24.6 | 8 | 32.5 | 6.6 | | 21.2 | | 21.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)3(N) | 12:57 | Bottom | 1 | 24.4 | 8 | 32.5 | 6.5 | 6.6 | 20.2 | | 22.3 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | CS(Mf)3(N) | 12:57 | Bottom | 2 | 24.6 | 8 | 32.6 | 6.6 | | 20.6 | | 22.7 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)16 | 13:34 | Surface | 1 | 24.9 | 8.1 | 32.6 | 6.7 | 6.7 | 4.8 | 5.2 | 8.7 | 9.7 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)16 | 13:34 | Surface | 2 | 25.1 | 8 | 32.3 | 6.7 | | 4.8 | | 9.1 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)16 | 13:34 | Middle | 1 | 24.8 | 8.1 | 32.6 | 6.7 | | 5.2 | | 9.6 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)16 | 13:34 | Middle | 2 | 25 | 8 | 32.3 | 6.7 | | 5.3 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)16 | 13:34 | Bottom | 1 | 24.7 | 8.1 | 32.6 | 6.7 | 6.7 | 5.6 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)16 | 13:34 | Bottom | 2 | 24.8 | 8 | 32.3 | 6.6 | | 5.6 | | 10.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4a | 13:22 | Surface | 1 | 24.9 | 8 | 32.5 | 6.4 | 6.4 | 9.4 | 9.3 | 13.1 | 13.9 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4a | 13:22 | Surface | 2 | 25 | 7.9 | 32.3 | 6.4 | | 9.4 | | 13.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4a | 13:22 | Bottom | 1 | 24.9 | 8 | 32.5 | 6.4 | 6.4 | 9.2 | | 14.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4a | 13:22 | Bottom | 2 | 25 | 7.9 | 32.3 | 6.4 | | 9.2 | | 14.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4 | 13:18 | Surface | 1 | 24.9 | 8 | 32.5 | 6.4 | 6.4 | 10.5 | 10.6 | 15.9 | 16.0 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4 | 13:18 | Surface | 2 | 25.1 | 7.9 | 32.3 | 6.3 | | 10.5 | | 15.9 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4 | 13:18 | Bottom | 1 | 24.9 | 8 | 32.5 | 6.4 | 6.4 | 10.7 | | 16.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | SR4 | 13:18 | Bottom | 2 | 25 | 7.9 | 32.3 | 6.3 | | 10.7 | | 15.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS8 | 13:11 | Surface | 1 | 24.8 | 8 | 32.6 | 6.6 | 6.6 | 9.7 | 10.8 | 8.7 | 10.6 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS8 | 13:11 | Surface | 2 | 25 | 7.9 | 32.3 | 6.6 | | 9.8 | | 9.7 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS8 | 13:11 | Bottom | 1 | 24.7 | 8 | 32.6 | 6.6 | 6.6 | 11.8 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS8 | 13:11 | Bottom | 2 | 24.9 | 8 | 32.3 | 6.5 | | 11.8 | | 12.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)9 | 13:04 | Surface | 1 | 24.5 | 8 | 32.5 | 6.4 | 6.4 | 10.2 | 10.1 | 6.5 | 6.7 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)9 | 13:04 | Surface | 2 | 24.7 | 7.9 | 32.2 | 6.4 | | 10.1 | | 6.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)9 | 13:04 | Bottom | 1 | 24.5 | 8 | 32.5 | 6.4 | 6.4 | 10 | | 7.1 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Ebb | IS(Mf)9 | 13:04 | Bottom | 2 | 24.7 | 7.9 | 32.3 | 6.4 | | 10 | | 6.6 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)5 | 8:05 | Surface | 1 | 24.8 | 8 | 32.2 | 6.4 | 6.4 | 5.4 | 6.2 | 8.9 | 11.9 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)5 | 8:05 | Surface | 2 | 24.6 | 8 | 32.5 | 6.4 | | 5.3 | | 9 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)5 | 8:05 | Middle | 1 | 24.8 | 7.9 | 32.2 | 6.4 | | 6.2 | | 10 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)5 | 8:05 | Middle | 2 | 24.6 | 8 | 32.5 | 6.4 | | 6.2 | | 9.3 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)5 | 8:05 | Bottom | 1 | 24.8 | 7.9 | 32.3 | 6.4 | 6.4 | 6.9 | | 16.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)5 | 8:05 | Bottom | 2 | 24.7 | 8 | 32.5 | 6.4 | | 6.9 | | 17.7 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)3(N) | 9:13 | Surface | 1 | 24.5 | 8 | 31.5 | 6.5 | 6.5 | 18.5 | 21.5 | 18.9 | 20.5 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)3(N) | 9:13 | Surface | 2 | 24.7 | 8 | 31.7 | 6.4 | | 19.3 | | 18.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)3(N) | 9:13 | Middle | 1 | 24.5 | 8 | 31.5 | 6.4 | | 20.6 | | 21.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)3(N) | 9:13 | Middle | 2 | 24.7 | 8 | 31.7 | 6.6 | | 20.8 | | 20 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)3(N) | 9:13 | Bottom | 1 | 24.5 | 8 | 31.6 | 6.4 | 6.4 | 24.6 | | 21.6 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | CS(Mf)3(N) | 9:13 | Bottom | 2 | 24.7 | 8 | 31.7 | 6.4 | | 25.1 | | 22.6 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)16 | 8:29 | Surface | 1 | 24.5 | 8 | 32.3 | 6.5 | 6.5 | 13.9 | 14.1 | 15.6 | 16.7 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)16 | 8:29 | Surface | 2 | 24.4 | 8 | 32.5 | 6.5 | | 13.9 | | 15.3 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)16 | 8:29 | Bottom | 1 | 24.5 | 8 | 32.3 | 6.5 | 6.5 | 14.3 | | 18.1 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)16 | 8:29 | Bottom | 2 | 24.4 | 8 | 32.5 | 6.5 | | 14.2 | | 17.9 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4a | 8:39 | Surface | 1 | 24.8 | 7.9 | 32.3 | 6.3 | 6.3 | 18.2 | 19.5 | 20.7 | 21.4 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4a | 8:39 | Surface | 2 | 24.6 | 8 | 32.5 | 6.3 | | 18.2 | | 22.2 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4a | 8:39 | Bottom | 1 | 24.8 | 7.9 | 32.3 | 6.3 | 6.3 | 20.8 | | 21.3 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4a | 8:39 | Bottom | 2 | 24.6 | 8 | 32.5 | 6.3 | | 20.6 | | 21.2 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4 | 8:43 | Surface | 1 | 24.8 | 7.9 | 32.3 | 6.3 | 6.3 | 20.6 | 19.3 | 16.9 | 17.3 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4 | 8:43 | Surface | 2 | 24.6 | 8 | 32.5 | 6.3 | | 20.1 | | 16.4 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4 | 8:43 | Bottom | 1 | 24.8 | 7.9 | 32.3 | 6.3 | 6.3 | 18.2 | | 17.8 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | SR4 | 8:43 | Bottom | 2 | 24.6 | 8 | 32.5 | 6.3 | | 18.2 | | 18.1 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS8 | 9:00 | Surface | 1 | 24.8 | 7.9 | 32.3 | 6.4 | 6.4 | 17 | 17.2 | 17.9 | 19.6 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS8 | 9:00 | Surface | 2 | 24.6 | 8 | 32.6 | 6.4 | | 17 | | 16.8 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS8 | 9:00 | Bottom | 1 | 24.8 | 7.9 | 32.3 | 6.4 | 6.4 | 17.4 | | 22.5 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS8 | 9:00 | Bottom | 2 | 24.6 | 8 | 32.6 | 6.4 | | 17.4 | | 21.1 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)9 | 9:08 | Surface | 1 | 24.6 | 7.9 | 32.2 | 6.5 | 6.5 | 13.9 | 15.3 | 20.8 | 23.7 |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)9 | 9:08 | Surface | 2 | 24.4 | 8 | 32.4 | 6.5 | | 13.8 | | 21.8 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)9 | 9:08 | Bottom | 1 | 24.6 | 7.9 | 32.2 | 6.4 | 6.4 | 16.7 | | 25.6 | |
| TMCLKL | HY/2012/07 | 2017-11-06 | Mid-Flood | IS(Mf)9 | 9:08 | Bottom | 2 | 24.4 | 8 | 32.5 | 6.4 | | 16.7 | | 26.5 | |

