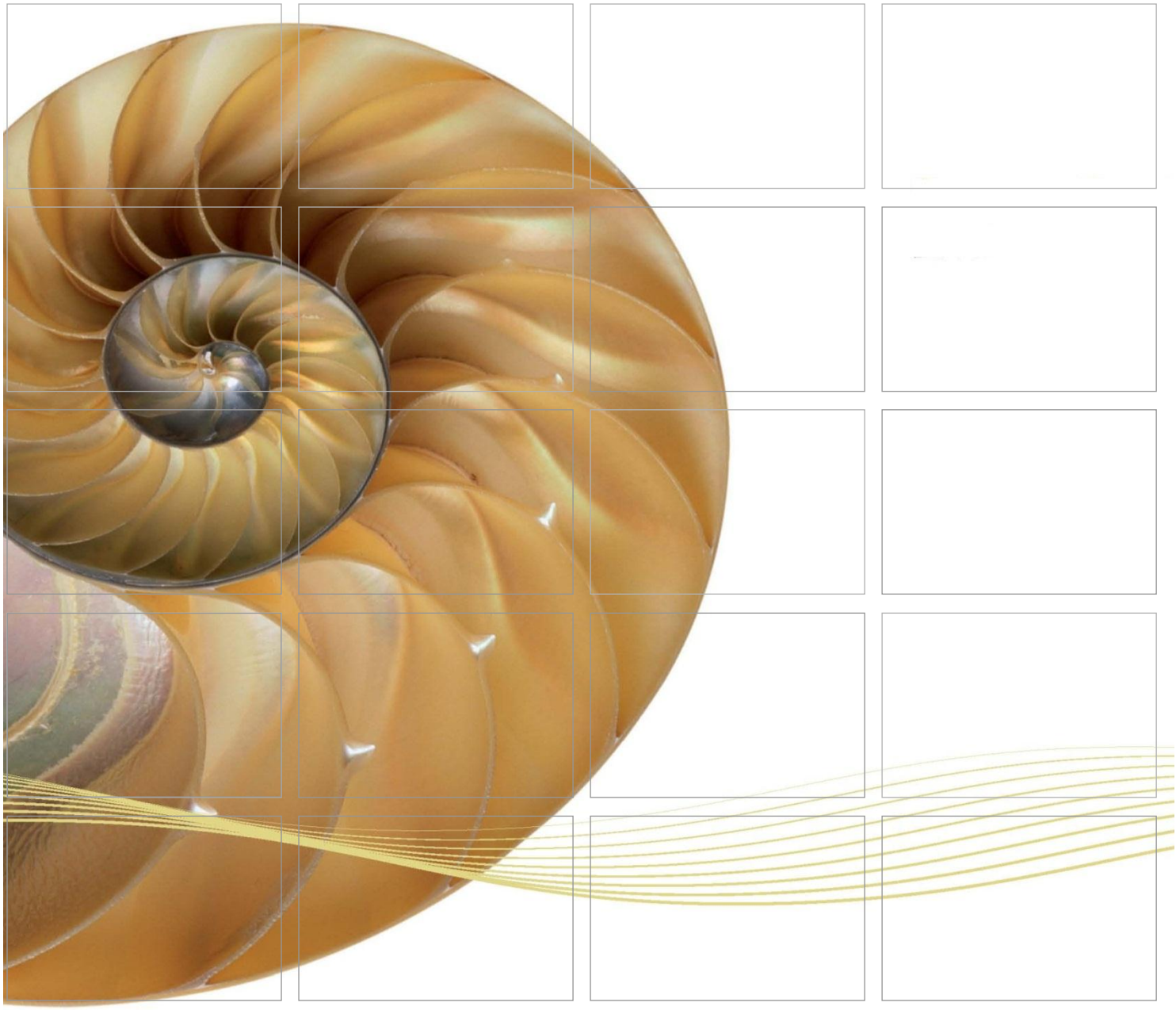
Report



Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section

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

05 August 2014

Environmental Resources Management
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Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section

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

Document Code: 0212330_2nd Quarterly EM&A_20140801.doc

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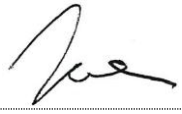
Client: DBJV	Project No: 0212330
Summary: This document presents the Second Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.	Date: 05 August 2014 Approved by:  *Mr Craig Reid* *Partner* Certified by:  *Mr Jovy Tam* *ET Leader*

Revision	Description	By	Checked	Approved	Date
	2nd Quarterly EM&A Report	VAR	JT	CAR	05/08/14

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ENVIRON

Ref.: HYDHZMBEEM00_0_2119L.14 12 Aug 2014

AECOM
Supervising Officer Representative's Office
No.8 Mong Fat Street, Tuen Mun,
New Territories, Hong Kong

By Fax (2293 6300) and By Post

Attention: Messrs. Edwin Ching / Andy Westmorelan

Dear Sir,

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/2012/08 TM-CLKL Northern Connection Sub-sea Tunnel Section
Quarterly EM&A Report for March 2014 to May 2014 (EP-354/2009/B)

Reference is made to the Quarterly Environmental Monitoring and Audit (EM&A) Report (for March 2014 to May 2014) certified by the ET Leader (ET's ref.: "0212330_2nd Quarterly EM&A_20140801.doc" dated 5 Aug 2014) and provided to us via email on 12 Aug 2014.

We are pleased to inform you that we have no adverse comments on the captioned quarterly EM&A Report.

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

Yours sincerely,

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

c.c. HyD – Mr. Stephen Chan (By Fax: 3188 6614)
HyD – Mr. Matthew Fung (By Fax: 3188 6614)
AECOM – Mr. Conrad Ng (By Fax: 3922 9797)
ERM – Mr. Jovy Tam (By Fax: 2723 5660)
Dragages – Mr. C. F. Kwong (By Fax: 2293 7499)

Internal: DY, YH, PL, ENPO Site

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ENVIRON Hong Kong Limited 英環香港有限公司
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Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel 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) in accordance with *Environmental Permit No. EP-354/2009/A*. ENVIRON Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO). Another application for variation of environmental permit (VEP) (*EP-354/2009/B*) was granted on 28 January 2014.

The construction phase of the Project commenced on 1 November 2013 and will tentatively be completed by the end of 2018. The impact monitoring of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.

This is the Second Quarterly EM&A report presenting the EM&A works carried out during the period from 1 March 2014 to 31 May 2014 for the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section* (the "Project") in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, the major activities in the reporting quarter included:

Marine-based Works

- Dredging at Portion N-C
- Reclamation Filling at Portion N-A
- Construction of Vertical Seawall and Sloping Seawall at Portion N-B
- Marine Sheet Piling for Box Culvert extension at Portion N-A

Land-based Works

Site WA 18

- Site office structural works

Portion N6

- CLP Substation structure works
- CLP Substation E&M works
- Bored Piling
- Pile Cap Construction

Reclamation Area – Portion N-A

- Construction of temporary access
- Diaphragm Wall Construction

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

24-hour TSP Monitoring	16 sessions
1-hour TSP Monitoring	16 sessions
Impact Water Quality Monitoring	39 sessions
Impact Dolphin Monitoring	6 sessions
Joint Environmental Site Inspection	13 sessions

Daily marine mammal exclusion zone monitoring was undertaken during the period of dredging works. No sighting of the Indo-Pacific humpback dolphin *Sousa chinensis* was observed during the exclusion zone monitoring.

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Three Action Level and no Limit Level exceedances for 1-hr TSP; no Action Level or Limit Level exceedances for 24-hr TSP were recorded from the air quality monitoring in this reporting period. The exceedances were considered to be due to the sporadic events from cumulative anthropogenic activities in this area of Hong Kong.

Breaches of Action and Limit Levels for Water Quality

One Action Level and one Limit Level exceedances for depth-averaged suspended solids (SS) were recorded in this reporting period. The exceedances were considered to be the increased input of turbid water from the Pearl River due to heavy rainfall.

Dolphin Monitoring

Whilst two Action Level exceedances were observed for the quarterly dolphin monitoring data between March 2014 and May 2014, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations during the dolphin monitoring in this reporting quarter. The exceedances are considered to be the natural variation of Chinese White Dolphin ranging pattern.

Environmental Complaints, Non-compliance & Summons

No non-compliance with EIA recommendations, EP conditions and other requirements associated with the construction of this Contract was recorded in this reporting period.

One potential complaint/ enquiry case was notified by the Contractor on 25 April 2014. The investigation findings showed that the case was considered not related to the works under this Contract and is thus invalid.

No environmental summons was received in this reporting period.

Reporting Change

There was no reporting change required in the reporting period.

Upcoming Works for the Next Reporting Period

Works to be undertaken in the coming quarterly period include the following:

Marine-based works

- Dredging
- Reclamation Filling
- Vertical seawall construction
- Sloping seawall construction
- Marine sheet piling for box culvert extension
- Predrilling for box culvert foundation

Land-based works

Portion N6

- CLP substation utilities works
- Bored Piling

Reclamation Area – Portion N-A

- Diaphragm Wall Construction
- Construction of temporary access; and,
- Pile Cap Construction

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are expected to be mainly associated with dust, marine water quality, marine ecology and waste management.

1 INTRODUCTION

1.1 BACKGROUND

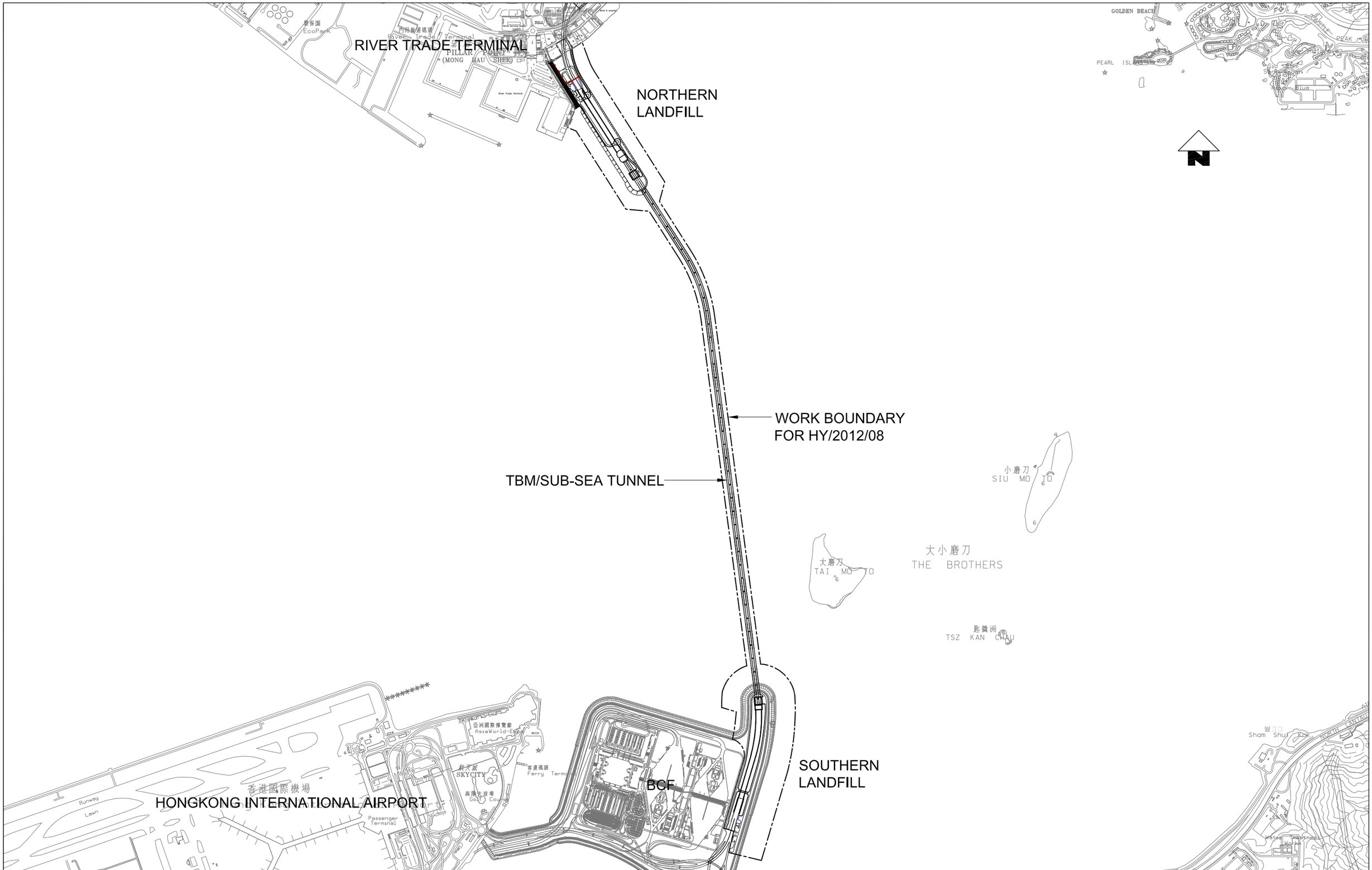
According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated 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-145/2009), 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 (VEP) (EP-354/2009A) was issued on 8 December 2010. Another application for VEP (EP-354/2009/B) was granted on 28 January 2014.

Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of TM-CLKL 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) in accordance with Environmental Permit No. EP-354/2009/A. ENVIRON Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

Layout of the Contract components is presented in *Figure 1.1*.

The construction phase of the Contract commenced on 1 November 2013 and will tentatively be completed by 2018. The impact monitoring phase of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.



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Rev.	Description	Date	Checked			Revision	A

Main Contractor: Dragages - Bouygues Joint Venture 實嘉 - 布依格聯營 (A member of the Bouygues Construction group)

Client: 路政署 HIGHWAYS DEPARTMENT

Contractor's Designer: ARUP Ove Arup & Partners Hong Kong Limited

Project: Contract No. HY/2012/08
Tuen Mun - Chek Lap Kok Link -
Northern Connection Sub-Sea Tunnel Section

Drawing Title: **Figure 1.1**

1.2 SCOPE OF REPORT

This is the Second Quarterly EM&A Report under the *Contract No. HY/2012/08 Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section*. This report presents a summary of the environmental monitoring and audit works from 1 March 2014 to 31 May 2014.

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
Highways Department	Engr 16/HZMB	Kenneth Lee	2762 4996	3188 6614
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Edwin Ching	2450 3111	2450 3099
		Andrew Westmoreland	2450 3511	2450 3099
ENPO / IEC (ENVIRON Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2888	3465 2899
	IEC	F. C. Tsang	3465 2828	3465 2899
Contractor (Dragages – Bouygues Joint Venture)	Environmental Manager	C.F. Kwong	2293 7322	2670 2798
	Environmental Officer	Bryan Lee	2293 7323	2670 2798
	24-hour complaint hotline	Rachel Lam	2293 7342	
ET (ERM-HK)	ET Leader	Jovy Tam	2271 3113	2723 5660

1.4 SUMMARY OF CONSTRUCTION WORKS

The construction phase of this Contract was commenced on 1 November 2013. The three-month rolling construction programme is shown in *Appendix B*.

With reference to DBJV's information, details of major construction works carried out in this reporting period are summarized in *Table 1.2*.

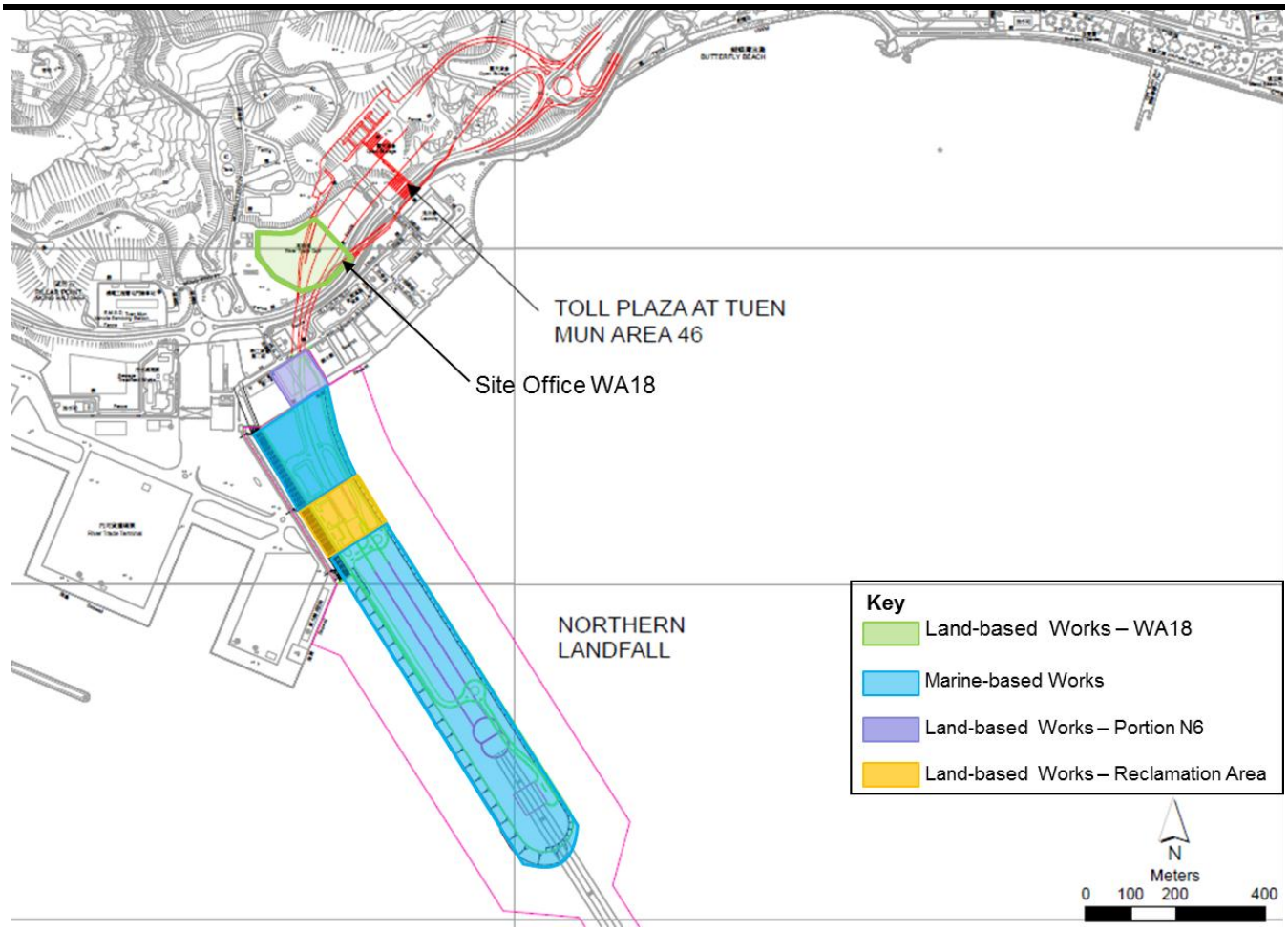
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.3*.

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

Table 1.2 Summary of Construction Activities Undertaken during the Reporting Period

Construction Activities Undertaken
Marine-based Works
• Dredging at Portion N-C
• Reclamation Filling at Portion N-A
• Construction of Vertical Seawall and Sloping Seawall at Portion N-B
• Marine Sheet Piling for Box Culvert extension at Portion N-A
Land-based Works
Site WA 18
• Site office structural works
Portion N6
• CLP Substation structure works
• CLP Substation E&M works
• Bored Piling
• Pile Cap Construction
Reclamation Area – Portion N-A
• Construction of temporary access
• Diaphragm Wall Construction

Figure 1.2 Locations of Construction Activities – March 2014 to May 2014



a. Tuen Mun – Land-based and Marine-based Works Area

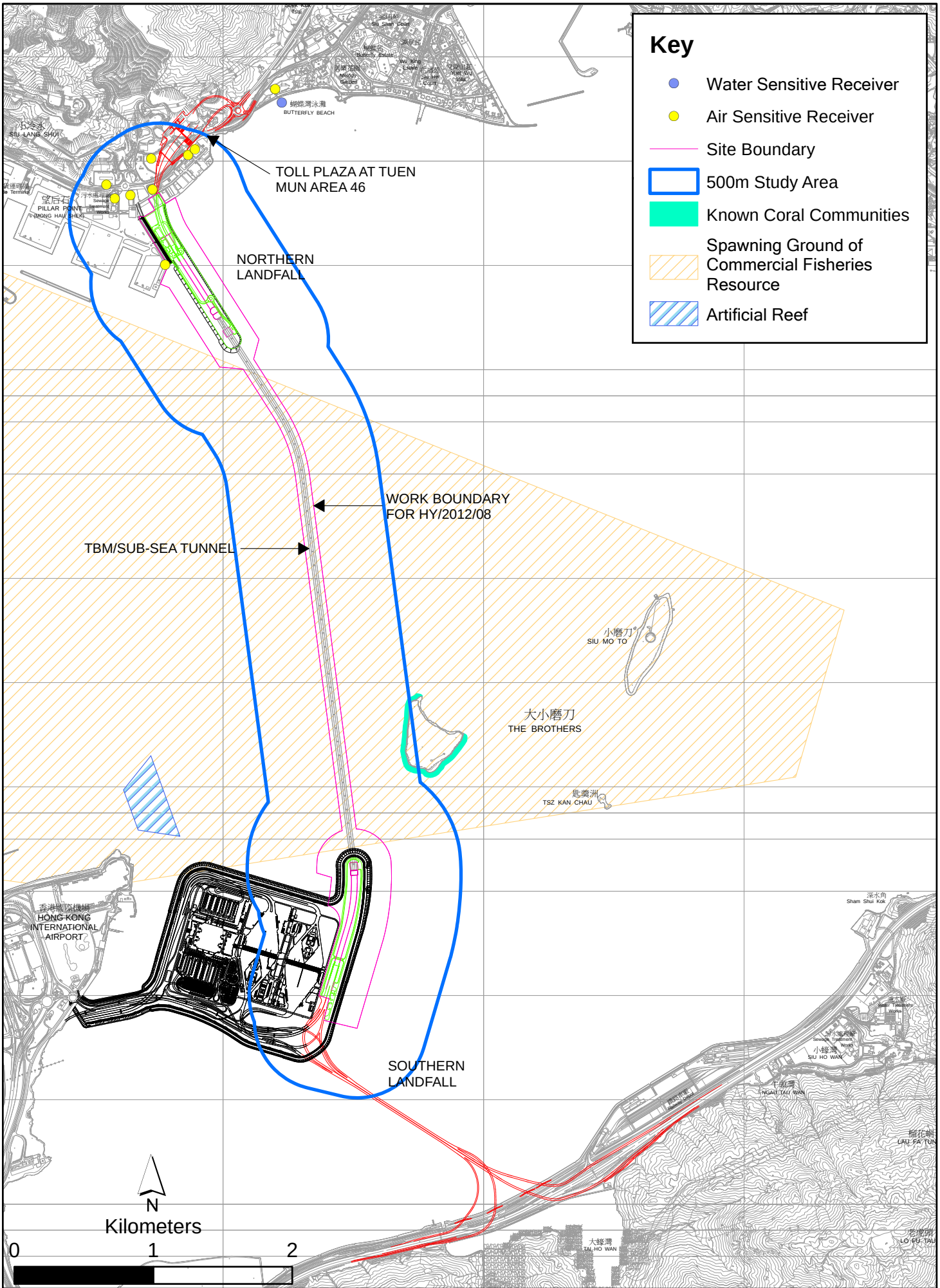


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

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Date: 15/4/2014

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2 EM&A RESULTS

The EM&A programme required environmental monitoring for air quality, 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

As per the requirements under *Condition 2.4* of *EP-354/2009/A* and *EP-354/2009/B*, the Enhanced TSP Monitoring Plan has been prepared under *Contract No. HY/2012/08*. Details of the monitoring plan are presented in the *Enhanced TSP Monitoring Plan* [1].

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual and the *Enhanced TSP Monitoring Plan*, impact 1-hour TSP monitoring was conducted three (3) times in every six (6) days and impact 24-hour TSP monitoring was carried out once in every six (6) days when the highest dust impact was expected.

High volume samplers (HVSs) were used to carry out the 1-hour and 24-hour TSP monitoring in the reporting quarter at the five (5) air quality monitoring stations in accordance with the requirements stipulated in the Updated EM&A Manual (*Figure 2.1*; *Table 2.1*). Wind anemometer was installed at the rooftop of ASR5 for logging wind speed and wind direction. Details of the equipment deployed are provided in *Table 2.2*.

(1) ERM (2013) Enhanced TSP Monitoring Plan. Submitted on 28 October 2013 and subsequently approved by EPD on 1 November 2013.

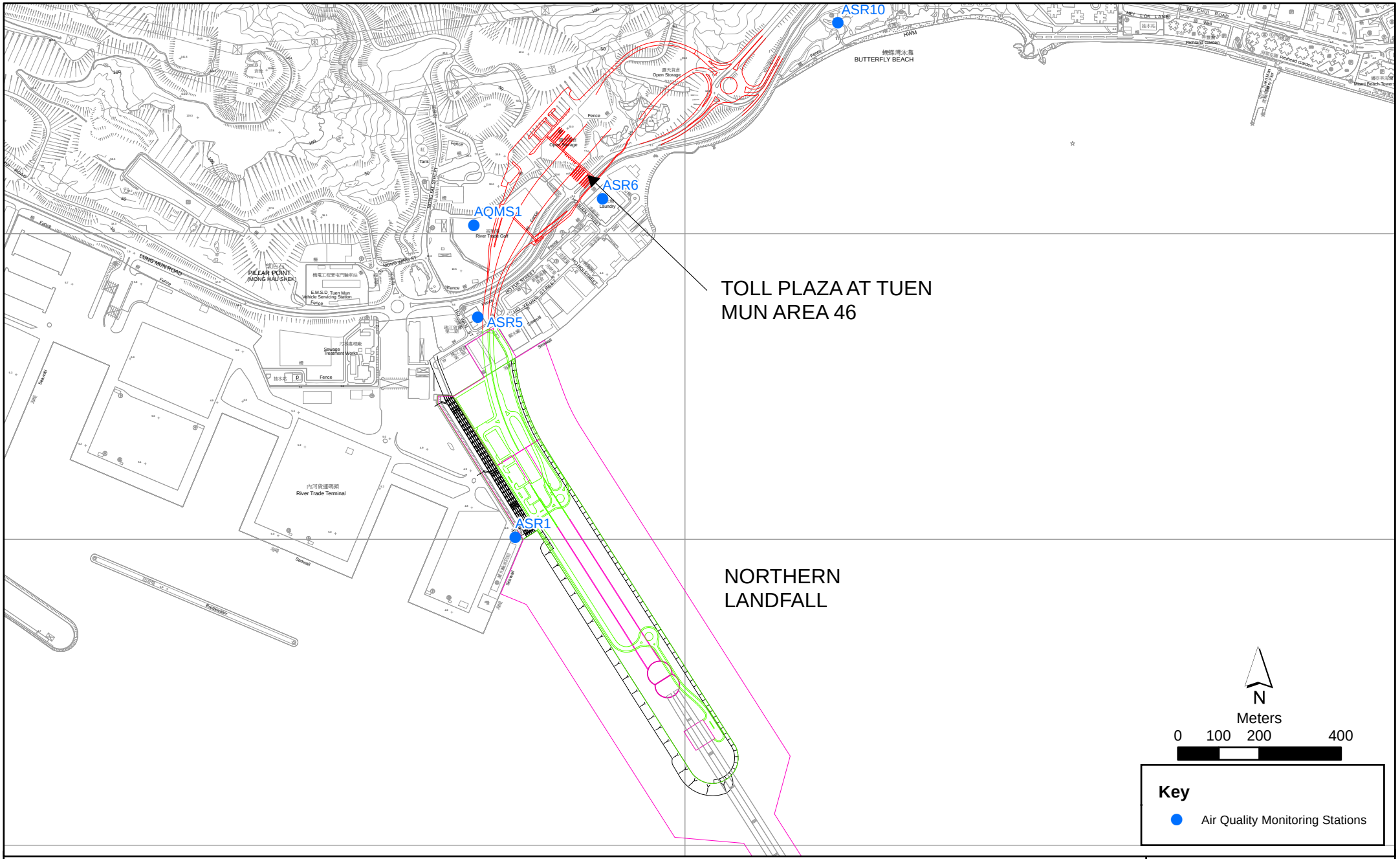

Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

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Date: 21/2/2014

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

Monitoring Station	Location	Description	Parameters & Frequency	Monitoring Dates
ASR1	Tuen Mun Fireboat Station	Office	• 1-hour Total Suspended Particulates (1-hour TSP, $\mu g/m^3$), 3 times per day in every 6 days • 24-hour Total Suspended Particulates (24-hour TSP, $\mu g/m^3$), daily for 24-hour in every 6 days	6, 12, 18, 24 and 28 March 2014; 3, 9, 15, 18, 24 and 30 April 2014; 5, 10, 16, 22 and 28 May 2014
ASR5	Pillar Point Fire Station	Office		
AQMS1	Previous River Trade Golf	Bare ground		
ASR6	Butterfly Beach Laundry	Office		
ASR10	Butterfly Beach Park	Recreational uses		

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

Equipment	Brand and Model
High Volume Sampler (1-hour TSP and 24-hour TSP)	Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Sampler (Model No. TE-5170)
Wind Meter	MetPak (Model: MetPak II (S/N: 13130002)
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 is provided in *Appendix D*. The Event and Action plan is presented in *Appendix I*.

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

Impact air quality monitoring was conducted at all designated monitoring stations in the reporting period under favourable weather conditions. The major dust sources in the reporting period include construction activities under the Contract as well as nearby traffic emissions.

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* and detailed impact air quality monitoring data were reported in the *Fifth* to *Seventh Monthly EM&A Report*.

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

Month/Year	Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
March 2014	ASR 1	160	62 – 391	331	500
to May 2014	ASR 5	192	82 – 402	340	500
	AQMS1	144	56 – 299	335	500
	ASR6	145	52 – 318	338	500
	ASR10	120	59 – 381	337	500

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

Month/Year	Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
March 2014	ASR 1	90	46 – 135	213	260
to May 2014	ASR 5	93	55 – 119	238	260
	AQMS1	75	43 – 129	213	260
	ASR6	74	44 – 107	238	260
	ASR10	69	40 – 108	214	260

In this reporting period, a total of sixteen monitoring events were undertaken in which three Action Level exceedances and no Limit Level exceedances for 1-hr TSP; no Action Level exceedances or Limit Level exceedances for 24-hr TSP were recorded. Summary of Exceedances for Air Quality Impact Monitoring in this Reporting Quarter is detailed in *Table 2.15*.

2.2 *WATER QUALITY MONITORING*

The baseline water quality monitoring undertaken by the Hong Kong – Zhuhai – Macao Bridge Hong Kong Projects (HKZMB) between 6 and 31 October 2011 has included all monitoring stations for the Project. Thus, the baseline monitoring results and Action/Limit Levels presented in HKZMB Baseline Monitoring Report [1] are adopted for this Project.

2.2.1 *Monitoring Requirements & Equipment*

In accordance with the Updated EM&A Manual, impact water quality monitoring was carried out three days per week during the construction period at nine (9) water quality monitoring stations (*Figure 2.2*; *Table 2.5*).

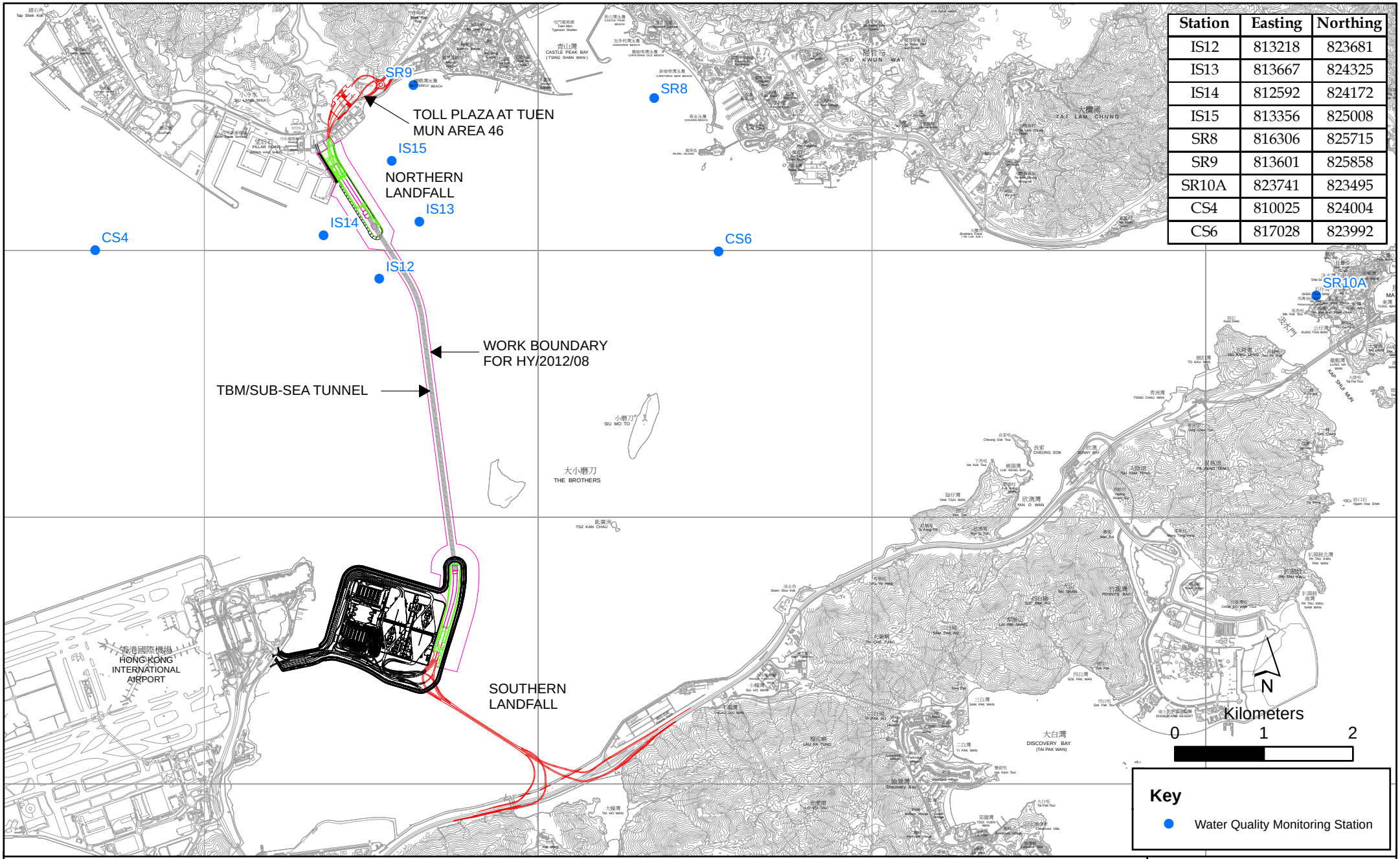
Table 2.5 Locations of Water Quality Monitoring Stations and the Corresponding Monitoring Requirements

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS12	Impact Station	813218	823681	• Temperature(°C) • pH(pH unit) • Turbidity (NTU) • Water depth (m) • Salinity (ppt) • DO (mg/L and % of saturation) • SS (mg/L)	3 water depths: 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Contract.
IS13	Impact Station	813667	824325			
IS14	Impact Station	812592	824172			
IS15	Impact Station	813356	825008			
CS4	Control / Far Field Station	810025	824004			
CS6	Control / Far Field Station	817028	823992			
SR8	Sensitive receiver (Gazettal beaches in Tuen Mun)	816306	825715			
SR9	Sensitive receiver (Butterfly Beach)	813601	825858			
SR10A	Sensitive receiver (Ma Wan FCZ)	823741	823495			

*Notes:
In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded.

Table 2.6 summarizes the equipment used in the impact water quality monitoring programme.

[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.



Station	Easting	Northing
IS12	813218	823681
IS13	813667	824325
IS14	812592	824172
IS15	813356	825008
SR8	816306	825715
SR9	813601	825858
SR10A	823741	823495
CS4	810025	824004
CS6	817028	823992

Figure 2.2

Water Quality Monitoring Station

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Date: 15/11/2013

Environmental Resources Management

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Table 2.6 Water Quality Monitoring Equipment

Equipment	Model	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Dissolved Oxygen Meter	YSI Pro 2030	1
pH Meter	HANNA HI 8314	1
Turbidity Meter	HACH 2100Q	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model eXplorist GC	4
	DGPS Koden KGP913MK2 (1)	1

2.2.2 *Action & Limit Levels*

The Action and Limit Levels of the water quality monitoring is provided in *Appendix D*. The Event and Action plan is presented in *Appendix I.*

2.2.3 *Monitoring Schedule for the Reporting Period*

The schedules for water quality monitoring in the reporting period are provided in *Appendix E.*

2.2.4 *Results and Observations*

During this reporting period, major marine dredging activities included dredging at Portions N-B and N-C and reclamation filling at Portion N-A. A closed grab dredger was used and silt curtains (cage-type and single floating type) were deployed during dredging works in accordance with the EP. The level of dredging activities was within the working rate described in the EP and the approved EIA Report. In addition, reclamation filling was undertaken between the 200 m of leading seawalls using filling materials specified in the EP and the approved EIA Report with a single layer silt curtain being deployed as a precautionary measure to reduce dispersion of suspended solids. It is useful to note that heavy marine traffic (not associated with the Project) was commonly observed nearby the Project site and its vicinity.

Impact water quality monitoring was conducted at all designated monitoring stations in the reporting period under favourable weather conditions. Monitoring results are presented graphically in *Appendix G* and detailed impact water quality monitoring data were reported in the *Fifth* to *Seventh Monthly EM&A Report*.

In this reporting period, a total of thirty-nine monitoring events were undertaken in which one Action Level exceedance and one Limit Level exceedances for depth-averaged SS were recorded. Summary of Exceedances for Water Quality Impact Monitoring in this Reporting Quarter is detailed in *Table 2.17*.

2.3 DOLPHIN MONITORING

2.3.1 Monitoring Requirements

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

2.3.2 Monitoring Equipment

Table 2.7 summarises the equipment used for the impact dolphin monitoring.

Table 2.7 Dolphin Monitoring Equipment

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

2.3.3 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.

2.3.4 Monitoring Location

The impact dolphin monitoring was carried out in the NEL and NWL along the line transect as depicted in *Figure 2.3*. The co-ordinates of all transect lines are shown in *Table 2.8* below.

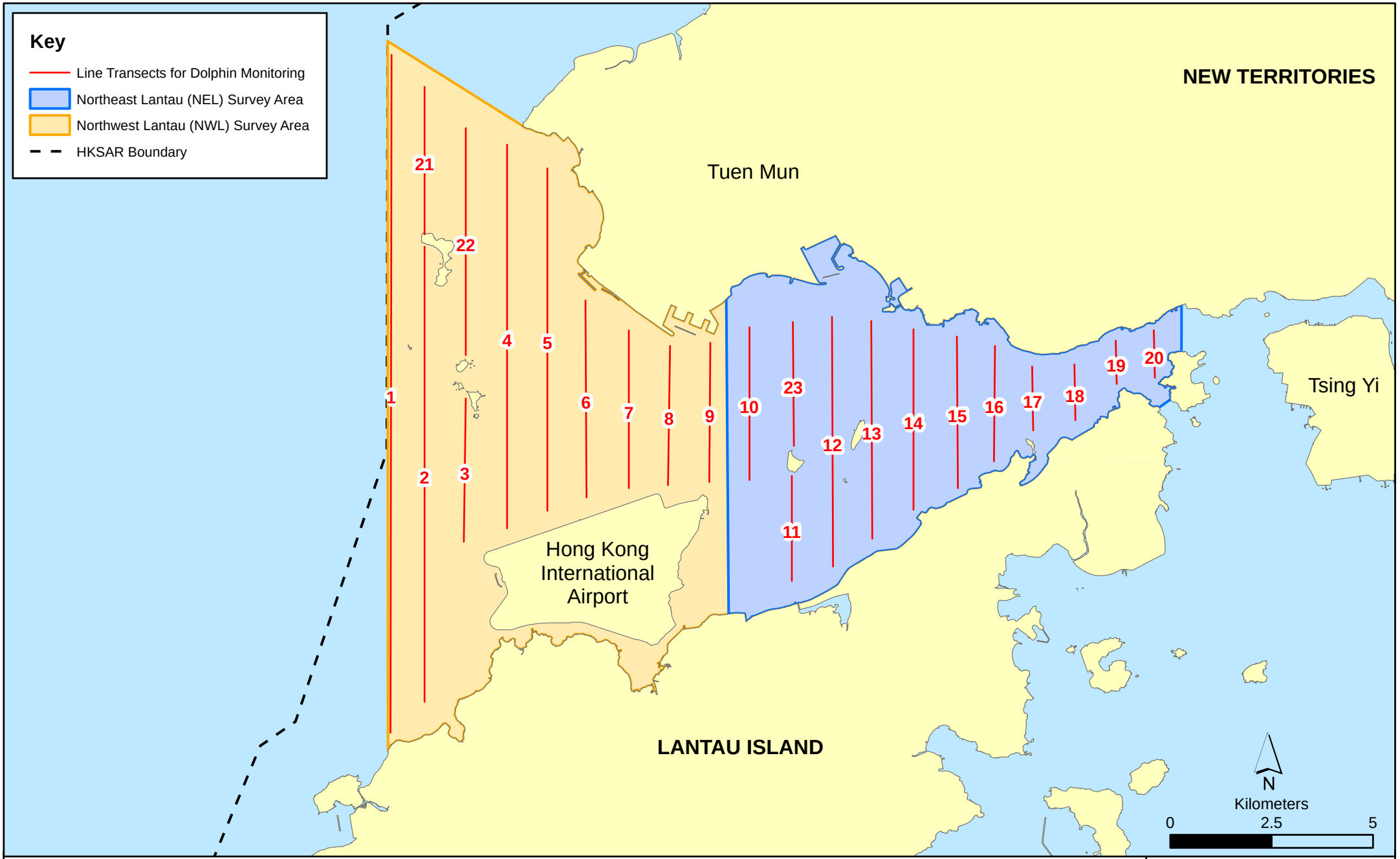

Figure 2.3

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

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Date: 29/11/2013

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Table 2.8 Impact Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	814577	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805475	815457	14	Start Point	817537	820220
2	End Point	805477	826654	14	End Point	817537	824613
3	Start Point	806464	819435	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	819771	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	820220	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	820466	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	820690	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	820847	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	820892	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	820872	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818449	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807				
12	End Point	815542	824882				

2.3.5 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 I*.

2.3.6 *Monitoring Schedule for the Reporting Period*

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

2.3.7 *Results & Observations*

A total of 891.87 km of survey effort was collected, with 87.4% of the total survey effort being conducted under favourable weather conditions (ie Beaufort Sea State 3 or below with good visibility) in this reporting quarter. Amongst the two areas, 350.40 km and 541.47 km of survey effort were collected from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 642.67 km and 249.20 km, respectively. The survey efforts are summarized in *Appendix H*.

A total of 31 groups of 103 Chinese White Dolphin sightings were recorded during the six sets of surveys in this reporting quarter. All except one sighting were made during on-effort search. Twenty-five on-effort sightings were made on primary lines, while five other on-effort sightings were made on secondary lines. During this reporting quarter, all dolphin groups were sighted in NWL, while none was sighted in NEL.

For the detailed comparison of dolphin occurrence and usage of NEL and NWL survey area between the impact phase and baseline phase monitoring, only the quarterly data of March 2014 to May 2014 from the impact phase monitoring was used in the present report to tally with the three-month period of baseline monitoring (September 2011 to November 2011).

As the baseline monitoring period was in the autumn season (September 2011 to November 2011) while the present monitoring period was in the spring season (March 2014 to May 2014), a direct comparison in dolphin distribution between the two quarterly periods of spring months in 2013 and 2014 was also made to avoid the potential bias in seasonal variation.

Between the two spring periods, none of the dolphin sightings was made in NEL in spring 2014, while there were two sightings made in spring 2013. Moreover, more dolphin sightings were made in the middle portion of North Lantau waters and to the west of the airport platform in spring 2013 than in spring 2014.

Encounter rates of Chinese White Dolphins are deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort 3 or below with good visibility) in the reporting quarter with the results and comparison with baseline results present in *Tables 2.9* and *2.10*.

Table 2.9 Individual Survey Event 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)
		Primary Lines Only	**Primary Lines Only**
NEL	Set 1: Mar 5th/11th	0.0	0.0
	Set 2: Mar 17th/25th	0.0	0.0
	Set 3: Apr 4th/14th	0.0	0.0
	Set 4: Apr 16th/24th	0.0	0.0
	Set 5: May 2nd/19th	0.0	0.0
	Set 6: May21st/26th	0.0	0.0
NWL	Set 1: Mar 5th/11th	6.43	23.57
	Set 2: Mar 17th/25th	13.15	24.83
	Set 3: Apr 4th/14th	4.89	26.88
	Set 4: Apr 16th/24th	4.94	11.54
	Set 5: May 2nd/19th	5.47	18.24
	Set 6: May21st/26th	4.18	9.75

Note: Dolphin Encounter Rates are deduced from the Two Sets of Surveys (Two Surveys in Each Set) in the reporting quarter in Northeast (NEL) and Northwest Lantau (NWL)

Table 2.10 Monthly Average Encounter Rates

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)**	
	March 2014 – May 2014	**September 2011 – November 2011**	**March 2014 – May 2014**	**September 2011 – November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	6.51 ± 3.34	9.85 ± 5.85	19.14 ± 7.19	44.66 ± 29.85

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.

Group size of Chinese White Dolphins ranged from 1 - 13 individuals per group in North Lantau region during March 2014 to May 2014. 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 2.11*.

Table 2.11 Average Dolphin Group Size

	Average Dolphin Group Size	
	March 2014 – May 2014	**September 2011 – November 2011**
Overall	3.32 ± 2.87	3.72 ± 3.13
Northeast Lantau	0.0	3.18 ± 2.16
Northwest Lantau	3.32 ± 2.87	3.92 ± 3.40

During this reporting quarter of dolphin monitoring, no unacceptable impact from the construction activities of this Contract was recorded from the general observations.

Although the dolphins infrequently occurred along the alignment of TM-CLKL Northern Connection Sub-Sea Tunnel Section in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL.

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.

2.3.8 Marine Mammal Exclusion Zone Monitoring

Daily 250 m marine mammal exclusion zone monitoring was undertaken during the period of dredging activities under this Contract. No sighting of the Indo-Pacific humpback dolphin (i.e. Chinese White Dolphin) *Sousa chinensis* was recorded during the exclusion zone monitoring.

2.4 POST TRANSLOCATION CORAL MONITORING

The second quarterly Coral Post-Translocation Monitoring was conducted on 16 April 2014 and the results were provided in the *Second Quarterly Post-Translocation Coral Monitoring Report*. The findings indicated that the Action or Limit Levels for coral monitoring were not exceeded as increase in percentage of partial mortality was not detected for both the tagged translocated and natural coral colonies when comparing to the pre-translocation dataset.

2.5 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. Thirteen (13) site inspections were carried out

in the reporting quarter on 4, 11, 19 and 26 March; 1, 8, 16, 22 and 30 April; 7, 13, 21, 27 May 2014.

Key observations during the site inspections in this reporting period are summarized in *Table 2.12*.

Table 2.12 Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Period

Inspection Date	Environmental Observations	Recommendations/ Remarks
4 March 2014	Barge – GD2 • Sediment outflow was observed outside the cage-type silt curtain. Cage-type silt curtain should be maintained regularly. • Acoustic decoupling measures should be placed underneath all generators. Barge – Wing Go • Excess sandy materials should be regularly cleaned from decks and exposed fittings of the barge. Works Area - WA23 • Sandy materials should be regularly cleared to avoid runoff.	Barge – GD2 • The Contractor was reminded to regularly maintain the cage-type silt curtain to prevent sediment out flow. • The Contractor was reminded to check for all generators if the acoustic decoupling measures have been placed underneath all generators. Barge – Wing Go • The Contractor was reminded to regularly clear excess sandy materials from decks and exposed fittings of the barge. Works Area - WA23 • The Contractor was reminded to clear the sandy materials more often to avoid runoff.
11 March 2014	Barge – GD12 and GD2 • Acoustic decoupling measures should be placed underneath all generators. Barge – GD2 • Oily water and surface runoff was observed on the deck. • Cage-type silt curtain should be maintained regularly throughout the dredging works.	Barge – GD12 and GD2 • The Contractor was reminded to place the proper isolation material underneath all generators. Barge – GD2 • The Contractor was reminded to clean up the oily water as chemical waste immediately and to check for oil spill regularly. • The Contractor was reminded to fix the cage-type silt curtain before dredging works commence.
19 March 2014	Barge – CA11 and GD2 • Excess material should be regularly cleaned from decks and the side of the barge. • Cage-type silt curtain should be maintained regularly throughout the dredging works. Works Area - Portion N6 • C&D waste material sorting area should be set up properly.	Barge – CA11 and GD2 • The Contractor was reminded to do regular cleaning of excess material on the side decks of the barge. • The Contractor was reminded to perform regular maintanence on the cage-type silt curtain. Works Area - Portion N6 • The Contractor was reminded to set up a proper C&D waste material sorting area.
26 March 2014	Marine Works Area - Portion N-A and N-B • The Contractor was reminded to tie the floating type silt curtain. Works Area - Portion N6	Marine Works Area - Portion N-A and N-B • The Contractor was reminded to regularly check and maintain the floating type silt curtain.

Inspection Date	Environmental Observations	Recommendations/ Remarks
	• Stagnant water should be cleared. • Water spraying should be applied during ground breaking works to control dust.	Works Area - Portion N6 • The Contractor was reminded to clear the stagnant water. • The Contractor was reminded to apply water spraying during ground breaking works and provide adequate water spraying throughout the day to avoid dust generation.
1 April 2014	Barge – Tai Hip 2 • Chemical containers on the barge was observed without drip tray. • Oil spillage was observed in the water adjacent to the barge. Works Area - Portion N6 • Bunds should be provided to avoid sediment runoff into the sea.	Barge – Tai Hip 2 • The Contractor was reminded to provide drip tray for the chemical containers to avoid chemical spillage. • The Contractor was reminded to clean up the oil spill as chemical waste. Works Area - Portion N6 • The Contractor was reminded to provide bunds.
8 April 2014	Barge – GBFC • Chemical containers and oil drum on the barge were observed without drip tray. Reclamation Area – Zone E • Sandy materials were observed on the seawall block next to the barge. Barge – Leader F53 • Acoustic decoupling measures should be placed underneath all generators.	Barge – GBFC • The Contractor was reminded to provide drip tray for chemical containers and oil drum on the barge. Reclamation Area – Zone E • The Contractor was reminded to regularly clear the sandy materials on the seawall block. Barge – Leader F53 • The Contractor was reminded to check all generators for acoustic decoupling measures on newly arrived vessels.
16 April 2014	Reclamation Area – Zone E • Drip tray should be provided to the chemical containers.	Reclamation Area – Zone E • The Contractor was reminded to provide drip tray for the chemical containers.
22 April 2014	Barge – CA1 • Acoustic decoupling measures should be properly installed underneath the generator. Barge – Wing Ko • Excess materials were observed on the deck of the barge and on top of seawall blocks. Works Area - Portion N6 • Excess materials were observed on the edge of the site area.	Barge – CA1 • The Contractor was reminded to check all the generators for proper implementation of acoustic decoupling measures. Barge – Wing Ko • Excess materials should be cleared regularly on the deck of the barge and on top of seawall blocks. Works Area - Portion N6 • Excess materials should be cleared regularly on the edge of the site area to avoid runoff.
30 April 2014	Works Area - Portion N6 • Silty water was observed near the drilling machine. • Excess materials were observed on the edge of the site area.	Works Area - Portion N6 • The Contractor was reminded to clear the silty water. • The Contractor was reminded to clear the excess materials to avoid runoff.
7 May 2014	Barge – CA1 • Cage-type silt curtain should be properly installed. • Sediment flow was observed behind hopper barge. Works Area - Portion N6 • Drip tray should be provided to the chemical containers.	Barge – CA1 • The Contractor was reminded to properly install the cage-type silt curtain before dredging commences. • The Contractor was reminded to maintain the silt curtain behind hopper barge. Works Area - Portion N6 • The Contractor was reminded to provide drip tray to the chemical containers.

Inspection Date	Environmental Observations	Recommendations/ Remarks
13 May 2014	Reclamation Area - Portion N-A • Drip tray should be provided for the generator once in use. Marine Works Area - Portion N-A • Muddy plume was observed near the seawall.	Reclamation Area - Portion N-A • The Contractor was reminded to provide drip tray for the generator. Marine Works Area - Portion N-A • The Contractor was reminded to provide a layer of geotextile next to the seawall to prevent muddy plume.
21 May 2014	Reclamation Area - Portion N-A • Silt curtain should be maintained regularly. • Mechanical equipment should be covered during rainstorm to avoid chemical spillage.	Reclamation Area - Portion N-A • The Contractor was reminded to properly tie the silt curtain. • The Contractor was reminded to cover the mechanical equipment during rainstorm.
27 May 2014	Works Area – Portion N6 • Water inside drip tray should be cleared. Reclamation Area - Portion N-A • EP should be displayed at the site entrance.	Works Area – Portion N6 • The Contractor was reminded to regularly check the capacity of drip trays. Reclamation Area - Portion N-A • The Contractor was reminded to display EP at the site entrance.

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

2.6 *WASTE MANAGEMENT STATUS*

The Contractor had 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), imported fill, recyclable materials, and marine sediments. 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 2.13*.

Table 2.13 Quantities of Different Waste Generated in the Reporting Period

Month/Year	Inert Construction Waste [a] (tonnes)	Imported Fill (tonnes)	Inert Construction Waste Re-used (tonnes)	Non-inert Construction Waste [b] (tonnes)	Recyclable Materials [c] (kg)	Chemical Wastes (kg)	Marine Sediment (m^3)	
							Category L	Category M
March 2014	105	516,400	0	36	0	0	37,300	40,450
April 2014	22	467,867	0	26	160	0	28,600	15,400
May 2014	1,016	516,368	0	42	0	0	18,700	29,150
Total	1,143	1,500,635	0	104	160	0	84,600	85,000

Notes:

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

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

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

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

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

2.7 *ENVIRONMENTAL LICENSES AND PERMITS*

The status of environmental licensing and permit is summarized in *Table 2.14* below.

Table 2.14 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-354/2009/B	28 January 2014	Throughout the Contract	HyD	Application for VEP on 20 January 2014 to replace EP-354/2009/A
Construction Dust Notification	363510	19 August 2013	Throughout the Contract	DBJV	-
Chemical Waste Registration	5213-422-D2516-01	10 September 2013	Throughout the Contract	DBJV	-
Construction Waste Disposal Account	7018108	19 August 2013	Throughout the Contract	DBJV	Waste disposal in Contract HY/2012/08
Waste Water Discharge License	WT00017707-2013	18 November 2013	30 November 2018	DBJV	For works in site WA18
Waste Water Discharge License	WT00018433-2014	6 March 2014	31 March 2019	DBJV	For works in site Portion N6
Construction Noise Permit	GW-RW0223-14	29 March 2014	28 September 2014	DBJV	For works in site Portion N6
Construction Noise Permit	GW-RW0691-13	15 October 2013	14 April 2014	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0095-14	10 February 2014	9 August 2014	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0234-14	29 March 2014	28 September 2014	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0822-13	14 November 2013	10 May 2014	DBJV	For works in site WA18
Construction Noise Permit	GW-RS0814-13	15 November 2013	10 May 2014	DBJV	For works in site WA23
Construction Noise Permit	GW-RS0362-14	11 May 2014	10 November 2014	DBJV	For works in site WA23
Construction Noise Permit	GW-RW0077-14	17 February 2014	16 August 2014	DBJV	For Portion N6
Marine Dumping Permit	EP/MD/14-072	1 November 2013	30 April 2014	DBJV	For Type 1
Marine Dumping Permit	EP/MD/14-140	1 March 2014	31 March 2014	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/14-072	3 April 2014	30 April 2014	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-007	1 May 2014	31 May 2014	DBJV	For Type 1 (dedicated site) and Type 2

Notes:
HyD = Highways Department
DBJV = Dragages – Bouygues Joint Venture
VEP = Variation of Environmental Permit

2.8 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

In response to the site audit findings, the Contractors carried out all corrective actions.

A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in *Appendix C*. The necessary mitigation measures relevant to this Contract were implemented properly.

2.9 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

For air quality impact monitoring, a total of sixteen monitoring events were undertaken in which three Action Level exceedances and no Limit Level exceedances for 1-hr TSP; no Action Level exceedances or Limit Level exceedances for 24-hr TSP were recorded. (*Table 2.15*). Upon further investigation, the recorded exceedances in air quality monitoring were considered to be sporadic events of cumulative anthropogenic activities in this area of Hong Kong. Detailed investigation findings were presented in *Appendix L* of the *Fifth* to *Sixth Monthly EM&A Report*.

Table 2.15 Summary of Exceedances for Air Quality Impact Monitoring in this Reporting Quarter

Station	Exceedance Level	1-hr TSP	24-hr TSP	Number of Exceedances	
				1-hr TSP	24-hr TSP
AQMS1	Action Level	-	-	0	0
	Limit Level	-	-	0	0
ASR1	Action Level	2014-03-24	-	1	0
	Limit Level	-	-	0	0
ASR5	Action Level	2014-03-24	-	1	0
	Limit Level	-	-	0	0
ASR6	Action Level	-	-	0	0
	Limit Level	-	-	0	0
ASR10	Action Level	2014-04-03	-	1	0
	Limit Level	-	-	0	0
Total number of Action level Exceedances:				3	0
Total number of Limit level Exceedances:				0	0

For marine water quality impact monitoring, a total of thirty-nine monitoring events were undertaken in which one Action Level exceedance and one Limit Level exceedances for depth-averaged SS were recorded (*Table 2.17*). The exceedances were considered to be the increased input of turbid water from the Pearl River due to heavy rainfall upon further investigation. Detailed investigation findings are presented in *Appendix L* of the *Fifth Monthly EM&A Report*. In addition, the construction impact on depth-averaged SS was assessed to compare the quarterly mean values of depth-averaged SS with the relevant ambient mean values. Results showed that the quarterly mean values of depth-averaged SS at all monitoring stations are well below the

ambient mean values (*Table 2.16*), thus no further action is required in accordance with the Updated EM&A Manual.

Table 2.16 Comparison between Quarterly Mean and Ambient Mean Values of Depth-averaged Suspended Solids

Station	Baseline Mean		Ambient Mean [(a)]		Quarterly Mean (March 2014 to May 2014)	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
CS4	10.2	9.0	13.3	11.7	4.3	4.2
CS6	10.9	11.7	14.1	15.2	4.2	4.3
IS12	9.2	9.5	12.0	12.3	4.6	5.0
IS13	10.0	10.5	13.0	13.7	4.4	4.5
IS14	10.4	9.7	13.5	12.6	4.4	4.8
IS15	9.6	11.0	12.5	14.2	4.3	4.6
SR10A	10.3	10.2	13.3	13.3	4.3	4.6
SR8	10.1	11.3	13.1	14.7	4.2	4.4
SR9	8.8	9.9	11.4	12.8	4.4	4.4
Grand Total	**10.0**	**10.3**	**13.0**	**13.4**	**4.3**	**4.5**

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

Table 2.17 Summary of Exceedances for Marine Water Quality Impact Monitoring in this Reporting Quarter

Station	Exceedance Level [(a)]	DO (Surface and Middle)		DO (Bottom)		Turbidity (depth-averaged)		SS (depth-averaged)	
		Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
CS4	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
CS6	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
IS12	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	2014-03-31
IS13	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
IS14	AL	-	-	-	-	-	-	-	2014-03-31
	LL	-	-	-	-	-	-	-	-
IS15	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
SR8	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
SR9	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
SR10	AL	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
	Total AL Exceedances:	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
	Total LL Exceedances:	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

Notes:
(a) AL = Action Level; LL = Limit Level

Two Action Level exccedances of impact dolphin monitoring were recorded in this reporting quarter. Following the review of monitoring data and marine works details in accordance with the procedures stipulated in the Event and Action Plan of the Updated EM&A Manual, the recorded exceedances were considered to be due to natural variation of dolphin ranging pattern. Detailed investigation findings are presented in *Appendix J*.

Cumulative statistics are provided in *Appendix J*.

2.10 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

The Environmental Complaint Handling Procedure is provided in *Figure 2.4*.

No non-compliance event was recorded during the reporting period.

One potential complaint/ enquiry case was notified by the Contractor on 25 April 2014. The investigation findings showed that the case was considered not related to the works under this Contract and is thus invalid. Detailed investigation findings are provided in *Appendix L* of the *Seventh EM&A Monthly Report*.

No summons/ prosecution was received during the reporting period.

Statistics on complaints, notifications of summons and successful prosecutions are summarized in *Appendix J*.

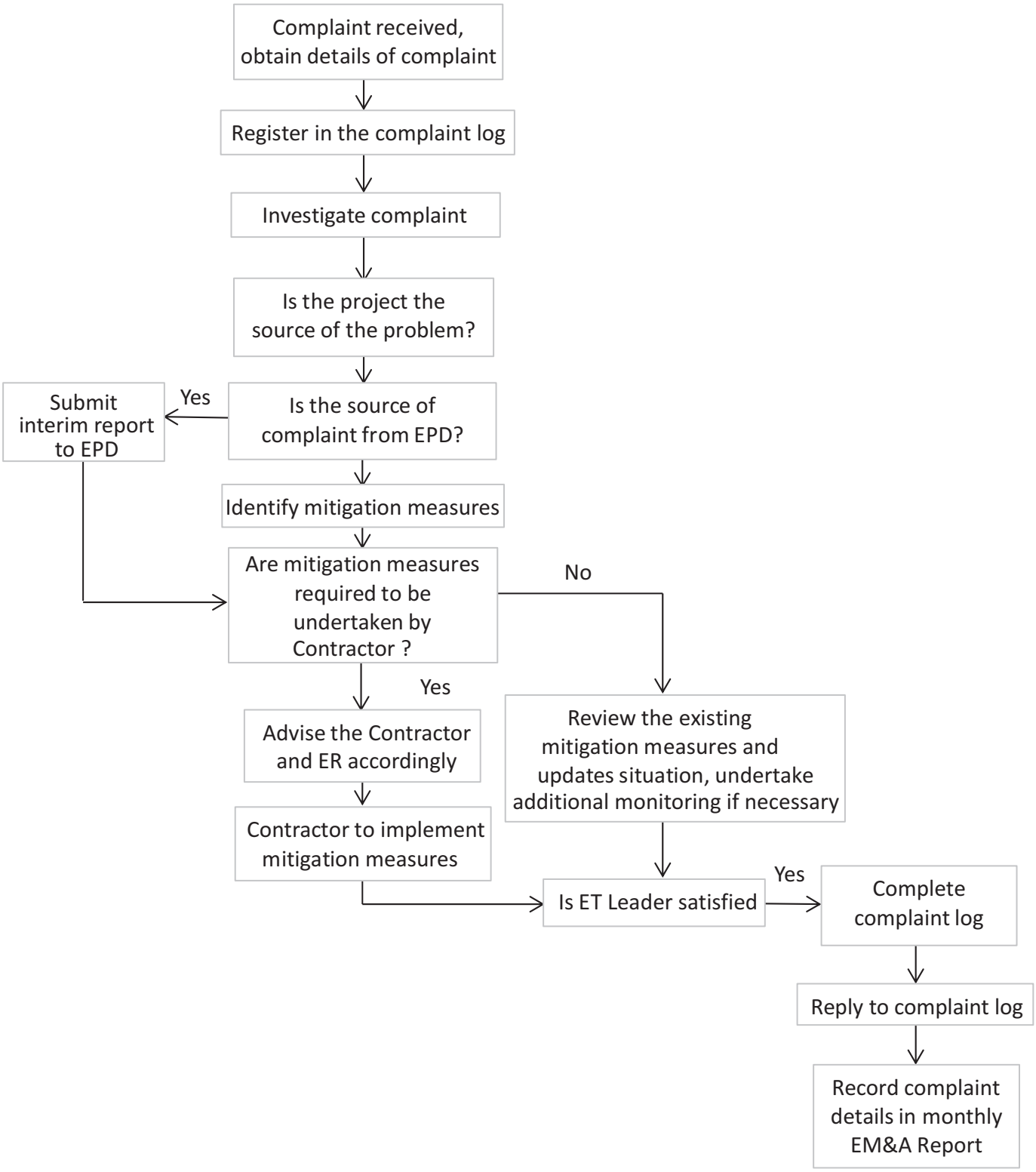

Figure 2.4 Environmental Complaint Handling Procedure

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Environmental Resources Management

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3 FUTURE KEY ISSUES

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING QUARTER

As informed by the Contractor, the major works for the Project in the coming quarter are summarized in *Table 3.1*.

Table 3.1 Construction Works to Be Undertaken in the Coming Quarter

Works to be undertaken
Marine-based Works
• Dredging
• Reclamation Filling
• Vertical Seawall construction
• Sloping Seawall construction
• Marine Sheet Piling for Box Culvert extension
• Predrilling for Box culvert Foundation
Land-based Works
Works Area - Portion N6
• CLP Substation utilities works
• Bored Piling
Reclamation Area – Portion N-A
• Construction of temporary access
• Pile Cap Construction
• Diaphragm Wall Construction

3.2 KEY ISSUES FOR THE COMING QUARTER

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

3.3 MONITORING SCHEDULE FOR THE COMING QUARTER

Impact monitoring for air quality, marine water quality and marine ecology (include dolphin monitoring and post-translocation coral 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. Change to the monitoring programme was thus not considered to be necessary at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period.

4 CONCLUSIONS

This Second Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 March 2014 to 31 May 2014, in accordance with the Updated EM&A Manual and the requirements of *EP-354/2009/B*.

Air quality (including 1-hour TSP and 24-hour TSP), marine water quality and dolphin monitoring were carried out in the reporting period. Three Action Level and no Limit Level exceedances for 1-hr TSP, and no Action Level or Limit Level exceedances for 24-hr TSP were recorded during the reporting period. One Action Level and one Limit Level exceedances for depth-averaged SS were recorded in marine water quality impact monitoring during the reporting period. The review of monitoring data suggested that no unacceptable impact was resulting from the construction activities under this Contract in the reporting period. Nevertheless, the Contractor was reminded to ensure that all dust mitigation measures are provided at the construction sites and the proper deployment of cage-type silt curtains at the dredging site.

A total of 31 groups of 103 Chinese White Dolphin sightings were recorded during the six sets of surveys from March 2014 to May 2014. Whilst two Action Level exceedances were recorded for the quarterly dolphin monitoring data between March and May 2014, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations. Although the dolphins infrequently occurred along the alignment of TM-CLKL Northern Connection Sub-Sea Tunnel Section in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL. 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 construction works of the Contract, and whether suitable mitigation measure can be applied to improve the situation.

Thirteen weekly environmental site inspections were carried out in the reporting period. Recommendations on remedial actions provided for the deficiencies identified during the site audits were properly implemented by the Contractor. No non-compliance event was recorded during the reporting period.

One potential complaint/ enquiry case was notified by the Contractor on 25 April 2014. The investigation findings showed that the case was considered not related to the works under this Contract and is thus invalid.

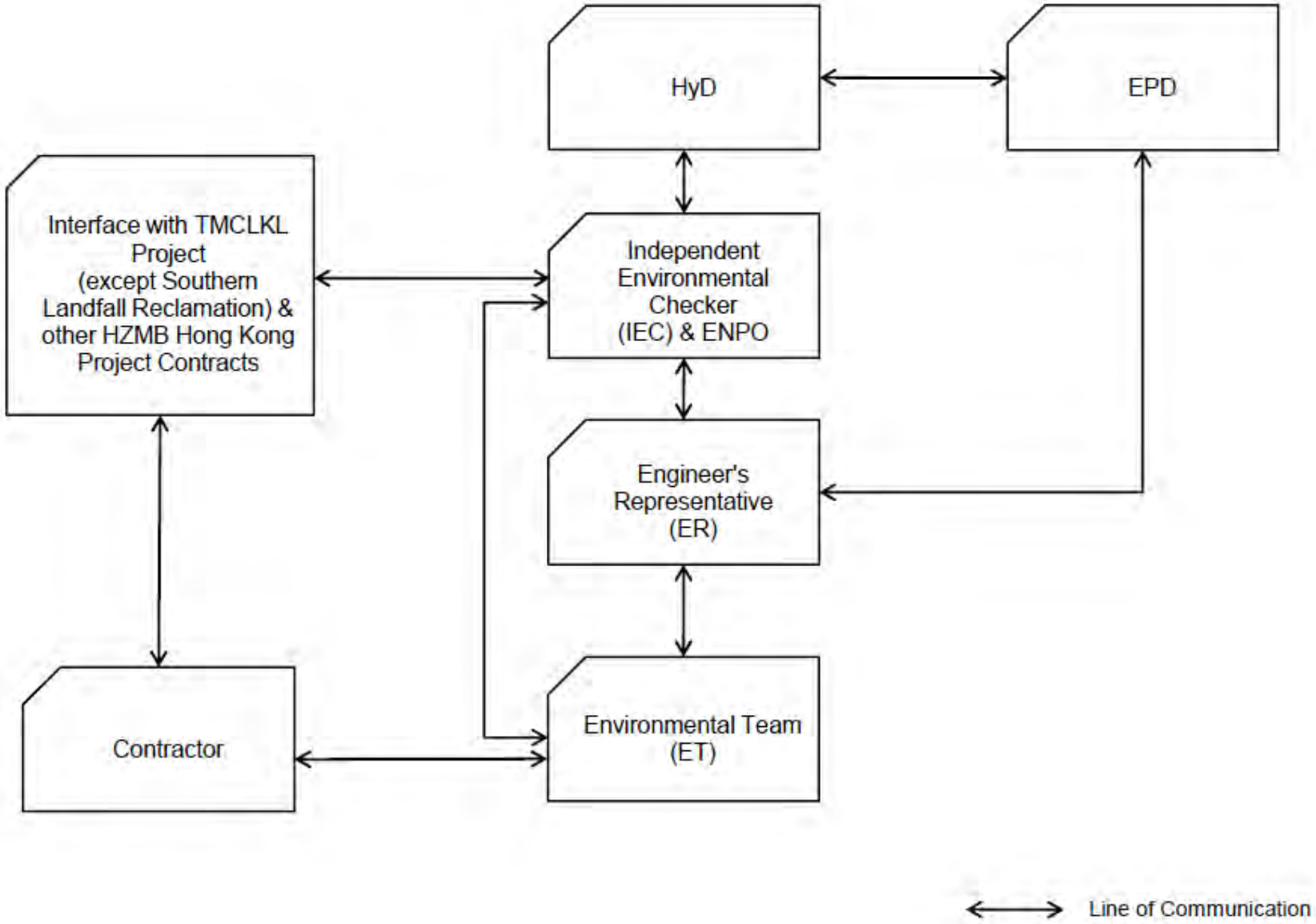
No summons/ prosecution was received during the reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not recommended at this stage. The

monitoring programme will be evaluated as appropriate in the next reporting period. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A

Project Organization for Environmental Works



Appendix A1

Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section
Project Organization

DATE: 06/03/2013

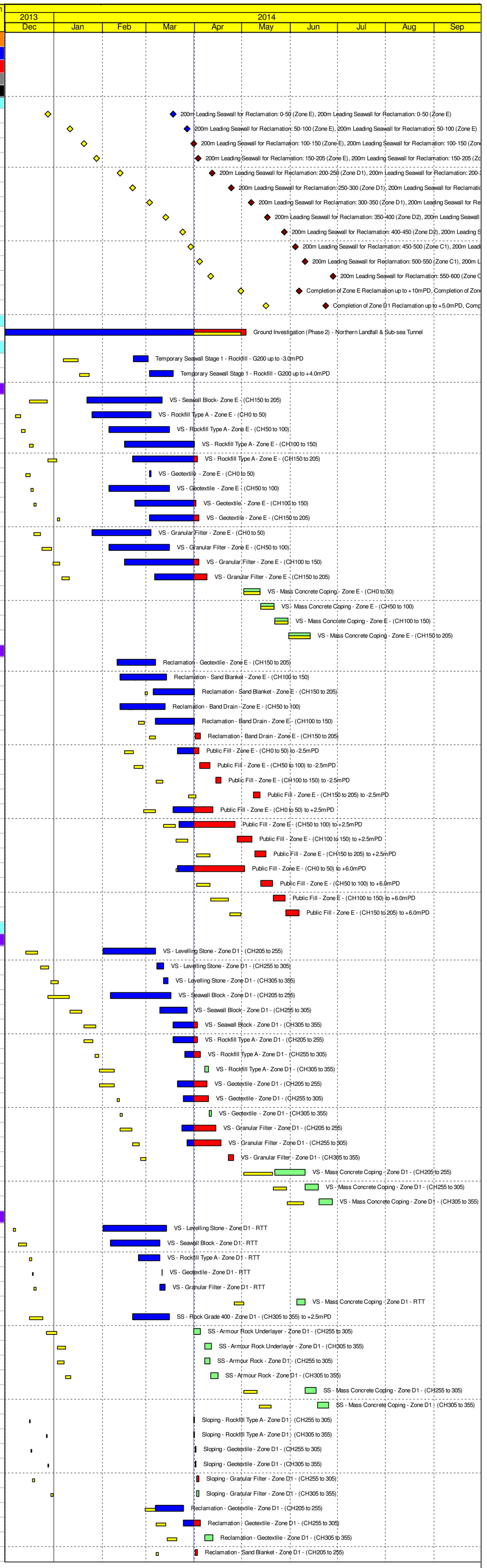
Environmental Resources Management

ERM

Appendix B

Three-Month Rolling Construction Programme

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
TMCLK - Northern Connection Sub-Sea Tunnel Section		332	25-Oct-13	30-Sep-14	25-Oct-13A	09-Dec-14
Construction		332	25-Oct-13	30-Sep-14	25-Oct-13A	09-Dec-14
Northern Landfall		332	25-Oct-13	30-Sep-14	25-Oct-13A	09-Dec-14
North Reclamation (Phase 1)		205	25-Oct-13	13-Jun-14	25-Oct-13A	10-Jul-14
Construction		205	25-Oct-13	13-Jun-14	25-Oct-13A	10-Jul-14
Milestones		70	28-Dec-13	16-May-14	18-Mar-14A	28-Jun-14
NRC10000	200m Leading Seawall for Reclamation: 0-50 (Zone E)	0	28-Dec-13		18-Mar-14A	
NRC10010	200m Leading Seawall for Reclamation: 50-100 (Zone E)	0	11-Jan-14		27-Mar-14A	
NRC10020	200m Leading Seawall for Reclamation: 100-150 (Zone E)	0	20-Jan-14		31-Mar-14	
NRC10030	200m Leading Seawall for Reclamation: 150-205 (Zone E)	0	28-Jan-14		03-Apr-14	
NRC10040	200m Leading Seawall for Reclamation: 200-250 (Zone D1)	0	12-Feb-14		12-Apr-14	
NRC10050	200m Leading Seawall for Reclamation: 250-300 (Zone D1)	0	20-Feb-14		24-Apr-14	
NRC10060	200m Leading Seawall for Reclamation: 300-350 (Zone D1)	0	03-Mar-14		07-May-14	
NRC10070	200m Leading Seawall for Reclamation: 350-400 (Zone D2)	0	13-Mar-14		17-May-14	
NRC10080	200m Leading Seawall for Reclamation: 400-450 (Zone D2)	0	24-Mar-14		28-May-14	
NRC10090	200m Leading Seawall for Reclamation: 450-500 (Zone C1)	0	29-Mar-14		04-Jun-14	
NRC10100	200m Leading Seawall for Reclamation: 500-550 (Zone C1)	0	04-Apr-14		10-Jun-14	
NRC10110	200m Leading Seawall for Reclamation: 550-600 (Zone C2)	0	11-Apr-14		28-Jun-14	
NRC13140	Completion of Zone E Reclamation up to +10mPD	0		30-Apr-14		06-Jun-14
NRC13150	Completion of Zone D1 Reclamation up to +5.0mPD	0		16-May-14		23-Jun-14
Ground Investigation		122	25-Oct-13	30-Apr-14	25-Oct-13A	03-May-14
DDP09010	Ground Investigation (Phase 2) - Northern Landfall & Sub-sea Tunnel	122	25-Oct-13	30-Apr-14	25-Oct-13A	03-May-14
Zone E		142	07-Dec-13	13-Jun-14	22-Jan-14A	13-Jun-14
NRC13820	Temporary Seawall Stage 1 - Rockfill - G200 up to -3.0mPD	9	07-Jan-14	16-Jan-14	21-Feb-14A	02-Mar-14A
NRC13830	Temporary Seawall Stage 1 - Rockfill - G200 up to +4.0mPD	6	17-Jan-14	23-Jan-14	03-Mar-14A	18-Mar-14A
Vertical Seawall		142	07-Dec-13	13-Jun-14	22-Jan-14A	13-Jun-14
NRC10310	VS - Seawall Block- Zone E - (CH150 to 205)	9	16-Dec-13	27-Dec-13	22-Jan-14A	11-Mar-14 A
NRC10320	VS - Rockfill Type A - Zone E - (CH0 to 50)	3	07-Dec-13	10-Dec-13	25-Jan-14A	04-Mar-14A
NRC10330	VS - Rockfill Type A- Zone E - (CH50 to 100)	3	11-Dec-13	13-Dec-13	05-Feb-14A	16-Mar-14A
NRC10340	VS - Rockfill Type A- Zone E - (CH100 to 150)	2	16-Dec-13	18-Dec-13	15-Feb-14A	31-Mar-14
NRC10350	VS - Rockfill Type A- Zone E - (CH150 to 205)	3	28-Dec-13	02-Jan-14	20-Feb-14A	02-Apr-14
NRC10360	VS - Geotextile - Zone E - (CH0 to 50)	2	14-Dec-13	16-Dec-13	03-Mar-14A	04-Mar-14A
NRC10370	VS - Geotextile - Zone E - (CH50 to 100)	2	17-Dec-13	18-Dec-13	05-Feb-14A	16-Mar-14A
NRC10380	VS - Geotextile - Zone E - (CH100 to 150)	2	19-Dec-13	20-Dec-13	22-Feb-14A	01-Apr-14
NRC10390	VS - Geotextile - Zone E - (CH150 to 205)	1	03-Jan-14	04-Jan-14	03-Mar-14A	03-Apr-14
NRC10400	VS - Granular Filter - Zone E - (CH0 to 50)	4	19-Dec-13	23-Dec-13	25-Jan-14A	04-Mar-14A
NRC10410	VS - Granular Filter - Zone E - (CH50 to 100)	4	24-Dec-13	30-Dec-13	05-Feb-14A	16-Mar-14A
NRC10420	VS - Granular Filter - Zone E - (CH100 to 150)	2	31-Dec-13	04-Jan-14	15-Feb-14A	03-Apr-14
NRC10430	VS - Granular Filter - Zone E - (CH150 to 205)	3	06-Jan-14	10-Jan-14	06-Mar-14A	08-Apr-14
NRC10480	VS - Mass Concrete Coping - Zone E - (CH0 to 50)	8	02-May-14	12-May-14	02-May-14*	12-May-14
NRC10490	VS - Mass Concrete Coping - Zone E - (CH50 to 100)	8	13-May-14	21-May-14	13-May-14	21-May-14
NRC10500	VS - Mass Concrete Coping - Zone E - (CH100 to 150)	8	22-May-14	30-May-14	22-May-14	30-May-14
NRC10510	VS - Mass Concrete Coping - Zone E - (CH150 to 205)	11	31-May-14	13-Jun-14	31-May-14	13-Jun-14
Reclamation		89	15-Feb-14	30-Apr-14	10-Feb-14A	06-Jun-14
NRC10550	Reclamation - Geotextile - Zone E - (CH150 to 205)	6	21-Feb-14	27-Feb-14	10-Feb-14A	07-Mar-14A
NRC10580	Reclamation - Sand Blanket - Zone E - (CH100 to 150)	2	21-Feb-14	22-Feb-14	12-Feb-14A	14-Mar-14A
NRC10590	Reclamation - Sand Blanket - Zone E - (CH150 to 205)	1	28-Feb-14	01-Mar-14	05-Mar-14A	31-Mar-14
NRC10610	Reclamation - Band Drain - Zone E - (CH50 to 100)	4	17-Feb-14	20-Feb-14	12-Feb-14A	13-Mar-14A
NRC10620	Reclamation - Band Drain - Zone E - (CH100 to 150)	3	24-Feb-14	27-Feb-14	07-Mar-14A	31-Mar-14
NRC10630	Reclamation - Band Drain - Zone E - (CH150 to 205)	4	03-Mar-14	06-Mar-14	01-Apr-14	04-Apr-14
NRC10640	Public Fill - Zone E - (CH0 to 50) to -2.5mPD	2	15-Feb-14	20-Feb-14	21-Mar-14A	03-Apr-14
NRC10650	Public Fill - Zone E - (CH50 to 100) to -2.5mPD	5	21-Feb-14	26-Feb-14	04-Apr-14	10-Apr-14
NRC10660	Public Fill - Zone E - (CH100 to 150) to -2.5mPD	4	07-Mar-14	11-Mar-14	14-Apr-14	17-Apr-14
NRC10670	Public Fill - Zone E - (CH150 to 205) to -2.5mPD	4	28-Mar-14	01-Apr-14	08-May-14	12-May-14
NRC10680	Public Fill - Zone E - (CH0 to 50) to +2.5mPD	5	27-Feb-14	06-Mar-14	18-Mar-14A	12-Apr-14
NRC10690	Public Fill - Zone E - (CH50 to 100) to +2.5mPD	3	12-Mar-14	19-Mar-14	22-Mar-14A	26-Apr-14
NRC10700	Public Fill - Zone E - (CH100 to 150) to +2.5mPD	7	20-Mar-14	27-Mar-14	28-Apr-14	07-May-14
NRC10710	Public Fill - Zone E - (CH150 to 205) to +2.5mPD	7	02-Apr-14	10-Apr-14	09-May-14	16-May-14
NRC10720	Public Fill - Zone E - (CH0 to 50) to +6.0mPD	4	20-Mar-14	27-Mar-14	21-Mar-14A	02-May-14
NRC10730	Public Fill - Zone E - (CH50 to 100) to +6.0mPD	7	02-Apr-14	10-Apr-14	13-May-14	20-May-14
NRC10740	Public Fill - Zone E - (CH100 to 150) to +6.0mPD	7	11-Apr-14	22-Apr-14	21-May-14	28-May-14
NRC10750	Public Fill - Zone E - (CH150 to 205) to +6.0mPD	7	23-Apr-14	30-Apr-14	29-May-14	06-Jun-14
Zone D1		151	06-Dec-13	09-Jun-14	01-Feb-14A	27-Jun-14
Vertical Seawall		129	14-Dec-13	09-Jun-14	01-Feb-14A	27-Jun-14
NRC10910	VS - Levelling Stone - Zone D1 - (CH205 to 255)	7	14-Dec-13	21-Dec-13	01-Feb-14A	07-Mar-14A
NRC10920	VS - Levelling Stone - Zone D1 - (CH255 to 305)	4	23-Dec-13	28-Dec-13	08-Mar-14A	12-Mar-14A
NRC10930	VS - Levelling Stone - Zone D1 - (CH305 to 355)	4	30-Dec-13	03-Jan-14	12-Mar-14A	15-Mar-14A
NRC10960	VS - Seawall Block - Zone D1 - (CH205 to 255)	11	28-Dec-13	10-Jan-14	06-Feb-14A	17-Mar-14A
NRC10970	VS - Seawall Block - Zone D1 - (CH255 to 305)	7	11-Jan-14	18-Jan-14	10-Mar-14A	27-Mar-14A
NRC10980	VS - Seawall Block - Zone D1 - (CH305 to 355)	4	20-Jan-14	27-Jan-14	18-Mar-14A	02-Apr-14
NRC11010	VS - Rockfill Type A - Zone D1 - (CH205 to 255)	3	20-Jan-14	25-Jan-14	18-Mar-14A	02-Apr-14
NRC11020	VS - Rockfill Type A- Zone D1 - (CH255 to 305)	1	27-Jan-14	29-Jan-14	26-Mar-14A	04-Apr-14
NRC11030	VS - Rockfill Type A- Zone D1 - (CH305 to 355)	3	30-Jan-14	08-Feb-14	07-Apr-14	09-Apr-14
NRC11060	VS - Geotextile - Zone D1 - (CH205 to 255)	1	30-Jan-14	08-Feb-14	21-Mar-14A	08-Apr-14
NRC11070	VS - Geotextile - Zone D1 - (CH255 to 305)	1	10-Feb-14	11-Feb-14	25-Mar-14A	09-Apr-14
NRC11080	VS - Geotextile - Zone D1 - (CH305 to 355)	2	12-Feb-14	13-Feb-14	10-Apr-14	11-Apr-14
NRC11140	VS - Granular Filter - Zone D1 - (CH205 to 255)	3	12-Feb-14	19-Feb-14	24-Mar-14A	14-Apr-14
NRC11210	VS - Granular Filter - Zone D1 - (CH255 to 305)	1	20-Feb-14	24-Feb-14	27-Mar-14A	17-Apr-14
NRC11280	VS - Granular Filter - Zone D1 - (CH305 to 355)	4	25-Feb-14	28-Feb-14	22-Apr-14	25-Apr-14
NRC11720	VS - Mass Concrete Coping - Zone D1 - (CH205 to 255)	15	02-May-14	20-May-14	22-May-14*	10-Jun-14
NRC11790	VS - Mass Concrete Coping - Zone D1 - (CH255 to 305)	8	21-May-14	29-May-14	10-Jun-14	18-Jun-14
NRC11860	VS - Mass Concrete Coping - Zone D1 - (CH305 to 355)	8	30-May-14	09-Jun-14	19-Jun-14	27-Jun-14
Sloping Seawall		149	06-Dec-13	19-May-14	01-Feb-14A	25-Jun-14
NRC1202030	VS - Levelling Stone - Zone D1 - RTT	2	06-Dec-13	07-Dec-13	01-Feb-14A	14-Mar-14A
NRC1202040	VS - Seawall Block - Zone D1 - RTT	6	09-Dec-13	14-Dec-13	06-Feb-14A	10-Mar-14A
NRC1202050	VS - Rockfill Type A- Zone D1 - RTT	2	16-Dec-13	17-Dec-13	24-Feb-14A	10-Mar-14A
NRC1202060	VS - Geotextile - Zone D1 - RTT	1	18-Dec-13	18-Dec-13	11-Mar-14 A	11-Mar-14 A
NRC1202070	VS - Granular Filter - Zone D1 - RTT	2	19-Dec-13	20-Dec-13	10-Mar-14A	13-Mar-14A
NRC1202090	VS - Mass Concrete Coping - Zone D1 - RTT	4	26-Apr-14	02-May-14	05-Jun-14	10-Jun-14
NRC12330	SS - Rock Grade 400 - Zone D1 - (CH305 to 355) to +2.5mPD	15	16-Dec-13	24-Dec-13	20-Feb-14A	16-Mar-14A
NRC13610	SS - Armour Rock Underlayer - Zone D1 - (CH255 to 305)	5	27-Dec-13	02-Jan-14	31-Mar-14	04-Apr-14
NRC13690	SS - Armour Rock Underlayer - Zone D1 - (CH305 to 355)	5	03-Jan-14	08-Jan-14	07-Apr-14	11-Apr-14
NRC14070	SS - Armour Rock - Zone D1 - (CH255 to 305)	4	03-Jan-14	07-Jan-14	07-Apr-14	10-Apr-14
NRC14080	SS - Armour Rock - Zone D1 - (CH305 to 355)	4	08-Jan-14	11-Jan-14	11-Apr-14	15-Apr-14
NRC14120	SS - Mass Concrete Coping - Zone D1 - (CH255 to 305)	7	02-May-14	10-May-14	10-Jun-14	17-Jun-14
NRC14130	SS - Mass Concrete Coping - Zone D1 - (CH305 to 355)	7	12-May-14	19-May-14	18-Jun-14	25-Jun-14
NRC14170	Sloping - Rockfill Type A- Zone D1 - (CH255 to 305)	1	16-Dec-13	16-Dec-13	31-Mar-14	31-Mar-14
NRC14180	Sloping - Rockfill Type A- Zone D1 - (CH305 to 355)	1	27-Dec-13	27-Dec-13	31-Mar-14	31-Mar-14
NRC14220	Sloping - Geotextile - Zone D1 - (CH255 to 305)	1	17-Dec-13	17-Dec-13	01-Apr-14	01-Apr-14
NRC14230	Sloping - Geotextile - Zone D1 - (CH305 to 355)	1	28-Dec-13	28-Dec-13	01-Apr-14	01-Apr-14
NRC14270	Sloping - Granular Filter - Zone D1 - (CH255 to 305)	2	18-Dec-13	19-Dec-13	02-Apr-14	03-Apr-14
NRC14280	Sloping - Granular Filter - Zone D1 - (CH305 to 355)	2	30-Dec-13	31-Dec-13	02-Apr-14	03-Apr-14
NRC14310	Reclamation - Geotextile - Zone D1 - (CH205 to 255)	6	28-Feb-14	06-Mar-14	07-Mar-14A	25-Mar-14A
NRC14320	Reclamation - Geotextile - Zone D1 - (CH255 to 305)	5	07-Mar-14	13-Mar-14	25-Mar-14A	04-Apr-14
NRC14330	Reclamation - Geotextile - Zone D1 - (CH305 to 355)	6	14-Mar-14	20-Mar-14	07-Apr-14	12-Apr-14
NRC14360	Reclamation - Sand Blanket - Zone D1 - (CH205 to 255)	2	07-Mar-14	08-Mar-14	01-Apr-14	02-Apr-14



CurrentBar
CurrentBar - Critical
Planned Bar
Planned Milestone
CurrentMilestone
ProgressMilestone
ProgressBar

TMCLK - Northern Connection Sub-Sea Tunnel Section

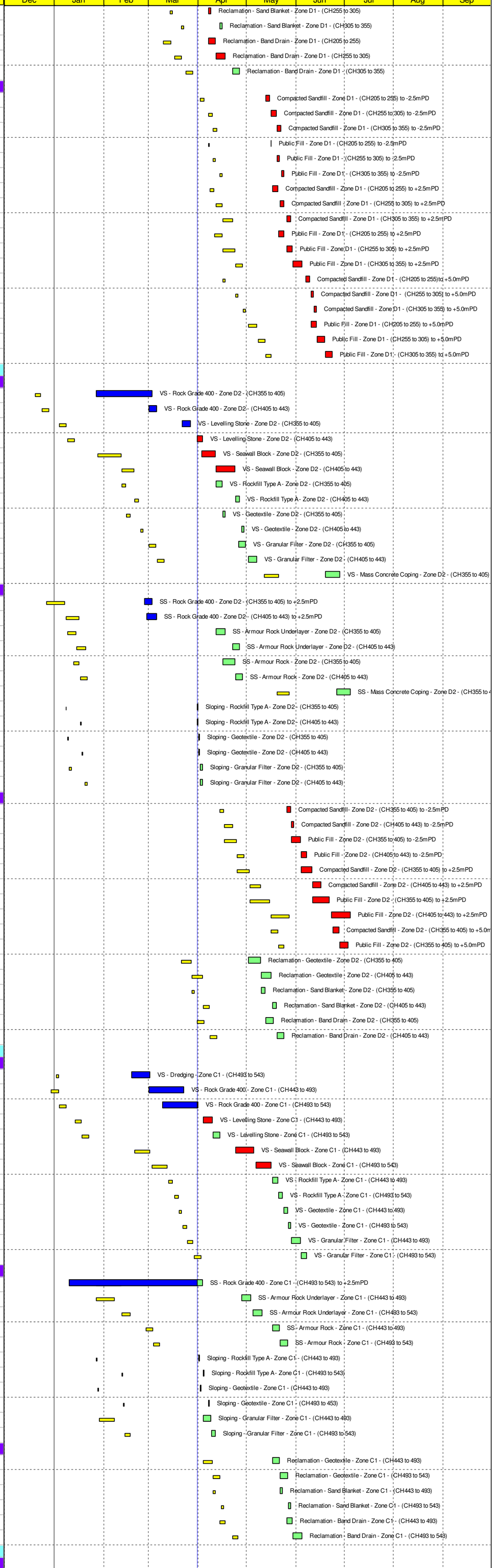
3-Months Rolling Programme - Construction