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

Photo 1 - Mid-Flood at IS(Mf)9 on 6 November 2017




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

**Email message**

**Environmental Resources Management**

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

ERM

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 16 November 2017 |

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Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_8 November 2017_Depth-averaged SS_F_Station SR4**

A total of one (1) exceedance was recorded on 8 November 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

| | | |
|---|---|---|
| **Log No.** | **Action Level Exceedance**<br>**0215660_8 November 2017_Depth-averaged SS_F_Station SR4**<br><br>**[Total No. of Exceedances = 1]** | |
| **Date** | 8 November 2017 (Measured)<br>9 November 2017 (*In situ* results received by ERM)<br>16 November 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Depth-averaged Suspended Solids (SS) | |
| **Action Levels for SS** | SS | 120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L). |
| **Limit Levels for SS** | SS | 130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L) |
| **Measured Levels** | Action Level Exceedance<br>1. Mid-flood at SR4 (Depth-averaged SS = 26.7mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 8 November 2017. | |
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedance of depth-averaged SS is unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 8 November 2017.<br>• Apart from SR4, depth-averaged SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day.<br>• Depth-averaged Turbidity levels and average DO levels at all stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. | |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. | |
| **Remarks** | The monitoring results on 8 November 2017 and locations of water quality monitoring stations are attached. Site photo record on 8 November 2017 is attached. | |

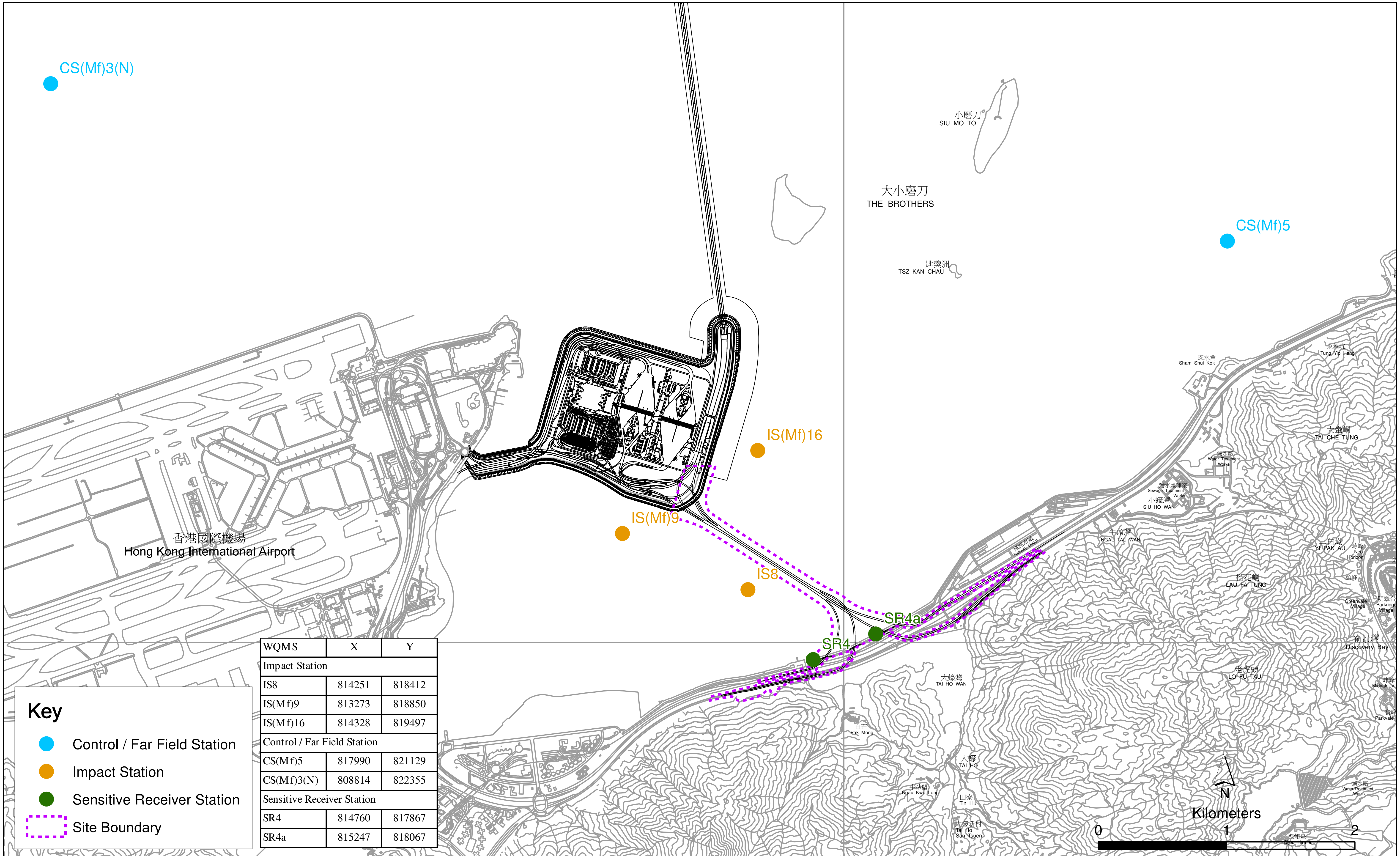
| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)5 | 15:47 | Surface | 1 | 25.0 | 8.0 | 32.2 | 6.1 | 6.1 | 5.4 | 5.6 | 7.8 | 8.7 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)5 | 15:47 | Surface | 2 | 24.9 | 8.0 | 32.4 | 6.1 | | 5.4 | | 7.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)5 | 15:47 | Middle | 1 | 25.0 | 8.0 | 32.3 | 6.1 | | 5.7 | | 10.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)5 | 15:47 | Middle | 2 | 24.9 | 8.0 | 32.5 | 6.1 | | 5.7 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)5 | 15:47 | Bottom | 1 | 25.0 | 8.0 | 32.2 | 6.1 | 6.1 | 5.6 | | 8.8 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)5 | 15:47 | Bottom | 2 | 24.9 | 8.0 | 32.5 | 6.1 | | 5.6 | | 9.6 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)3(N) | 14:38 | Surface | 1 | 24.5 | 8.1 | 32.1 | 6.5 | 6.5 | 15.0 | 19.8 | 15.8 | 19.9 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)3(N) | 14:38 | Surface | 2 | 24.2 | 8.1 | 32.2 | 6.5 | | 14.0 | | 16.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)3(N) | 14:38 | Middle | 1 | 24.5 | 8.1 | 32.1 | 6.5 | | 19.4 | | 19.6 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)3(N) | 14:38 | Middle | 2 | 24.2 | 8.1 | 32.2 | 6.5 | | 18.7 | | 20.8 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)3(N) | 14:38 | Bottom | 1 | 24.4 | 8.1 | 32.1 | 6.4 | 6.5 | 25.9 | | 24.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | CS(Mf)3(N) | 14:38 | Bottom | 2 | 24.2 | 8.1 | 32.2 | 6.5 | | 25.7 | | 23.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)16 | 15:22 | Surface | 1 | 24.8 | 8.0 | 32.0 | 6.8 | 6.7 | 6.5 | 11.6 | 8.5 | 8.0 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)16 | 15:22 | Surface | 2 | 24.7 | 8.0 | 32.2 | 6.8 | | 6.6 | | 7.3 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)16 | 15:22 | Middle | 1 | 24.5 | 8.0 | 32.0 | 6.5 | | 9.0 | | 7.7 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)16 | 15:22 | Middle | 2 | 24.4 | 8.0 | 32.2 | 6.5 | | 9.0 | | 7.4 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)16 | 15:22 | Bottom | 1 | 24.7 | 8.0 | 32.0 | 6.5 | 6.5 | 19.1 | | 8.3 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)16 | 15:22 | Bottom | 2 | 24.5 | 8.0 | 32.2 | 6.5 | | 19.1 | | 8.7 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4a | 15:11 | Surface | 1 | 25.0 | 7.9 | 32.0 | 6.5 | 6.5 | 11.8 | 12.0 | 10.8 | 11.4 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4a | 15:11 | Surface | 2 | 24.8 | 8.0 | 32.2 | 6.5 | | 11.8 | | 10.8 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4a | 15:11 | Bottom | 1 | 25.0 | 7.9 | 32.0 | 6.6 | 6.6 | 12.1 | | 11.7 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4a | 15:11 | Bottom | 2 | 24.8 | 8.0 | 32.2 | 6.6 | | 12.2 | | 12.3 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4 | 15:04 | Surface | 1 | 24.7 | 7.9 | 32.0 | 6.2 | 6.3 | 19.0 | 19.1 | 20.8 | 22.5 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4 | 15:04 | Surface | 2 | 24.6 | 8.0 | 32.2 | 6.3 | | 19.0 | | 22.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4 | 15:04 | Bottom | 1 | 24.7 | 7.9 | 32.0 | 6.3 | 6.3 | 19.2 | | 23.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | SR4 | 15:04 | Bottom | 2 | 24.6 | 8.0 | 32.2 | 6.3 | | 19.2 | | 24.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS8 | 14:57 | Surface | 1 | 24.8 | 7.9 | 32.0 | 6.3 | 6.3 | 11.0 | 16.3 | 9.0 | 9.6 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS8 | 14:57 | Surface | 2 | 24.7 | 8.0 | 32.2 | 6.3 | | 11.0 | | 10.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS8 | 14:57 | Bottom | 1 | 24.7 | 7.9 | 32.0 | 6.3 | 6.3 | 21.6 | | 10.2 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS8 | 14:57 | Bottom | 2 | 24.5 | 8.0 | 32.2 | 6.3 | | 21.6 | | 9.2 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)9 | 14:49 | Surface | 1 | 24.7 | 8.0 | 32.0 | 6.5 | 6.4 | 11.7 | 14.3 | 8.0 | 7.5 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)9 | 14:49 | Surface | 2 | 24.6 | 8.0 | 32.2 | 6.3 | | 11.7 | | 7.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)9 | 14:49 | Bottom | 1 | 24.5 | 8.0 | 32.1 | 6.2 | 6.2 | 16.9 | | 7.2 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Ebb | IS(Mf)9 | 14:49 | Bottom | 2 | 24.3 | 8.0 | 32.3 | 6.2 | | 16.9 | | 7.6 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)5 | 9:36 | Surface | 1 | 24.5 | 8.0 | 31.9 | 6.4 | 6.4 | 3.2 | 6.4 | 9.7 | 10.1 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)5 | 9:36 | Surface | 2 | 24.3 | 8.0 | 32.1 | 6.4 | | 3.2 | | 11.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)5 | 9:36 | Middle | 1 | 24.5 | 8.0 | 32.0 | 6.3 | | 8.5 | | 10.5 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)5 | 9:36 | Middle | 2 | 24.4 | 8.0 | 32.2 | 6.3 | | 8.5 | | 10.5 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)5 | 9:36 | Bottom | 1 | 24.5 | 8.0 | 32.0 | 6.4 | 6.4 | 7.5 | | 9.4 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)5 | 9:36 | Bottom | 2 | 24.4 | 8.0 | 32.2 | 6.3 | | 7.4 | | 9.6 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)3(N) | 10:29 | Surface | 1 | 24.6 | 8.0 | 31.4 | 6.4 | 6.4 | 22.1 | 25.2 | 20.4 | 22.8 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)3(N) | 10:29 | Surface | 2 | 24.3 | 8.0 | 31.2 | 6.4 | | 22.1 | | 20.2 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)3(N) | 10:29 | Middle | 1 | 24.6 | 8.0 | 31.4 | 6.3 | | 24.8 | | 24.3 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)3(N) | 10:29 | Middle | 2 | 24.3 | 8.0 | 31.3 | 6.4 | | 25.0 | | 24.6 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)3(N) | 10:29 | Bottom | 1 | 24.6 | 8.0 | 31.5 | 6.3 | 6.4 | 28.7 | | 23.5 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | CS(Mf)3(N) | 10:29 | Bottom | 2 | 24.3 | 8.0 | 31.3 | 6.4 | | 28.4 | | 23.5 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)16 | 10:03 | Surface | 1 | 24.4 | 8.0 | 31.9 | 6.4 | 6.4 | 16.6 | 15.4 | 11.9 | 16.5 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)16 | 10:03 | Surface | 2 | 24.2 | 8.0 | 32.2 | 6.4 | | 16.6 | | 11.9 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)16 | 10:03 | Bottom | 1 | 24.4 | 8.0 | 31.9 | 6.4 | 6.4 | 14.1 | | 21.8 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)16 | 10:03 | Bottom | 2 | 24.2 | 8.0 | 32.2 | 6.4 | | 14.2 | | 20.4 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4a | 10:14 | Surface | 1 | 24.5 | 8.0 | 32.0 | 6.2 | 6.2 | 18.3 | 18.4 | 20.3 | 22.5 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4a | 10:14 | Surface | 2 | 24.3 | 8.0 | 32.2 | 6.2 | | 18.2 | | 21.4 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4a | 10:14 | Bottom | 1 | 24.5 | 8.0 | 32.0 | 6.2 | 6.2 | 18.5 | | 24.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4a | 10:14 | Bottom | 2 | 24.3 | 8.0 | 32.2 | 6.2 | | 18.5 | | 24.2 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4 | 10:18 | Surface | 1 | 24.5 | 7.9 | 32.0 | 6.0 | 6.0 | 14.1 | 17.2 | 24.7 | 26.7 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4 | 10:18 | Surface | 2 | 24.4 | 8.0 | 32.2 | 6.0 | | 14.1 | | 24.3 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4 | 10:18 | Bottom | 1 | 24.5 | 7.9 | 32.0 | 6.0 | 6.1 | 20.2 | | 28.1 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | SR4 | 10:18 | Bottom | 2 | 24.4 | 8.0 | 32.2 | 6.1 | | 20.2 | | 29.7 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS8 | 10:28 | Surface | 1 | 24.5 | 7.9 | 32.0 | 6.3 | 6.3 | 14.4 | 18.1 | 20.5 | 19.9 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS8 | 10:28 | Surface | 2 | 24.3 | 8.0 | 32.2 | 6.3 | | 14.3 | | 19.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS8 | 10:28 | Bottom | 1 | 24.5 | 7.9 | 32.0 | 6.3 | 6.3 | 21.9 | | 20.8 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS8 | 10:28 | Bottom | 2 | 24.3 | 8.0 | 32.2 | 6.3 | | 21.9 | | 19.3 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)9 | 10:36 | Surface | 1 | 24.4 | 7.9 | 32.1 | 6.2 | 6.2 | 10.0 | 11.1 | 19.5 | 21.5 |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)9 | 10:36 | Surface | 2 | 24.3 | 8.0 | 32.3 | 6.2 | | 10.0 | | 20.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)9 | 10:36 | Bottom | 1 | 24.4 | 7.9 | 32.1 | 6.2 | 6.2 | 12.3 | | 24.0 | |
| TMCLKL | HY/2012/07 | 2017-11-08 | Mid-Flood | IS(Mf)9 | 10:36 | Bottom | 2 | 24.3 | 8.0 | 32.3 | 6.2 | | 12.2 | | 22.3 | |