As of 31-Mar-14 Progress

Dragages HongKong
A member of the Bouygues Construction group
BOUYGUES TRAVAUX PUBLICS
Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
21-Feb-14	TMCLK/DBJ/GEN/PRG/98505	SPa	WYu

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
NRC14370	Reclamation - Sand Blanket - Zone D1 - (CH255 to 305)	2	14-Mar-14	15-Mar-14	07-Apr-14	08-Apr-14
NRC14380	Reclamation - Sand Blanket - Zone D1 - (CH305 to 355)	2	21-Mar-14	22-Mar-14	14-Apr-14	15-Apr-14
NRC14410	Reclamation - Band Drain - Zone D1 - (CH205 to 255)	5	10-Mar-14	14-Mar-14	07-Apr-14	11-Apr-14
NRC14420	Reclamation - Band Drain - Zone D1 - (CH255 to 305)	5	17-Mar-14	21-Mar-14	12-Apr-14	17-Apr-14
NRC14430	Reclamation - Band Drain - Zone D1 - (CH305 to 355)	5	24-Mar-14	28-Mar-14	22-Apr-14	26-Apr-14
Reclamation		35	02-Apr-14	16-May-14	13-May-14	23-Jun-14
NRC13260	Compacted Sandfill - Zone D1 - (CH205 to 255) to -2.5mPD	3	02-Apr-14	04-Apr-14	13-May-14	15-May-14
NRC13270	Compacted Sandfill - Zone D1 - (CH255 to 305) to -2.5mPD	3	07-Apr-14	09-Apr-14	16-May-14	19-May-14
NRC13280	Compacted Sandfill - Zone D1 - (CH305 to 355) to -2.5mPD	3	10-Apr-14	12-Apr-14	20-May-14	22-May-14
NRC13290	Public Fill - Zone D1 - (CH205 to 255) to -2.5mPD	1	07-Apr-14	07-Apr-14	16-May-14	16-May-14
NRC13300	Public Fill - Zone D1 - (CH255 to 305) to -2.5mPD	2	10-Apr-14	11-Apr-14	20-May-14	21-May-14
NRC13310	Public Fill - Zone D1 - (CH305 to 355) to -2.5mPD	2	14-Apr-14	15-Apr-14	23-May-14	24-May-14
NRC13320	Compacted Sandfill - Zone D1 - (CH205 to 255) to +2.5mPD	3	08-Apr-14	10-Apr-14	17-May-14	20-May-14
NRC13340	Compacted Sandfill - Zone D1 - (CH255 to 305) to +2.5mPD	3	12-Apr-14	15-Apr-14	22-May-14	24-May-14
NRC13350	Compacted Sandfill - Zone D1 - (CH305 to 355) to +2.5mPD	3	16-Apr-14	22-Apr-14	26-May-14	28-May-14
NRC13360	Public Fill - Zone D1 - (CH205 to 255) to +2.5mPD	4	11-Apr-14	15-Apr-14	21-May-14	24-May-14
NRC13370	Public Fill - Zone D1 - (CH255 to 305) to +2.5mPD	4	16-Apr-14	23-Apr-14	26-May-14	29-May-14
NRC13380	Public Fill - Zone D1 - (CH305 to 355) to +2.5mPD	4	24-Apr-14	28-Apr-14	30-May-14	04-Jun-14
NRC13390	Compacted Sandfill - Zone D1 - (CH205 to 255)to +5.0mPD	2	16-Apr-14	17-Apr-14	07-Jun-14	09-Jun-14
NRC13400	Compacted Sandfill - Zone D1 - (CH255 to 305) to +5.0mPD	2	24-Apr-14	25-Apr-14	10-Jun-14	11-Jun-14
NRC13410	Compacted Sandfill - Zone D1 - (CH305 to 355) to +5.0mPD	2	29-Apr-14	30-Apr-14	12-Jun-14	13-Jun-14
NRC13420	Public Fill - Zone D1 - (CH205 to 255) to +5.0mPD	4	02-May-14	07-May-14	10-Jun-14	13-Jun-14
NRC13430	Public Fill - Zone D1 - (CH255 to 305) to +5.0mPD	4	08-May-14	12-May-14	14-Jun-14	18-Jun-14
NRC13450	Public Fill - Zone D1 - (CH305 to 355) to +5.0mPD	4	13-May-14	16-May-14	19-Jun-14	23-Jun-14
Zone D2		126	20-Dec-13	27-May-14	27-Jan-14A	04-Jul-14
Vertical Seawall		119	20-Dec-13	21-May-14	27-Jan-14A	28-Jun-14
NRC10890	VS - Rock Grade 400 - Zone D2 - (CH355 to 405)	6	20-Dec-13	23-Dec-13	27-Jan-14A	03-Mar-14A
NRC10900	VS - Rock Grade 400 - Zone D2 - (CH405 to 443)	6	24-Dec-13	28-Dec-13	01-Mar-14A	06-Mar-14A
NRC10940	VS - Levelling Stone - Zone D2 - (CH355 to 405)	4	04-Jan-14	08-Jan-14	22-Mar-14A	27-Mar-14A
NRC10950	VS - Levelling Stone - Zone D2 - (CH405 to 443)	4	09-Jan-14	13-Jan-14	31-Mar-14	03-Apr-14
NRC10990	VS - Seawall Block - Zone D2 - (CH355 to 405)	7	28-Jan-14	11-Feb-14	03-Apr-14	11-Apr-14
NRC11000	VS - Seawall Block - Zone D2 - (CH405 to 443)	7	12-Feb-14	19-Feb-14	12-Apr-14	23-Apr-14
NRC11040	VS - Rockfill Type A- Zone D2 - (CH355 to 405)	3	12-Feb-14	14-Feb-14	12-Apr-14	15-Apr-14
NRC11050	VS - Rockfill Type A- Zone D2 - (CH405 to 443)	3	20-Feb-14	22-Feb-14	24-Apr-14	26-Apr-14
NRC11090	VS - Geotextile - Zone D2 - (CH355 to 405)	2	15-Feb-14	17-Feb-14	16-Apr-14	17-Apr-14
NRC11100	VS - Geotextile - Zone D2 - (CH405 to 443)	2	24-Feb-14	25-Feb-14	28-Apr-14	29-Apr-14
NRC11350	VS - Granular Filter - Zone D2 - (CH355 to 405)	4	01-Mar-14	05-Mar-14	26-Apr-14	30-Apr-14
NRC11390	VS - Granular Filter - Zone D2 - (CH405 to 443)	4	06-Mar-14	10-Mar-14	02-May-14	07-May-14
NRC11930	VS - Mass Concrete Coping - Zone D2 - (CH355 to 405)	8	12-May-14	21-May-14	19-Jun-14	28-Jun-14
Sloping Seawall		126	27-Dec-13	27-May-14	26-Feb-14A	04-Jul-14
NRC12430	SS - Rock Grade 400 - Zone D2 - (CH355 to 405) to +2.5mPD	16	27-Dec-13	07-Jan-14	26-Feb-14A	03-Mar-14A
NRC12840	SS - Rock Grade 400 - Zone D2 - (CH405 to 443) to +2.5mPD	15	08-Jan-14	16-Jan-14	28-Feb-14A	06-Mar-14A
NRC13770	SS - Armour Rock Underlayer - Zone D2 - (CH355 to 405)	5	09-Jan-14	14-Jan-14	12-Apr-14	17-Apr-14
NRC13880	SS - Armour Rock Underlayer - Zone D2 - (CH405 to 443)	5	15-Jan-14	20-Jan-14	22-Apr-14	26-Apr-14
NRC14090	SS - Armour Rock - Zone D2 - (CH355 to 405)	4	13-Jan-14	16-Jan-14	16-Apr-14	23-Apr-14
NRC14100	SS - Armour Rock - Zone D2 - (CH405 to 443)	4	17-Jan-14	21-Jan-14	24-Apr-14	28-Apr-14
NRC14140	SS - Mass Concrete Coping - Zone D2 - (CH355 to 405)	7	20-May-14	27-May-14	26-Jun-14	04-Jul-14
NRC14190	Sloping - Rockfill Type A- Zone D2 - (CH355 to 405)	1	08-Jan-14	08-Jan-14	31-Mar-14	31-Mar-14
NRC14200	Sloping - Rockfill Type A- Zone D2 - (CH405 to 443)	1	17-Jan-14	17-Jan-14	31-Mar-14	31-Mar-14
NRC14240	Sloping - Geotextile - Zone D2 - (CH355 to 405)	1	09-Jan-14	09-Jan-14	01-Apr-14	01-Apr-14
NRC14250	Sloping - Geotextile - Zone D2 - (CH405 to 443)	1	18-Jan-14	18-Jan-14	01-Apr-14	01-Apr-14
NRC14290	Sloping - Granular Filter - Zone D2 - (CH355 to 405)	2	10-Jan-14	11-Jan-14	02-Apr-14	03-Apr-14
NRC14300	Sloping - Granular Filter - Zone D2 - (CH405 to 443)	2	20-Jan-14	21-Jan-14	02-Apr-14	03-Apr-14
Reclamation		52	21-Mar-14	27-May-14	02-May-14	04-Jul-14
NRC13490	Compacted Sandfill- Zone D2 - (CH355 to 405) to -2.5mPD	3	14-Apr-14	16-Apr-14	26-May-14	28-May-14
NRC13500	Compacted Sandfill - Zone D2 - (CH405 to 443) to -2.5mPD	2	17-Apr-14	22-Apr-14	29-May-14	30-May-14
NRC13510	Public Fill - Zone D2 - (CH355 to 405) to -2.5mPD	4	17-Apr-14	24-Apr-14	29-May-14	03-Jun-14
NRC13520	Public Fill - Zone D2 - (CH405 to 443) to -2.5mPD	4	25-Apr-14	29-Apr-14	04-Jun-14	07-Jun-14
NRC13540	Compacted Sandfill - Zone D2 - (CH355 to 405) to +2.5mPD	6	25-Apr-14	02-May-14	04-Jun-14	10-Jun-14
NRC13550	Compacted Sandfill - Zone D2 - (CH405 to 443) to +2.5mPD	5	03-May-14	09-May-14	11-Jun-14	16-Jun-14
NRC13560	Public Fill - Zone D2 - (CH355 to 405) to +2.5mPD	10	03-May-14	15-May-14	11-Jun-14	21-Jun-14
NRC13570	Public Fill - Zone D2 - (CH405 to 443) to +2.5mPD	10	16-May-14	27-May-14	23-Jun-14	04-Jul-14
NRC13580	Compacted Sandfill - Zone D2 - (CH355 to 405) to +5.0mPD	4	16-May-14	20-May-14	24-Jun-14	27-Jun-14
NRC13600	Public Fill - Zone D2 - (CH355 to 405) to +5.0mPD	4	21-May-14	24-May-14	28-Jun-14	03-Jul-14
NRC14340	Reclamation - Geotextile - Zone D2 - (CH355 to 405)	6	21-Mar-14	27-Mar-14	02-May-14	09-May-14
NRC14350	Reclamation - Geotextile - Zone D2 - (CH405 to 443)	6	28-Mar-14	03-Apr-14	10-May-14	16-May-14
NRC14390	Reclamation - Sand Blanket - Zone D2 - (CH355 to 405)	2	28-Mar-14	29-Mar-14	10-May-14	12-May-14
NRC14400	Reclamation - Sand Blanket - Zone D2 - (CH405 to 443)	2	04-Apr-14	07-Apr-14	17-May-14	19-May-14
NRC14440	Reclamation - Band Drain - Zone D2 - (CH355 to 405)	5	31-Mar-14	04-Apr-14	13-May-14	17-May-14
NRC14450	Reclamation - Band Drain - Zone D2 - (CH405 to 443)	5	08-Apr-14	12-Apr-14	20-May-14	24-May-14
Zone C1		90	30-Dec-13	25-Apr-14	10-Jan-14A	07-Jun-14
Vertical Seawall		90	30-Dec-13	02-Apr-14	18-Feb-14A	07-Jun-14
NRC14470	VS - Dredging - Zone C1 - (CH493 to 543)	2	02-Jan-14	03-Jan-14	18-Feb-14A	01-Mar-14A
NRC14490	VS - Rock Grade 400 - Zone C1 - (CH443 to 493)	6	30-Dec-13	03-Jan-14	01-Mar-14A	23-Mar-14A
NRC14500	VS - Rock Grade 400 - Zone C1 - (CH493 to 543)	6	04-Jan-14	08-Jan-14	10-Mar-14A	31-Mar-14
NRC14520	VS - Levelling Stone - Zone C1 - (CH443 to 493)	4	14-Jan-14	17-Jan-14	04-Apr-14	09-Apr-14
NRC14530	VS - Levelling Stone - Zone C1 - (CH493 to 543)	4	18-Jan-14	22-Jan-14	10-Apr-14	14-Apr-14
NRC14550	VS - Seawall Block - Zone C1 - (CH443 to 493)	9	20-Feb-14	01-Mar-14	24-Apr-14	05-May-14
NRC14560	VS - Seawall Block - Zone C1 - (CH493 to 543)	9	03-Mar-14	12-Mar-14	07-May-14	16-May-14
NRC14580	VS - Rockfill Type A- Zone C1 - (CH443 to 493)	3	13-Mar-14	15-Mar-14	17-May-14	20-May-14
NRC14590	VS - Rockfill Type A- Zone C1 - (CH493 to 543)	3	17-Mar-14	19-Mar-14	21-May-14	23-May-14
NRC14610	VS - Geotextile - Zone C1 - (CH443 to 493)	2	20-Mar-14	21-Mar-14	24-May-14	26-May-14
NRC14620	VS - Geotextile - Zone C1 - (CH493 to 543)	2	22-Mar-14	24-Mar-14	27-May-14	28-May-14
NRC14640	VS - Granular Filter - Zone C1 - (CH443 to 493)	4	25-Mar-14	28-Mar-14	29-May-14	03-Jun-14
NRC14650	VS - Granular Filter - Zone C1 - (CH493 to 543)	4	29-Mar-14	02-Apr-14	04-Jun-14	07-Jun-14
Sloping Seawall		48	27-Jan-14	07-Mar-14	10-Jan-14A	26-May-14
NRC14770	SS - Rock Grade 400 - Zone C1 - (CH493 to 543) to +2.5mPD	11	27-Jan-14	11-Feb-14	10-Jan-14A	03-Apr-14
NRC14820	SS - Armour Rock Underlayer - Zone C1 - (CH443 to 493)	5	27-Jan-14	07-Feb-14	28-Apr-14	03-May-14
NRC14830	SS - Armour Rock Underlayer - Zone C1 - (CH493 to 543)	5	12-Feb-14	17-Feb-14	05-May-14	10-May-14
NRC14850	SS - Armour Rock - Zone C1 - (CH443 to 493)	4	27-Feb-14	03-Mar-14	17-May-14	21-May-14
NRC14860	SS - Armour Rock - Zone C1 - (CH493 to 543)	4	04-Mar-14	07-Mar-14	22-May-14	26-May-14
NRC14910	Sloping - Rockfill Type A- Zone C1 - (CH443 to 493)	1	27-Jan-14	27-Jan-14	01-Apr-14	01-Apr-14
NRC14920	Sloping - Rockfill Type A- Zone C1 - (CH493 to 543)	1	12-Feb-14	12-Feb-14	04-Apr-14	04-Apr-14
NRC14940	Sloping - Geotextile - Zone C1 - (CH443 to 493)	1	28-Jan-14	28-Jan-14	02-Apr-14	02-Apr-14
NRC14950	Sloping - Geotextile - Zone C1 - (CH493 to 453)	1	13-Feb-14	13-Feb-14	07-Apr-14	07-Apr-14
NRC14970	Sloping - Granular Filter - Zone C1 - (CH443 to 493)	3	29-Jan-14	07-Feb-14	04-Apr-14	08-Apr-14
NRC14980	Sloping - Granular Filter - Zone C1 - (CH493 to 543)	3	14-Feb-14	17-Feb-14	09-Apr-14	11-Apr-14
Reclamation		15	04-Apr-14	25-Apr-14	17-May-14	04-Jun-14
NRC15000	Reclamation - Geotextile - Zone C1 - (CH443 to 493)	4	04-Apr-14	09-Apr-14	17-May-14	21-May-14
NRC15010	Reclamation - Geotextile - Zone C1 - (CH493 to 543)	4	10-Apr-14	14-Apr-14	22-May-14	26-May-14
NRC15030	Reclamation - Sand Blanket - Zone C1 - (CH443 to 493)	2	10-Apr-14	11-Apr-14	22-May-14	23-May-14
NRC15040	Reclamation - Sand Blanket - Zone C1 - (CH493 to 543)	2	15-Apr-14	16-Apr-14	27-May-14	28-May-14
NRC15060	Reclamation - Band Drain - Zone C1 - (CH443 to 493)	4	14-Apr-14	17-Apr-14	26-May-14	29-May-14
NRC15070	Reclamation - Band Drain - Zone C1 - (CH493 to 543)	4	22-Apr-14	25-Apr-14	30-May-14	04-Jun-14
Zone C2		83	07-Jan-14	30-Apr-14	27-Feb-14A	12-Jun-14
Vertical Seawall		83	07-Jan-14	08-Apr-14	27-Feb-14A	12-Jun-14



CurrentBar
CurrentBar - Critical
Planned Bar
Planned Milestone
CurrentMilestone
ProgressMilestone
ProgressBar

TMCLK - Northern Connection Sub-Sea Tunnel Section

3-Months Rolling Programme - Construction

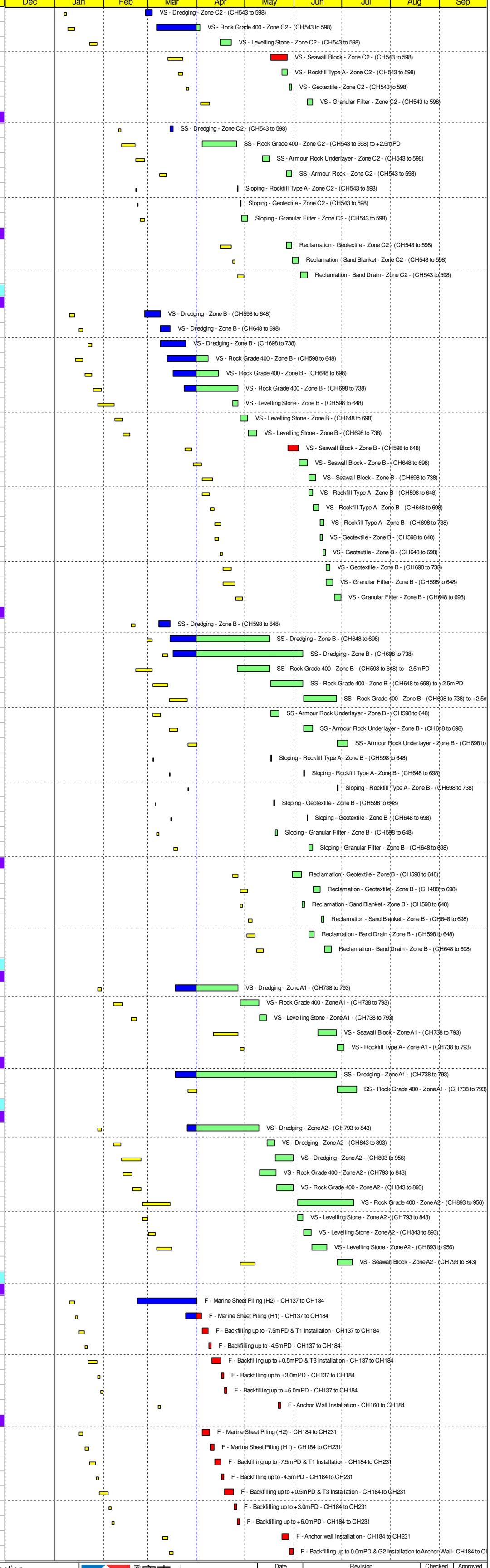
As of 31-Mar-14 Progress

Dragages HongKong
A member of the Bouygues Construction group
Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

BOUYGUES TRAVAUX PUBLICS

Date	Revision	Checked	Approved
21-Feb-14	TMCLK/DBJ/GEN/PRG/98505	SPa	WYu

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
NRC14480	VS - Dredging - Zone C2 - (CH543 to 598)	2	07-Jan-14	08-Jan-14	27-Feb-14A	03-Mar-14A
NRC14510	VS - Rock Grade 400 - Zone C2 - (CH543 to 598)	6	09-Jan-14	13-Jan-14	06-Mar-14A	02-Apr-14
NRC14540	VS - Levelling Stone - Zone C2 - (CH543 to 598)	4	23-Jan-14	27-Jan-14	15-Apr-14	22-Apr-14
NRC14570	VS - Seawall Block - Zone C2 - (CH543 to 598)	9	13-Mar-14	22-Mar-14	17-May-14	27-May-14
NRC14600	VS - Rockfill Type A- Zone C2 - (CH543 to 598)	3	20-Mar-14	22-Mar-14	24-May-14	27-May-14
NRC14630	VS - Geotextile - Zone C2 - (CH543 to 598)	2	25-Mar-14	26-Mar-14	29-May-14	30-May-14
NRC14660	VS - Granular Filter - Zone C2 - (CH543 to 598)	4	03-Apr-14	08-Apr-14	09-Jun-14	12-Jun-14
Sloping Seawall		43	10-Feb-14	12-Mar-14	15-Mar-14A	30-May-14
NRC14750	SS - Dredging - Zone C2 - (CH543 to 598)	2	10-Feb-14	11-Feb-14	15-Mar-14A	17-Mar-14A
NRC14780	SS - Rock Grade 400 - Zone C2 - (CH543 to 598) to +2.5mPD	15	12-Feb-14	20-Feb-14	04-Apr-14	25-Apr-14
NRC14840	SS - Armour Rock Underlayer - Zone C2 - (CH543 to 598)	5	21-Feb-14	26-Feb-14	12-May-14	16-May-14
NRC14870	SS - Armour Rock - Zone C2 - (CH543 to 598)	4	08-Mar-14	12-Mar-14	27-May-14	30-May-14
NRC14930	Sloping - Rockfill Type A- Zone C2 - (CH543 to 598)	1	21-Feb-14	21-Feb-14	26-Apr-14	26-Apr-14
NRC14960	Sloping - Geotextile - Zone C2 - (CH543 to 598)	1	22-Feb-14	22-Feb-14	28-Apr-14	28-Apr-14
NRC14990	Sloping - Granular Filter - Zone C2 - (CH543 to 598)	3	24-Feb-14	26-Feb-14	29-Apr-14	02-May-14
Reclamation		11	15-Apr-14	30-Apr-14	27-May-14	09-Jun-14
NRC15020	Reclamation - Geotextile - Zone C2 - (CH543 to 598)	4	15-Apr-14	22-Apr-14	27-May-14	30-May-14
NRC15050	Reclamation - Sand Blanket - Zone C2 - (CH543 to 598)	2	23-Apr-14	24-Apr-14	31-May-14	03-Jun-14
NRC15080	Reclamation - Band Drain - Zone C2 - (CH543 to 598)	4	26-Apr-14	30-Apr-14	05-Jun-14	09-Jun-14
Zone B		94	10-Jan-14	12-May-14	27-Feb-14A	04-Jul-14
Vertical Seawall		91	10-Jan-14	29-Apr-14	27-Feb-14A	30-Jun-14
NRC11110	VS - Dredging - Zone B - (CH598 to 648)	3	10-Jan-14	13-Jan-14	27-Feb-14A	09-Mar-14A
NRC11120	VS - Dredging - Zone B - (CH648 to 698)	3	16-Jan-14	18-Jan-14	09-Mar-14A	15-Mar-14A
NRC11130	VS - Dredging - Zone B - (CH698 to 738)	3	22-Jan-14	24-Jan-14	09-Mar-14A	25-Mar-14A
NRC11150	VS - Rock Grade 400 - Zone B - (CH598 to 648)	5	14-Jan-14	18-Jan-14	13-Mar-14A	07-Apr-14
NRC11160	VS - Rock Grade 400 - Zone B - (CH648 to 698)	3	20-Jan-14	24-Jan-14	17-Mar-14A	14-Apr-14
NRC11170	VS - Rock Grade 400 - Zone B - (CH698 to 738)	2	25-Jan-14	30-Jan-14	24-Mar-14A	26-Apr-14
NRC11180	VS - Levelling Stone - Zone B - (CH598 to 648)	4	28-Jan-14	07-Feb-14	23-Apr-14	26-Apr-14
NRC11190	VS - Levelling Stone - Zone B - (CH648 to 698)	4	08-Feb-14	12-Feb-14	28-Apr-14	02-May-14
NRC11200	VS - Levelling Stone - Zone B - (CH698 to 738)	4	13-Feb-14	17-Feb-14	03-May-14	08-May-14
NRC11220	VS - Seawall Block - Zone B - (CH598 to 648)	5	24-Mar-14	28-Mar-14	28-May-14	03-Jun-14
NRC11230	VS - Seawall Block - Zone B - (CH648 to 698)	5	29-Mar-14	03-Apr-14	04-Jun-14	09-Jun-14
NRC11240	VS - Seawall Block - Zone B - (CH698 to 738)	5	04-Apr-14	10-Apr-14	10-Jun-14	14-Jun-14
NRC11250	VS - Rockfill Type A- Zone B - (CH598 to 648)	3	04-Apr-14	08-Apr-14	10-Jun-14	12-Jun-14
NRC11260	VS - Rockfill Type A- Zone B - (CH648 to 698)	3	09-Apr-14	11-Apr-14	13-Jun-14	16-Jun-14
NRC11270	VS - Rockfill Type A- Zone B - (CH698 to 738)	3	12-Apr-14	15-Apr-14	17-Jun-14	19-Jun-14
NRC11290	VS - Geotextile - Zone B - (CH598 to 648)	2	12-Apr-14	14-Apr-14	17-Jun-14	18-Jun-14
NRC11300	VS - Geotextile - Zone B - (CH648 to 698)	2	15-Apr-14	16-Apr-14	19-Jun-14	20-Jun-14
NRC11310	VS - Geotextile - Zone B - (CH698 to 738)	2	17-Apr-14	22-Apr-14	21-Jun-14	23-Jun-14
NRC11320	VS - Granular Filter - Zone B - (CH598 to 648)	4	17-Apr-14	24-Apr-14	21-Jun-14	25-Jun-14
NRC11330	VS - Granular Filter - Zone B - (CH648 to 698)	4	25-Apr-14	29-Apr-14	26-Jun-14	30-Jun-14
Sloping Seawall		56	18-Feb-14	31-Mar-14	08-Mar-14A	04-Jul-14
NRC11440	SS - Dredging - Zone B - (CH598 to 648)	3	18-Feb-14	20-Feb-14	08-Mar-14A	15-Mar-14A
NRC11450	SS - Dredging - Zone B - (CH648 to 698)	2	28-Feb-14	03-Mar-14	15-Mar-14A	16-May-14
NRC11460	SS - Dredging - Zone B - (CH698 to 738)	2	10-Mar-14	13-Mar-14	17-Mar-14A	06-Jun-14
NRC11470	SS - Rock Grade 400 - Zone B - (CH598 to 648) to +2.5mPD	16	21-Feb-14	03-Mar-14	26-Apr-14	16-May-14
NRC11480	SS - Rock Grade 400 - Zone B - (CH648 to 698) to +2.5mPD	17	04-Mar-14	13-Mar-14	17-May-14	06-Jun-14
NRC11490	SS - Rock Grade 400 - Zone B - (CH698 to 738) to +2.5mPD	18	14-Mar-14	25-Mar-14	07-Jun-14	27-Jun-14
NRC11540	SS - Armour Rock Underlayer - Zone B - (CH598 to 648)	5	04-Mar-14	08-Mar-14	17-May-14	22-May-14
NRC11550	SS - Armour Rock Underlayer - Zone B - (CH648 to 698)	5	14-Mar-14	19-Mar-14	07-Jun-14	12-Jun-14
NRC11560	SS - Armour Rock Underlayer - Zone B - (CH698 to 738)	5	26-Mar-14	31-Mar-14	28-Jun-14	04-Jul-14
NRC11650	Sloping - Rockfill Type A- Zone B - (CH598 to 648)	1	04-Mar-14	04-Mar-14	17-May-14	17-May-14
NRC11660	Sloping - Rockfill Type A- Zone B - (CH648 to 698)	1	14-Mar-14	14-Mar-14	07-Jun-14	07-Jun-14
NRC11670	Sloping - Rockfill Type A- Zone B - (CH698 to 738)	1	26-Mar-14	26-Mar-14	28-Jun-14	28-Jun-14
NRC11690	Sloping - Geotextile - Zone B - (CH598 to 648)	1	05-Mar-14	05-Mar-14	19-May-14	19-May-14
NRC11700	Sloping - Geotextile - Zone B - (CH648 to 698)	1	15-Mar-14	15-Mar-14	09-Jun-14	09-Jun-14
NRC11730	Sloping - Granular Filter - Zone B - (CH598 to 648)	2	06-Mar-14	07-Mar-14	20-May-14	21-May-14
NRC11740	Sloping - Granular Filter - Zone B - (CH648 to 698)	3	17-Mar-14	19-Mar-14	10-Jun-14	12-Jun-14
Reclamation		20	23-Apr-14	12-May-14	31-May-14	24-Jun-14
NRC11760	Reclamation - Geotextile - Zone B - (CH598 to 648)	4	23-Apr-14	26-Apr-14	31-May-14	05-Jun-14
NRC11770	Reclamation - Geotextile - Zone B - (CH488 to 698)	4	28-Apr-14	02-May-14	13-Jun-14	17-Jun-14
NRC11800	Reclamation - Sand Blanket - Zone B - (CH598 to 648)	2	28-Apr-14	29-Apr-14	06-Jun-14	07-Jun-14
NRC11810	Reclamation - Sand Blanket - Zone B - (CH648 to 698)	2	03-May-14	05-May-14	18-Jun-14	19-Jun-14
NRC11830	Reclamation - Band Drain - Zone B - (CH598 to 648)	4	02-May-14	07-May-14	10-Jun-14	13-Jun-14
NRC11840	Reclamation - Band Drain - Zone B - (CH648 to 698)	4	08-May-14	12-May-14	20-Jun-14	24-Jun-14
Zone A1		72	28-Jan-14	30-Apr-14	18-Mar-14A	10-Jul-14
Vertical Seawall		65	28-Jan-14	30-Apr-14	18-Mar-14A	02-Jul-14
NRC12020	VS - Dredging - Zone A1 - (CH738 to 793)	2	28-Jan-14	30-Jan-14	18-Mar-14A	26-Apr-14
NRC12040	VS - Rock Grade 400 - Zone A1 - (CH738 to 793)	9	07-Feb-14	12-Feb-14	28-Apr-14	09-May-14
NRC12050	VS - Levelling Stone - Zone A1 - (CH738 to 793)	4	18-Feb-14	21-Feb-14	10-May-14	14-May-14
NRC12060	VS - Seawall Block - Zone A1 - (CH738 to 793)	11	11-Apr-14	26-Apr-14	16-Jun-14	27-Jun-14
NRC12080	VS - Rockfill Type A- Zone A1 - (CH738 to 793)	3	28-Apr-14	30-Apr-14	28-Jun-14	02-Jul-14
Sloping Seawall		10	20-Mar-14	31-Mar-14	18-Mar-14A	10-Jul-14
NRC12140	SS - Dredging - Zone A1 - (CH738 to 793)	2	20-Mar-14	25-Mar-14	18-Mar-14A	27-Jun-14
NRC12150	SS - Rock Grade 400 - Zone A1 - (CH738 to 793) to +2.5mPD (4k/d)	10	26-Mar-14	31-Mar-14	28-Jun-14	10-Jul-14
Zone A2		61	28-Jan-14	07-May-14	26-Mar-14A	08-Jul-14
Vertical Seawall		61	28-Jan-14	07-May-14	26-Mar-14A	08-Jul-14
NRC12350	VS - Dredging - Zone A2 - (CH793 to 843)	1	28-Jan-14	30-Jan-14	26-Mar-14A	09-May-14
NRC12360	VS - Dredging - Zone A2 - (CH843 to 893)	4	07-Feb-14	11-Feb-14	15-May-14	19-May-14
NRC12370	VS - Dredging - Zone A2 - (CH893 to 956)	11	12-Feb-14	24-Feb-14	20-May-14	31-May-14
NRC12380	VS - Rock Grade 400 - Zone A2 - (CH793 to 843)	9	13-Feb-14	18-Feb-14	10-May-14	20-May-14
NRC12390	VS - Rock Grade 400 - Zone A2 - (CH843 to 893)	10	19-Feb-14	24-Feb-14	21-May-14	31-May-14
NRC12400	VS - Rock Grade 400 - Zone A2 - (CH893 to 956)	30	25-Feb-14	14-Mar-14	03-Jun-14	08-Jul-14
NRC12410	VS - Levelling Stone - Zone A2 - (CH793 to 843)	4	25-Feb-14	28-Feb-14	03-Jun-14	06-Jun-14
NRC12420	VS - Levelling Stone - Zone A2 - (CH843 to 893)	4	01-Mar-14	05-Mar-14	07-Jun-14	11-Jun-14
NRC12440	VS - Levelling Stone - Zone A2 - (CH893 to 956)	9	06-Mar-14	15-Mar-14	12-Jun-14	21-Jun-14
NRC12450	VS - Seawall Block - Zone A2 - (CH793 to 843)	7	28-Apr-14	07-May-14	28-Jun-14	07-Jul-14
Zone F		134	10-Jan-14	10-Apr-14	22-Feb-14A	30-Jun-14
CH137 to CH184		103	10-Jan-14	08-Mar-14	22-Feb-14A	23-May-14
A6416030	F - Marine Sheet Piling (H2) - CH137 to CH184	3	10-Jan-14	13-Jan-14	22-Feb-14A	31-Mar-14
A6416035	F - Marine Sheet Piling (H1) - CH137 to CH184	1	14-Jan-14	15-Jan-14	25-Mar-14A	03-Apr-14
A6416100	F - Backfilling up to -7.5mPD & T1 Installation - CH137 to CH184	4	16-Jan-14	19-Jan-14	04-Apr-14	07-Apr-14
A6416110	F - Backfilling up to -4.5mPD - CH137 to CH184	2	20-Jan-14	21-Jan-14	08-Apr-14	09-Apr-14
A6416115	F - Backfilling up to +0.5mPD & T3 Installation - CH137 to CH184	6	22-Jan-14	27-Jan-14	10-Apr-14	15-Apr-14
A6416118	F - Backfilling up to +3.0mPD - CH137 to CH184	2	28-Jan-14	29-Jan-14	16-Apr-14	17-Apr-14
A6416120	F - Backfilling up to +6.0mPD - CH137 to CH184	2	30-Jan-14	31-Jan-14	18-Apr-14	19-Apr-14
A6416320	F - Anchor Wall Installation - CH160 to CH184	2	07-Mar-14	08-Mar-14	22-May-14	23-May-14
CH184 to CH231		47	16-Jan-14	21-Mar-14	04-Apr-14	05-Jun-14
A6416040	F - Marine Sheet Piling (H2) - CH184 to CH231	3	16-Jan-14	18-Jan-14	04-Apr-14	08-Apr-14
A6416050	F - Marine Sheet Piling (H1) - CH184 to CH231	3	20-Jan-14	22-Jan-14	09-Apr-14	11-Apr-14
A6416060	F - Backfilling up to -7.5mPD & T1 Installation - CH184 to CH231	4	23-Jan-14	26-Jan-14	12-Apr-14	15-Apr-14
A6416070	F - Backfilling up to -4.5mPD - CH184 to CH231	2	27-Jan-14	28-Jan-14	16-Apr-14	17-Apr-14
A6416080	F - Backfilling up to +0.5mPD & T3 Installation - CH184 to CH231	6	29-Jan-14	03-Feb-14	18-Apr-14	23-Apr-14
A6416085	F - Backfilling up to +3.0mPD - CH184 to CH231	2	04-Feb-14	05-Feb-14	24-Apr-14	25-Apr-14
A6416090	F - Backfilling up to +6.0mPD - CH184 to CH231	2	06-Feb-14	07-Feb-14	26-Apr-14	27-Apr-14
A6416230	F - Anchor wall Installation - CH184 to CH231	4	10-Mar-14	13-Mar-14	24-May-14	28-May-14
A6416290	F - Backfilling up to 0.0mPD & G2 Installation to Anchor Wall- CH184 to CH231	3	14-Mar-14	16-Mar-14	29-May-14	31-May-14



Current Bar
Progress Bar
Current Bar - Critical
Planned Bar
Planned Milestone
Current Milestone
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

3-Months Rolling Programme - Construction

As of 31-Mar-14 Progress

香港寶嘉 Dragages HongKong

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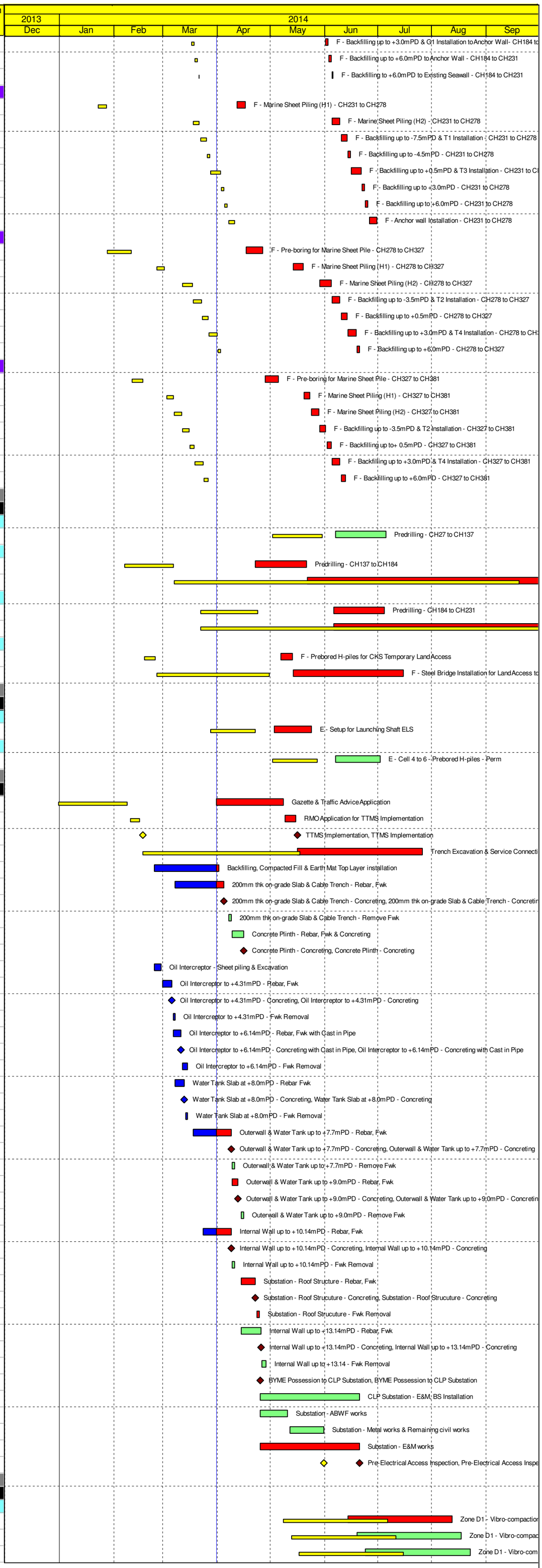
Date	Revision	Checked	Approved
21-Feb-14	TMCLK/DBJ/GEN/PRG/98505	SPa	WYu