Note: Indicates Exceedance of Action Level

Indicates Exceedance of Limit Level

Photo 1 - Mid-Flood at SR4 on 8 November 2017




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

Environmental Resources Management

ERM

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| *To* | Ramboll Environ – Hong Kong, Limited (ENPO) |
| *From* | ERM- Hong Kong, Limited |
| *Ref/Project number* | Contract No. HY/2012/07<br>Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section |
| *Subject* | Notification of Exceedance for Marine Water Quality Impact Monitoring |
| *Date* | 21 November 2017 |

Dear Sir/ Madam,

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

**Action Level Exceedance**
**0215660_13 November 2017_Depth-averaged SS_F_Station SR4a**
**0215660_13 November 2017_Depth-averaged SS_F_Station IS(Mf)9**

A total of two (2) exceedances were recorded on 13 November 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

ERM-Hong Kong, Limited

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

*Marine Water Quality Impact Monitoring*

## Notification of Exceedance

| | | |
|---|---|---|
| **Log No.** | <u>**Action Level Exceedance**</u><br>**0215660_13 November 2017_Depth-averaged SS_F_Station SR4a**<br>**0215660_13 November 2017_Depth-averaged SS_F_Station IS(Mf)9**<br><br>**[Total No. of Exceedances = 2]** | |
| **Date** | 13 November 2017 (Measured)<br>14 November 2017 (*In situ* results received by ERM)<br>21 November 2017 (Laboratory results received by ERM) | |
| **Monitoring Station** | CS(Mf)5, SR4a, SR4, IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N) | |
| **Parameter(s) with Exceedance(s)** | Depth-averaged Suspended Solids (SS) | |
| **Action Levels for SS** | SS | 120% of upstream control station at the same tide of the same day and 95%-ile of baseline data (i.e., 23.5 mg/L). |
| **Limit Levels for SS** | SS | 130% of upstream control station at the same tide of the same day and 99%-ile of baseline data. (i.e., 34.4 mg/L) |
| **Measured Levels** | <u>Action Level Exceedance</u><br>1. Mid-flood at SR4a (Depth-averaged SS = 29.5mg/L);<br>2. Mid-flood at IS(Mf)9 (Depth-averaged SS = 23.9mg/L). | |
| **Works Undertaken (at the time of monitoring event)** | No major marine works was undertaken under this Contract on 13 November 2017. | |
| **Possible Reason for Action or Limit Level Exceedance(s)** | The exceedances of depth-averaged SS are unlikely to be due to the Project, in view of the following:<br>• No marine works was undertaken under this Contract on 13 November 2017.<br>• Apart from SR4a and IS(Mf)9, depth-averaged SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day.<br>• Depth-averaged Turbidity levels and average DO levels at all stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. | |
| **Actions Taken / To Be Taken** | No immediate action is considered necessary. The ET will monitor for future trends in exceedances. | |
| **Remarks** | The monitoring results on 13 November 2017 and locations of water quality monitoring stations are attached. Site photo record on 13 November 2017 is attached. | |

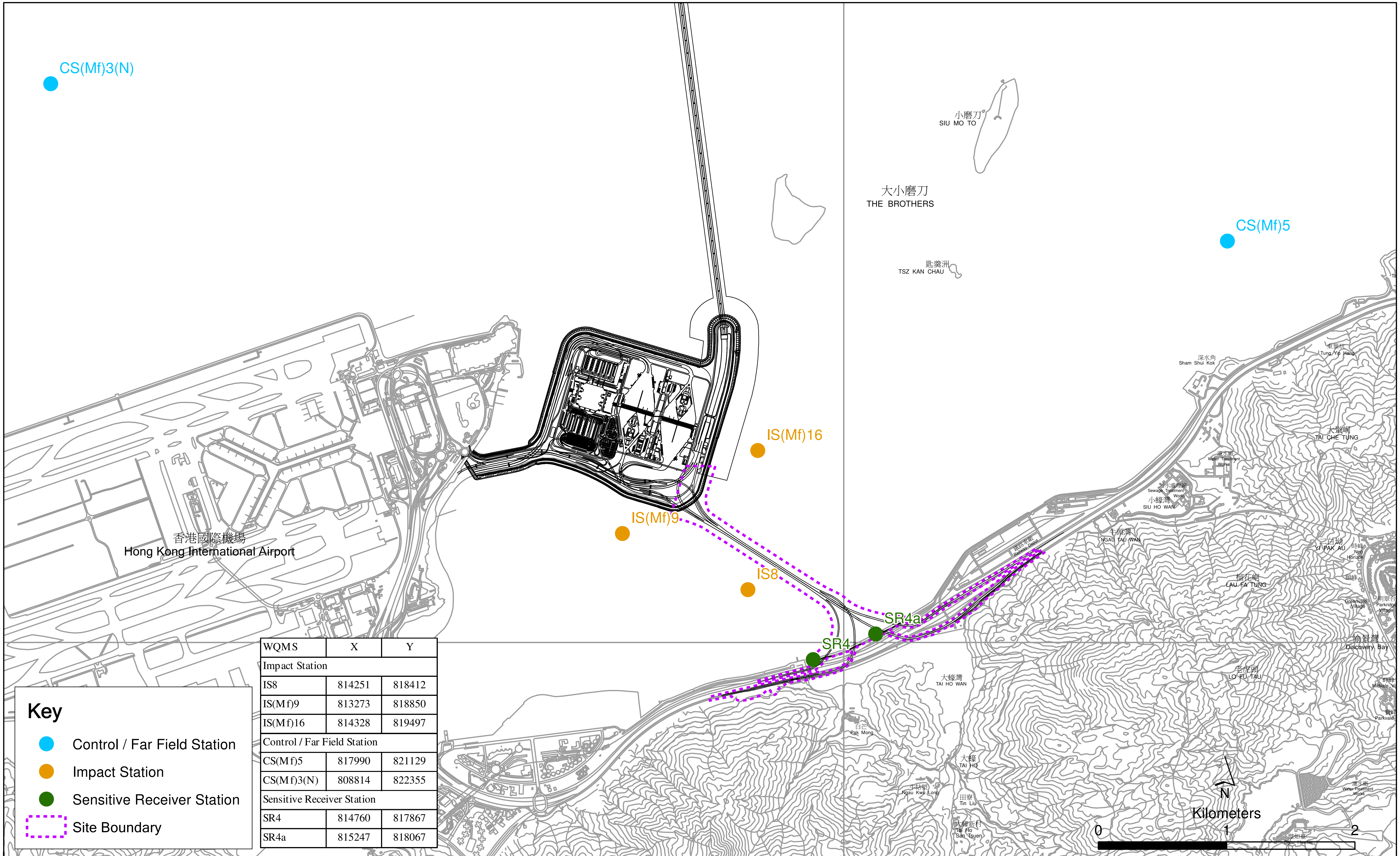
| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^oC$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)5 | 8:31 | Surface | 1 | 24.5 | 8.0 | 31.0 | 6.2 | 6.2 | 3.4 | 3.4 | 4.0 | 3.8 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)5 | 8:31 | Surface | 2 | 24.7 | 8.0 | 30.8 | 6.2 | | 3.5 | | 3.6 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)5 | 8:31 | Middle | 1 | 24.5 | 8.0 | 31.0 | 6.1 | | 3.4 | | 4.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)5 | 8:31 | Middle | 2 | 24.7 | 8.0 | 30.8 | 6.2 | | 3.4 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)5 | 8:31 | Bottom | 1 | 24.6 | 8.0 | 31.1 | 6.1 | 6.1 | 3.2 | | 3.8 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)5 | 8:31 | Bottom | 2 | 24.8 | 8.0 | 30.9 | 6.1 | | 3.3 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)3(N) | 9:34 | Surface | 1 | 24.4 | 7.9 | 28.7 | 6.5 | 6.5 | 3.3 | 5.2 | 3.8 | 4.6 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)3(N) | 9:34 | Surface | 2 | 24.6 | 7.9 | 28.9 | 6.4 | | 3.2 | | 4.2 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)3(N) | 9:34 | Middle | 1 | 24.4 | 7.9 | 29.4 | 6.5 | | 5.2 | | 3.9 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)3(N) | 9:34 | Middle | 2 | 24.6 | 7.9 | 29.6 | 6.4 | | 5.3 | | 4.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)3(N) | 9:34 | Bottom | 1 | 24.4 | 8.0 | 30.6 | 6.4 | 6.4 | 7.3 | | 5.9 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | CS(Mf)3(N) | 9:34 | Bottom | 2 | 24.6 | 8.0 | 30.9 | 6.4 | | 7.1 | | 5.4 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)16 | 9:02 | Surface | 1 | 24.3 | 8.0 | 30.8 | 6.4 | 6.4 | 7.5 | 10.6 | 6.6 | 7.3 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)16 | 9:02 | Surface | 2 | 24.5 | 8.0 | 30.6 | 6.4 | | 7.6 | | 6.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)16 | 9:02 | Bottom | 1 | 24.3 | 8.0 | 30.8 | 6.3 | 6.3 | 13.7 | | 7.9 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)16 | 9:02 | Bottom | 2 | 24.5 | 8.0 | 30.6 | 6.3 | | 13.7 | | 8.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4a | 9:12 | Surface | 1 | 24.5 | 8.0 | 30.7 | 6.0 | 6.0 | 13.3 | 14.0 | 10.8 | 11.5 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4a | 9:12 | Surface | 2 | 24.7 | 8.0 | 30.5 | 6.0 | | 13.3 | | 11.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4a | 9:12 | Bottom | 1 | 24.5 | 8.0 | 30.7 | 6.0 | 6.0 | 14.6 | | 11.1 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4a | 9:12 | Bottom | 2 | 24.7 | 8.0 | 30.5 | 6.0 | | 14.7 | | 12.4 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4 | 9:16 | Surface | 1 | 24.5 | 8.0 | 30.7 | 5.9 | 5.9 | 12.8 | 14.7 | 7.2 | 9.0 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4 | 9:16 | Surface | 2 | 24.7 | 8.0 | 30.5 | 5.9 | | 12.8 | | 8.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4 | 9:16 | Bottom | 1 | 24.5 | 8.0 | 30.7 | 6.0 | 6.0 | 16.6 | | 10.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | SR4 | 9:16 | Bottom | 2 | 24.7 | 8.0 | 30.5 | 5.9 | | 16.6 | | 10.6 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS8 | 9:30 | Surface | 1 | 24.4 | 8.0 | 30.8 | 6.3 | 6.3 | 21.1 | 21.9 | 16.7 | 17.0 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS8 | 9:30 | Surface | 2 | 24.5 | 8.0 | 30.6 | 6.3 | | 21.4 | | 17.8 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS8 | 9:30 | Bottom | 1 | 24.4 | 8.0 | 30.8 | 6.3 | 6.3 | 22.6 | | 16.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS8 | 9:30 | Bottom | 2 | 24.6 | 8.0 | 30.6 | 6.3 | | 22.6 | | 17.3 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)9 | 9:39 | Surface | 1 | 24.2 | 8.0 | 30.8 | 6.4 | 6.4 | 12.5 | 13.0 | 10.5 | 10.1 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)9 | 9:39 | Surface | 2 | 24.4 | 8.0 | 30.5 | 6.4 | | 12.5 | | 10.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)9 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)9 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)9 | 9:39 | Bottom | 1 | 24.2 | 8.0 | 30.8 | 6.4 | 6.4 | 13.4 | | 10.6 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Ebb | IS(Mf)9 | 9:39 | Bottom | 2 | 24.4 | 8.0 | 30.5 | 6.4 | | 13.5 | | 9.4 | |