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
A6416295	F - Backfilling up to +3.0mPD & G1 Installation to Anchor Wall- CH184 to CH231	2	17-Mar-14	18-Mar-14	01-Jun-14	02-Jun-14
A6416300	F - Backfilling up to +6.0mPD to Anchor Wall - CH184 to CH231	2	19-Mar-14	20-Mar-14	03-Jun-14	04-Jun-14
A6416400	F - Backfilling to +6.0mPD to Existing Seawall - CH184 to CH231	1	21-Mar-14	21-Mar-14	05-Jun-14	05-Jun-14
CH231 to CH278		62	23-Jan-14	10-Apr-14	12-Apr-14	30-Jun-14
A6416240	F - Marine Sheet Piling (H1) - CH231 to CH278	4	23-Jan-14	27-Jan-14	12-Apr-14	16-Apr-14
A6416250	F - Marine Sheet Piling (H2) - CH231 to CH278	4	18-Mar-14	21-Mar-14	05-Jun-14	09-Jun-14
A6416260	F - Backfilling up to -7.5mPD & T1 Installation - CH231 to CH278	4	22-Mar-14	25-Mar-14	10-Jun-14	13-Jun-14
A6416270	F - Backfilling up to -4.5mPD - CH231 to CH278	2	26-Mar-14	27-Mar-14	14-Jun-14	15-Jun-14
A6416273	F - Backfilling up to +0.5mPD & T3 Installation - CH231 to CH278	6	28-Mar-14	02-Apr-14	16-Jun-14	21-Jun-14
A6416278	F - Backfilling up to +3.0mPD - CH231 to CH278	2	03-Apr-14	04-Apr-14	22-Jun-14	23-Jun-14
A6416280	F - Backfilling up to +6.0mPD - CH231 to CH278	2	05-Apr-14	06-Apr-14	24-Jun-14	25-Jun-14
A6416310	F - Anchor wall Installation - CH231 to CH278	4	07-Apr-14	10-Apr-14	26-Jun-14	30-Jun-14
CH278 to CH327		50	28-Jan-14	02-Apr-14	17-Apr-14	20-Jun-14
A6416180	F - Pre-boring for Marine Sheet Pile - CH278 to CH327	6	28-Jan-14	10-Feb-14	17-Apr-14	26-Apr-14
A6416190	F - Marine Sheet Piling (H1) - CH278 to CH327	5	25-Feb-14	01-Mar-14	14-May-14	19-May-14
A6416195	F - Marine Sheet Piling (H2) - CH278 to CH327	5	12-Mar-14	17-Mar-14	29-May-14	04-Jun-14
A6416200	F - Backfilling up to -3.5mPD & T2 Installation - CH278 to CH327	5	18-Mar-14	22-Mar-14	05-Jun-14	09-Jun-14
A6416210	F - Backfilling up to +0.5mPD - CH278 to CH327	4	23-Mar-14	26-Mar-14	10-Jun-14	13-Jun-14
A6416215	F - Backfilling up to +3.0mPD & T4 Installation - CH278 to CH327	5	27-Mar-14	31-Mar-14	14-Jun-14	18-Jun-14
A6416220	F - Backfilling up to +6.0mPD - CH278 to CH327	2	01-Apr-14	02-Apr-14	19-Jun-14	20-Jun-14
CH327 to CH381		37	11-Feb-14	26-Mar-14	28-Apr-14	12-Jun-14
A6416130	F - Pre-boring for Marine Sheet Pile - CH327 to CH381	6	11-Feb-14	17-Feb-14	28-Apr-14	05-May-14
A6416140	F - Marine Sheet Piling (H1) - CH327 to CH381	4	03-Mar-14	06-Mar-14	20-May-14	23-May-14
A6416145	F - Marine Sheet Piling (H2) - CH327 to CH381	4	07-Mar-14	11-Mar-14	24-May-14	28-May-14
A6416150	F - Backfilling up to -3.5mPD & T2 Installation - CH327 to CH381	4	12-Mar-14	15-Mar-14	29-May-14	01-Jun-14
A6416155	F - Backfilling up to+ 0.5mPD - CH327 to CH381	3	16-Mar-14	18-Mar-14	02-Jun-14	04-Jun-14
A6416160	F - Backfilling up to +3.0mPD & T4 Installation - CH327 to CH381	5	19-Mar-14	23-Mar-14	05-Jun-14	09-Jun-14
A6416170	F - Backfilling up to +6.0mPD - CH327 to CH381	3	24-Mar-14	26-Mar-14	10-Jun-14	12-Jun-14
Box Culvert Extension		192	07-Feb-14	30-Sep-14	22-Apr-14	09-Dec-14
Construction		192	07-Feb-14	30-Sep-14	22-Apr-14	09-Dec-14
CH000 to CH137		24	02-May-14	30-May-14	07-Jun-14	05-Jul-14
A6416600	Predrilling - CH27 to CH137	24	02-May-14	30-May-14	07-Jun-14	05-Jul-14
CH137 to CH184		184	07-Feb-14	19-Sep-14	22-Apr-14	29-Nov-14
A6416610	Predrilling - CH137 to CH184	24	07-Feb-14	06-Mar-14	22-Apr-14	21-May-14
A6416720	Bored Pile Construction - A42 to A35	160	07-Mar-14	19-Sep-14	22-May-14	29-Nov-14
CH184 to CH231		156	22-Mar-14	30-Sep-14	06-Jun-14	09-Dec-14
A6416620	Predrilling - CH184 to CH231	24	22-Mar-14	23-Apr-14	06-Jun-14	04-Jul-14
A6416730	Bored Pile Construction - A34 to A27	156	22-Mar-14	30-Sep-14	06-Jun-14	09-Dec-14
CH381 to CH399 (Box Culvert Connection)		58	18-Feb-14	30-Apr-14	07-May-14	15-Jul-14
A6416660	F - Prebored H-piles for CKS Temporary Land Access	6	18-Feb-14	24-Feb-14	07-May-14	13-May-14
A6417000	F - Steel Bridge Installation for Land Access to Zone E	52	25-Feb-14	30-Apr-14	14-May-14	15-Jul-14
North Shafts Construction & Tunnel Structure		49	28-Mar-14	27-May-14	03-May-14	02-Jul-14
Construction		49	28-Mar-14	27-May-14	03-May-14	02-Jul-14
North Launching Shaft ELS Foundation & Capping Beam (Cell 1 to 3)		18	28-Mar-14	22-Apr-14	03-May-14	24-May-14
NSH1180	E - Setup for Launching Shaft ELS	18	28-Mar-14	22-Apr-14	03-May-14	24-May-14
North Launching Shaft ELS Foundation & Capping Beam		21	02-May-14	27-May-14	07-Jun-14	02-Jul-14
NSH1210	E - Cell 4 to 6 - Prebored H-piles - Perm	21	02-May-14	27-May-14	07-Jun-14	02-Jul-14
CLP Temporary Substation		124	31-Dec-13	31-May-14	24-Feb-14A	26-Jul-14
Construction		124	31-Dec-13	31-May-14	24-Feb-14A	26-Jul-14
DDP12540	Gazette & Traffic Advice Application	28	31-Dec-13	08-Feb-14	31-Mar-14	08-May-14
DDP12550	RMO Application for TTMS Implementation	6	10-Feb-14	15-Feb-14	09-May-14	15-May-14
DDP12560	TTMS Implementation	0	17-Feb-14		16-May-14	
DDP12720	Trench Excavation & Service Connection	60	17-Feb-14	17-May-14	16-May-14	26-Jul-14
DDP1274030	Backfilling, Compacted Fill & Earth Mat Top Layer installation	9			24-Feb-14A	01-Apr-14
DDP1274040	200mm thk on-grade Slab & Cable Trench - Rebar, Fwk	3			08-Mar-14A	04-Apr-14
DDP1274045	200mm thk on-grade Slab & Cable Trench - Concreting	0				04-Apr-14
DDP1274047	200mm thk on-grade Slab & Cable Trench - Remove Fwk	2			07-Apr-14	08-Apr-14
DDP1274050	Concrete Plinth - Rebar, Fwk & Concreting	6			09-Apr-14	15-Apr-14
DDP1274060	Concrete Plinth - Concreting	0				15-Apr-14
DDP1275010	Oil Intercreptor - Sheet piling & Excavation	7			24-Feb-14A	28-Feb-14A
DDP1275020	Oil Intercreptor to +4.31mPD - Rebar, Fwk	3			01-Mar-14A	06-Mar-14A
DDP1275025	Oil Intercreptor to +4.31mPD - Concreting	0				06-Mar-14A
DDP1275027	Oil Intercreptor to +4.31mPD - Fwk Removal	2			07-Mar-14A	08-Mar-14A
DDP1275030	Oil Intercreptor to +6.14mPD - Rebar, Fwk with Cast in Pipe	5			07-Mar-14A	11-Mar-14 A
DDP1275035	Oil Intercreptor to +6.14mPD - Concreting with Cast in Pipe	0				11-Mar-14 A
DDP1275037	Oil Intercreptor to +6.14mPD - Fwk Removal	2			12-Mar-14A	15-Mar-14A
DDP127503710	Water Tank Slab at +8.0mPD - Rebar Fwk	5			08-Mar-14A	13-Mar-14A
DDP127503720	Water Tank Slab at +8.0mPD - Concreting	0				13-Mar-14A
DDP127503730	Water Tank Slab at +8.0mPD - Fwk Removal	2			14-Mar-14A	15-Mar-14A
DDP1275040	Outerwall & Water Tank up to +7.7mPD - Rebar, Fwk	2			18-Mar-14A	08-Apr-14
DDP1275050	Outerwall & Water Tank up to +7.7mPD - Concreting	0				08-Apr-14
DDP1275055	Outerwall & Water Tank up to +7.7mPD - Remove Fwk	2			09-Apr-14	10-Apr-14
DDP1275060	Outerwall & Water Tank up to +9.0mPD - Rebar, Fwk	4			09-Apr-14	12-Apr-14
DDP1275070	Outerwall & Water Tank up to +9.0mPD - Concreting	0				12-Apr-14
DDP1275075	Outerwall & Water Tank up to +9.0mPD - Remove Fwk	2			14-Apr-14	15-Apr-14
DDP127507540	Internal Wall up to +10.14mPD - Rebar, Fwk	3			24-Mar-14A	08-Apr-14
DDP127507550	Internal Wall up to +10.14mPD - Concreting	0				08-Apr-14
DDP127507560	Internal Wall up to +10.14mPD - Fwk Removal	2			09-Apr-14	10-Apr-14
DDP1275080	Substation - Roof Structure - Rebar, Fwk	5			14-Apr-14	22-Apr-14
DDP1275090	Substation - Roof Strucuture - Concreting	0				22-Apr-14
DDP1275095	Substation - Roof Strucuture - Fwk Removal	2			23-Apr-14	24-Apr-14
DDP1275100	Internal Wall up to +13.14mPD - Rebar, Fwk	8			14-Apr-14	25-Apr-14
DDP1275110	Internal Wall up to +13.14mPD - Concreting	0				25-Apr-14
DDP1275120	Internal Wall up to +13.14 - Fwk Removal	2			26-Apr-14	28-Apr-14
DDP1275130	BYME Possession to CLP Substation	0			25-Apr-14	
DDP1275140	CLP Substation - E&M, BS Installation	46			25-Apr-14	20-Jun-14
DDP1276010	Substation - ABWF works	12			25-Apr-14	10-May-14
DDP1276020	Substation - Metal works & Remaining civil works	18			12-May-14	31-May-14
DDP1276030	Substation - E&M works	46			25-Apr-14	20-Jun-14
DDP12780	Pre-Electrical Access Inspection	0		31-May-14		20-Jun-14
North Surface works for TBM Tunnelling		70	08-May-14	15-Jul-14	14-Jun-14	22-Aug-14
Construction		70	08-May-14	15-Jul-14	14-Jun-14	22-Aug-14
Zone D1		70	08-May-14	15-Jul-14	14-Jun-14	22-Aug-14
NRC13940	Zone D1 - Vibro-compaction (CH205 to 255)	60	08-May-14	06-Jul-14	14-Jun-14	12-Aug-14
NRC13950	Zone D1 - Vibro-compaction (CH255 to 305)	60	13-May-14	11-Jul-14	19-Jun-14	17-Aug-14
NRC13960	Zone D1 - Vibro-compaction (CH305 to 355)	60	17-May-14	15-Jul-14	24-Jun-14	22-Aug-14



Current Bar
Current Bar - Critical
Planned Bar
Planned Milestone
Current Milestone
Progress Milestone
Progress Bar

TMCLK - Northern Connection Sub-Sea Tunnel Section

3-Months Rolling Programme - Construction

As of 31-Mar-14 Progress

Dragages HongKong 香港寶嘉
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Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

BOUYGUES TRAVAUX PUBLICS

Date	Revision	Checked	Approved
21-Feb-14	TMCLK/DBJ/GEN/PRG/98505	SPa	WYu

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Air Quality									
4.8.1	3.8	An effective watering programme of twice 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	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		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		✓

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is	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		✓
WATER QUALITY									
Marine Works (Sequence A)									
6.1 Figure 6.2a Appendix D6a	Annex A	Construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. The protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2a and detailed in Appendix D6a. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation;	All areas/ prior to dredging and backfilling works	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 50% public fill to be used for all seawall filling below +2.5mPD for TM-CLKL southern and northern landfalls.	TM-CLKL seawall filling	Contractor	TM-EIAO		Y		✓

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	a maximum of 30% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL southern landfall	TM-CLKL southern landfall reclamation filling	Contractor	TM-EIAO		Y		N/A
6.1	-	a maximum of 100% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL northern landfall	TM-CLKL northern landfall reclamation filling	Contractor	TM-EIAO		Y		✓
6.1	-	Use of cage type silt curtains round allgrab dredgers during the HKBCF, HKLR and TM-CLKL southern reclamation works.	All areas dredging works	Contractor	TM-EIAO		Y		✓
	Figure 1.1 of Annex C	A layer of floating type silt curtain will be applied when dredging and reclamation works are being undertaken at Portion N-a as shown in Figure 1.1 of Annex C of the EM&A Manual.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	Trailer suction hopper dredgers shall not allow mud to overflow.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	The use of Lean Material Overboard (LMOB) systems shall be prohibited.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1 Figure 6.2b Appendix D6b	Annex A	For other parts of the reclamation works construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. It should be noted that the protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2b and detailed in Appendices D6b. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation; - Reclamation filling for Portion D of HKBCF; Reclamation filling for FSD berth of HKBCF; and	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		✓

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
		- Reclamation dredging and filling for Portion 1 of HKLR;							
6.1	-	The filling material for the other parts of the works are the same as Sequence A;	All other areas/backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	5.7	Cage type silt curtain (with steel enclosure) shall be used for grab dredgers working in the site of HKBCF and TM- CLKL southern reclamation. Cage type silt curtains will be applied round all grab dredgers at other works area.	HKBCF, HKLR and TM-CLKL grab dredging	Contractor	TM-EIAO		Y		✓
6.1	Annex A	A layer of floating type silt curtain will be applied around all works as defined in Appendix D6b.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	TM-CLKL northern landfall: - Reclamation filling shall not proceed until at least 200m section of leading seawall at both the east and west sides of the reclamation are formed above +2.5 mPD, except for 100m gaps for marine access;	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
General Marine Works									
6.1	-	Use of TMB for the construction of the submarine tunnel.	Tunnel works / Construction phase	Contractor	TM-EIAO		Y		N/A
6.1	-	Export dredged spoils from NWWCZ.	All areas as much as possible / dredging activities	Contractor	DASO Permit conditions		Y		✓
6.1	-	Where public fill is proposed for filling below +2.5mPD, the fine content in the public fill will be controlled to 25%	All areas/ backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	-	Where sand fill is proposed for filling below +2.5mPD, the fine content in the sand fill will be controlled to 5%.	All areas/ backfilling works	Contractor	TM-EIAO		Y		N.A
6.1	-	Mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	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		Y		✓

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

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
					Guidelines. DASO permit conditions.				
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		<>
6.1	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	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		Y		<>

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
					conditions.				
6.1	5.2	Silt curtain shall have proved effectiveness from the producer and shall be fully maintained throughout the works by the contractor.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.1	-	The daily maximum production rates shall not exceed those assumed in the water quality assessment.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The dredging and filling works shall be scheduled to spread the works evenly over a working day.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
Land Works									
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	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		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	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		<>
6.1	-	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		✓
6.1	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	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		<>
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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		✓
6.1	-	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	✓
6.1	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									
6.1	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period. One year operation phase water quality monitoring at designated stations.	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	✓
ECOLOGY									

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
8.14	6.3	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	6.3,6.5	Specification and implementation of 250m dolphin exclusion zone.	All dredging and reclamation areas/Detailed Design/during all reclamation and dredging works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600m2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	N/A. To be implemented 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 dredging and reclamation works	All areas/ Detailed Design/during dredging and reclamation works	Design Consultant/ Contractor	TMEIA	Y	Y		<>
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.5	Audit coral translocation success	Post translocation	Contractor	TMEIA		Y		✓
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		N/A.
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		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
7.13	6.5	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	The colour and shape of the toll control buildings, ventilation building and administration building shall adopt a design which could blend it into the vicinity elements, and the details will be developed in detailed design stage (DM2)	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	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		N/A
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The surplus surcharge should be transferred to a fill bank	Reclamation areas / after surcharge works	Contractor	TMEIA		Y		N/A
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		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	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			✓
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	Dredged marine mud shall be disposed of in a gazetted marine disposal ground under the requirements of the Dumping at Seas Ordinance.	Reclamation areas / throughout dredging works	Contractor	TMEIA		Y		✓
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	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: *f* suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; *f* Having a capacity of <450L unless the specifications have been approved by the EPD; and *f* Displaying a label in English and Chinese according to the instructions prescribed in Schedule 2 of the Regulations. *f* Clearly labelled and used solely for the storage of chemical wastes; *f* Enclosed with at least 3 sides; *f* 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; *f* Adequate ventilation; *f* Sufficiently covered to prevent rainfall	All areas / throughout construction period	Contractor	TMEIA		Y		<>

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
		entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and *f* 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		N/A
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	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

*** Remarks:**

✓	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

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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	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214	260
1 Hour TSP Level in μg /m³	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337	500

Table D2 Action and Limit Levels for Water Quality

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

Notes:

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

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

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

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

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

(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 D3 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 D4 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	NEL = [STG < 2.4 & ANI <8.9] and NWL = [STG < 3.9 & ANI <17.9]	

Appendix E

EM&A Monitoring Schedules

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - March 2014

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Mar
02-Mar	03-Mar	04-Mar	05-Mar	06-Mar	07-Mar	08-Mar
				1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*		
09-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar
			1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*			
16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar
		1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*				
23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar
	1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*				1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*	
30-Mar	31-Mar					

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - April 2014

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01-Apr	02-Apr	03-Apr	04-Apr	public holiday 05-Apr
				1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*		
06-Apr	07-Apr	08-Apr	09-Apr	10-Apr	11-Apr	12-Apr
			1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*			
13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	public holiday 18-Apr	public holiday 19-Apr
		1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*			1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*	
20-Apr	public holiday 21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr
				1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*		
27-Apr	28-Apr	29-Apr	30-Apr			
			1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*			

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - May 2014

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				public holiday 01-May	02-May	03-May
04-May	05-May	public holiday 06-May	07-May	08-May	09-May	10-May
	1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*					1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*
11-May	12-May	13-May	14-May	15-May	16-May	17-May
					1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*	
18-May	19-May	20-May	21-May	22-May	23-May	24-May
				1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*		
25-May	26-May	27-May	28-May	29-May	30-May	
			1-hour TSP - 3 times 24-hour TSP - 1 time *Impact AQM*			

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section
Impact Marine Water Quality Monitoring (WQM) Schedule (Mar 14)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01-Mar
02-Mar	03-Mar	04-Mar	05-Mar	06-Mar	07-Mar	08-Mar
	WQM Mid-Flood 8:27 (06:42 - 10:12) Mid-Ebb 14:26 (12:41 - 16:11)		**WQM** Mid-Flood 9:21 (07:36 - 11:06) Mid-Ebb 15:45 (14:00 - 17:30)		**WQM** Mid-Flood 10:20 (08:35 - 12:05) Mid-Ebb 17:23 (15:38 - 19:08)	
09-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar
	WQM Mid-Flood 8:34 (06:49 - 10:19) Mid-Ebb 21:00 (19:15 - 22:45)		**WQM** Mid-Ebb 10:57 (09:12 - 12:42) Mid-Flood 16:04 (14:19 - 17:49)		**WQM** Mid-Ebb 11:58 (10:13 - 13:43) Mid-Flood 17:40 (15:55 - 19:25)	
16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar
	WQM Mid-Ebb 13:23 (11:38 - 15:08) Mid-Flood 19:33 (17:48 - 21:18)		**WQM** Mid-Flood 8:18 (06:33 - 10:03) Mid-Ebb 14:29 (12:44 - 16:14)		**WQM** Mid-Flood 9:18 (07:34 - 11:04) Mid-Ebb 15:47 (14:02 - 17:32)	
23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar
	WQM Mid-Flood 11:24 (09:39 - 13:09) Mid-Ebb 18:53 (17:08 - 20:38)		**WQM** Mid-Ebb 9:47 (08:02 - 11:32) Mid-Flood 14:44 (12:59 - 16:29)		**WQM** Mid-Ebb 11:29 (09:44 - 13:14) Mid-Flood 17:03 (15:18 - 18:48)	
30-Mar	31-Mar					
	WQM Mid-Ebb 13:24 (11:39 - 15:09) Mid-Flood 19:38 (17:53 - 21:23)					

HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section
Impact Marine Water Quality Monitoring (WQM) Schedule (April 14)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01-Apr	02-Apr	03-Apr	04-Apr	05-Apr
			WQM Mid-Flood 8:11 (06:59 - 10:29) Mid-Ebb 14:40 (12:55 - 16:25)		**WQM** Mid-Flood 9:08 (07:23 - 10:53) Mid-Ebb 16:00 (14:15 - 17:45)	
06-Apr	07-Apr	08-Apr	09-Apr	10-Apr	11-Apr	12-Apr
	WQM Mid-Flood 10:18 (08:33 - 12:03) Mid-Ebb 18:35 (16:30 - 20:20)		**WQM** Mid-Ebb 9:29 (08:30 - 10:30) Mid-Flood 13:53 (12:08 - 15:38)		**WQM** Mid-Ebb 11:00 (09:15 - 12:45) Mid-Flood 16:40 (14:55 - 18:25)	
13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr
	WQM Mid-Ebb 12:29 (10:44 - 14:14) Mid-Flood 18:47 (17:02 - 20:32)		**WQM** Mid-Ebb 13:35 (11:50 - 15:20) Mid-Flood 20:08 (18:23 - 21:53)		**WQM** Mid-Flood 8:16 (06:31 - 10:01) Mid-Ebb 14:52 (13:07 - 16:37)	
20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr
	WQM Mid-Flood 10:15 (08:30 - 12:00) Mid-Ebb 17:26 (15:41 - 19:11)		**WQM** Mid-Ebb 8:16 (06:31 - 10:01) Mid-Flood 13:07 (11:22 - 14:52)		**WQM** Mid-Ebb 10:25 (08:40 - 12:10) Mid-Flood 15:57 (14:12 - 17:42)	
27-Apr	28-Apr	29-Apr	30-Apr	01-May	02-May	03-May
	WQM Mid-Ebb 12:27 (10:42 - 14:12) Mid-Flood 18:47 (17:02 - 20:32)		**WQM** Mid-Ebb 13:44 (11:59 - 15:29) Mid-Flood 20:25 (18:40 - 22:10)			

HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-sea Tunnel Section
Impact Marine Water Quality Monitoring (WQM) Schedule (May 14)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01-May	02-May	03-May
					WQM Mid-Flood 8:04 (06:19 - 09:49) Mid-Ebb 14:59 (13:14 - 16:44)	
04-May	05-May	06-May	07-May	08-May	09-May	10-May
	WQM Mid-Flood 9:33 (07:48 - 11:18) Mid-Ebb 16:56 (15:11 - 18:41)		**WQM** Mid-Flood 11:04 (09:19 - 12:49) Mid-Ebb 18:39 (16:54 - 20:24)		**WQM** Mid-Ebb 9:37 (07:52 - 11:22) Mid-Flood 14:54 (14:55 - 18:25)	
11-May	12-May	13-May	14-May	15-May	16-May	17-May
	WQM Mid-Ebb 11:30 (09:45 - 13:15) Mid-Flood 17:52 (16:07 - 19:37)		**WQM** Mid-Ebb 12:40 (10:55 - 14:25) Mid-Flood 19:23 (17:38 - 21:08)		**WQM** Mid-Flood 7:14 (05:29 - 8:59) Mid-Ebb 14:00 (12:15 - 15:45)	
18-May	19-May	20-May	21-May	22-May	23-May	24-May
	WQM Mid-Flood 9:19 (07:34 - 11:04) Mid-Ebb 16:22 (14:37 - 18:07)		**WQM** Mid-Flood 11:27 (09:42 - 13:12) Mid-Ebb 18:20 (16:35 - 20:05)		**WQM** Mid-Ebb 9:02 (07:17 - 10:47) Mid-Flood 14:33 (12:48 - 16:18)	
25-May	26-May	27-May	28-May	29-May	30-May	31-May
	WQM Mid-Ebb 11:31 (09:46 - 13:16) Mid-Flood 17:55 (16:10 - 19:40)		**WQM** Mid-Ebb 12:50 (11:05 - 14:35) Mid-Flood 19:38 (17:53 - 21:23)		**WQM** Mid-Flood 7:04 (05:19 - 8:49) Mid-Ebb 14:04 (12:19 - 15:49)	

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - March 2014

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - April 2014

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

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - May 2014

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

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

Appendix F

Impact Air Quality Monitoring Results

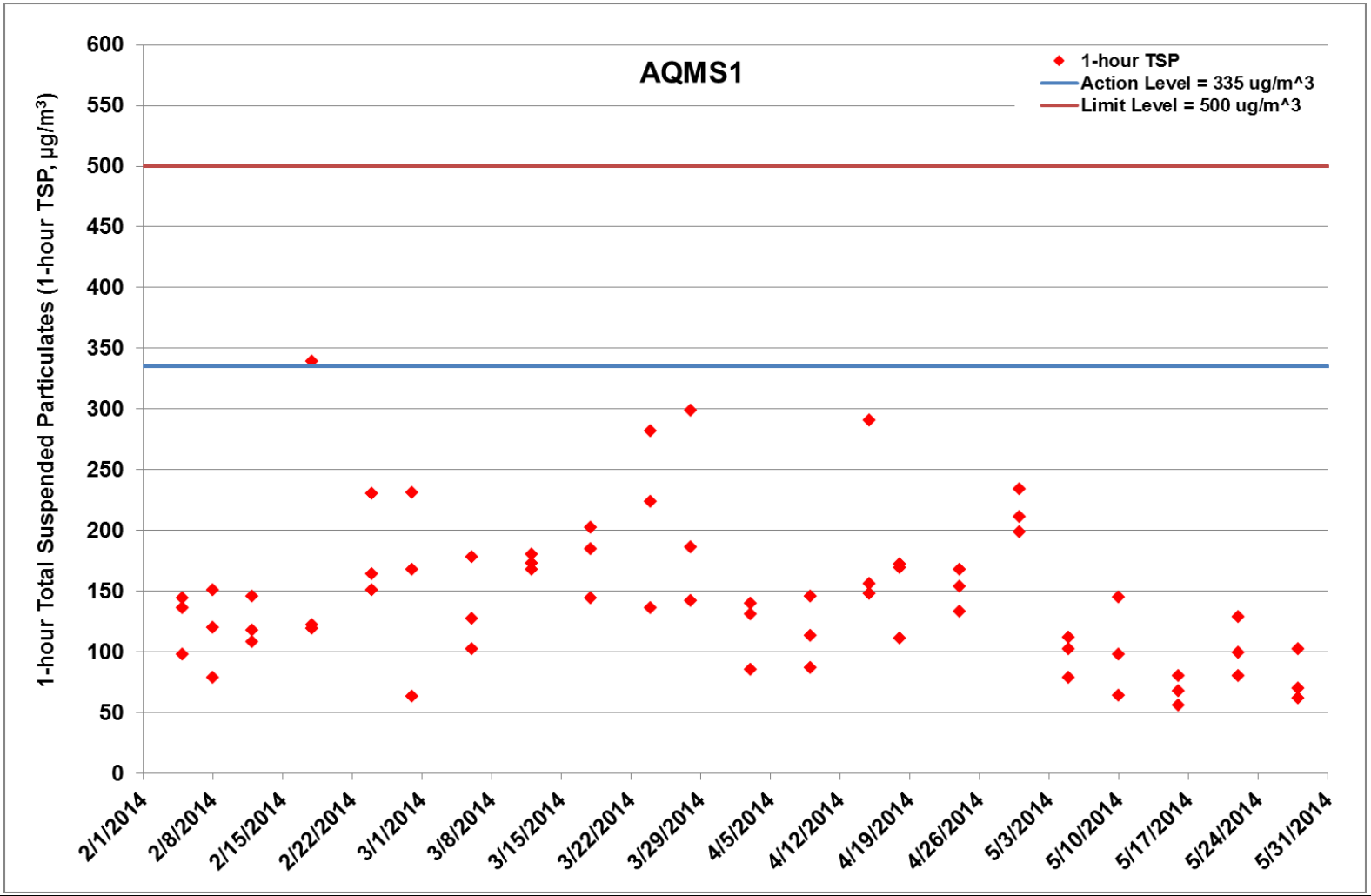


Figure G.1 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_Apr 2014_REV a.xlsx

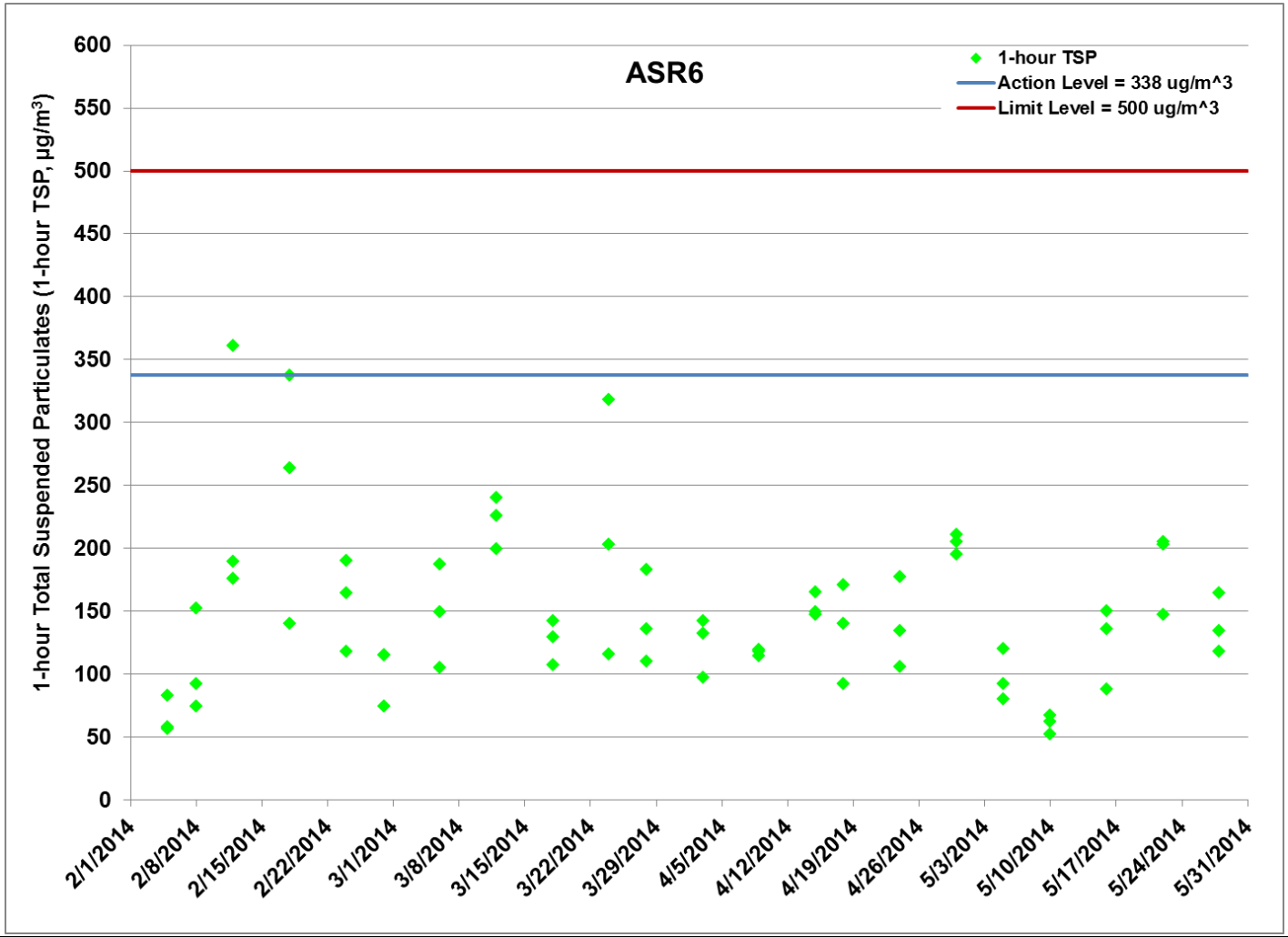


Figure G.2 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

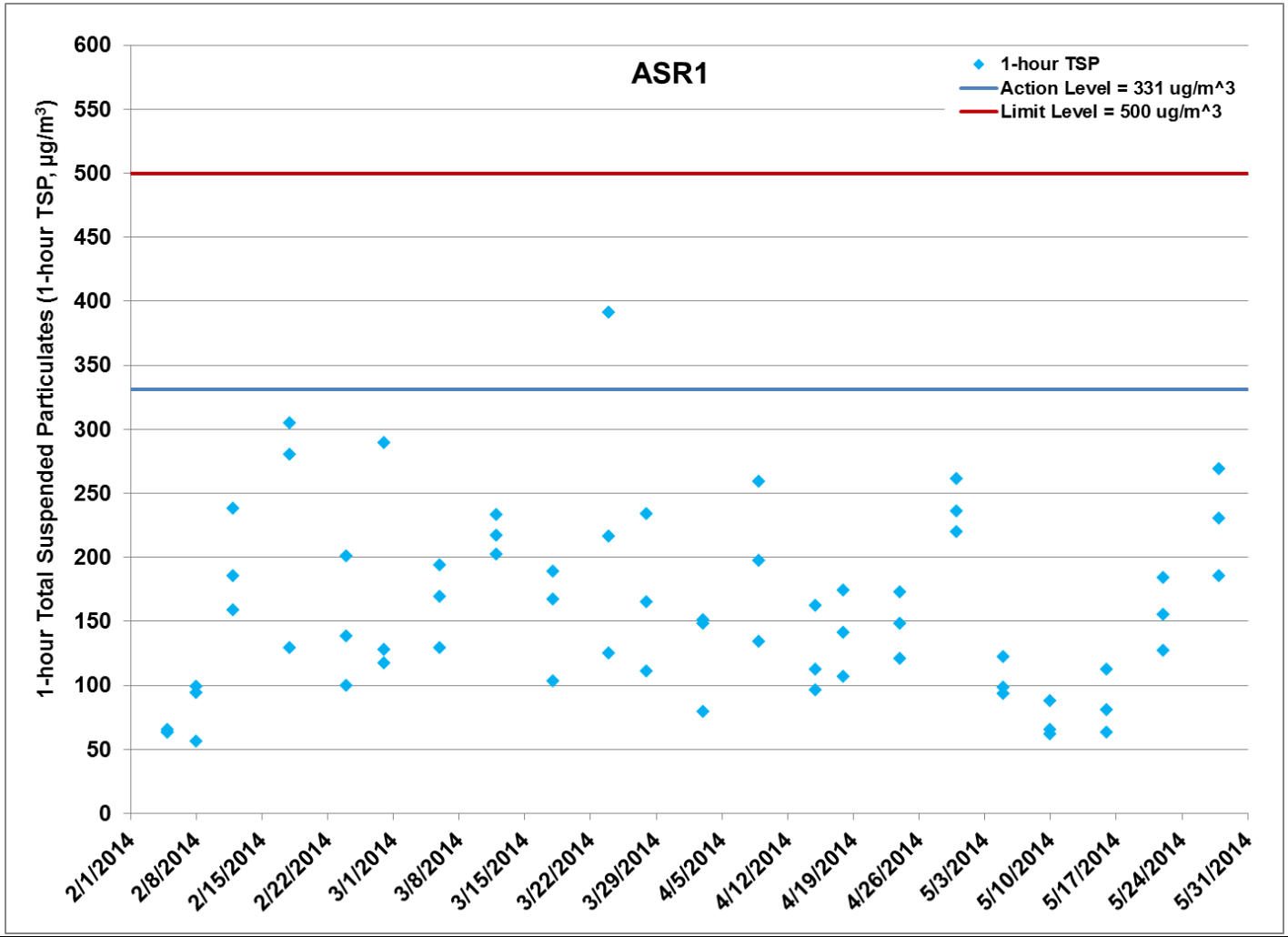


Figure G.3 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

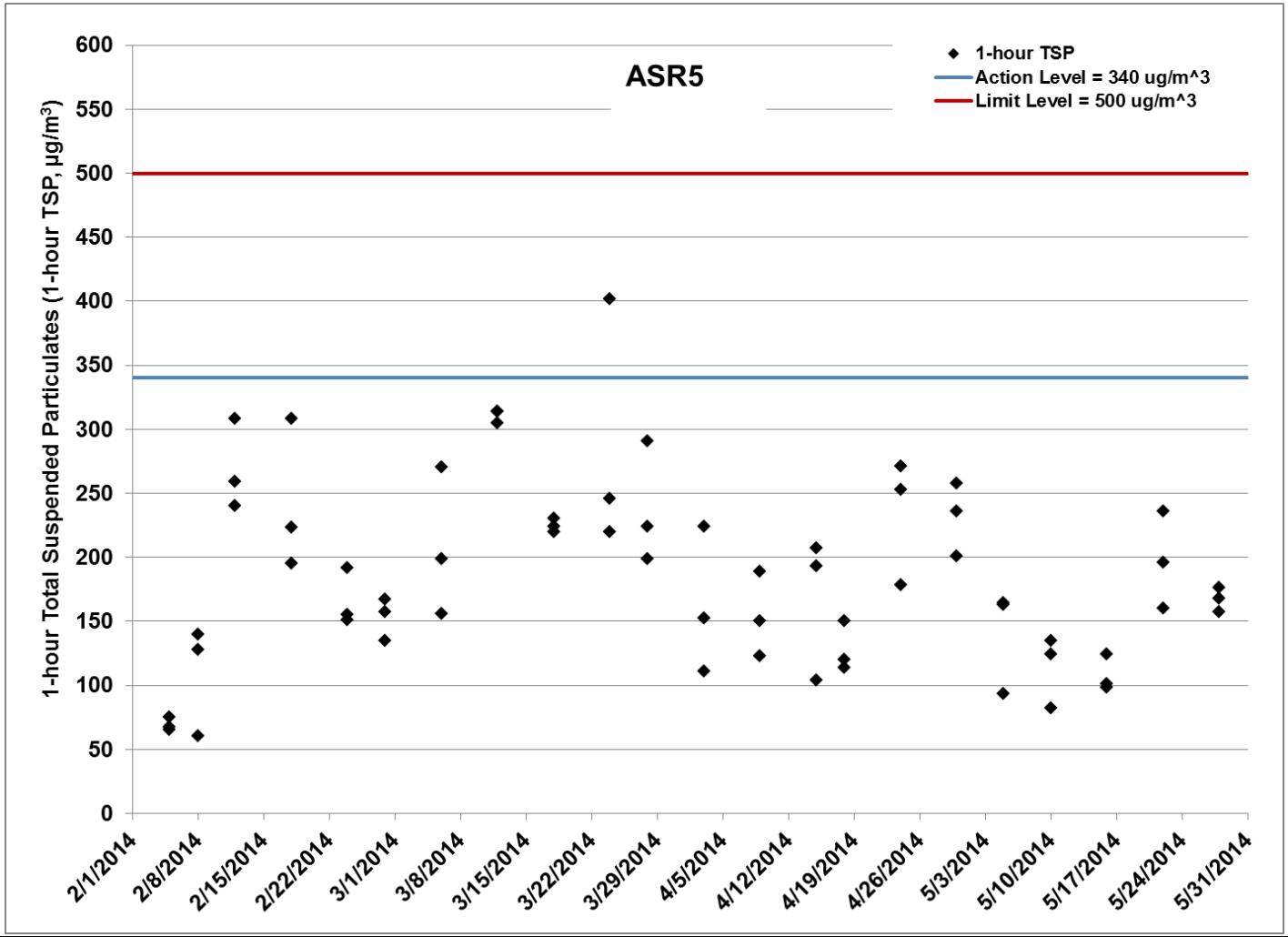


Figure G.4 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

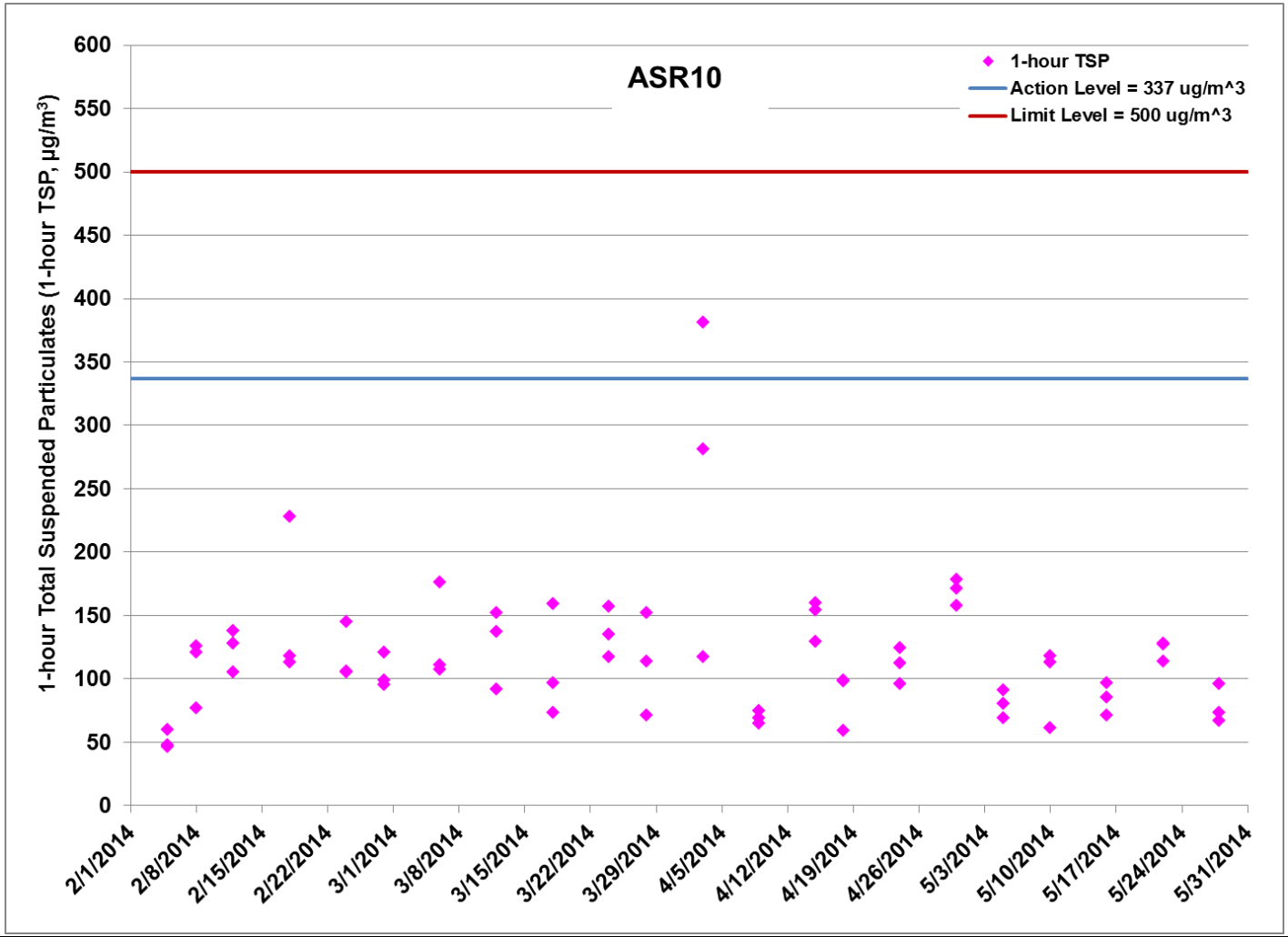


Figure G.5 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

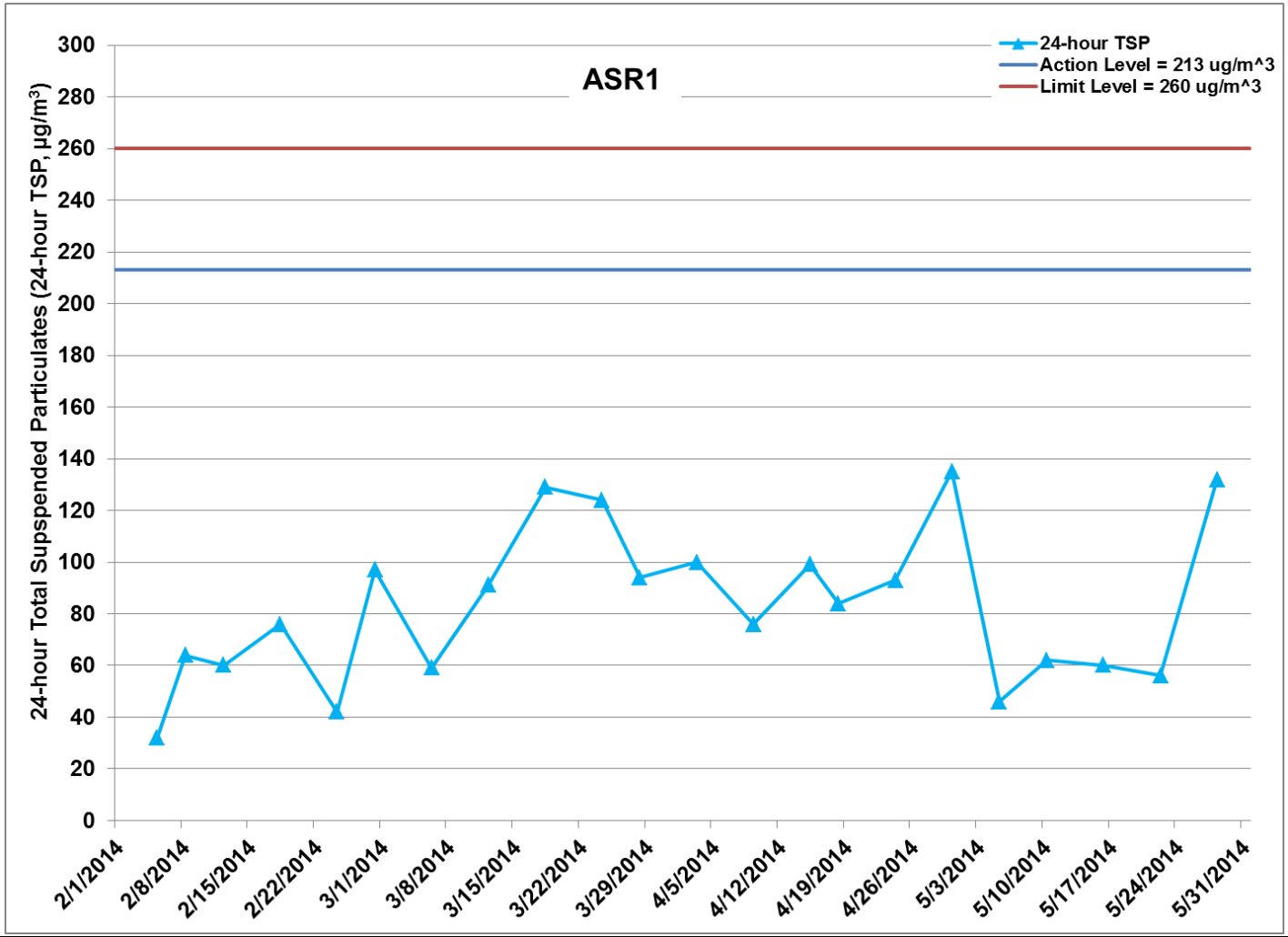


Figure G.6 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

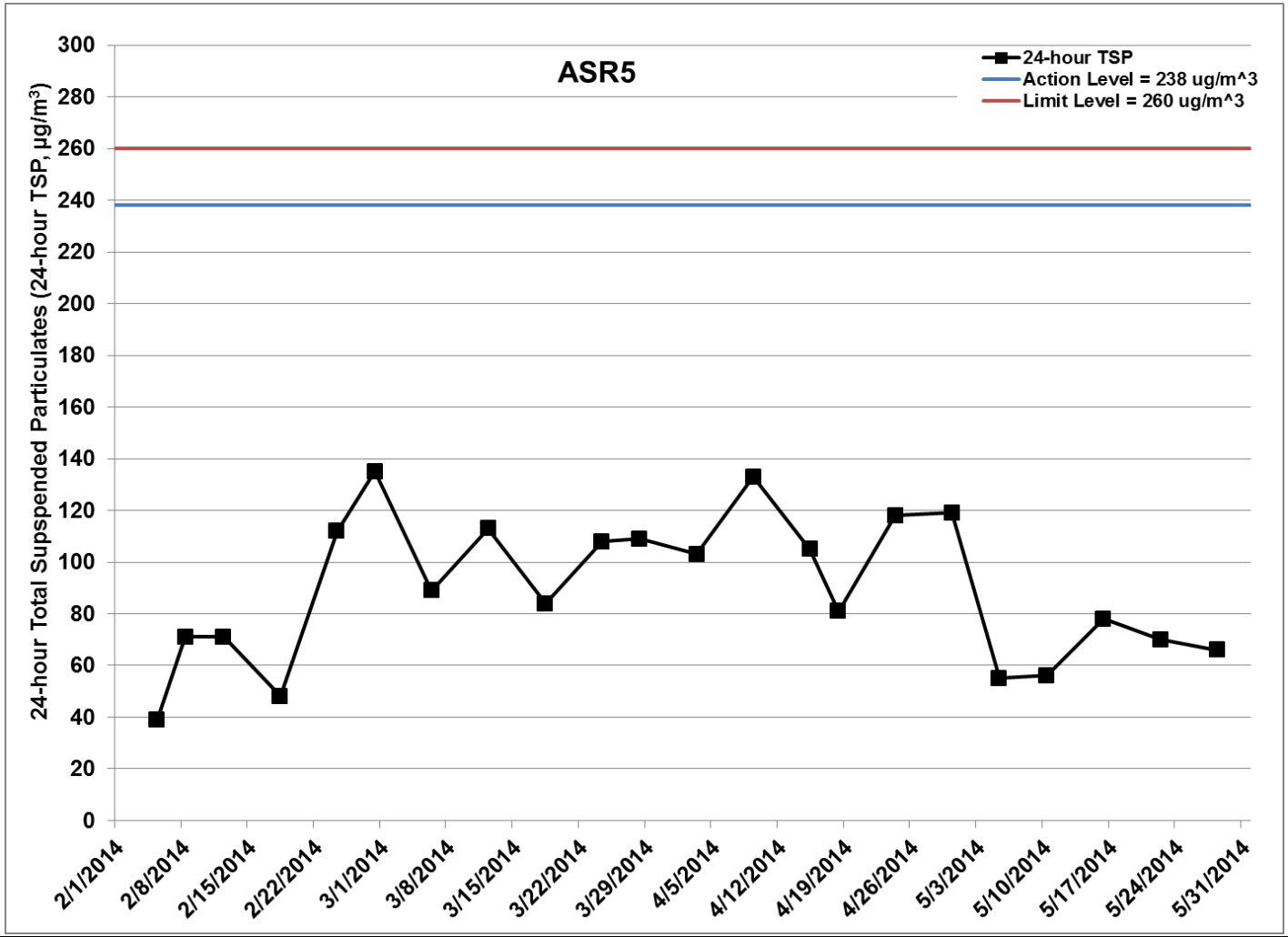


Figure G.7 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

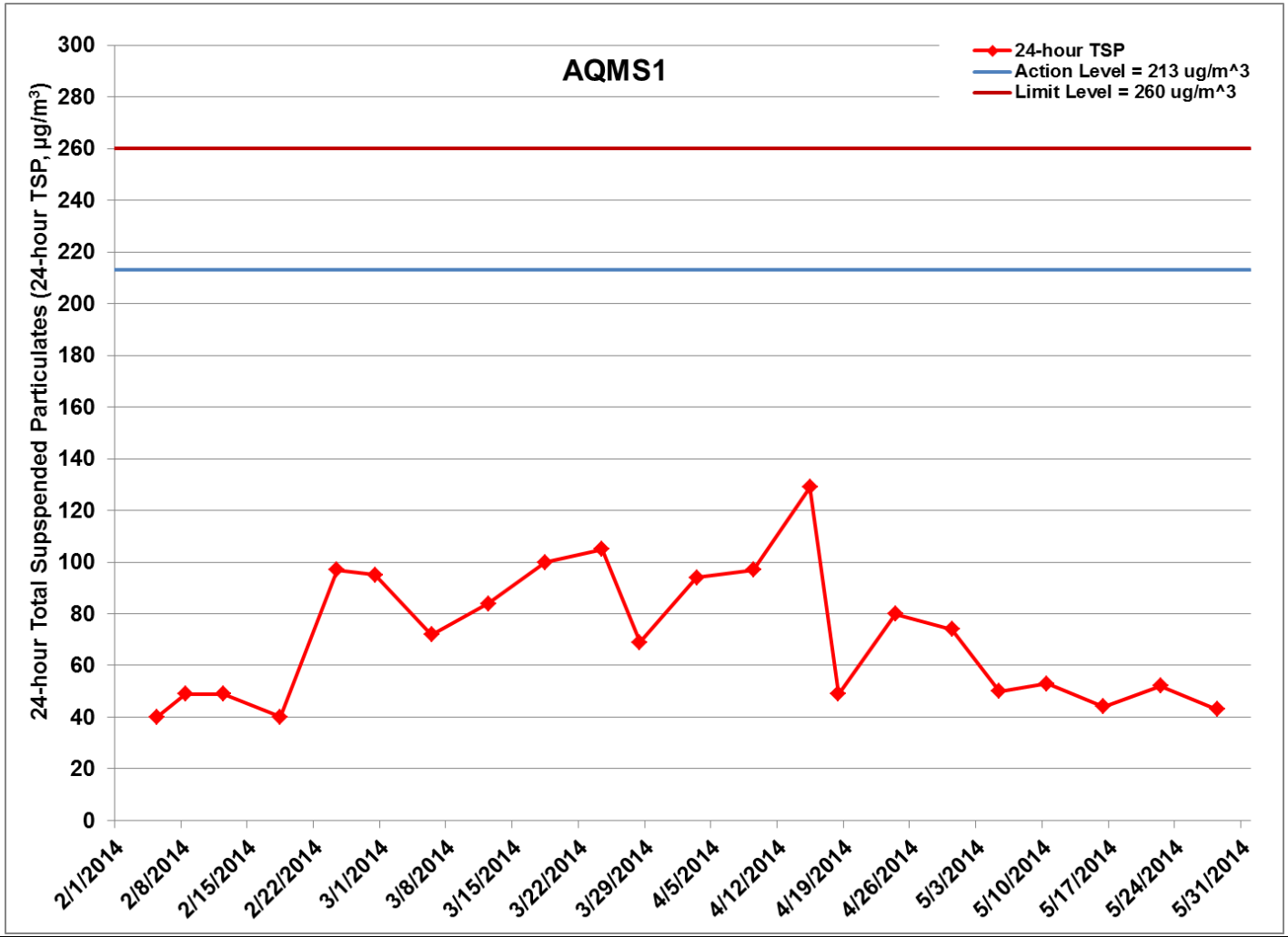


Figure G.8 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

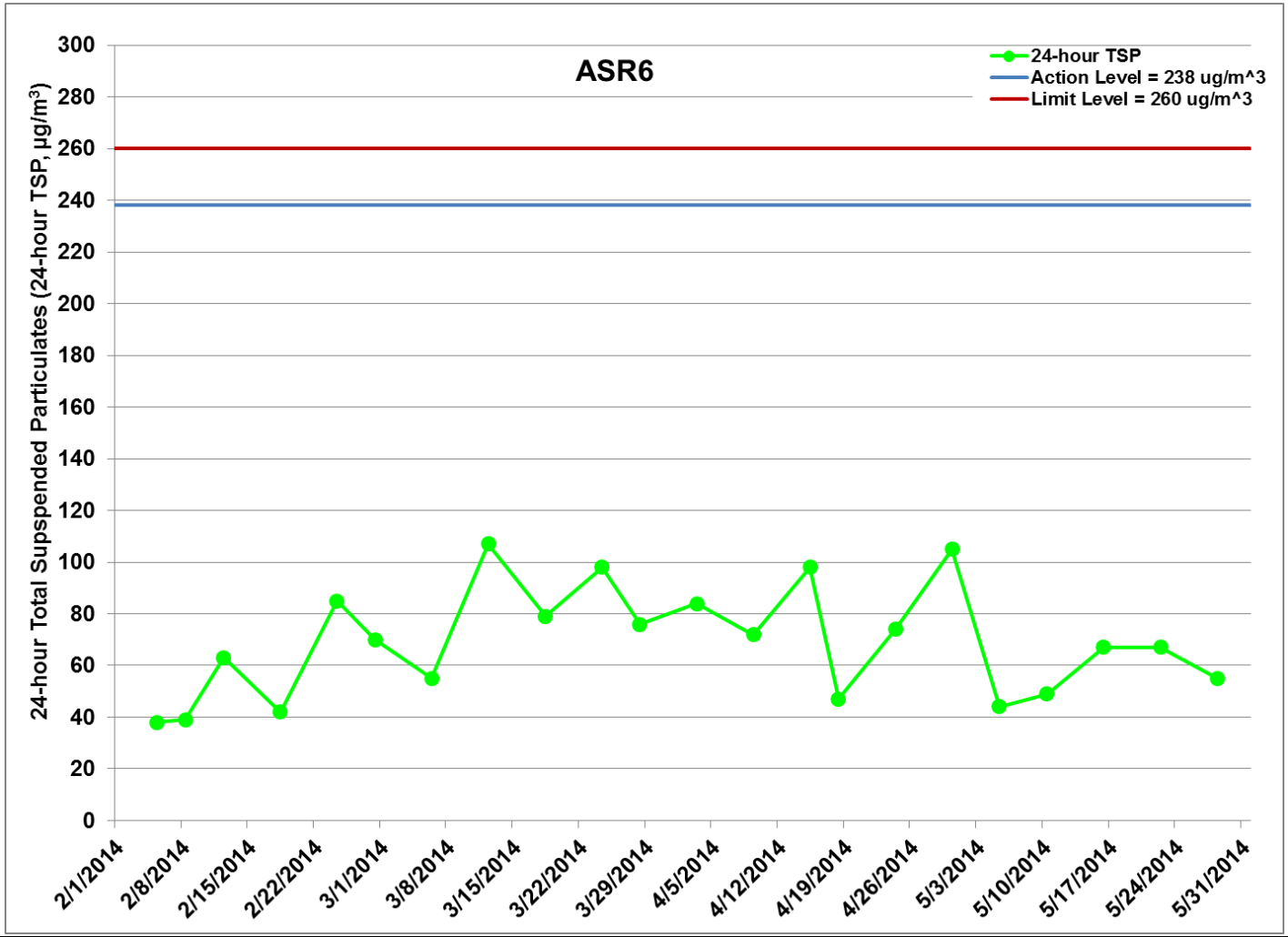


Figure G.9 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

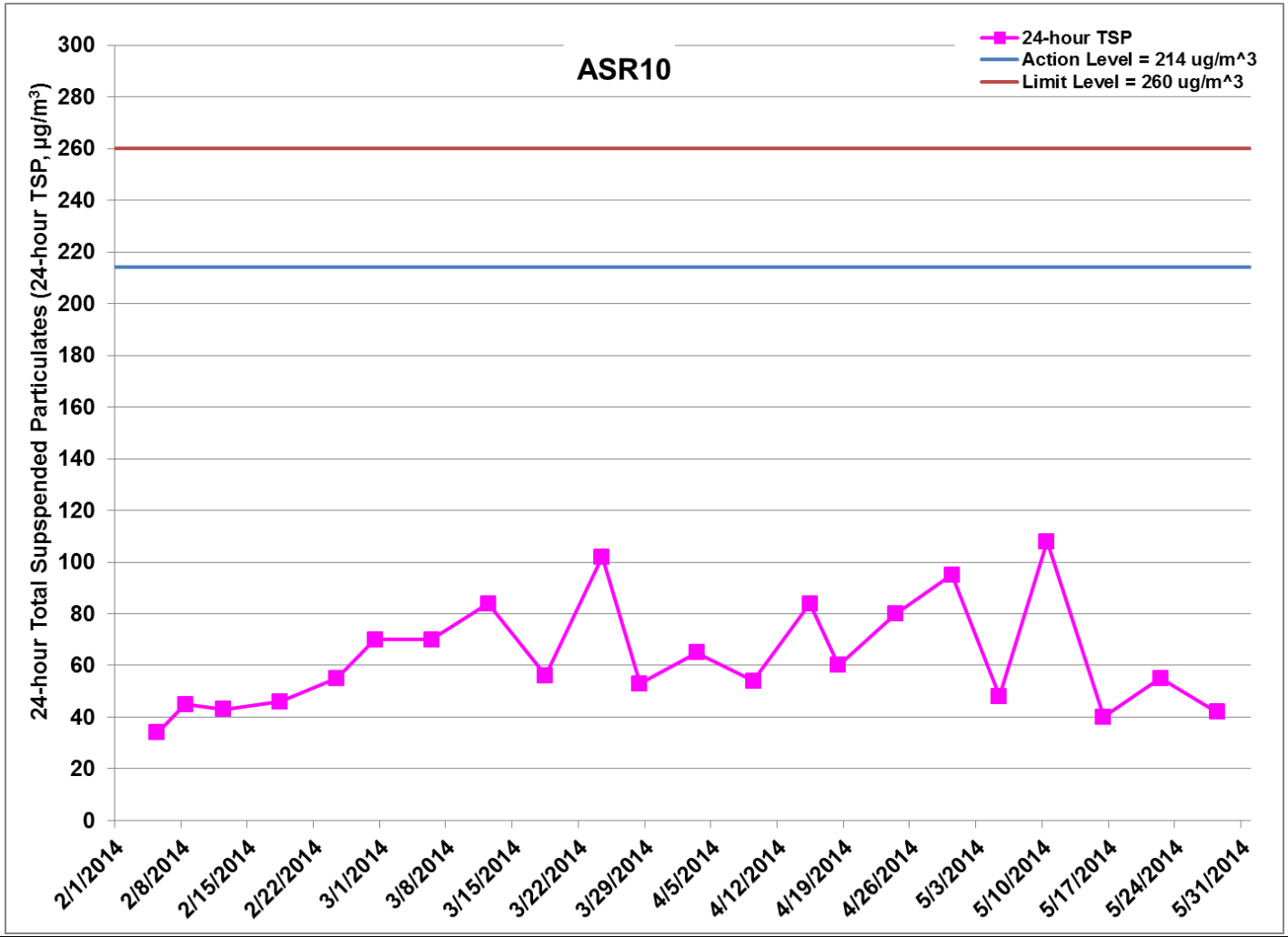
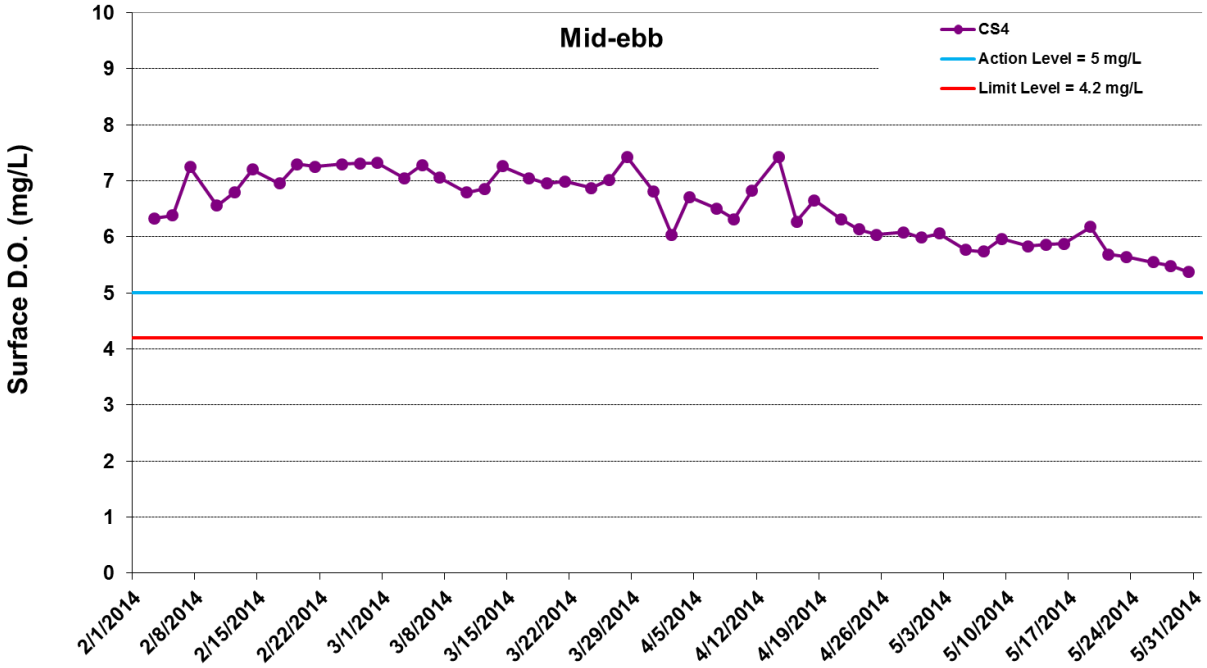


Figure G.10 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 February 2014 and 31 May 2014 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of Site Office at WA-18 (1/2/2014 – 28/2/2014), Diaphragm Wall Construction at Reclamation Area – Portion N-A (14/5/2014 – 31/5/2014) & Construction of CLP Temporary Substation at N6 (1/2/2014 – 31/5/2014)

Ref: 0212330_Impact AQM graphs_May 2014_REV JY.xlsx

Appendix G

Impact Water Quality Monitoring Results



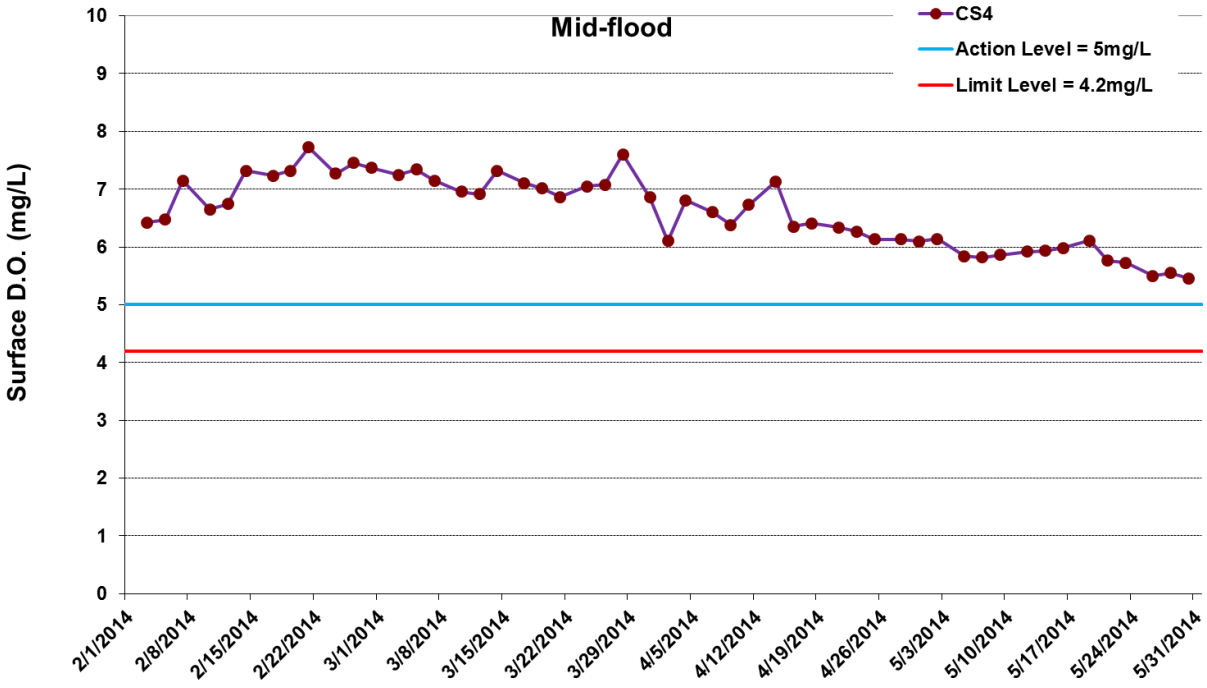


Figure G1 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at CS4. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls

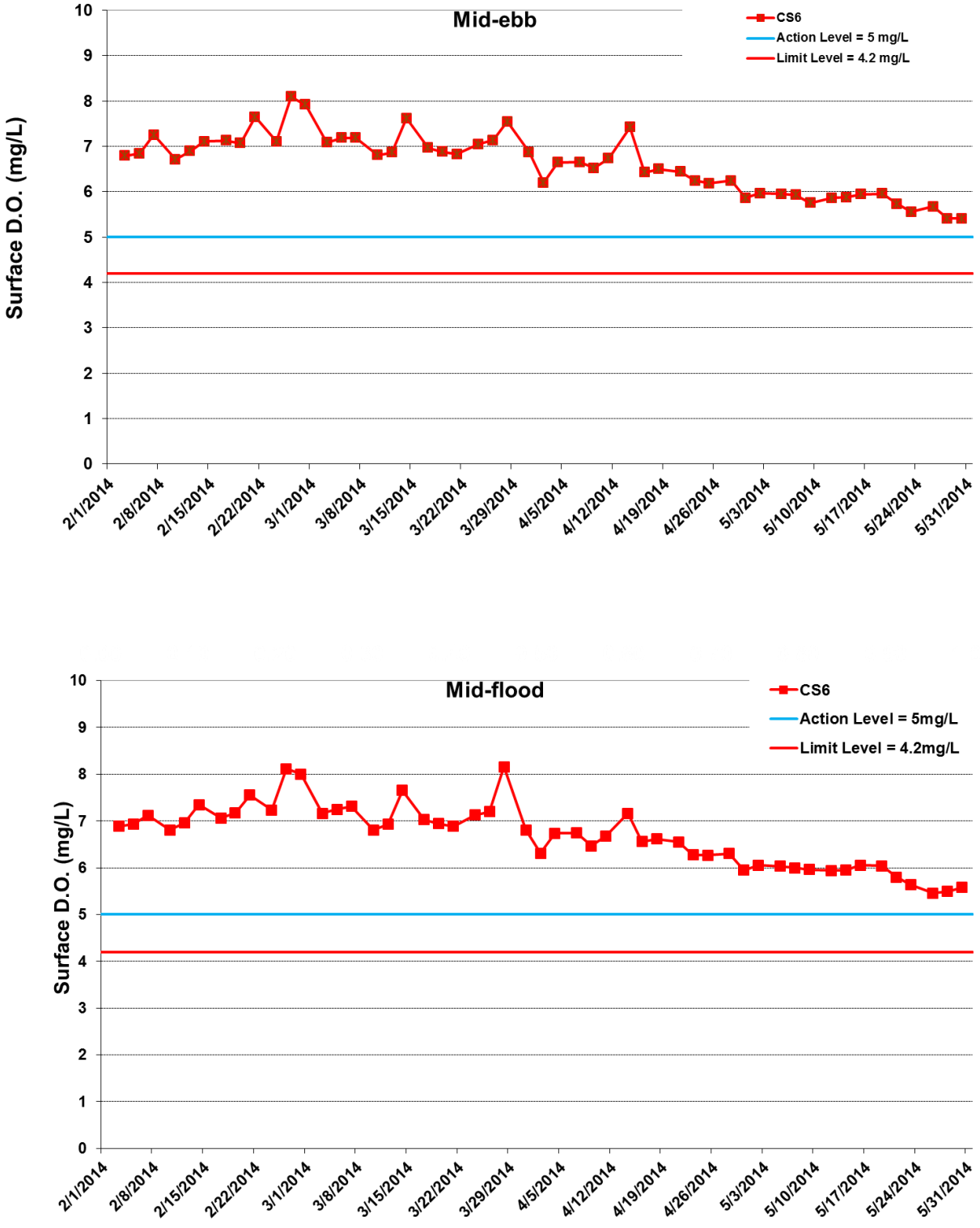
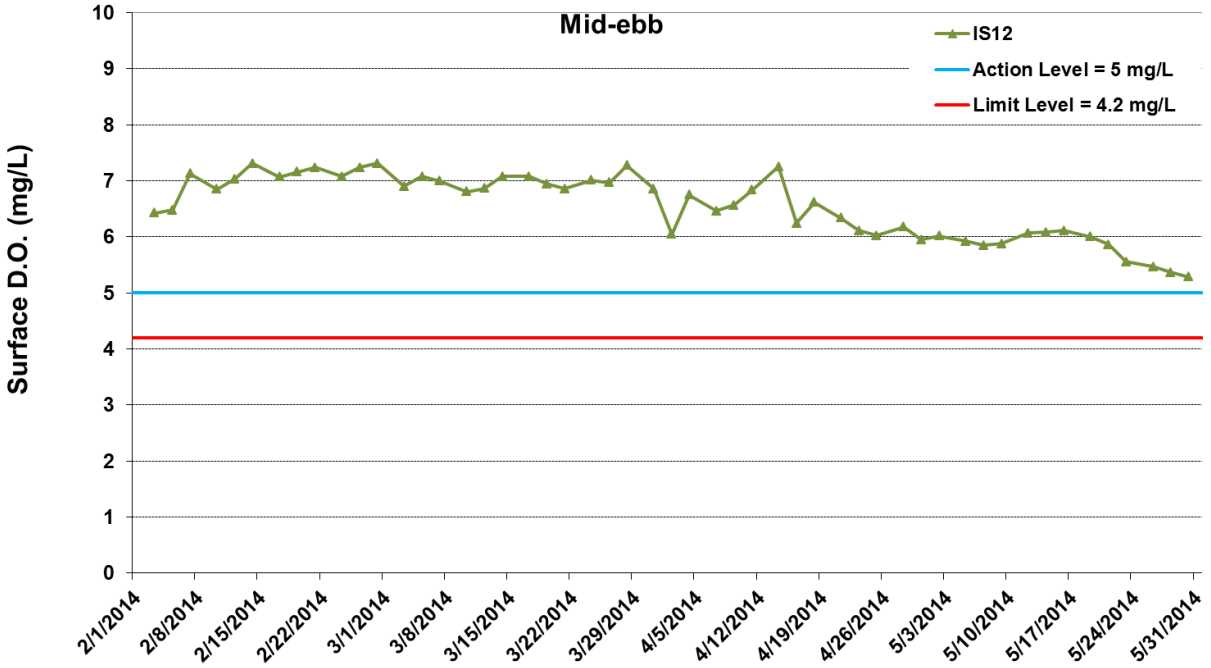


Figure G2 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at CS6. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



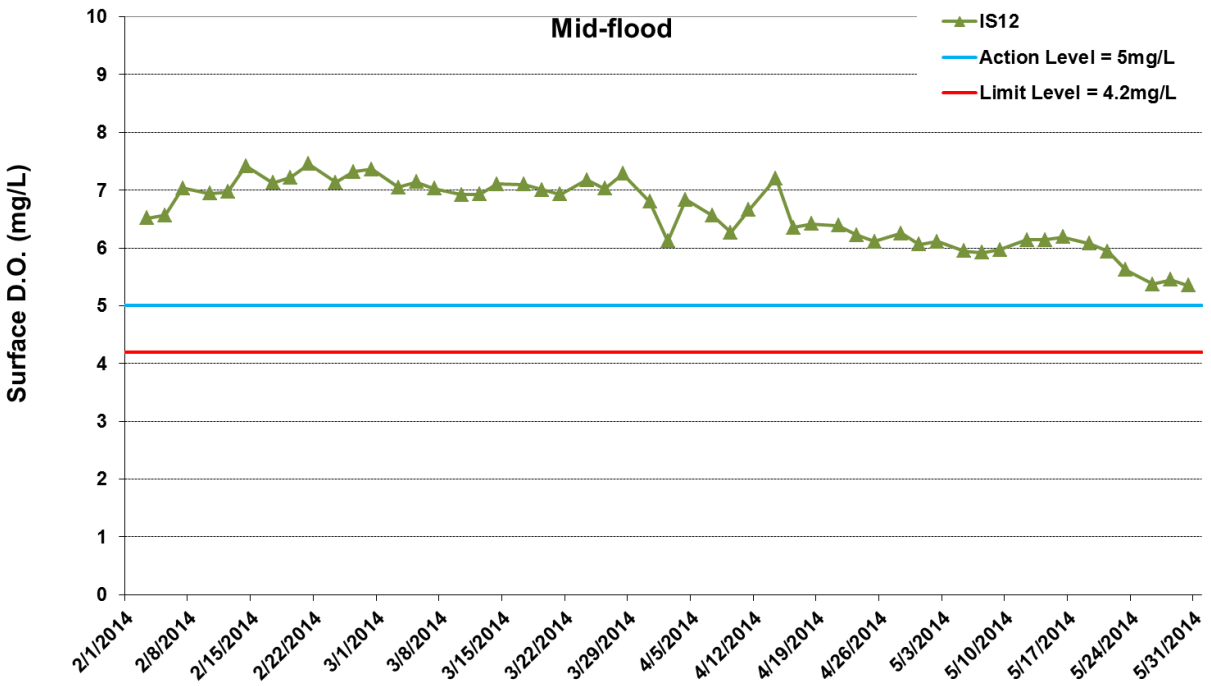


Figure G3 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at IS12. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls

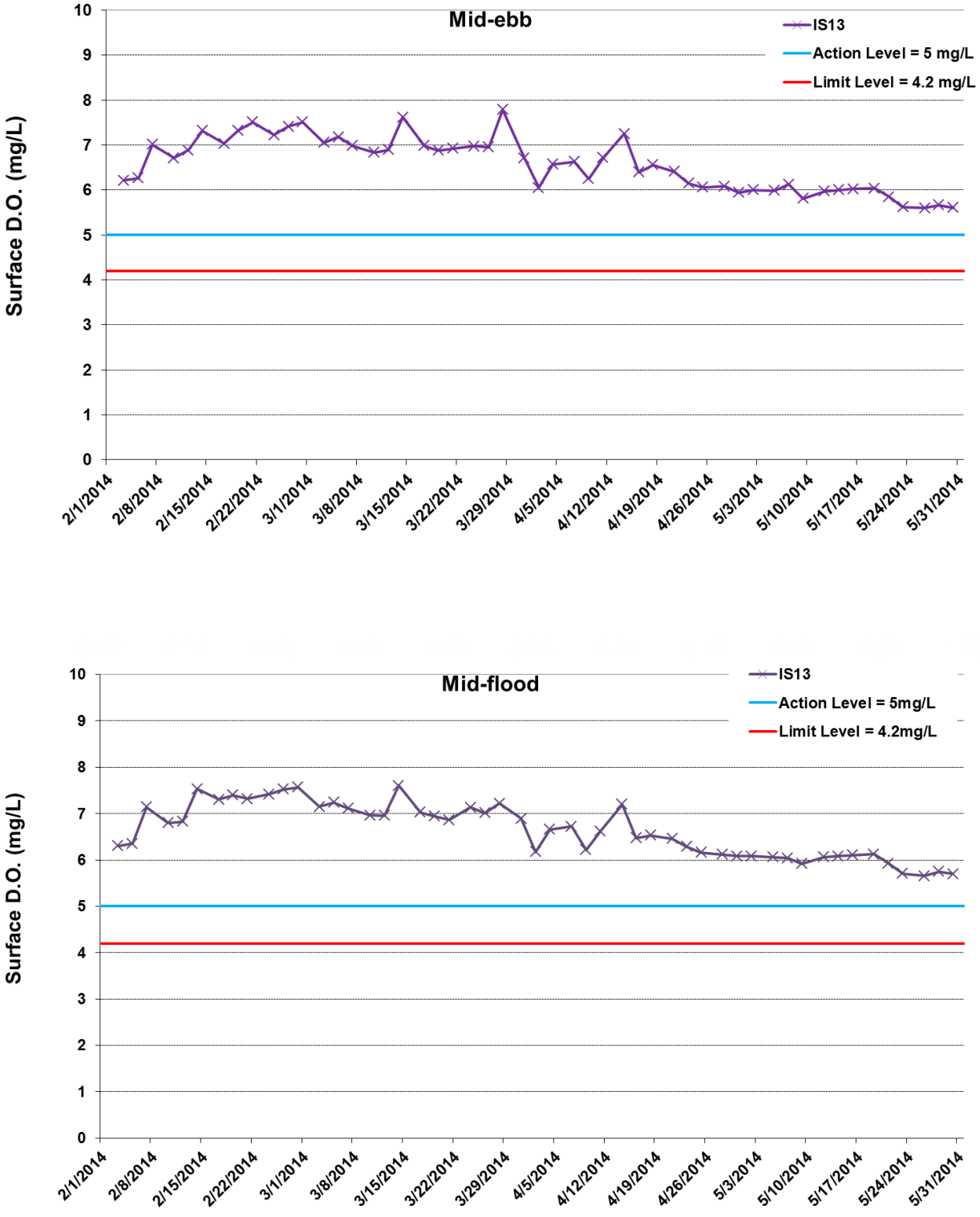
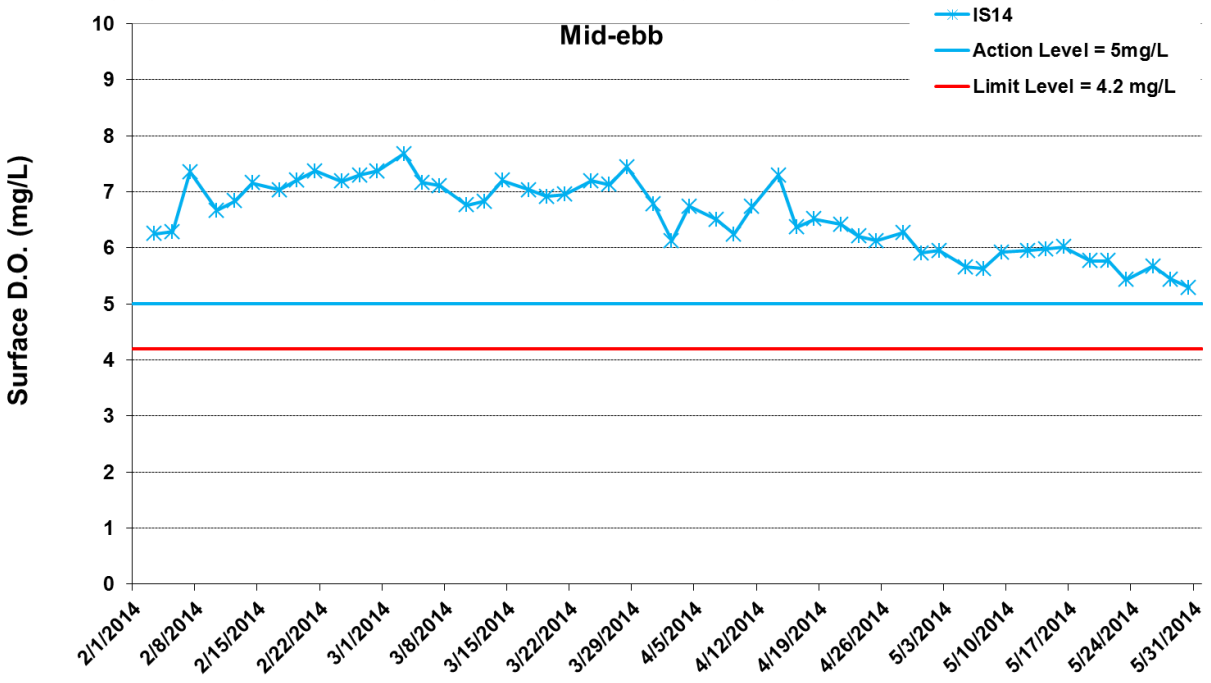


Figure G4 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at IS13. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



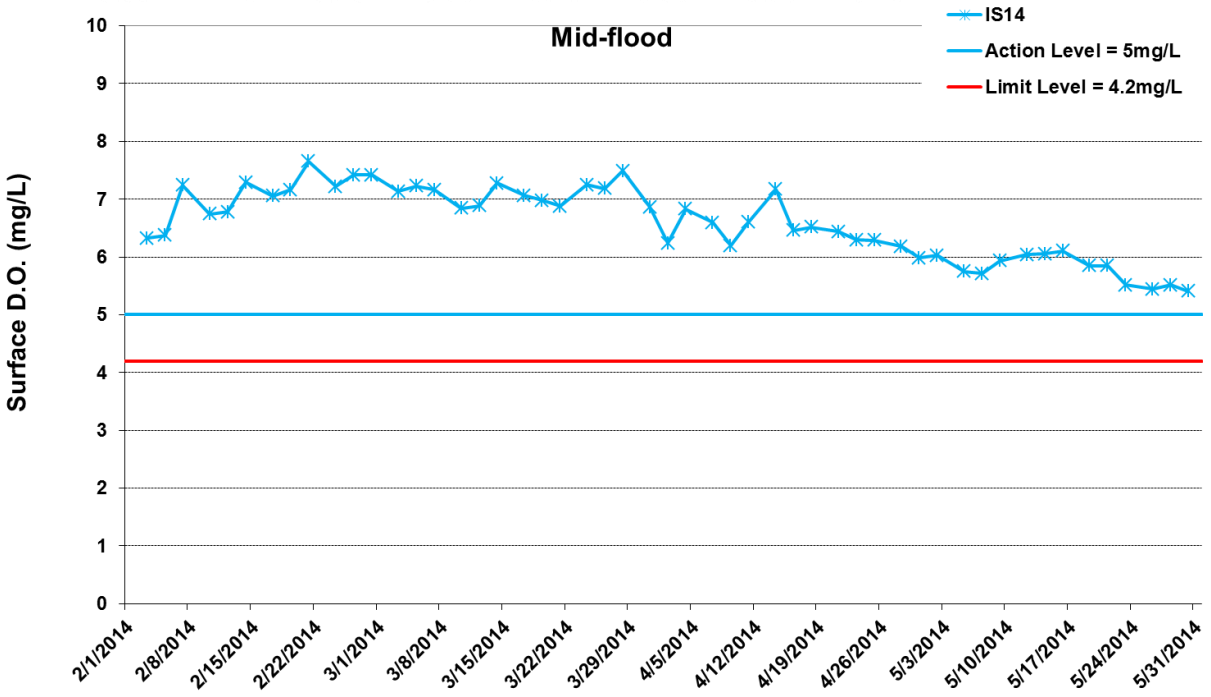
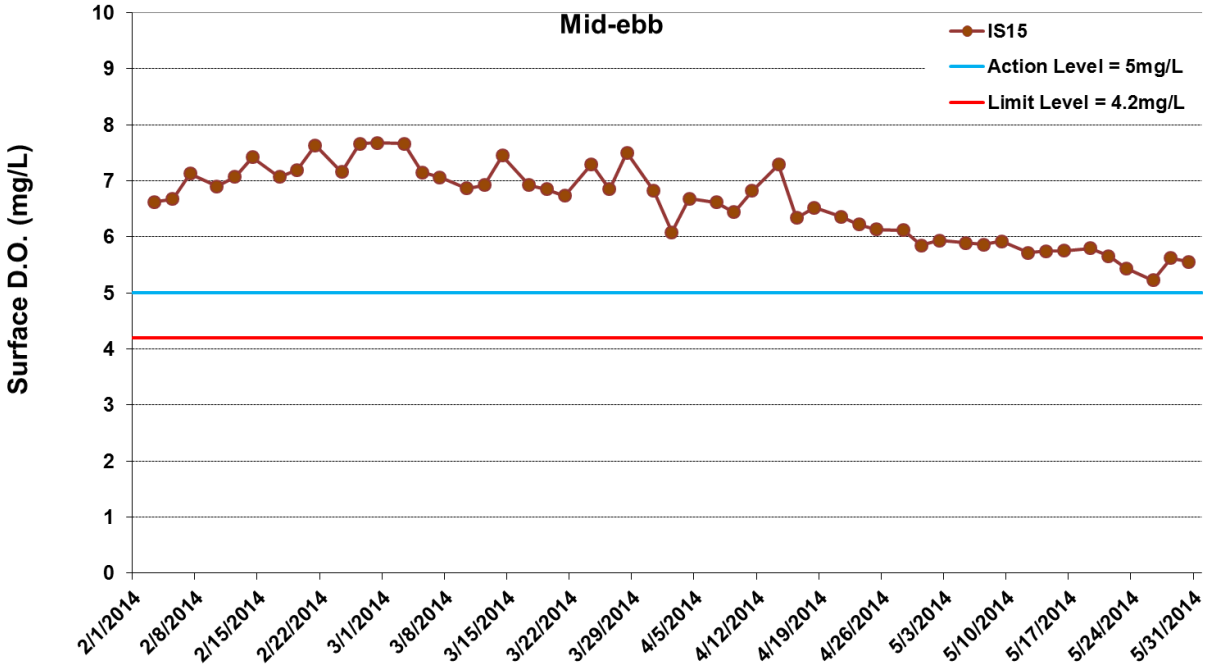


Figure G5 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at IS14. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



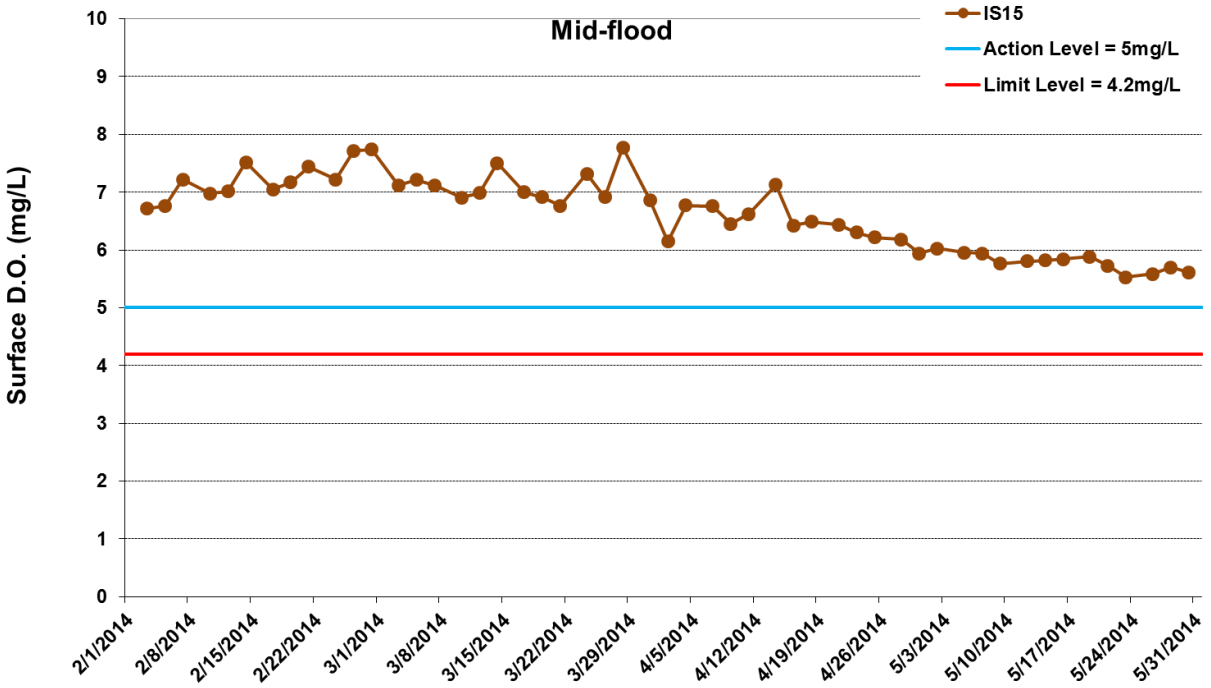


Figure G6 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at IS15. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls

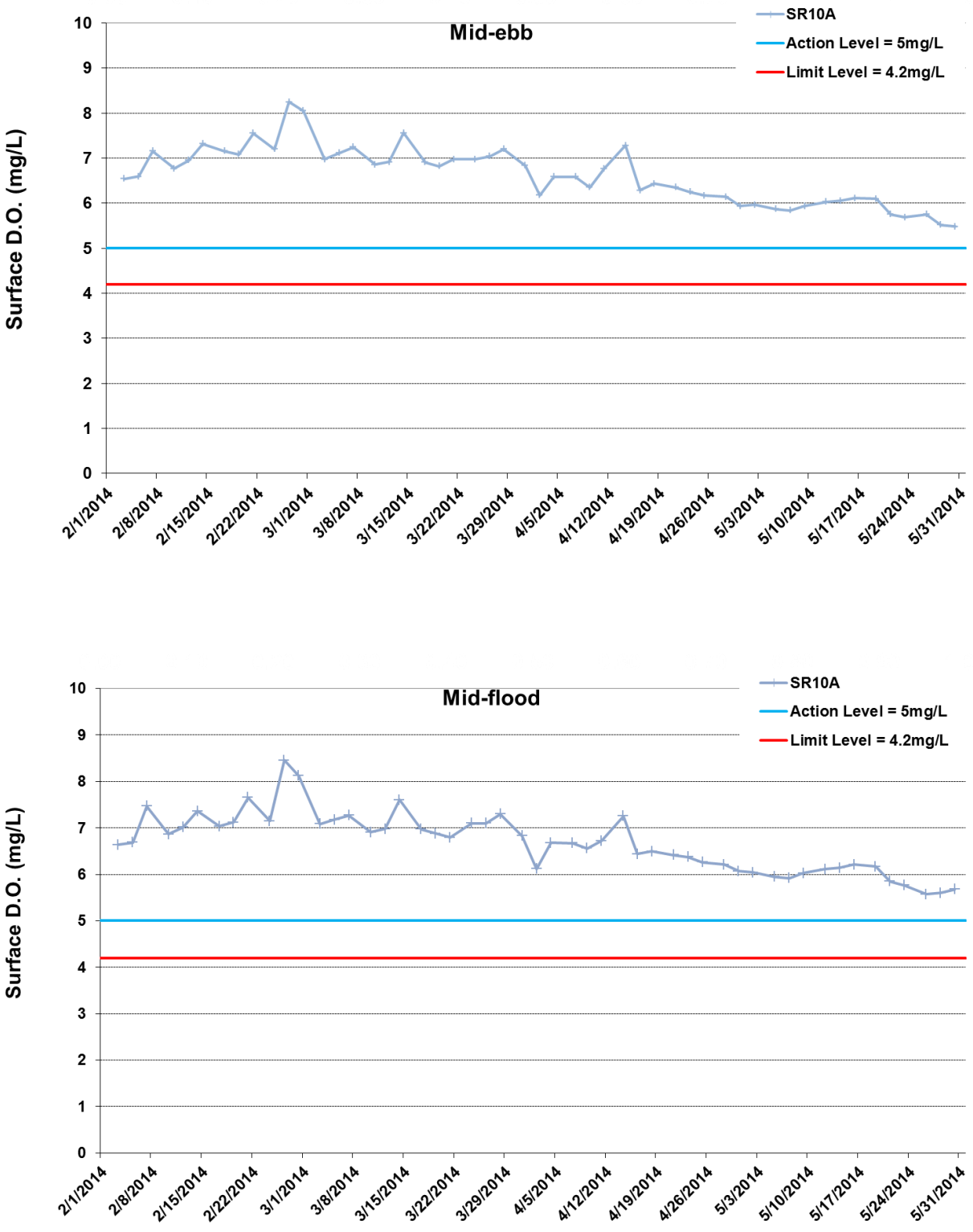
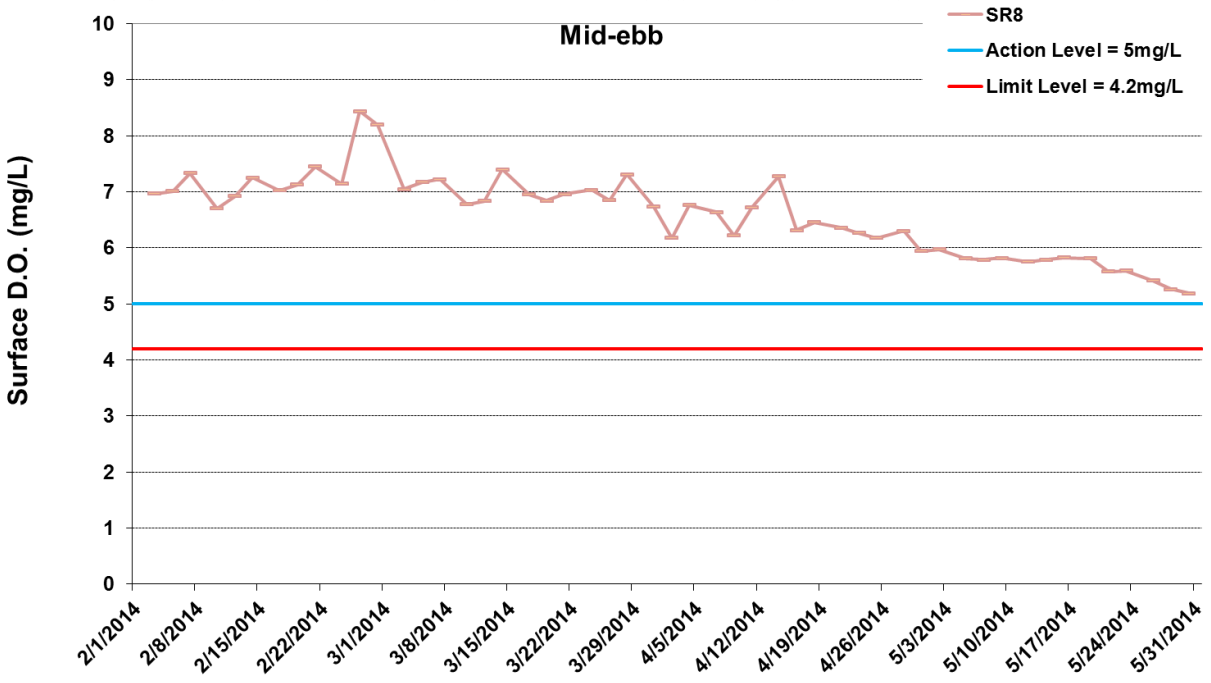