| Project | Works | Date (yyyy-mm-dd) | Tide | Station | Start Time | Level | Replicate | Temperature ($^{o}C$) | pH | Salinity (ppt) | DO (mg/L) | Average DO (mg/L) | Turbidity (NTU) | Depth-Averaged Turbidity | SS (mg/L) | Depth-Averaged SS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)5 | 16:06 | Surface | 1 | 24.6 | 8.0 | 30.6 | 6.2 | 6.2 | 2.8 | 4.8 | 2.1 | 3.0 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)5 | 16:06 | Surface | 2 | 24.8 | 8.0 | 30.4 | 6.2 | | 2.8 | | 2.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)5 | 16:06 | Middle | 1 | 24.6 | 8.0 | 30.9 | 6.2 | | 6.8 | | 3.3 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)5 | 16:06 | Middle | 2 | 24.7 | 8.0 | 30.7 | 6.2 | | 6.8 | | 3.1 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)5 | 16:06 | Bottom | 1 | 24.6 | 8.0 | 30.9 | 6.2 | 6.2 | 4.6 | | 3.4 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)5 | 16:06 | Bottom | 2 | 24.7 | 8.0 | 30.7 | 6.2 | | 4.8 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)3(N) | 14:56 | Surface | 1 | 24.6 | 7.9 | 27.3 | 6.3 | 6.2 | 3.1 | 5.5 | 2.7 | 3.0 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)3(N) | 14:56 | Surface | 2 | 24.8 | 7.8 | 27.3 | 6.2 | | 2.8 | | 3.7 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)3(N) | 14:56 | Middle | 1 | 24.5 | 7.9 | 27.9 | 6.2 | | 6.4 | | 2.7 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)3(N) | 14:56 | Middle | 2 | 24.8 | 7.9 | 27.7 | 6.2 | | 6.8 | | 2.9 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)3(N) | 14:56 | Bottom | 1 | 24.5 | 7.9 | 27.9 | 6.2 | 6.2 | 6.9 | | 3.2 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | CS(Mf)3(N) | 14:56 | Bottom | 2 | 24.8 | 7.9 | 27.7 | 6.2 | | 6.9 | | 3.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)16 | 15:40 | Surface | 1 | 24.4 | 8.0 | 30.1 | 6.4 | 6.4 | 7.9 | 10.3 | 3.2 | 3.3 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)16 | 15:40 | Surface | 2 | 24.6 | 8.0 | 29.9 | 6.4 | | 7.9 | | 3.3 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)16 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)16 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)16 | 15:40 | Bottom | 1 | 24.5 | 8.0 | 30.5 | 6.4 | 6.4 | 12.7 | | 3.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)16 | 15:40 | Bottom | 2 | 24.6 | 8.0 | 30.3 | 6.4 | | 12.7 | | 3.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4a | 15:29 | Surface | 1 | 24.4 | 8.0 | 30.0 | 6.4 | 6.4 | 18.7 | 19.6 | 28.6 | 29.5 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4a | 15:29 | Surface | 2 | 24.6 | 8.0 | 29.8 | 6.4 | | 18.7 | | 28.7 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4a | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4a | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4a | 15:29 | Bottom | 1 | 24.4 | 8.0 | 30.0 | 6.5 | 6.5 | 20.4 | | 30.7 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4a | 15:29 | Bottom | 2 | 24.6 | 8.0 | 29.8 | 6.5 | | 20.5 | | 29.8 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4 | 15:24 | Surface | 1 | 24.5 | 8.0 | 30.6 | 6.1 | 6.1 | 15.5 | 15.0 | 9.6 | 11.9 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4 | 15:24 | Surface | 2 | 24.7 | 8.0 | 30.4 | 6.1 | | 15.5 | | 10.1 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4 | 15:24 | Bottom | 1 | 24.5 | 8.0 | 30.6 | 6.2 | 6.2 | 14.5 | | 14.4 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | SR4 | 15:24 | Bottom | 2 | 24.7 | 8.0 | 30.4 | 6.1 | | 14.5 | | 13.5 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS8 | 15:14 | Surface | 1 | 24.4 | 7.9 | 30.7 | 6.1 | 6.1 | 19.7 | 20.1 | 20.9 | 21.5 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS8 | 15:14 | Surface | 2 | 24.6 | 8.0 | 30.5 | 6.1 | | 19.7 | | 20.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS8 | | Middle | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS8 | | Middle | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS8 | 15:14 | Bottom | 1 | 24.4 | 7.9 | 30.7 | 6.1 | 6.1 | 20.5 | | 22.9 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS8 | 15:14 | Bottom | 2 | 24.6 | 8.0 | 30.5 | 6.1 | | 20.6 | | 22.0 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)9 | | Surface | 1 | | | | | 6.3 | | 20.2 | | 23.9 |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)9 | | Surface | 2 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)9 | 15:04 | Middle | 1 | 24.4 | 7.9 | 30.8 | 6.3 | | 20.2 | | 23.6 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)9 | 15:04 | Middle | 2 | 24.5 | 8.0 | 30.6 | 6.3 | | 20.2 | | 24.2 | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)9 | | Bottom | 1 | | | | | | | | | |
| TMCLKL | HY/2012/07 | 2017-11-13 | Mid-Flood | IS(Mf)9 | | Bottom | 2 | | | | | | | | | |

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

Photo 1 - Mid-Flood at SR4a on 13 November 2017

Photo 2 - Mid-Flood at IS(Mf)9 on 13 November 2017




| WQMS | X | Y |
|---|---|---|
| Impact Station | | |
| IS8 | 814251 | 818412 |
| IS(Mf)9 | 813273 | 818850 |
| IS(Mf)16 | 814328 | 819497 |
| Control / Far Field Station | | |
| CS(Mf)5 | 817990 | 821129 |
| CS(Mf)3(N) | 808814 | 822355 |
| Sensitive Receiver Station | | |
| SR4 | 814760 | 817867 |
| SR4a | 815247 | 818067 |

Locations of Water Quality Monitoring Stations

File: T:\GIS\CONTRACT\0215660\Mxd\0215660_WQMS.mxd
Date: 28/4/2017

Environmental Resources Management

ERM

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

**ENVIRONMENTAL COMPLAINT/ ENQUIRY FORM**

| **Complaint/ ~~Enquiry~~ Received*** |
|---|
| Date: 24 November 2017<br>Time: Undisclosed<br>From: Environmental Protection Department (EPD)<br>Via: Email |
| Complainant/ ~~Enquirer~~*:<br>Name: Undisclosed<br>Tel: Undisclosed<br>Address: Undisclosed<br>Media: Dust / ~~Noise~~ / ~~Water Quality~~ / ~~Other~~<br>Description: A complaint was received by EPD regarding construction dust nuisance at Hong Kong Boundary Crossing Facilities (HKBCF) of Hong Kong–Zhuhai–Macau Bridge (HZMB) Projects. The complaint reported that dust nuisance was generated at HKBCF due to lack of watering for dust suppression at all unpaved areas. Serious dust nuisance was generated nearby the tollbooth at HKBCF in particular. The Environmental Team (ET) received the complaint notification from the Independent Environmental Checker (IEC) on 24 November 2017. |

***Investigation Report & Response***

Site records and watering records provided by the Contractor were reviewed upon receiving the complaint. Based on the site records, major works under this Contract included segment erection at Southern Landfall. According to the watering records, a programme of 8 times daily watering was maintained between 20 November 2017 and 24 November 2017, which is considered complying with the relevant requirements stipulated in the Environmental Permit and EM&A Manual of the Tuen Mun-Chek Lap Kok Link Project.