Figure G7 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at SR10A. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



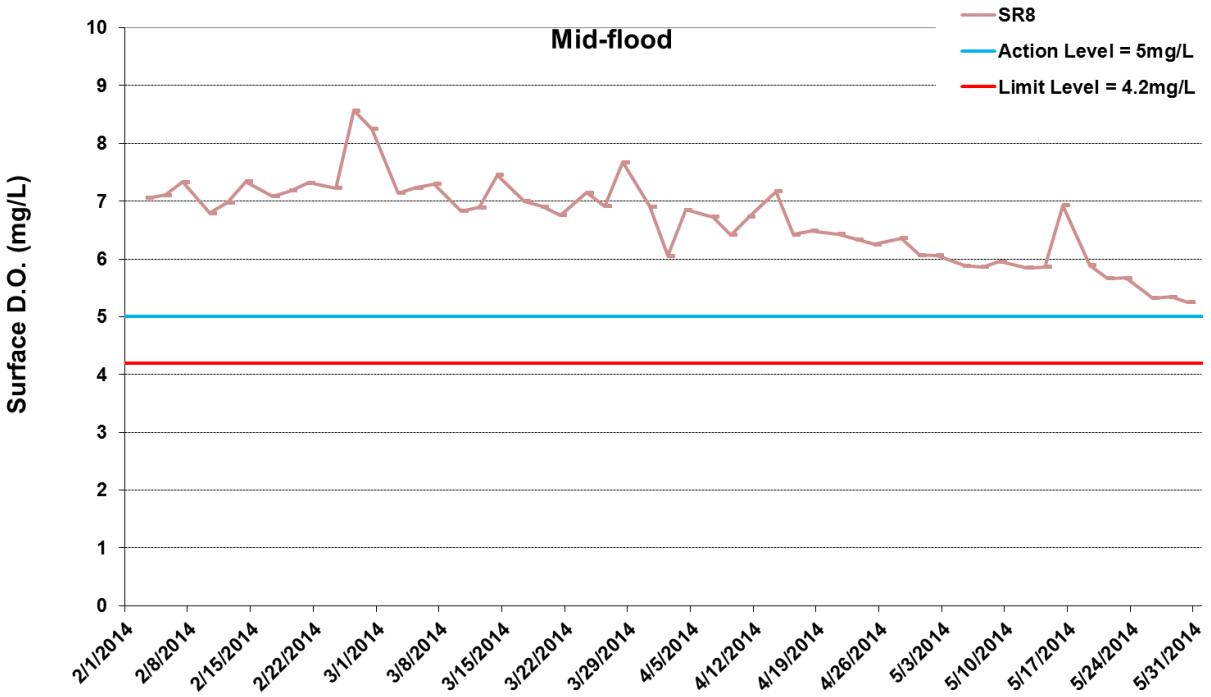
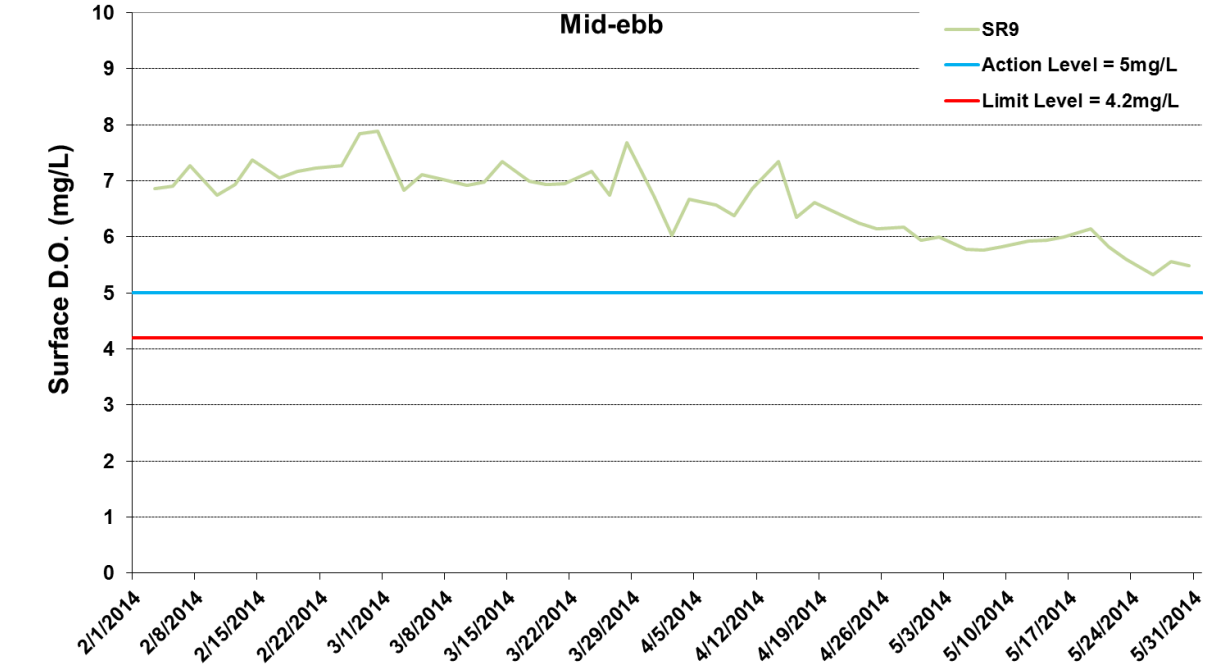


Figure G8 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at SR8. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



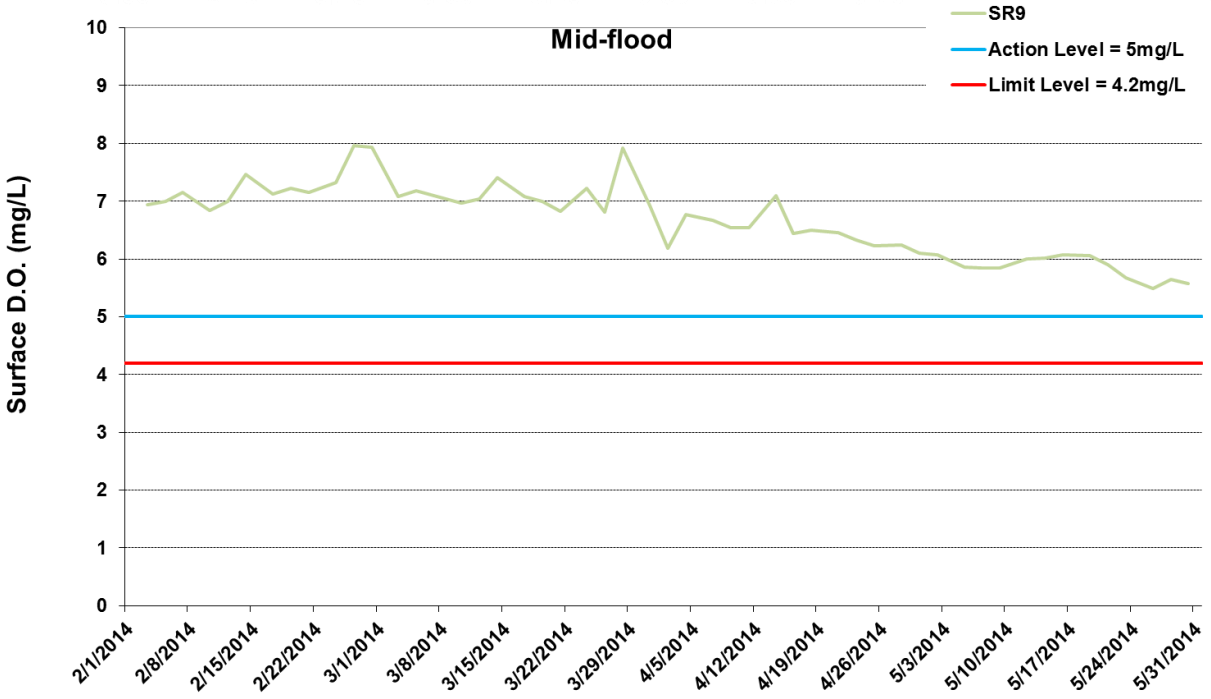


Figure G9 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 February 2014 and 31 May 2014 at SR9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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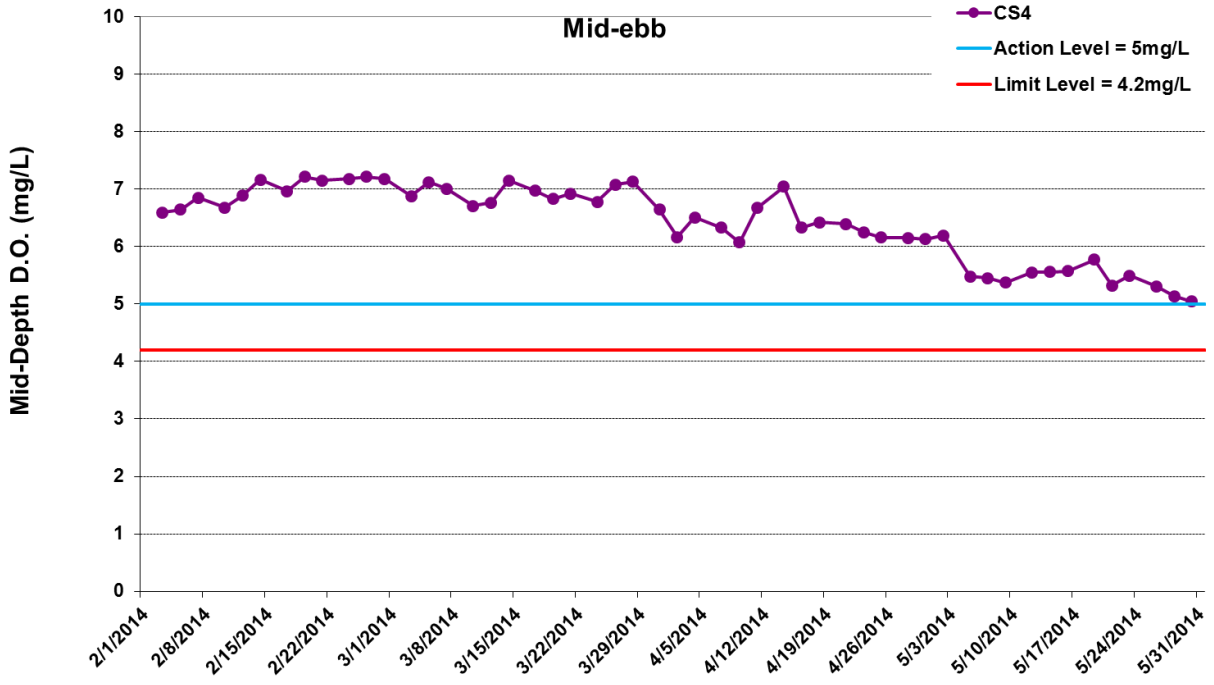

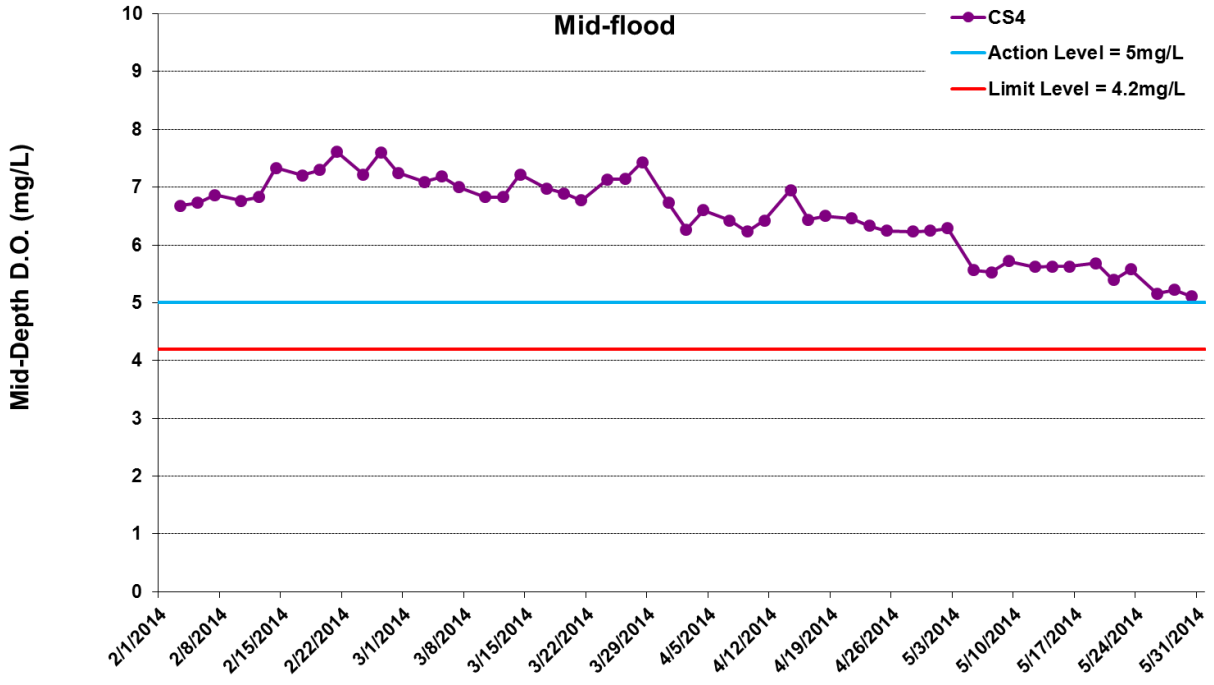

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G10 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at CS4. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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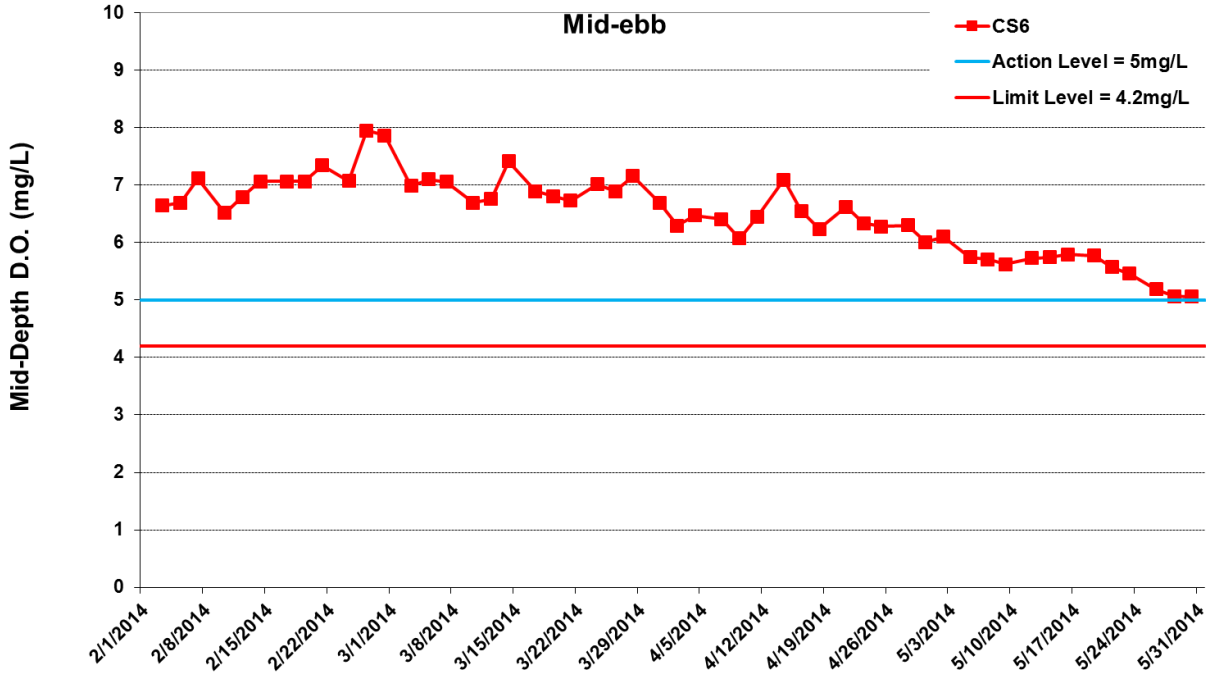

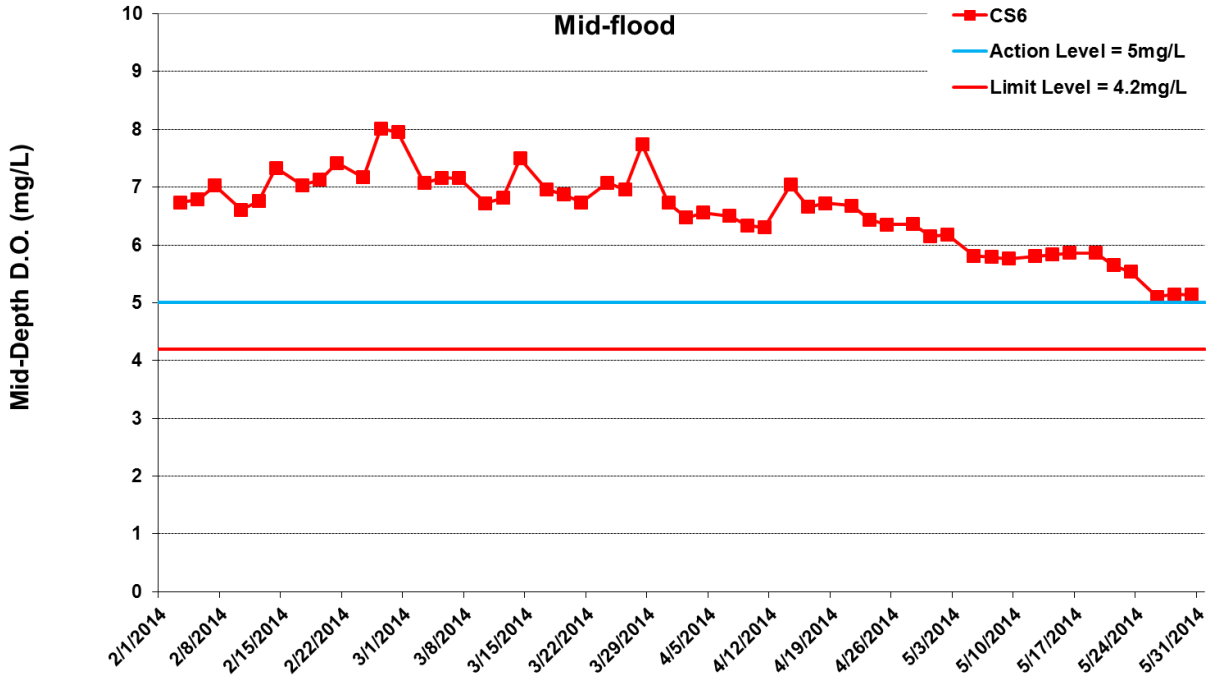

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G11 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at CS6. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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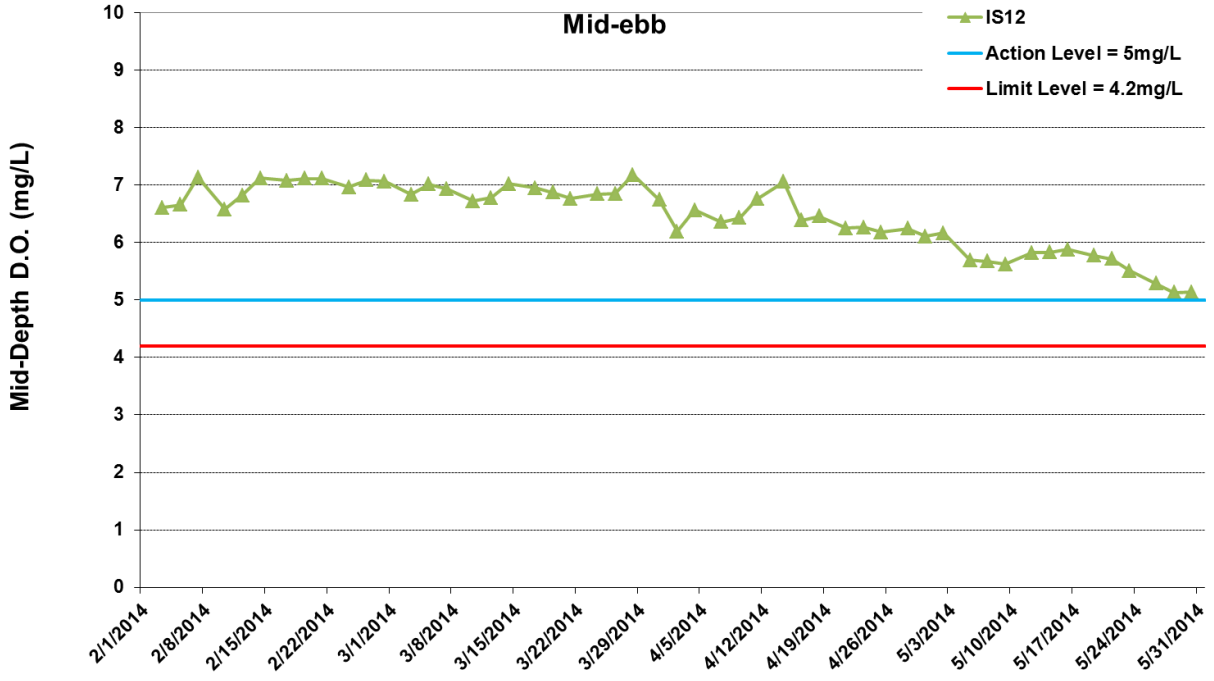

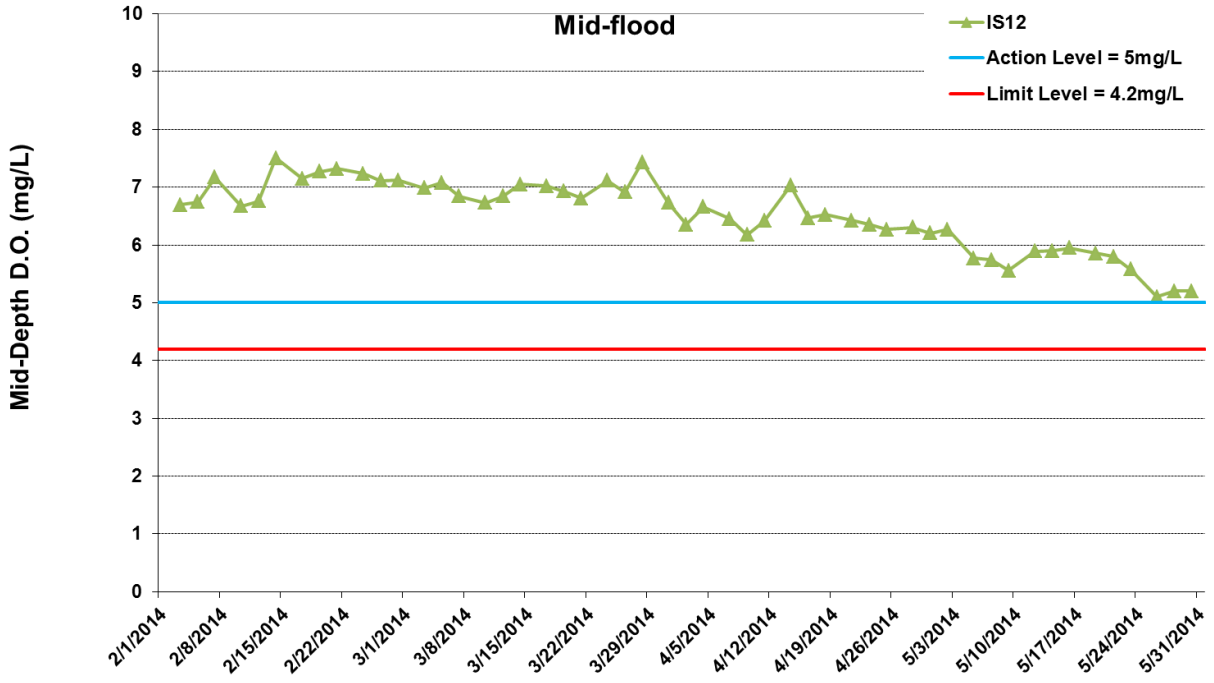

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G12 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at IS12. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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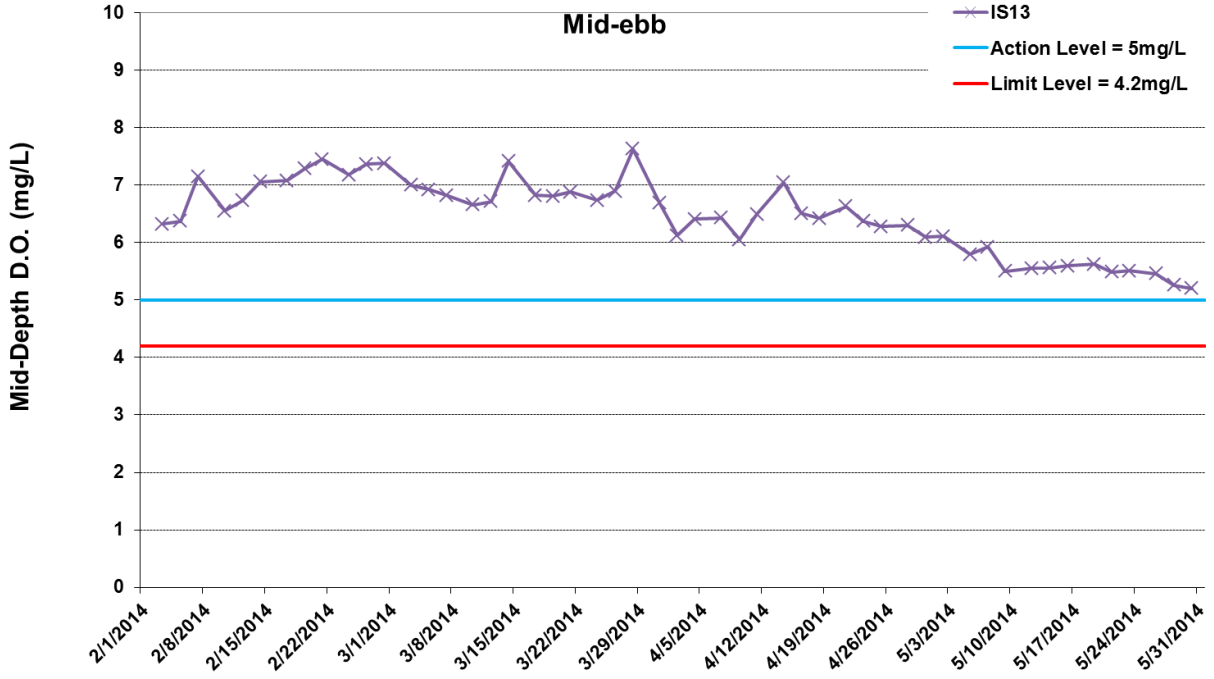

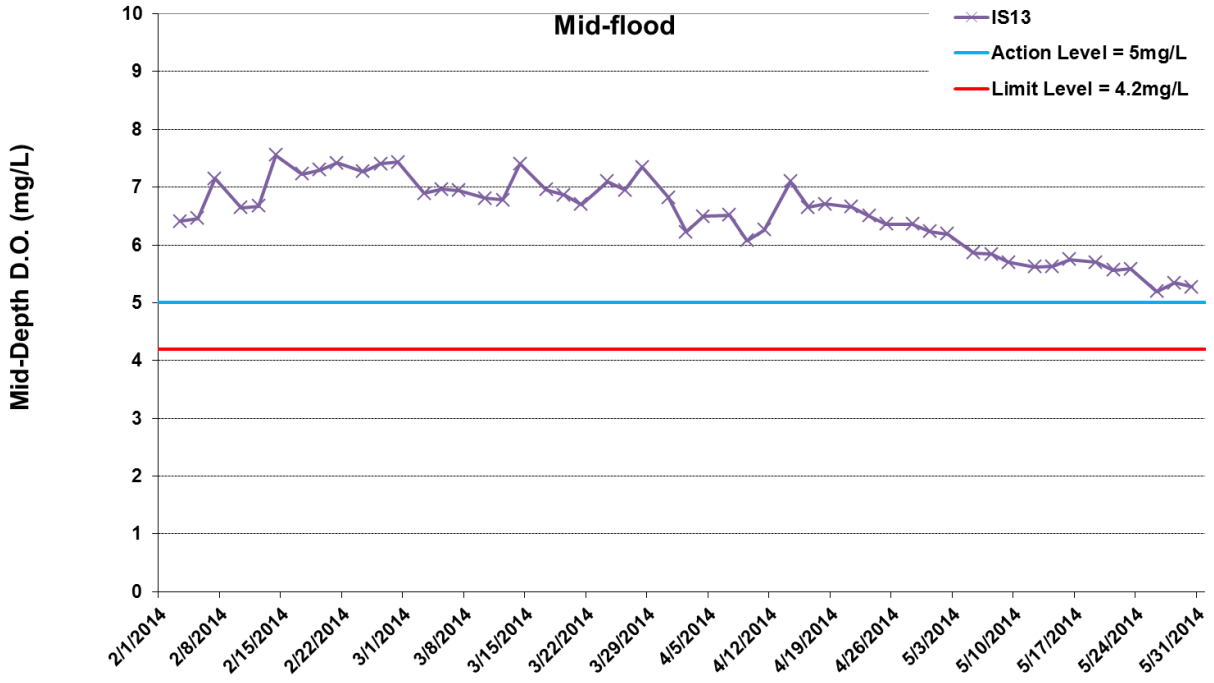

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G13 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at IS13. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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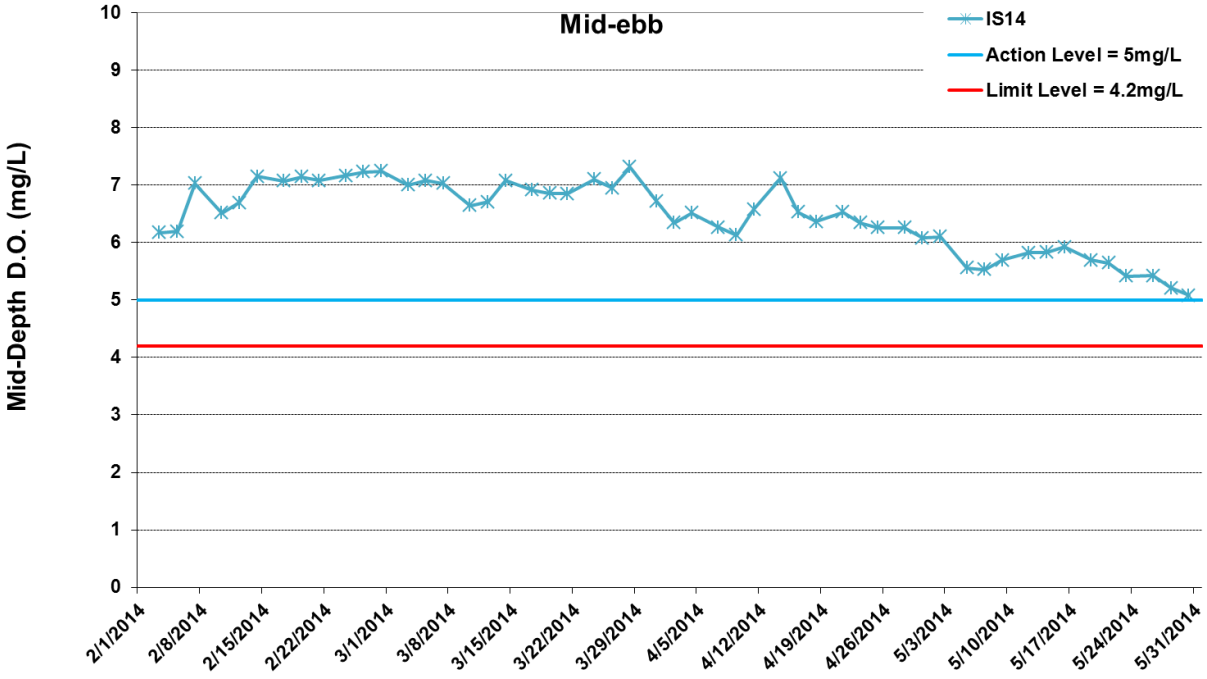

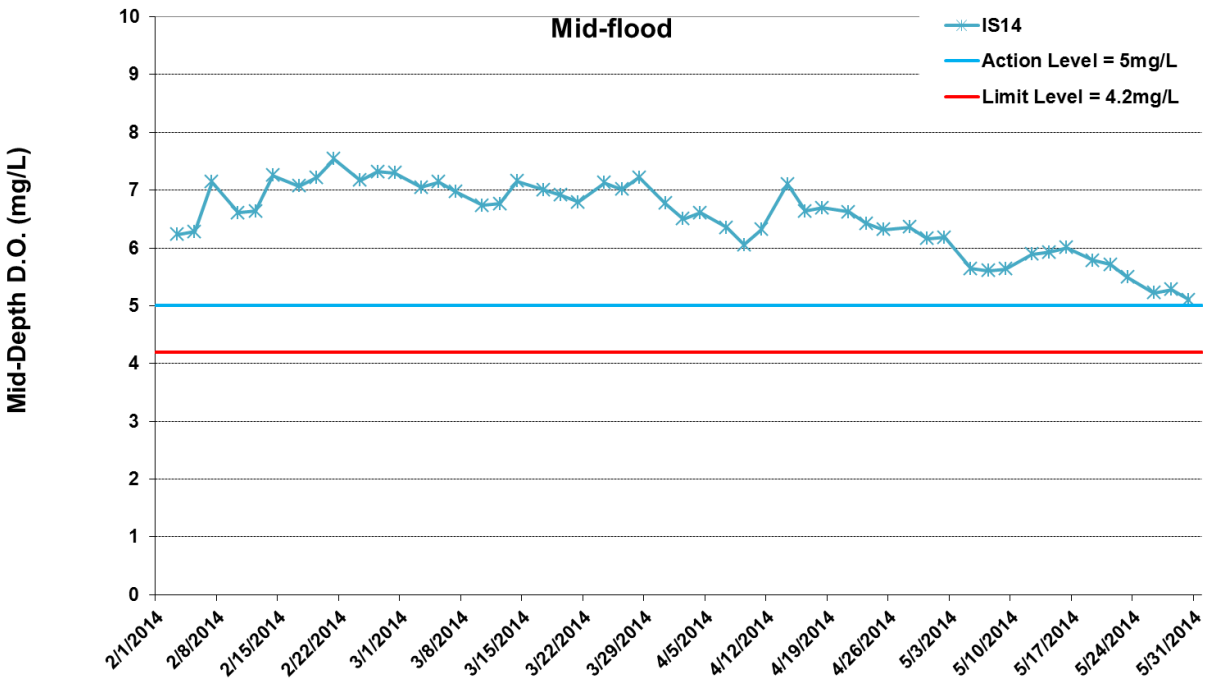

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G14 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at IS14. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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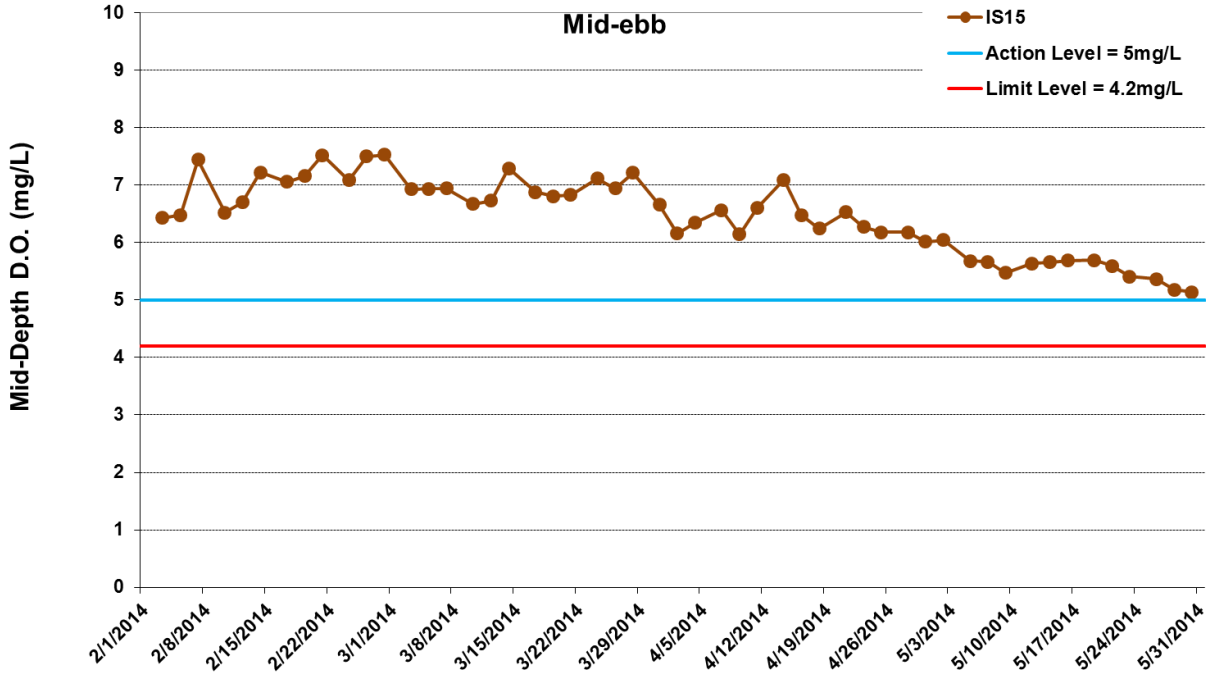

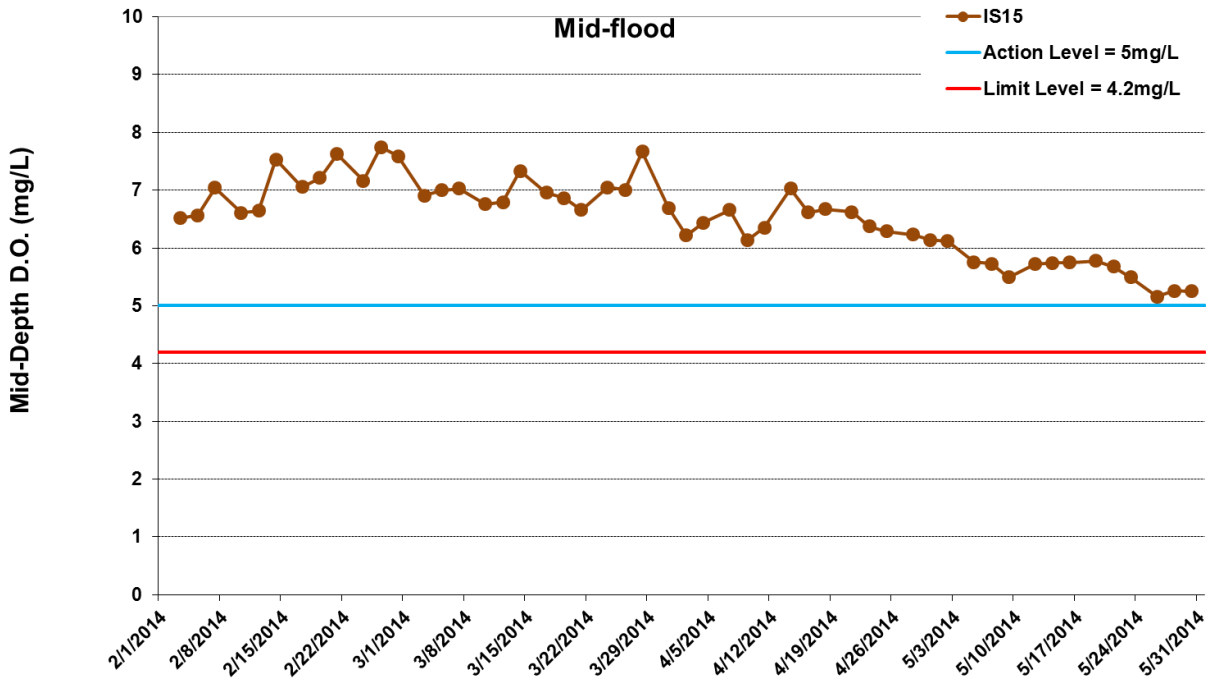

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G15 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at IS15. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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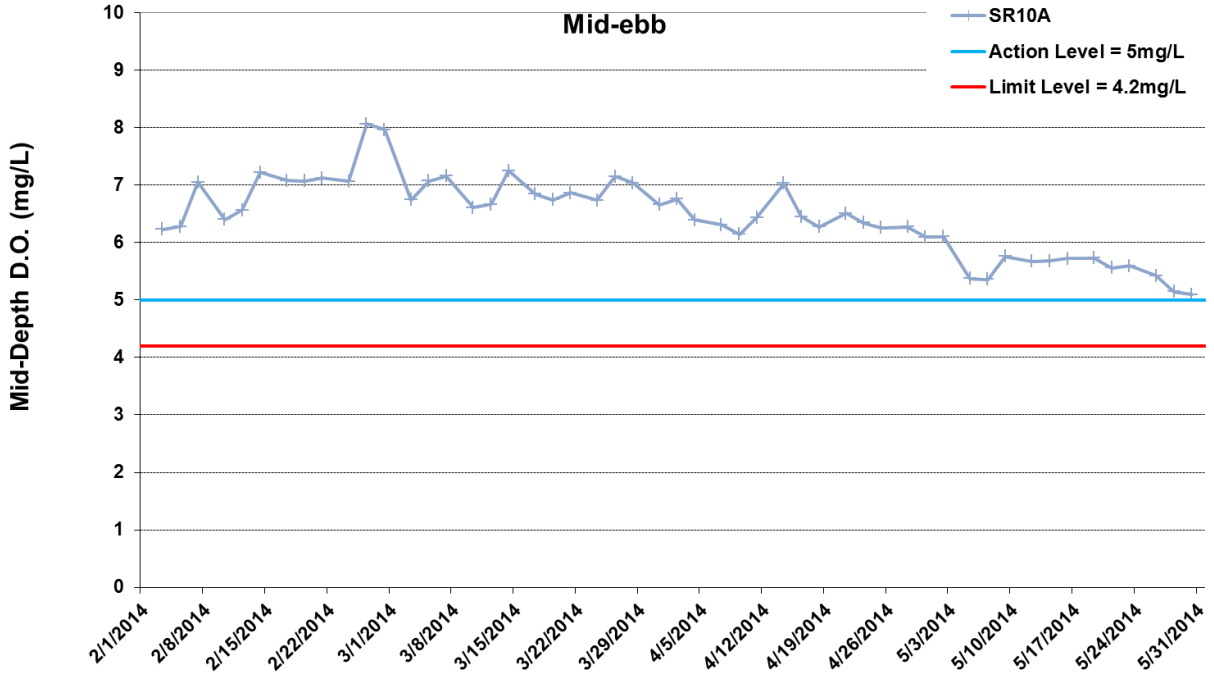

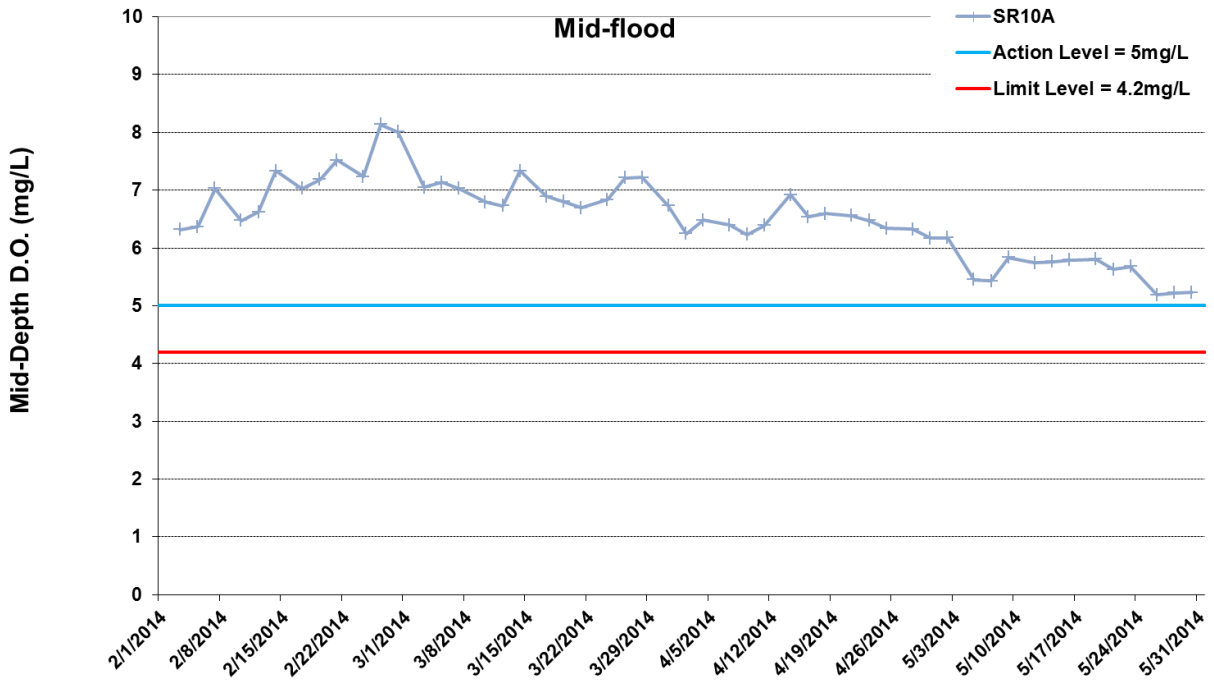

*No data for Stations SR8 and SR9 due to shallow water depth (< 6m).

Figure G16 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 February 2014 and 31 May 2014 at SR10A. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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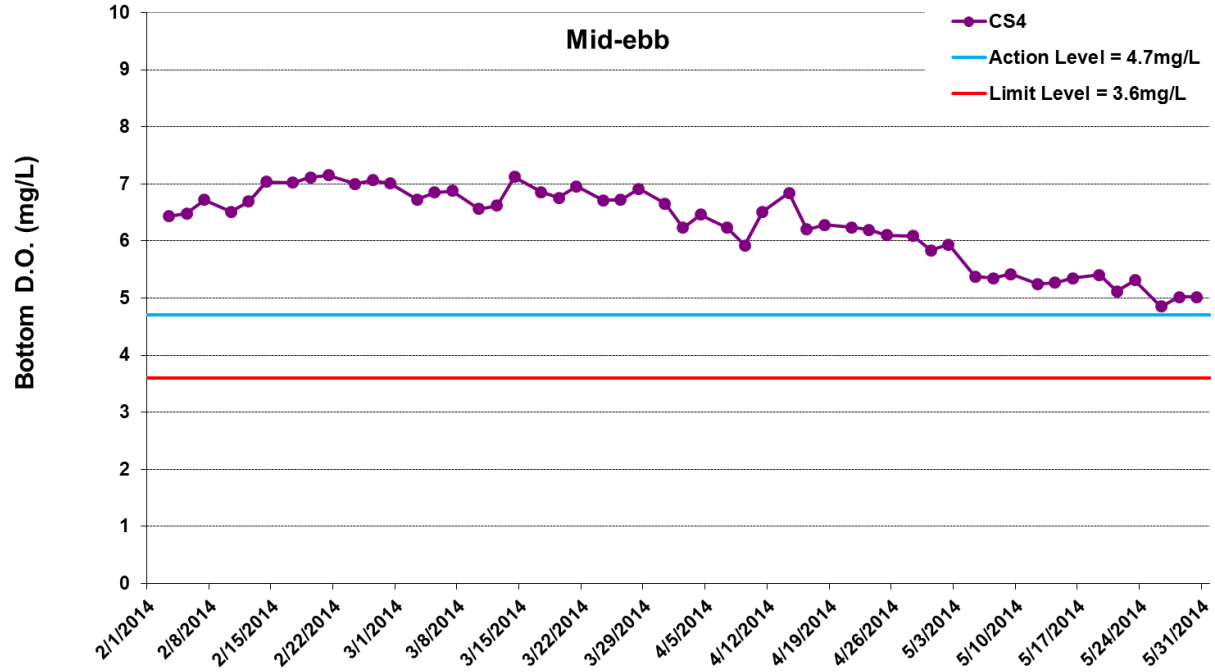

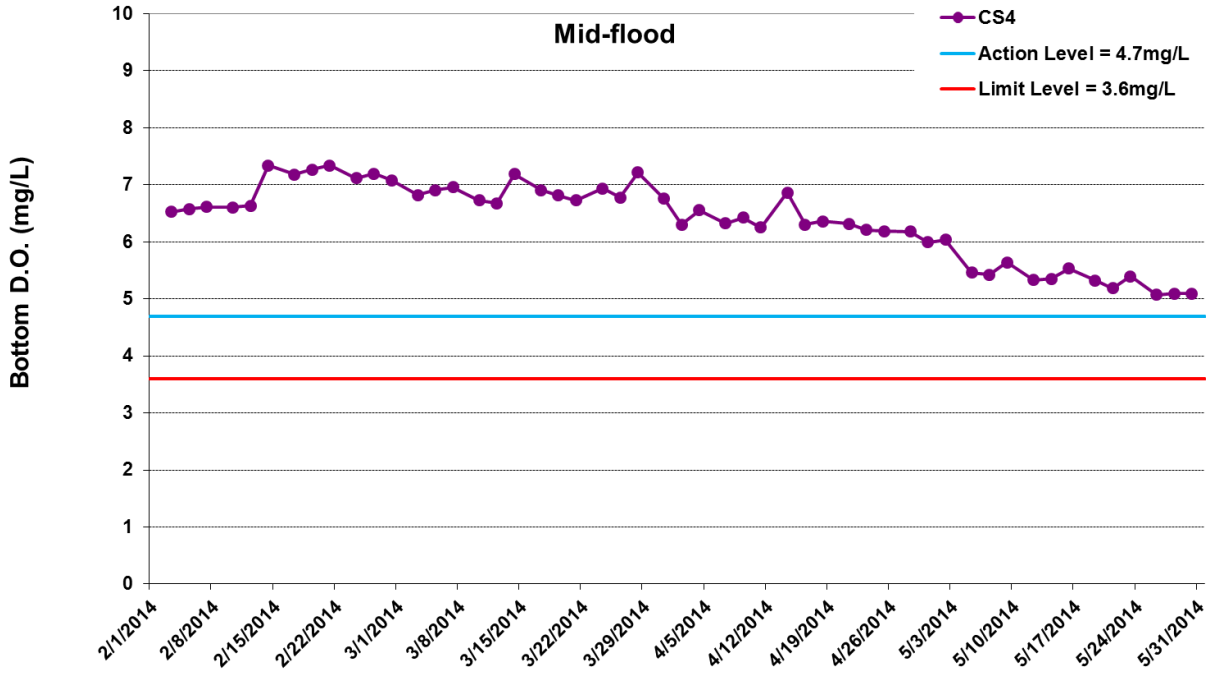

Figure G17 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at CS4. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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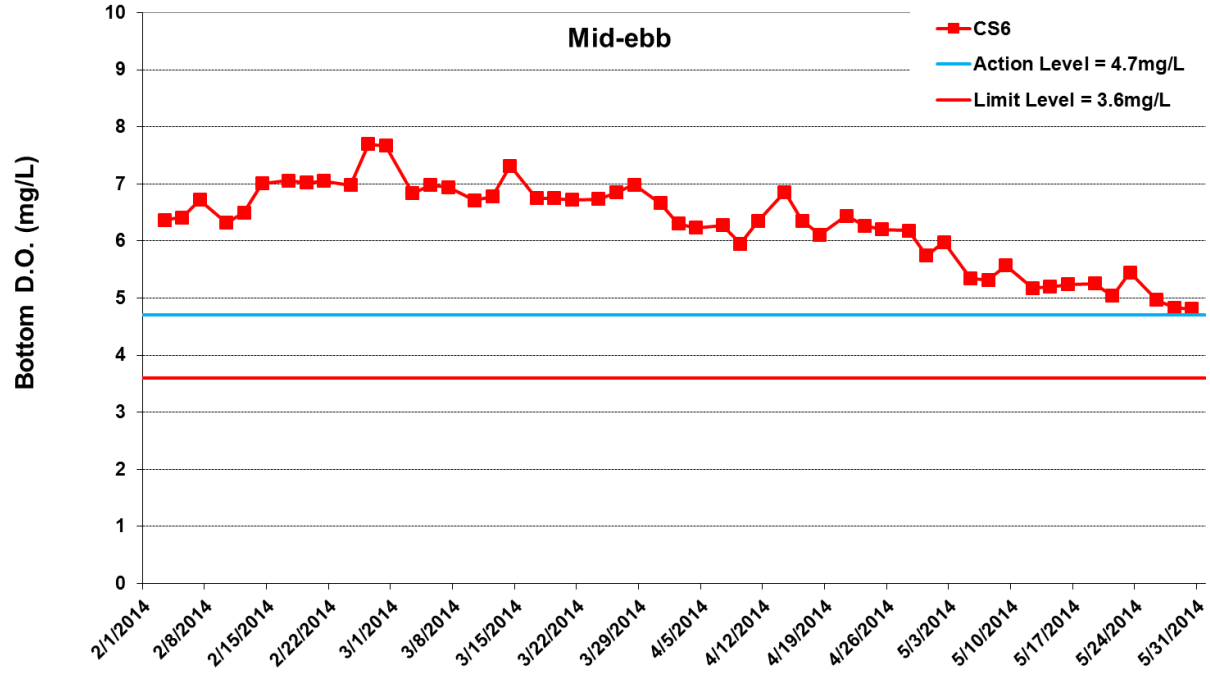

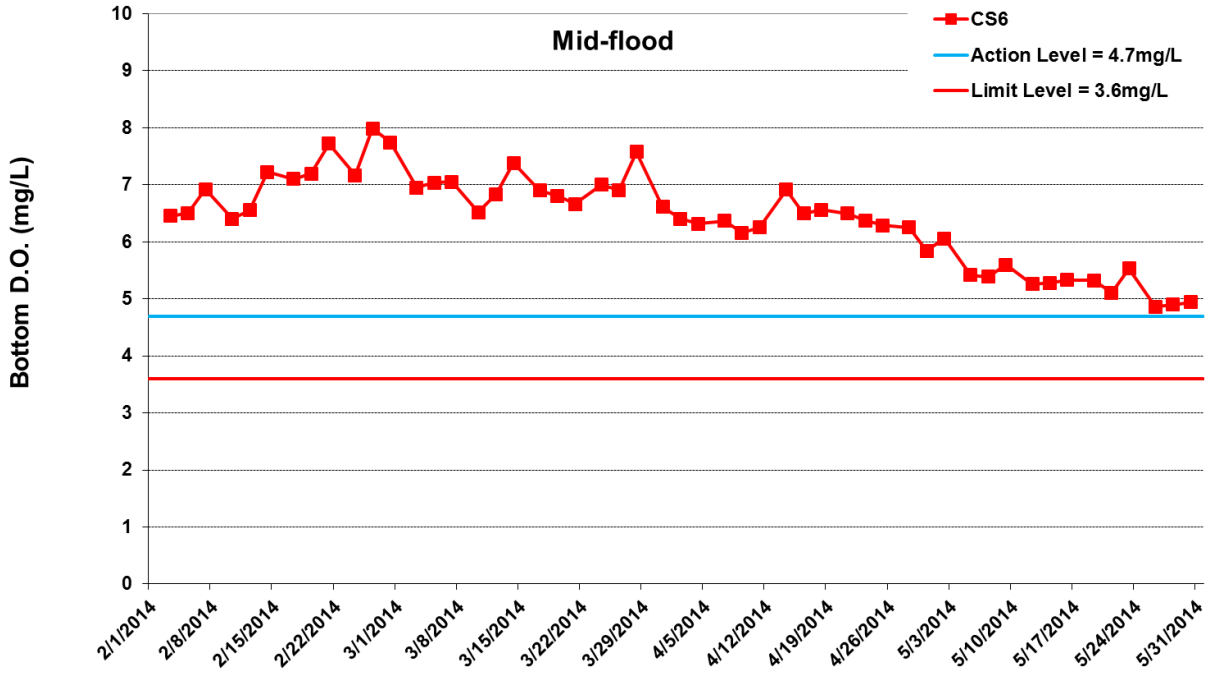

Figure G18 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at CS6. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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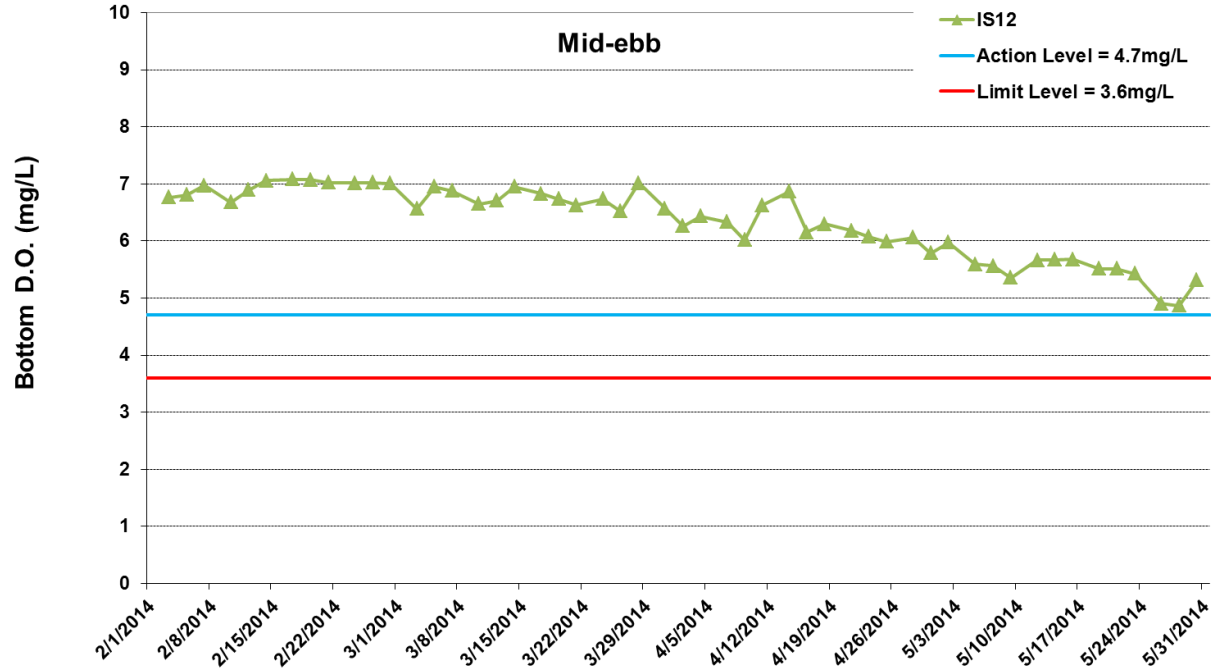

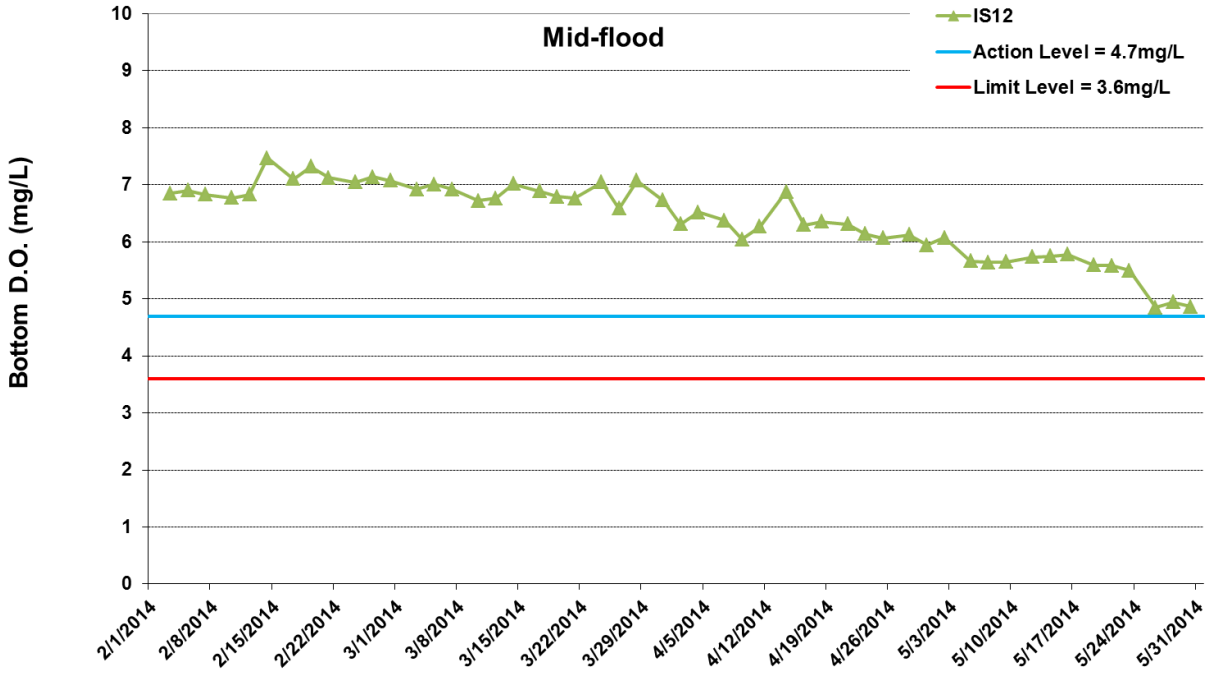

Figure G19 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at IS12. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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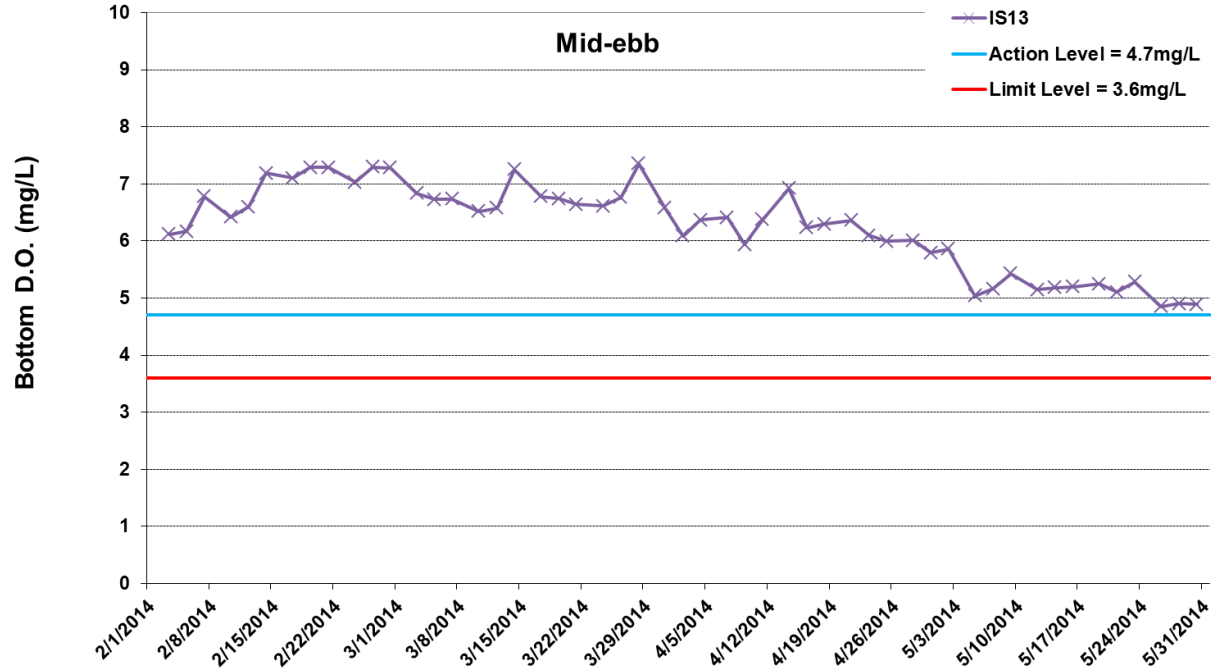

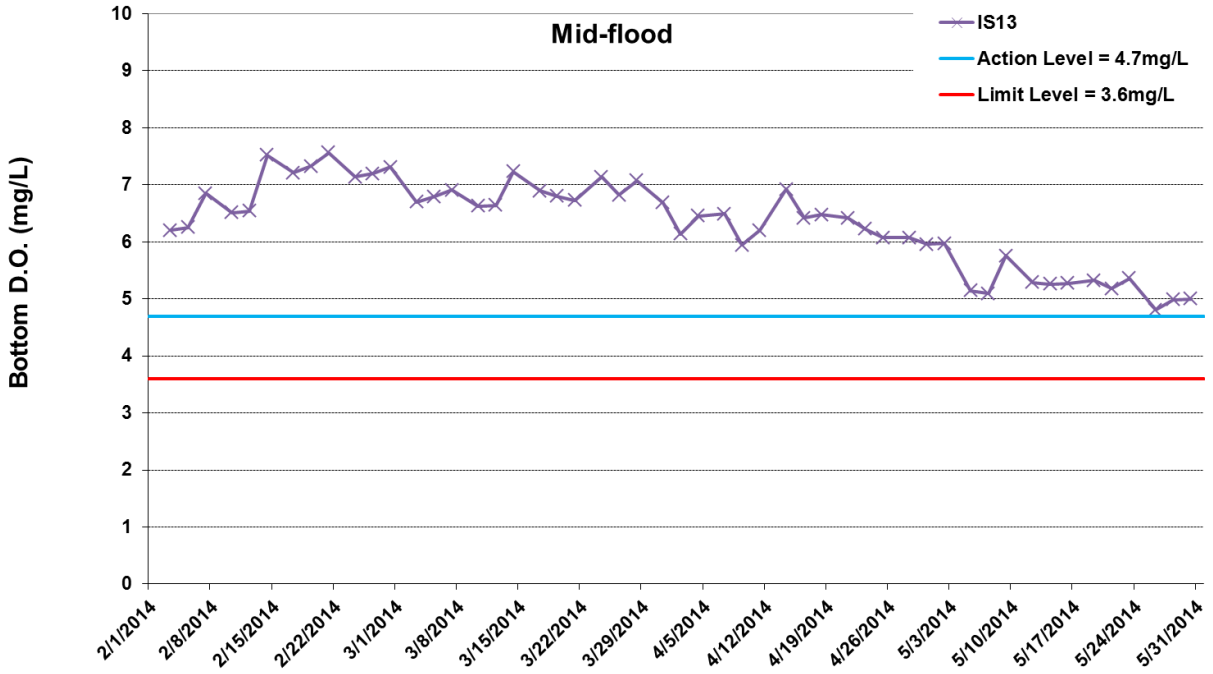

Figure G20 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at IS13. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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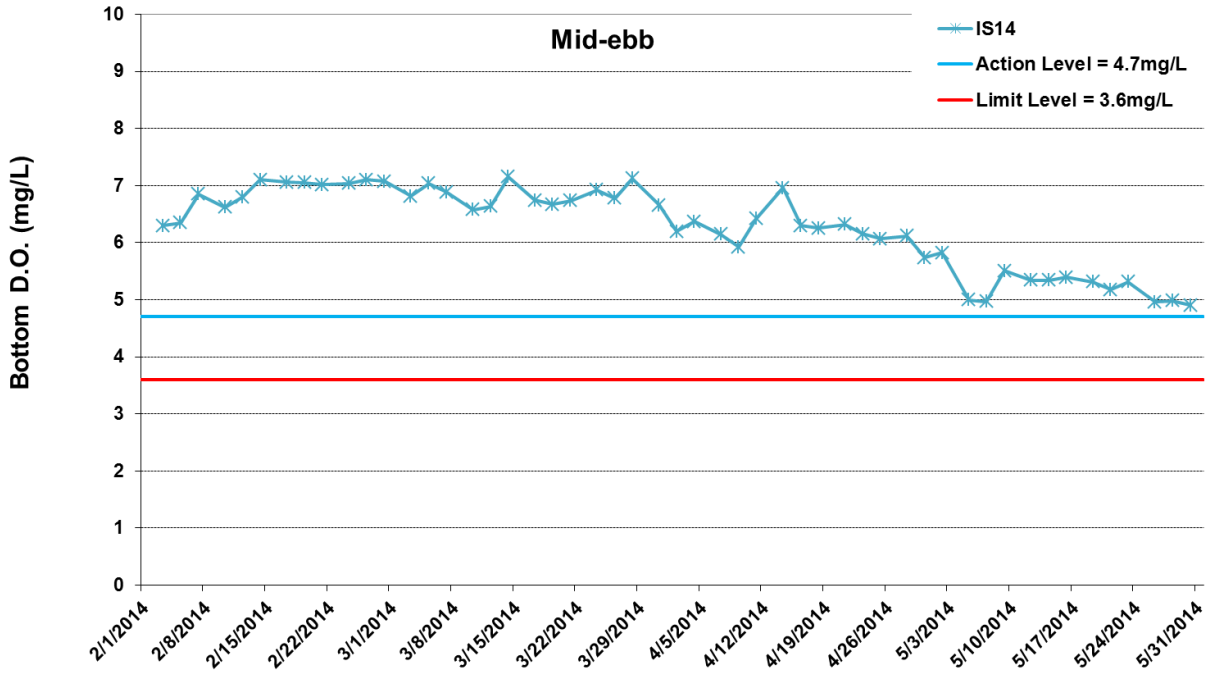

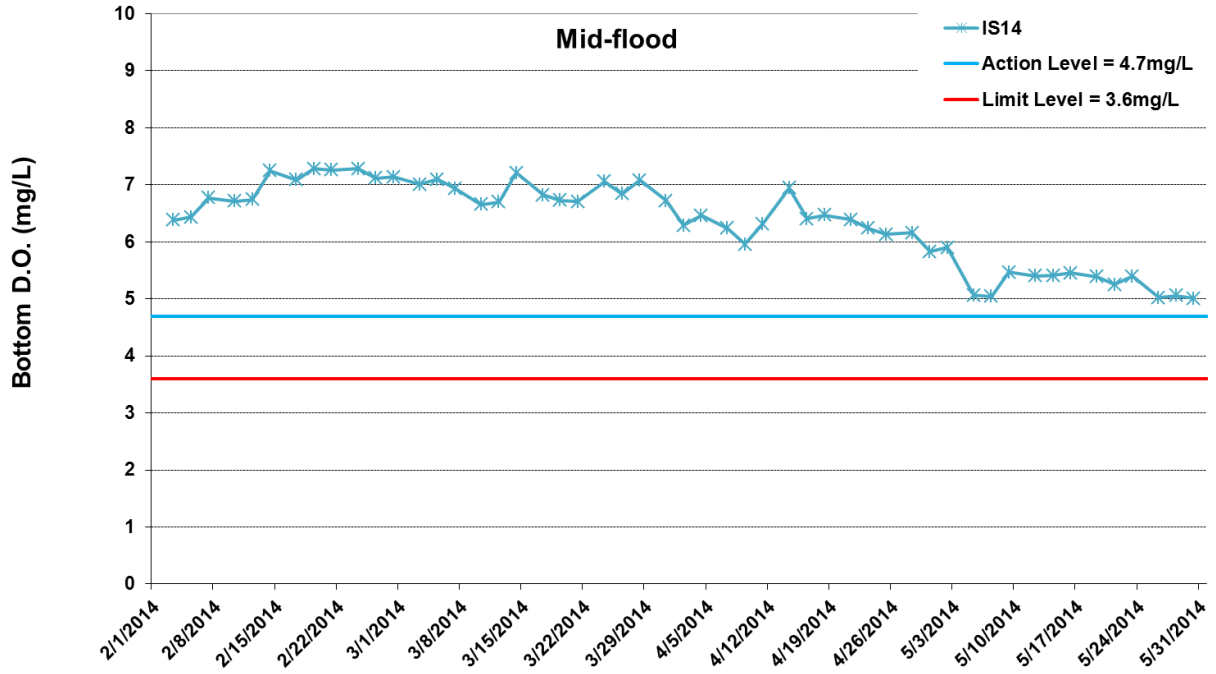

Figure G21 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at IS14. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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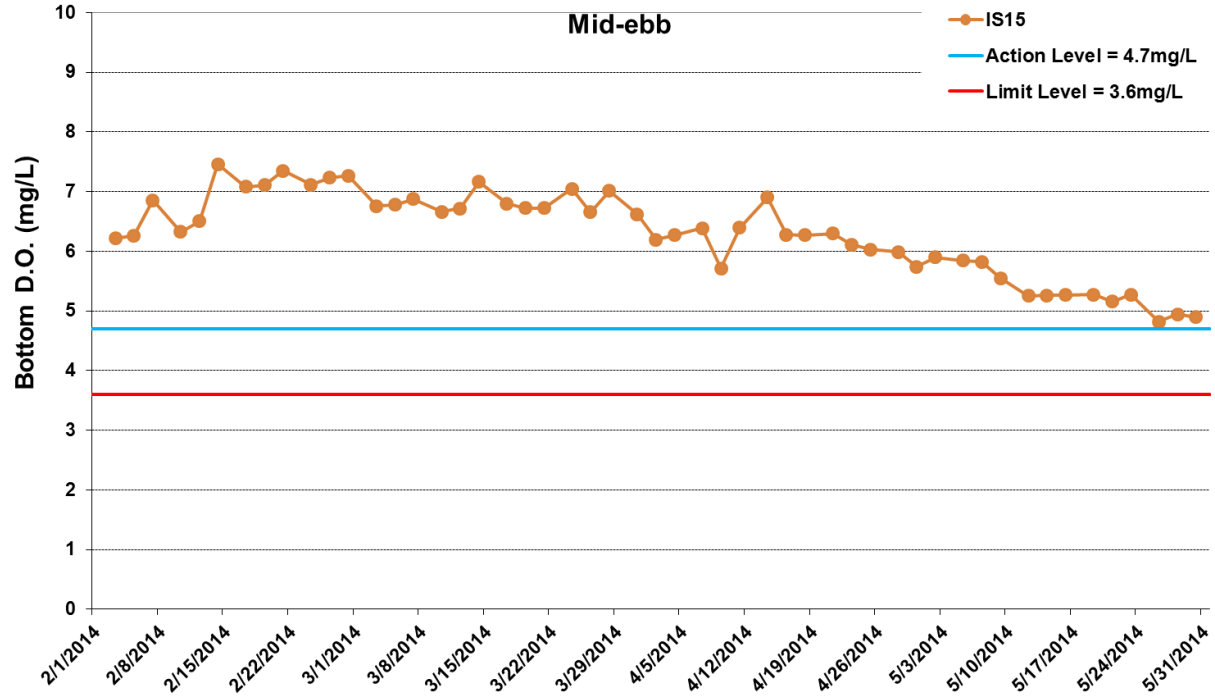

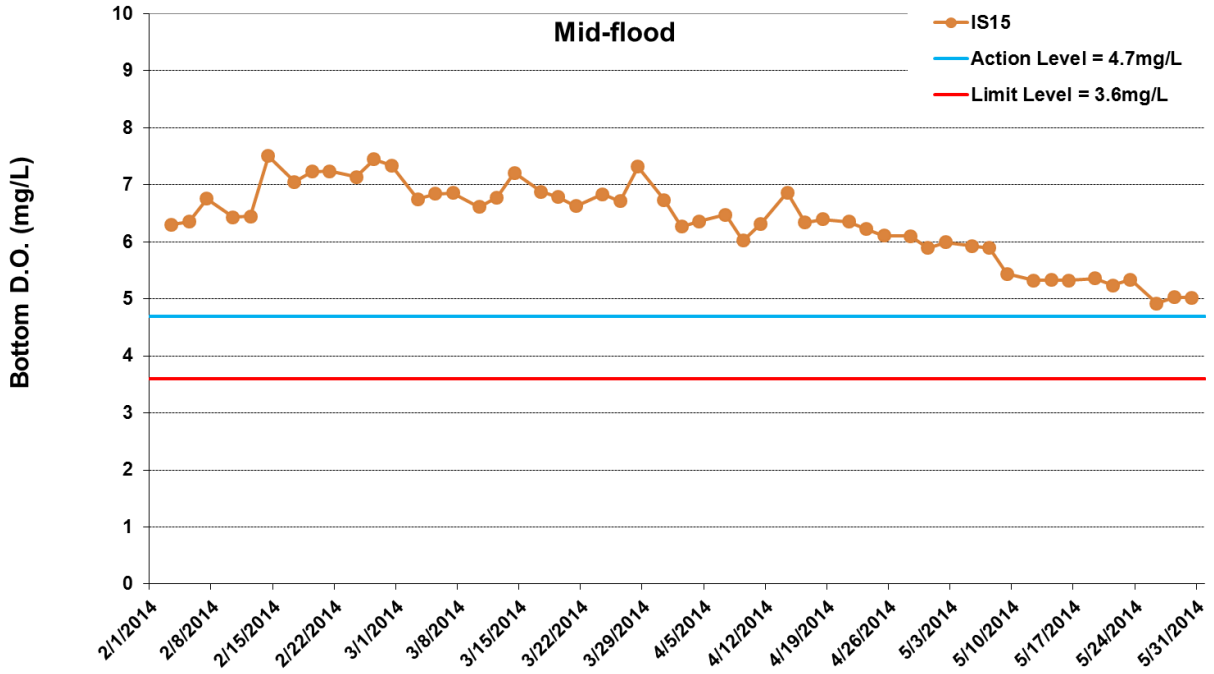

Figure G22 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at IS15. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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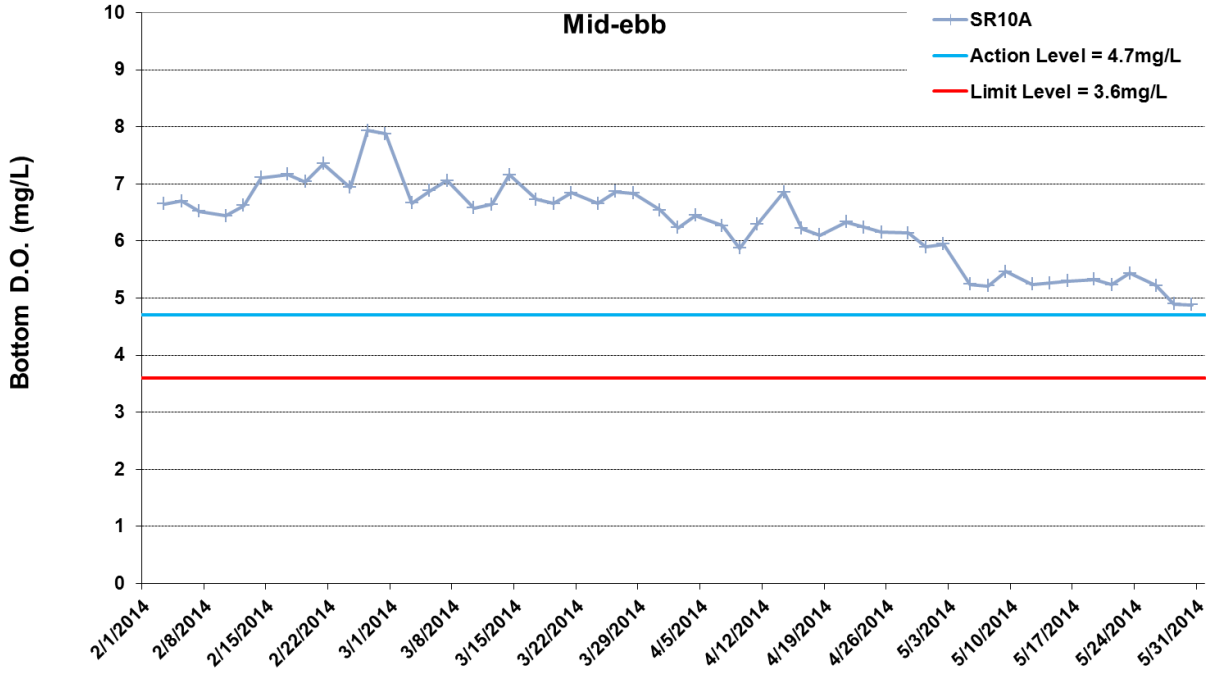

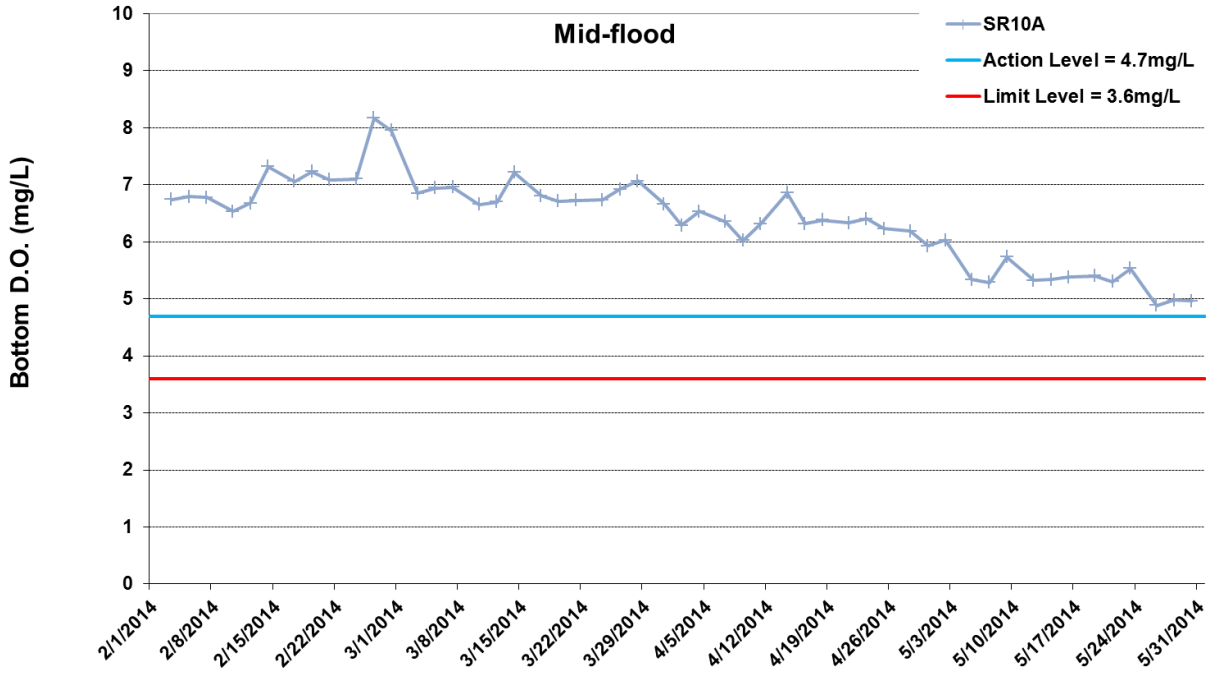

Figure G23 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at SR10A. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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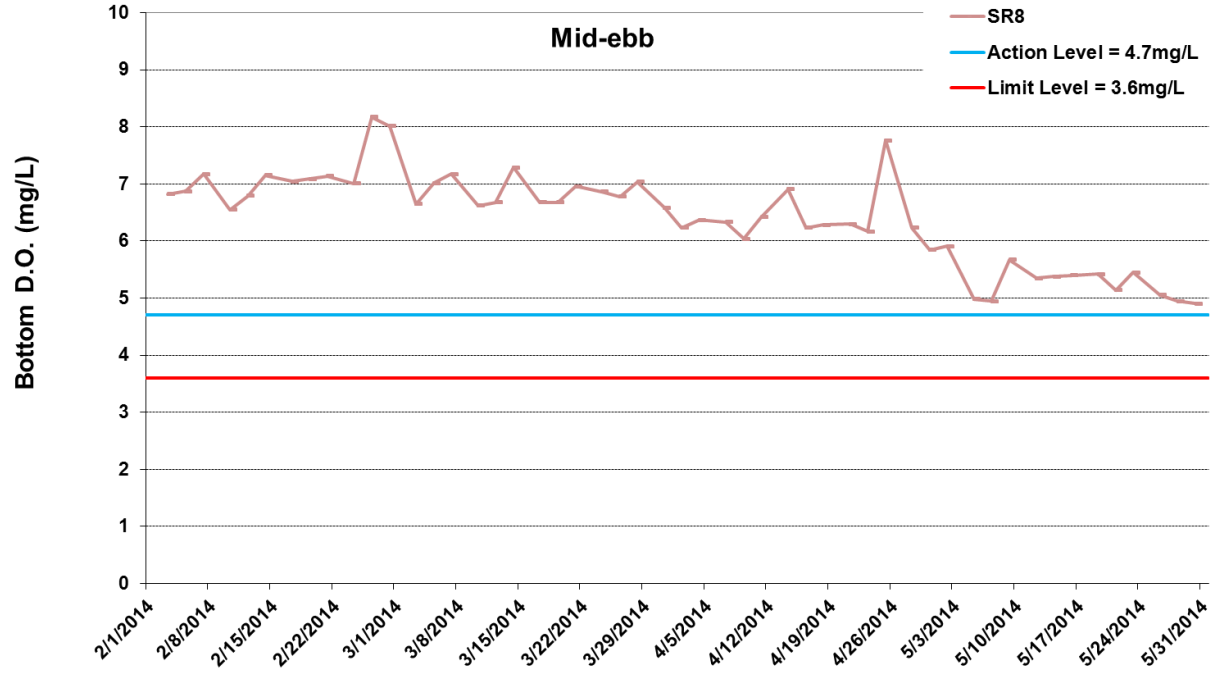

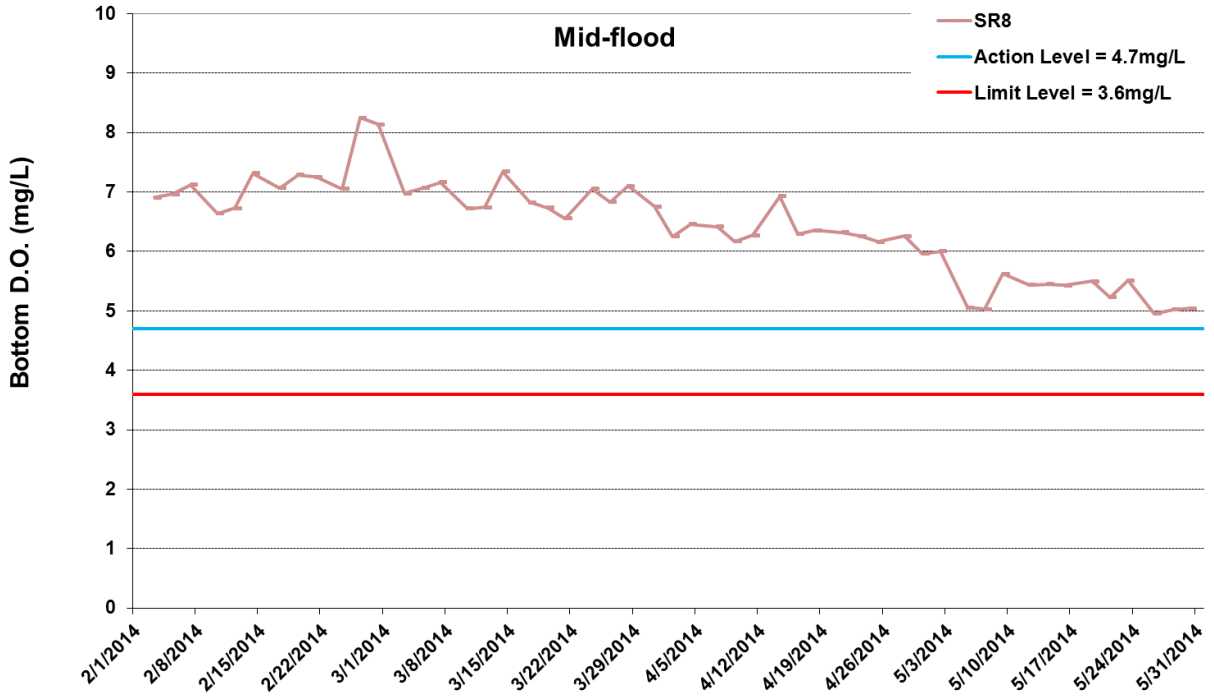

Figure G24 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at SR8. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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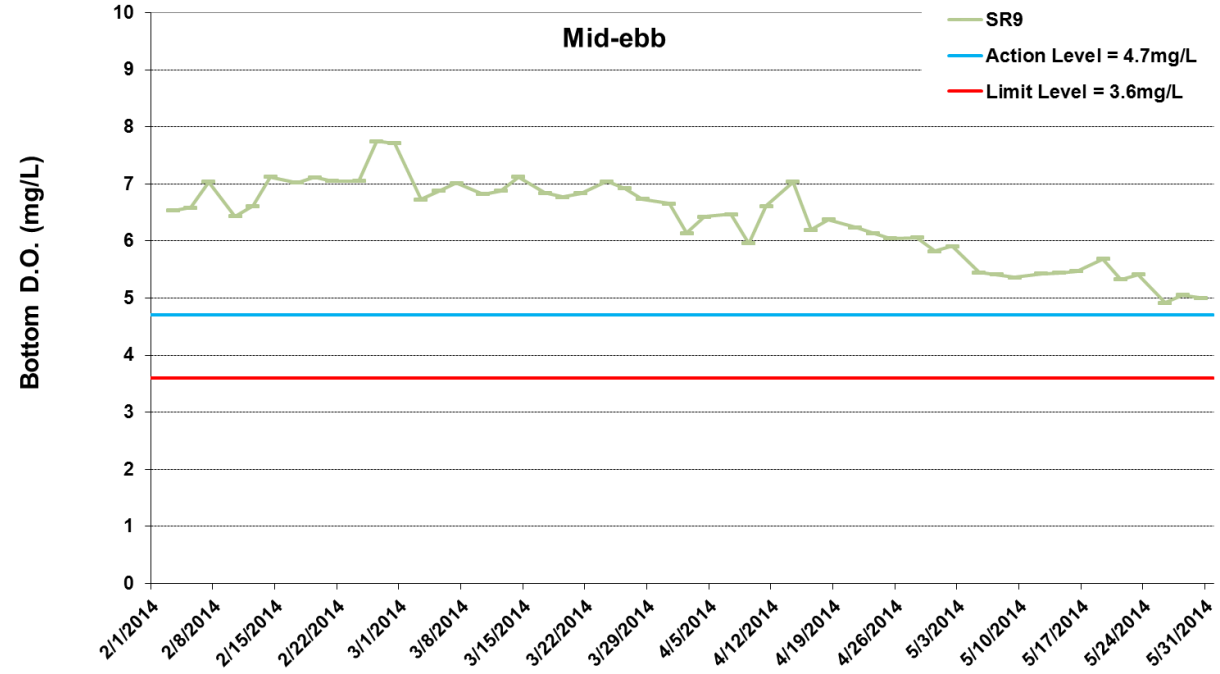