Site inspection was carried out on 24 November 2017. During the site inspection, no particular finding was observed. Watering was applied on unpaved roads under this Contract (see *Annex A*). The area nearby the tollbooth was not within the site boundary or the purview of this Contract, thus observations on this area were considered not in relation to this Contract. Construction site boundary under this Contract is shown in *Figure 1*.

Upon investigation, there is no evidence to indicate that the complaint case is related to this Contract.

***Mitigation Measures and Follow-Up Actions Recommended to Contractor***

Based on the investigation, there is no evidence to indicate that the complaint case is related to this Contract and thus no further action will be required. The Contractor has been reminded to maintain watering for at least 8 times per day at the construction areas throughout the construction period. Increase in watering frequency should also be considered when necessary.

Date of File Closed : 29 November 2017

Approved and Filed by:

(Jovy Tam, ET Leader)
Date: 29 November 2017

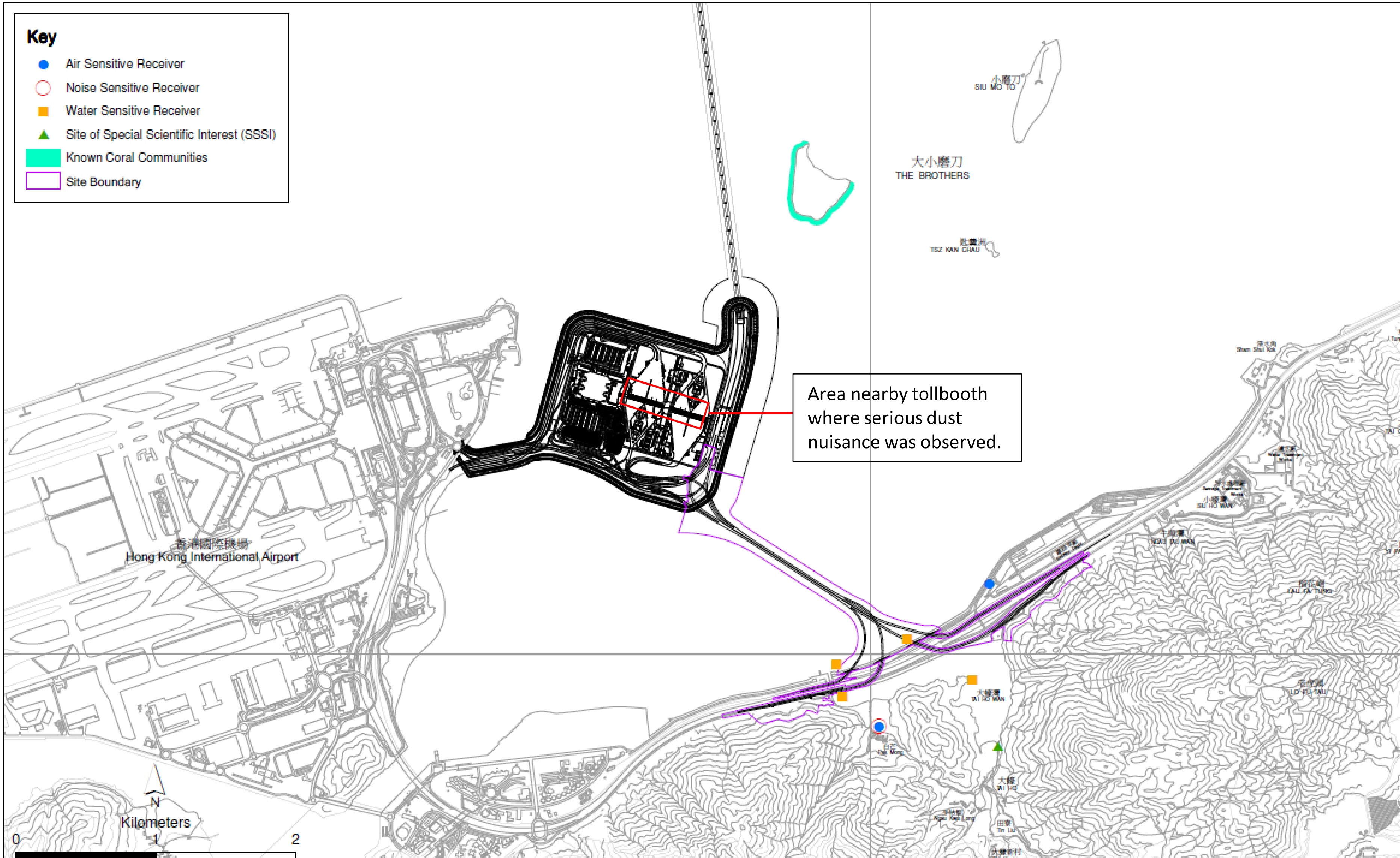



Figure 1

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

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

Environmental Resources Management

ERM

Annex A

# Photos of site inspection at Southern Landfall on 24 November 2017

*ANNEX A - PHOTOS OF SITE INSPECTION AT SOUTHERN LANDFALL ON 24 NOVEMBER 2017*

Photo 1 – Watering was maintained on unpaved road at Southern Landfall

Photo 2 – Road surface was in a moist condition

**Email message**

**Environmental Resources Management**

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

| | |
|---|---|
| ***To*** | Ramboll Hong Kong, Limited (ENPO) |
| ***From*** | ERM- Hong Kong, Limited |
| ***Ref/Project number*** | Contract No. HY/2012/07 Tuen Mun–Chek Lap Kok Link–Southern Connection Viaduct Section |
| ***Subject*** | Notification of Exceedance for Impact Dolphin Monitoring |
| ***Date*** | 15 March 2018 |

ERM

Dear Sir or Madam,

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

**0215660_Sep2017/Nov2017_dolphin_STG&ANI_NEL&NWL**

A total of one limit level exceedance was recorded in the quarterly impact dolphin monitoring data between September and November 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

**ERM-Hong Kong, Limited**

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

### Impact Dolphin Monitoring
### Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="2">0215660_Sep2017/Nov2017_dolphin_STG&ANI_NEL&NWL<br>[Total No. of Exceedance = 1]</td></tr>
<tr><td>Date</td><td colspan="2">September to November 2017 (monitored)<br>13 March 2018 (results received by ERM)</td></tr>
<tr><td>Monitoring Area</td><td colspan="2">Northeast Lantau (NEL) and Northwest Lantau (NWL)</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="2">Quarterly encounter rate of dolphin sightings (STG)<br>Quarterly encounter rate of total number of dolphins (ANI)</td></tr>
<tr><td>Action Levels</td><td rowspan="2">North Lantau Social cluster</td><td>NEL: STG < 4.2 & ANI < 15.5<br>or<br>NWL: STG < 6.9 & ANI < 31.3</td></tr>
<tr><td>Limit Levels</td><td>NEL: STG < 2.4 & ANI < 8.9<br>and<br>NWL: STG < 3.9 & ANI < 17.9</td></tr>
<tr><td rowspan="3">Recorded Levels</td><td>NEL</td><td>STG = 0 & ANI = 0</td></tr>
<tr><td>NWL</td><td>STG = 3.12 & ANI = 10.35</td></tr>
<tr><td colspan="2">One Limit Level Exceedance was recorded in the quarterly impact dolphin monitoring at NEL and NWL between September and November 2017. The exceedance was reported in the approved Forty-ninth Monthly EM&A Report dated 12 December 2017.</td></tr>
<tr><td>Statistical Analyses</td><td colspan="2">Further to the review of the available and relevant dolphin monitoring data in the EM&A under this Contract, statistical analyses were conducted as follows:<ul><li>A two-way ANOVA with repeated measures and unequal sample size was conducted using Period (2 levels: baseline vs impact – present impact quarter, September to November 2017) 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 α = 0.05 as the significance level in the statistical tests, significant differences in STG (p = 0.0057) and ANI (p = 0.0278) 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 November 2017) 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 α = 0.00001 as the significance level in the statistical tests, significant difference in STG (p = 0.000000) and in ANI (p = 0.000000) between Cumulative Period (baseline and impact phases) and Location (NEL and NWL) were detected.<br>* Note: The commencement date under Contract No. HY/2012/07 is 31 October 2013.</li></ul></td></tr>
<tr><td>Works Undertaken (in the monitoring quarter)</td><td colspan="2">In the quarter between September and November 2017, no marine works was undertaken under Contract No. HY/2012/07.</td></tr>
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| **Possible Reason for Action or Limit Level Exceedance(s)** | The potential factors that may have contributed to the observed exceedance are reviewed below:<br>• Blocking of CWD travelling corridor:<br>The *Monitoring of Marine Mammals in Hong Kong Waters (2016 – 17)* (1) reported that dolphin usage and traveling activities to the northern side of the airport (dolphin traveling corridor) are affected by frequent high-speed ferry traffic from Sky Pier (not related to this Contract), which is likely one of the factors resulting in the decrease in dolphin abundances in North Lantau.<br>• Marine works of the Contract:<br>As per the findings from the EIA report (*Section 8.11.9*), the major influences on the Chinese White Dolphin (CWD) *Sousa chinensis* under this Contract are marine traffics and bored piling works. The *Monitoring of Marine Mammals in Hong Kong Waters (2016-2017)* also reported that CWD decline were likely influenced by reclamation works, bored piling and intensive marine traffic from construction activities.<br>Based on these possible reasons, implementation of mitigation measures are reviewed. This Contract does not have any reclamation works, thus no habitat loss was caused by reclamation. In the reporting period, the Contractor implemented the marine traffic control as per the requirements in the *EP-354/2009/D* and the updated *EM&A Manual*. Most of the vessels of this Contract also worked within the site boundary, in which the area is seldom used by CWD. Disturbance from vessels of this Contract is considered minor. All of the marine bored piling works of this Contract was completed in September 2015. Thus, underwater noise emission from this Contract had been substantially reduced. During dolphin monitoring in this quarter, no unacceptable impact on CWD due to the activities under this Contract was observed.<br>• Impact on water quality:<br>According to the findings in the water quality monitoring results at the impact monitoring stations between September and November 2017, there were ninety-one (91) Action Level of Dissolved Oxygen (DO) exceedances, eight (8) Action Level of Suspended Solids (SS) exceedances and one (1) Limit Level of Turbidity exceedance for water quality impact monitoring in the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation report is presented in *Appendix L.*<br><br>In view of the above, marine ecological mitigation measures were considered properly implemented, and thus no unacceptable impact on CWD or its habitat was associated with this Contract in this quarter. |

(1) Hung SKY (2017). Prepared for AFCD. Available at: https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/files/Final_Report_2016_17.pdf

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| **Actions Taken / To Be Taken** | With reference to the site inspection records in this quarter, the respective marine ecological mitigation measures have been implemented properly by the Contractor throughout the marine works period, including:<br>1. 250m dolphin exclusion zone;<br>2. Acoustic decoupling plan;<br>3. Training to workers;<br>4. Offsite vessel routing control in accordance with Regular Marine Travel Routes Plan, including routing control within existing marine park boundaries;<br>5. Vessels speed limited at 5 knots and 10 knots within existing marine park boundaries and site boundary respectively;<br>6. Idling and mooring of working vessels within site boundary<br><br>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).<br><br>A joint team meeting was held on 7 March 2018 for discussion on CWD trend, with attendance of ENPO, Representatives of Resident Site Staff (RSS), Representatives of Environmental Team (ET) for Contract No. HY/2010/02, HY/2011/03, HY/2012/07 and HY/2012/08. The discussion/recommendation as recorded in the minutes of the meeting, which might be relevant to this Contract are summarized below. It was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified or separate from the other stress factors. ENPO presented the interim CWD survey results in mainland waters obtained from Hong Kong-Zhuhai-Macao Bridge Authority that some CWDs that previously more often sighted in Hong Kong waters have expanded their ranges into mainland waters, and some with reduced usage in Hong Kong waters, while they are partially accounted for the local decline. It was reminded that the ETs shall keep reviewing the implementation status of the dolphin related mitigation measures and remind the contractor to ensure the relevant measures are fully implemented. The ETs were also reminded to update the Brothers Marine Park (BMP) boundary in the Regular Marine Travel Route Plan. 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. The participants were also reminded that the protection measures (e.g. speed limit control) for the BMP shall be implemented so as to provide a better habitat for dolphin recovery. It is noted that even though marine vessels may moor within the mooring site of BMP, commercial activities including loading / unloading / transhipment are not allowed except a permit is obtained. The HZMB works vessels were recommended to avoid the BMP. It was also recommended that the marine works footprint and vessels for the marine works should be reduced as much as possible, and vessels idling / mooring in other part of the North Lantau shall be avoided whenever possible.<br><br>Dolphin specialists of the Projects confirmed that the CWD sighting nearby north of Sha Chau and Lung Kwu Chau Marine Park has significantly declined. The reason for the decline was likely related to the re-routing of high-speed ferry from Skypier. |
| **Remarks** | The results of impact water quality and impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved *Forty-seventh* to *Forty-ninth Monthly EM&A Reports*. Comparison on water quality between impact and baseline periods is elaborated in the *16th Quarterly EM&A Report*. |