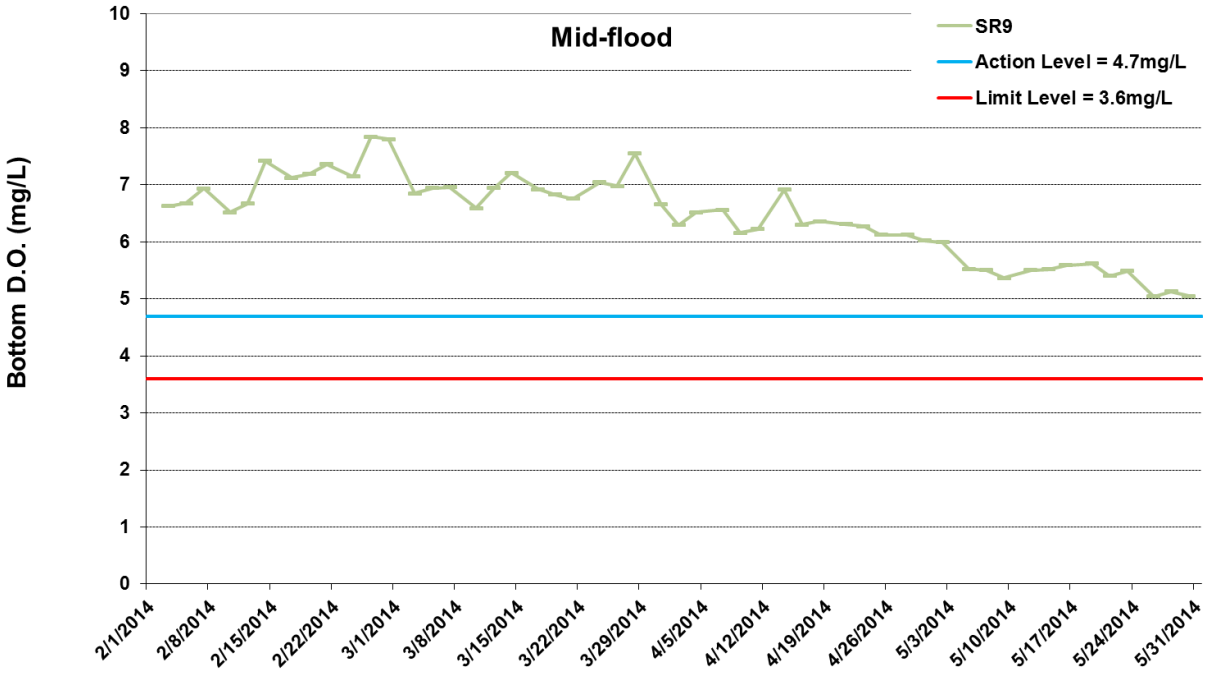

Figure G25 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 February 2014 and 31 May 2014 at SR9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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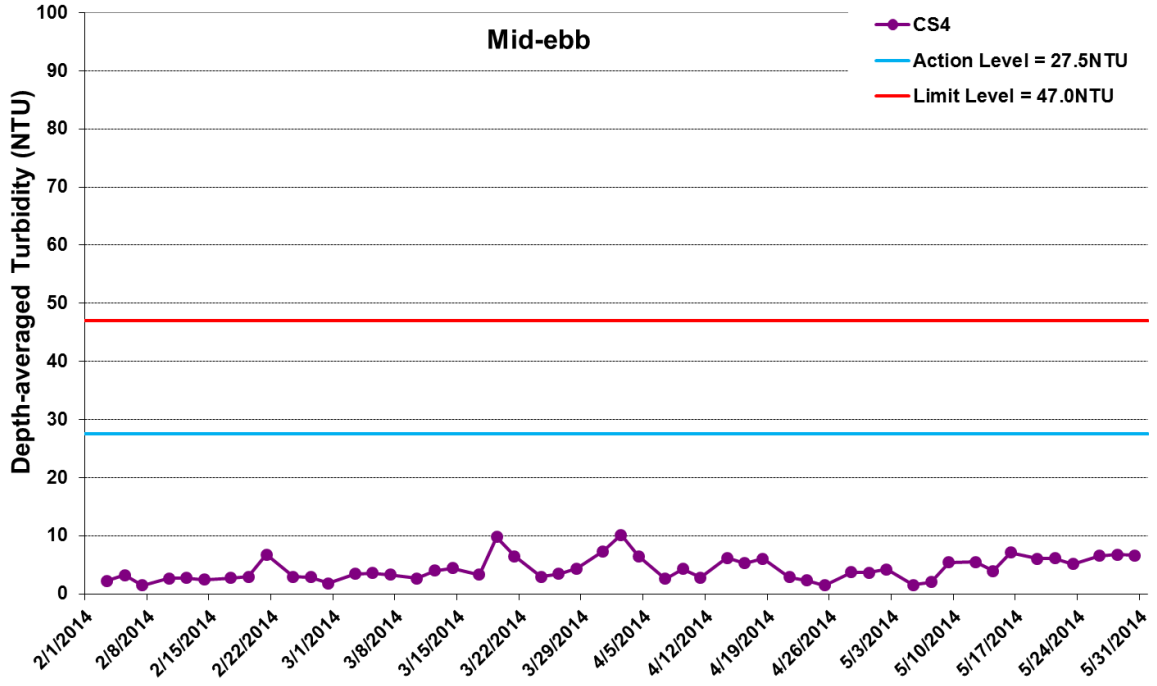

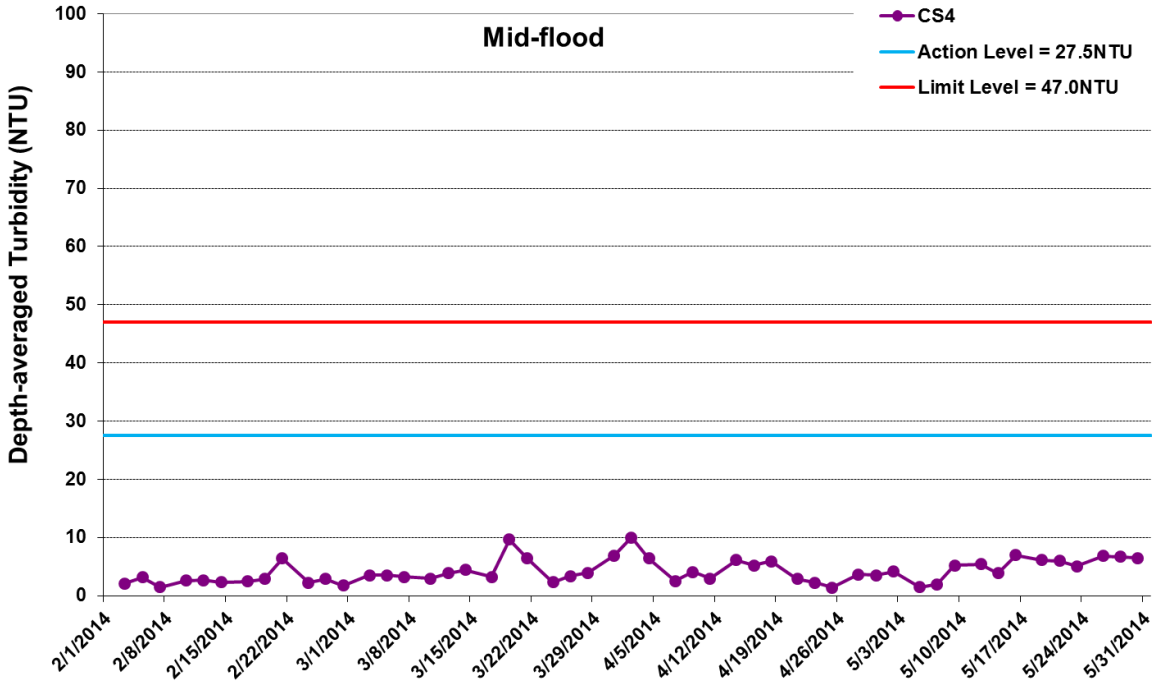

Figure G26 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at CS4. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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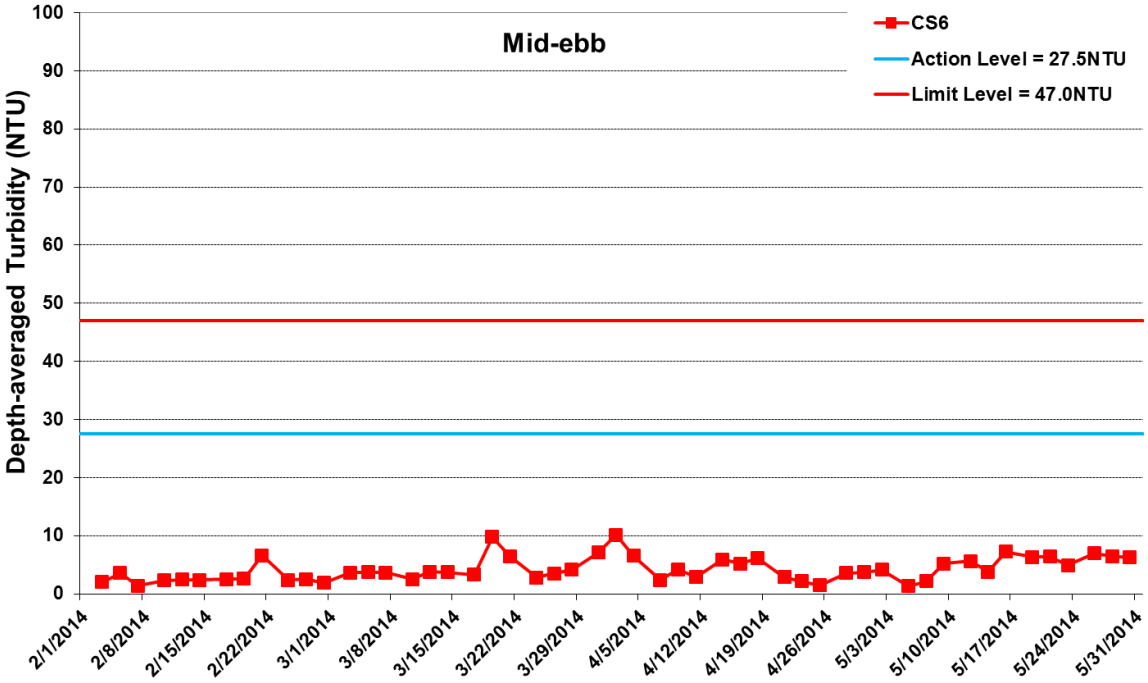

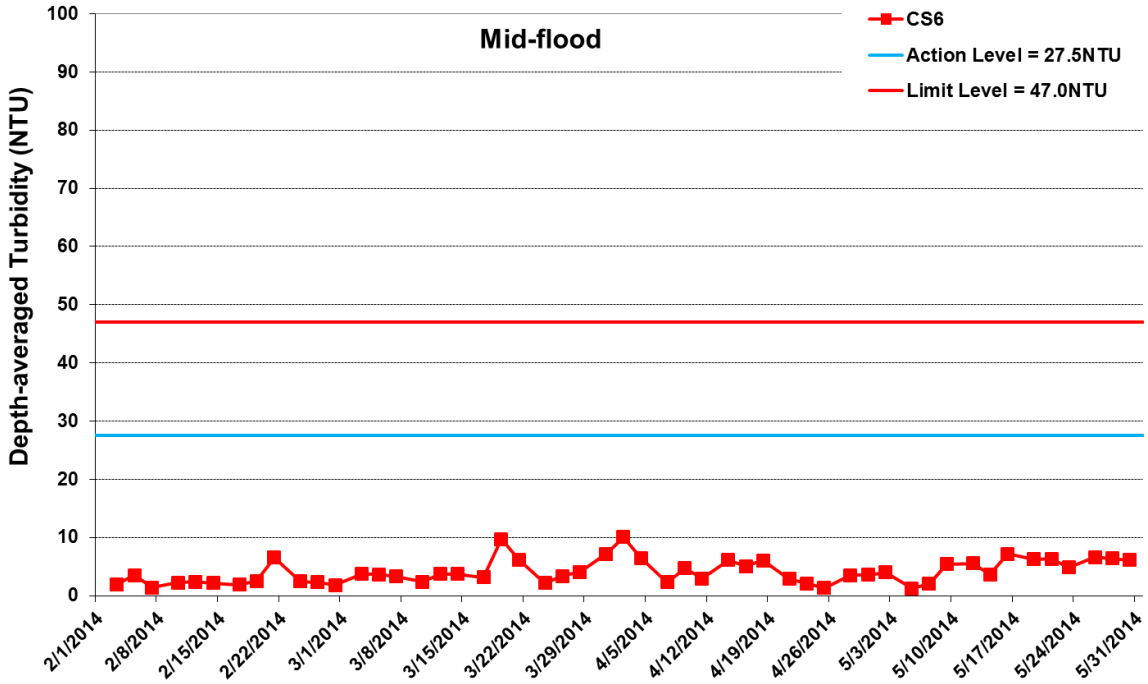

Figure G27 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at CS6. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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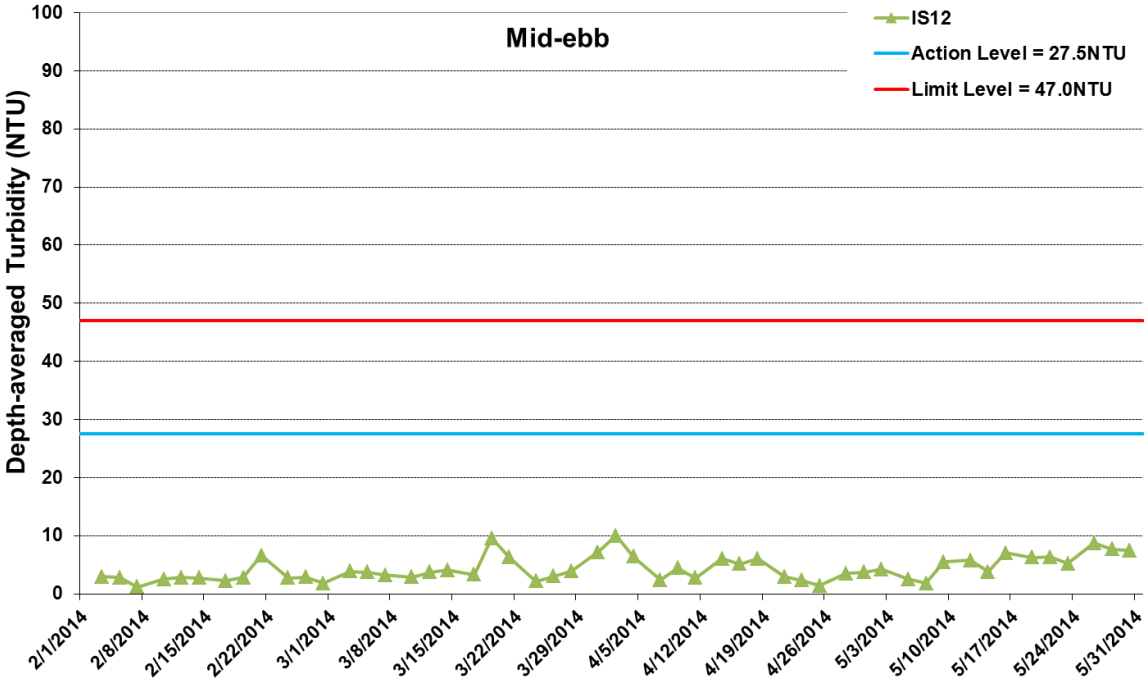

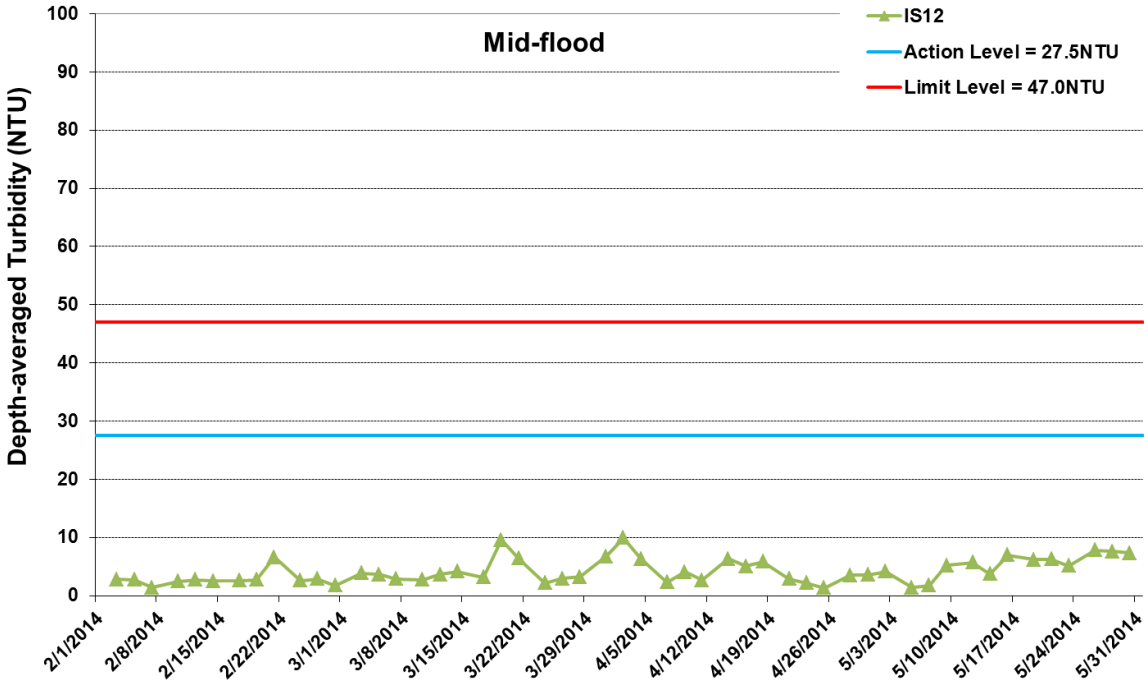

Figure G28 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at IS12. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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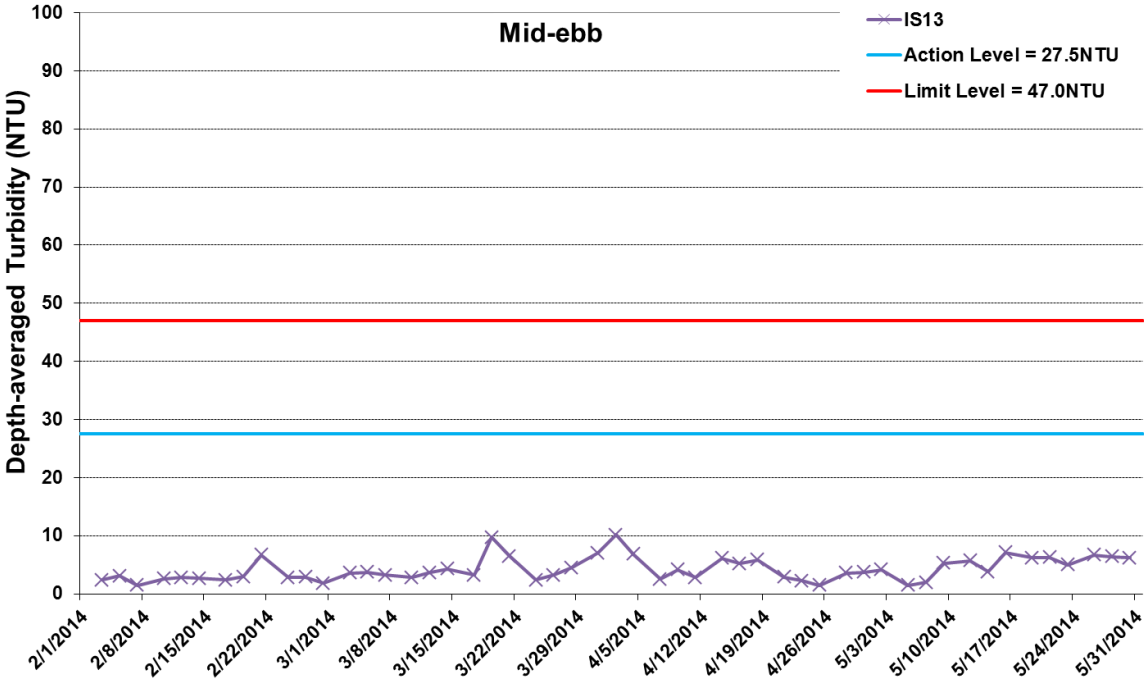


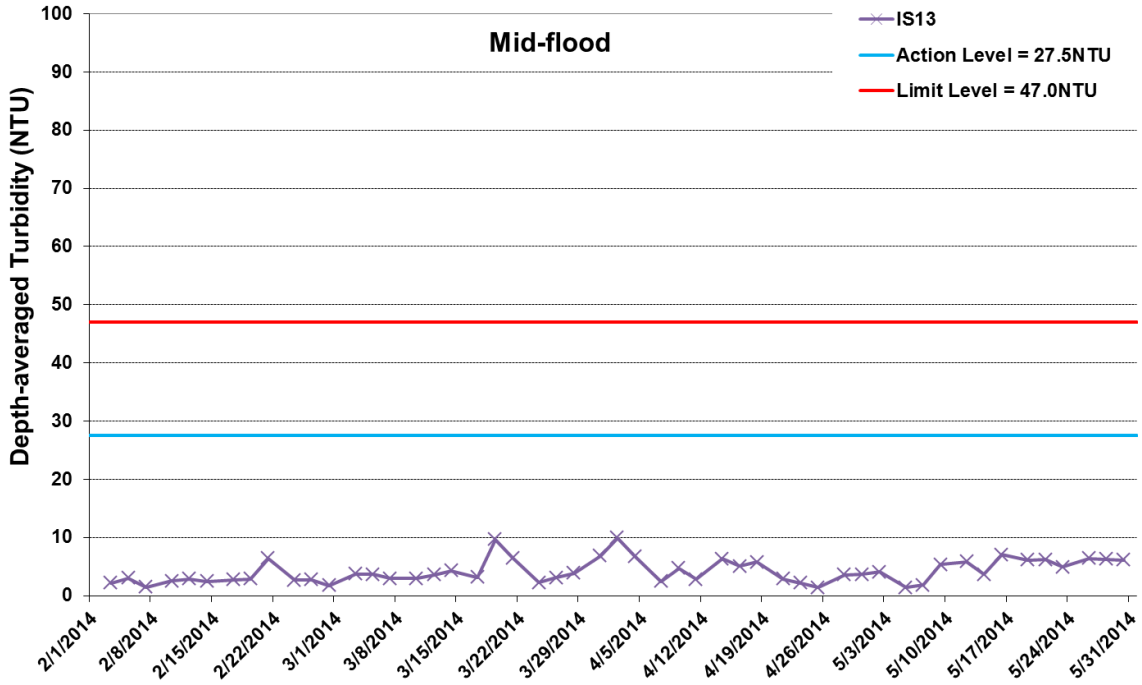
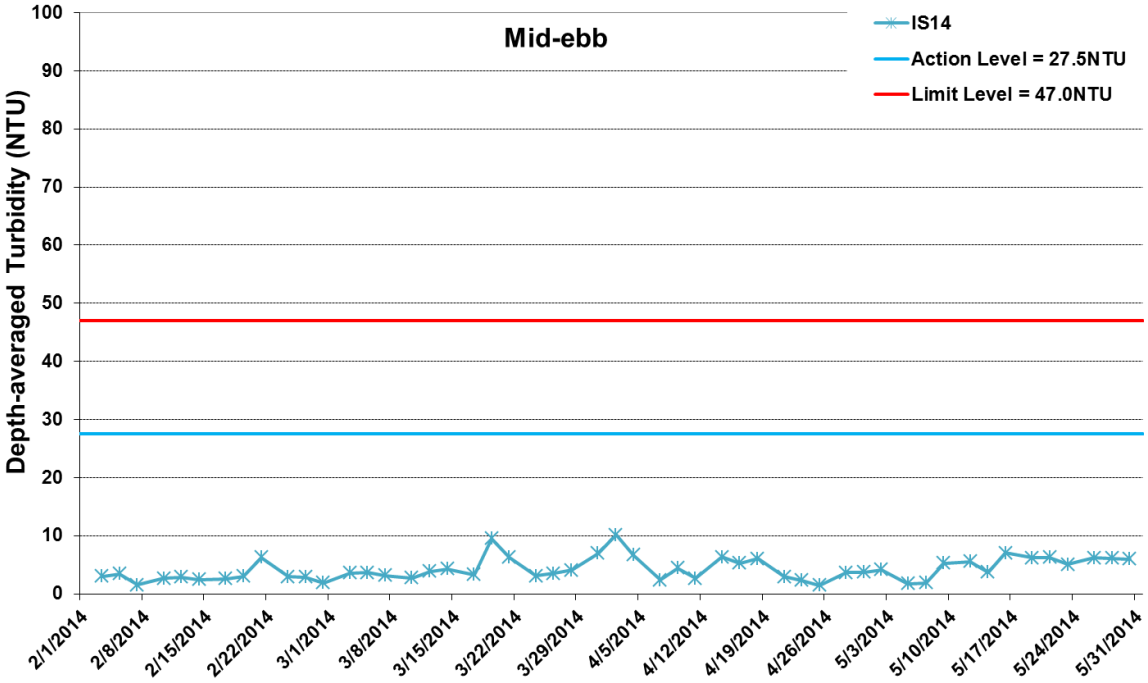


Figure G29 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at IS13. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



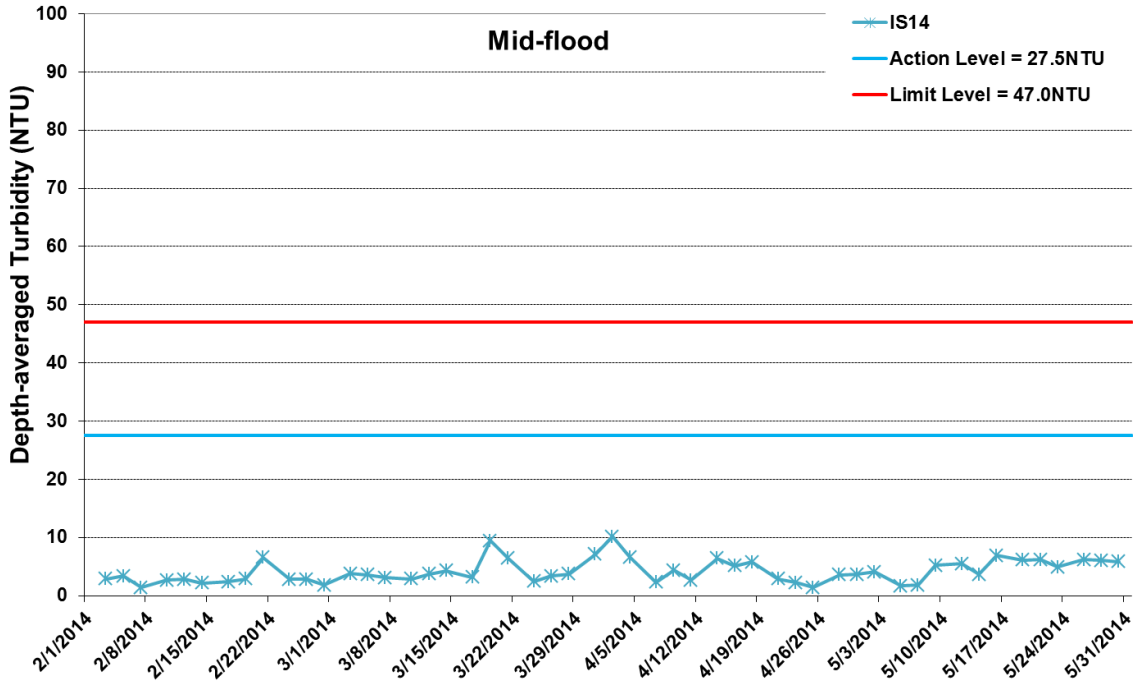
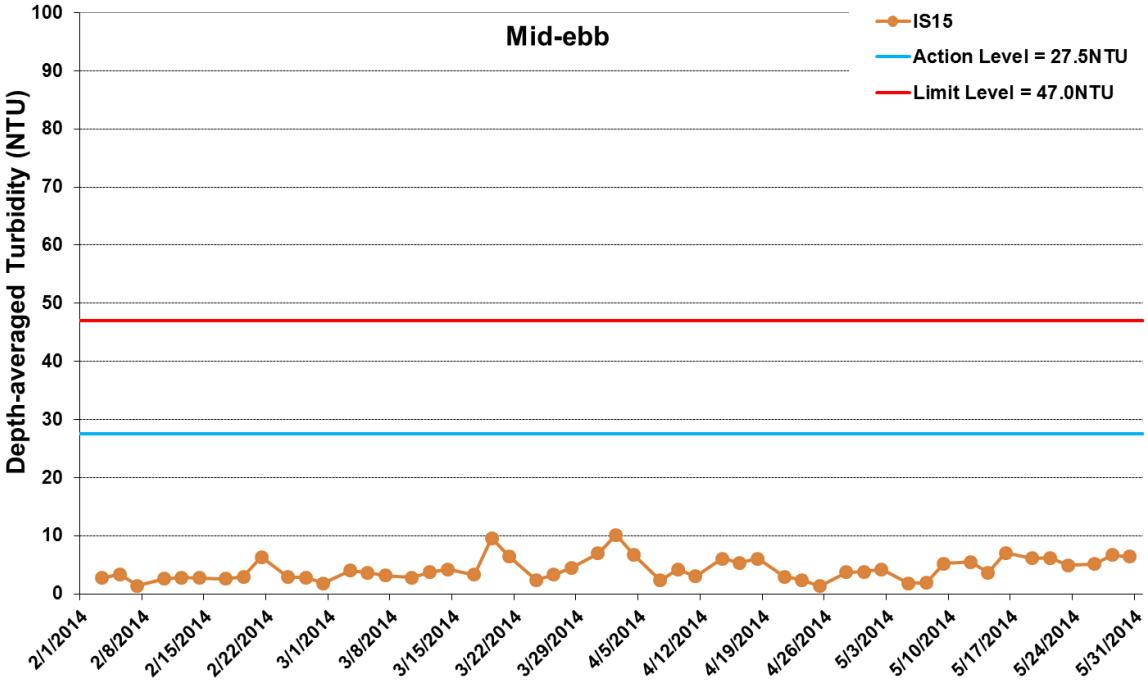


Figure G30 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at IS14. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls



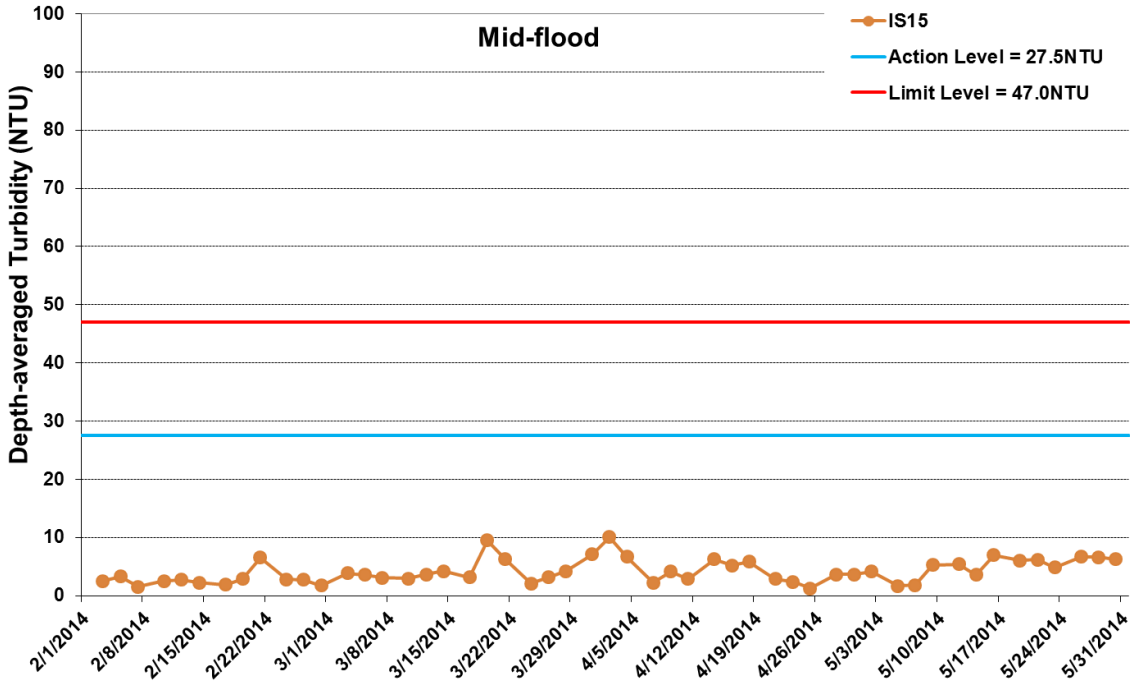


Figure G31 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at IS15. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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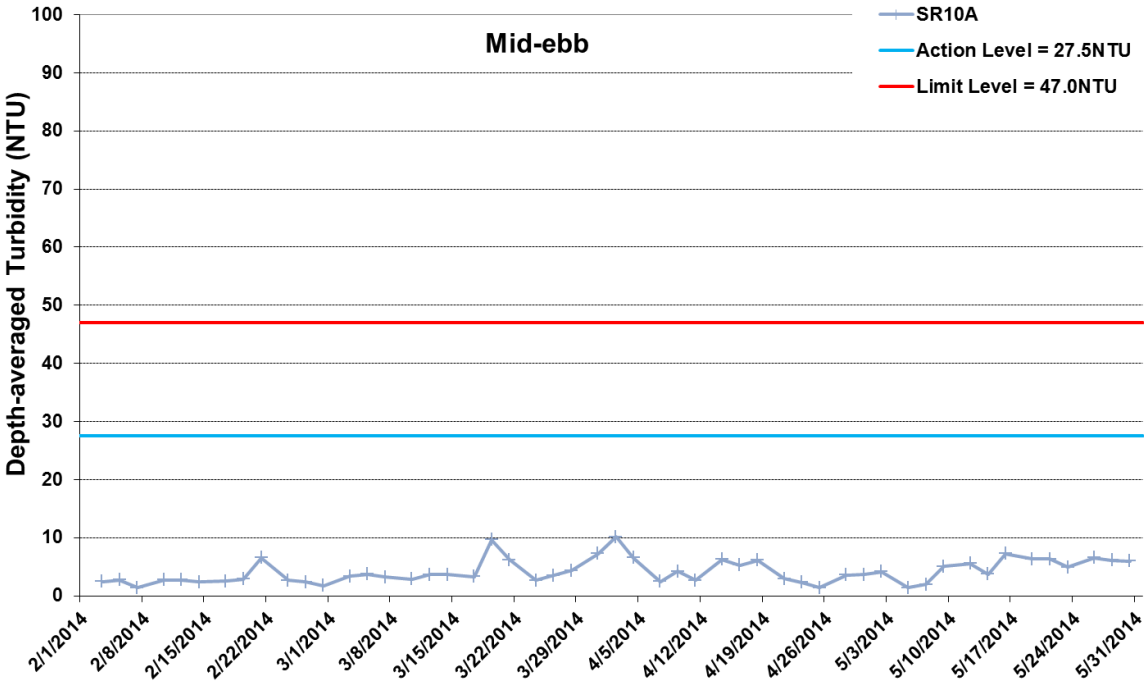

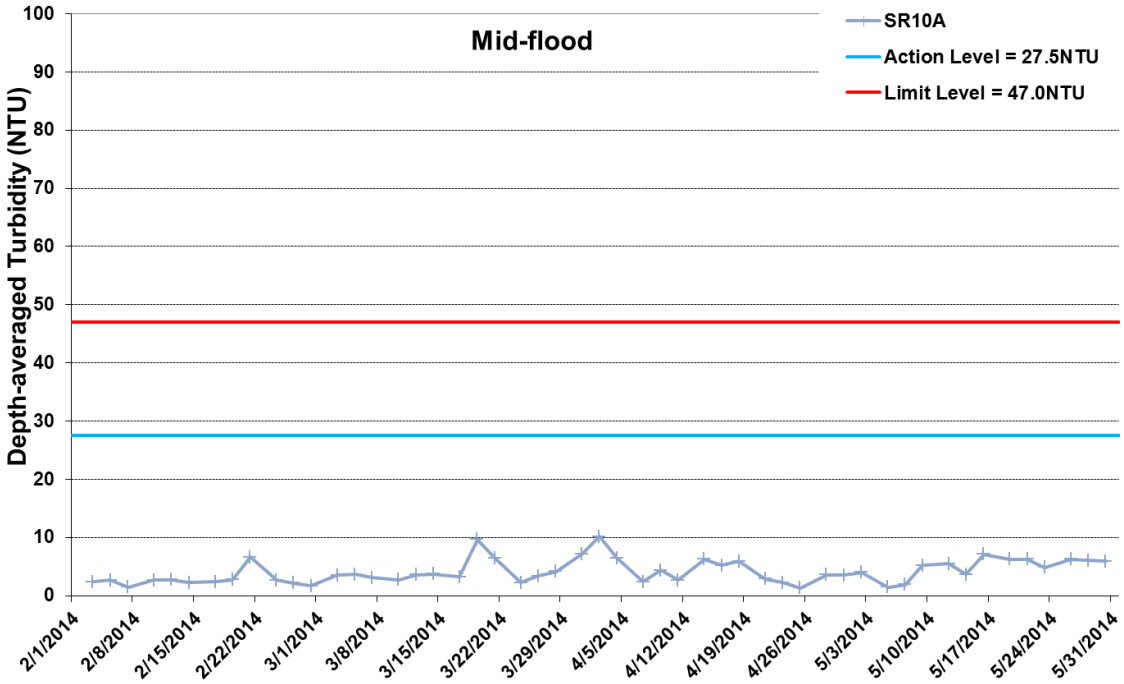

Figure G32 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at SR10A. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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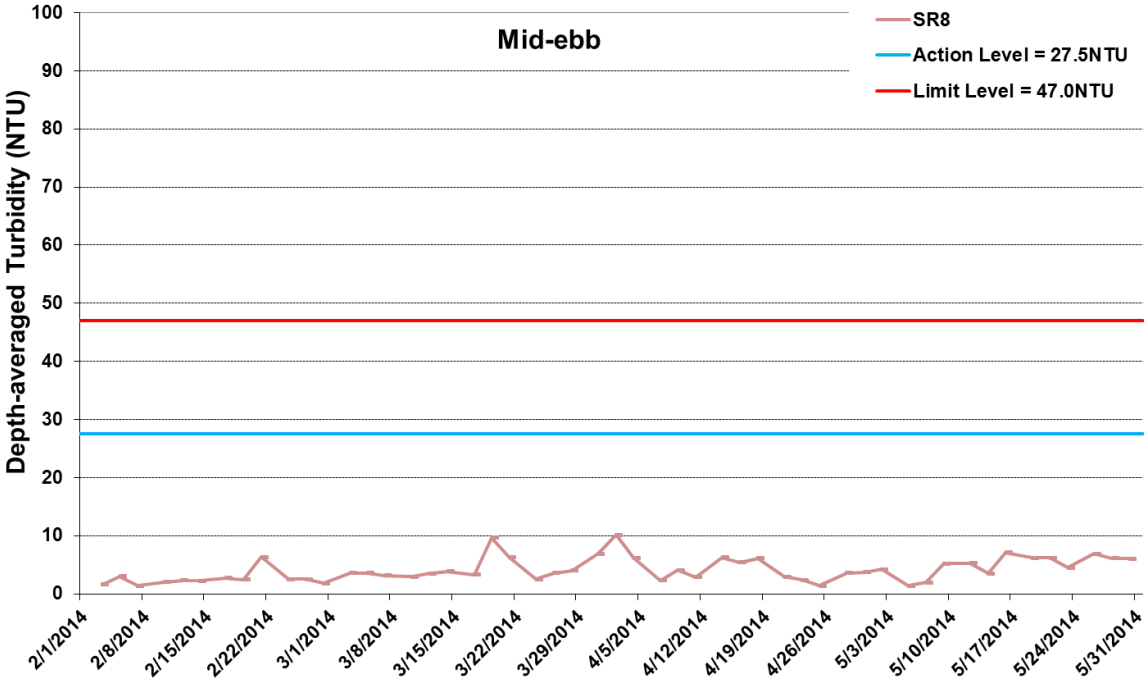

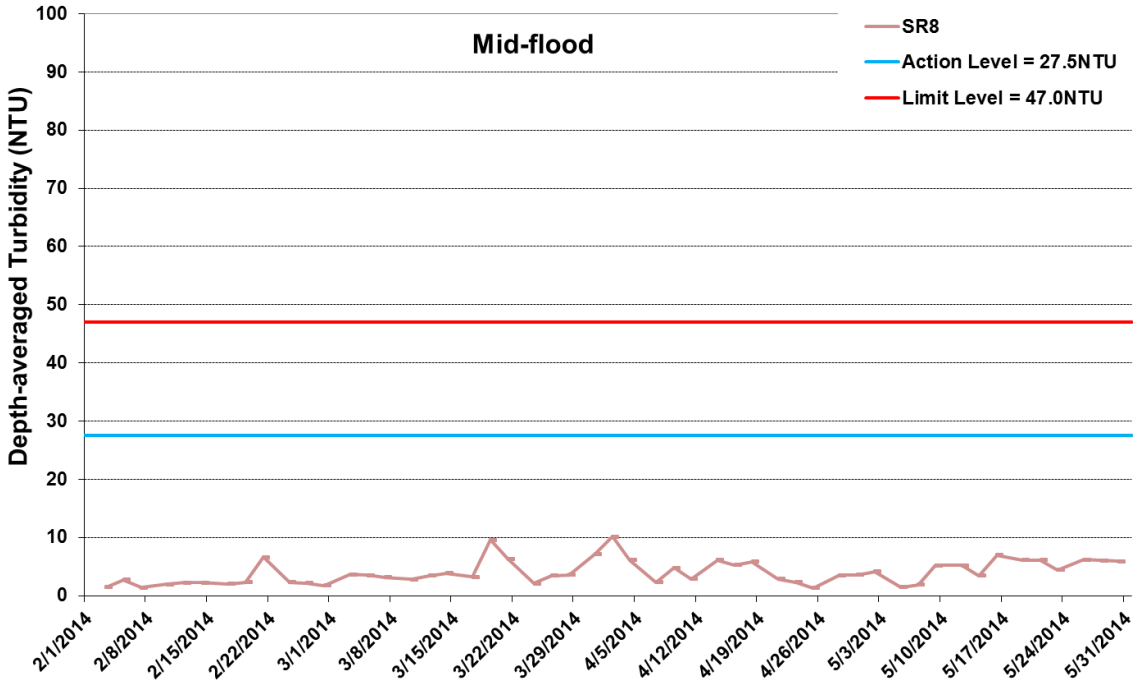

Figure G33 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at SR8. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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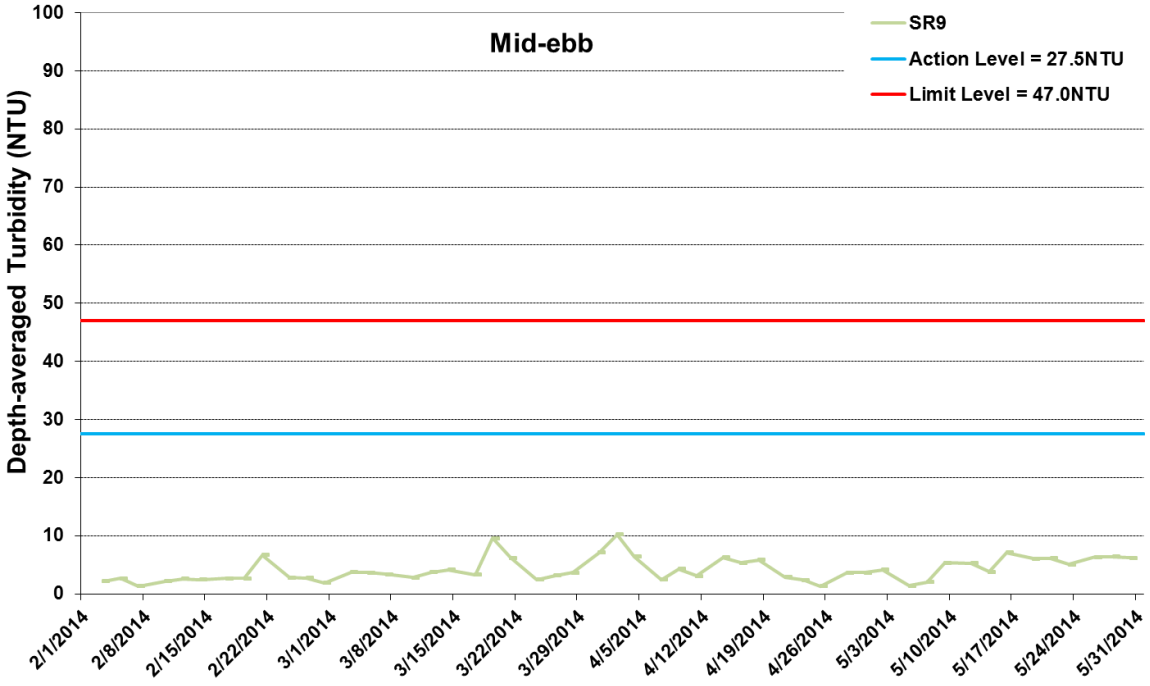

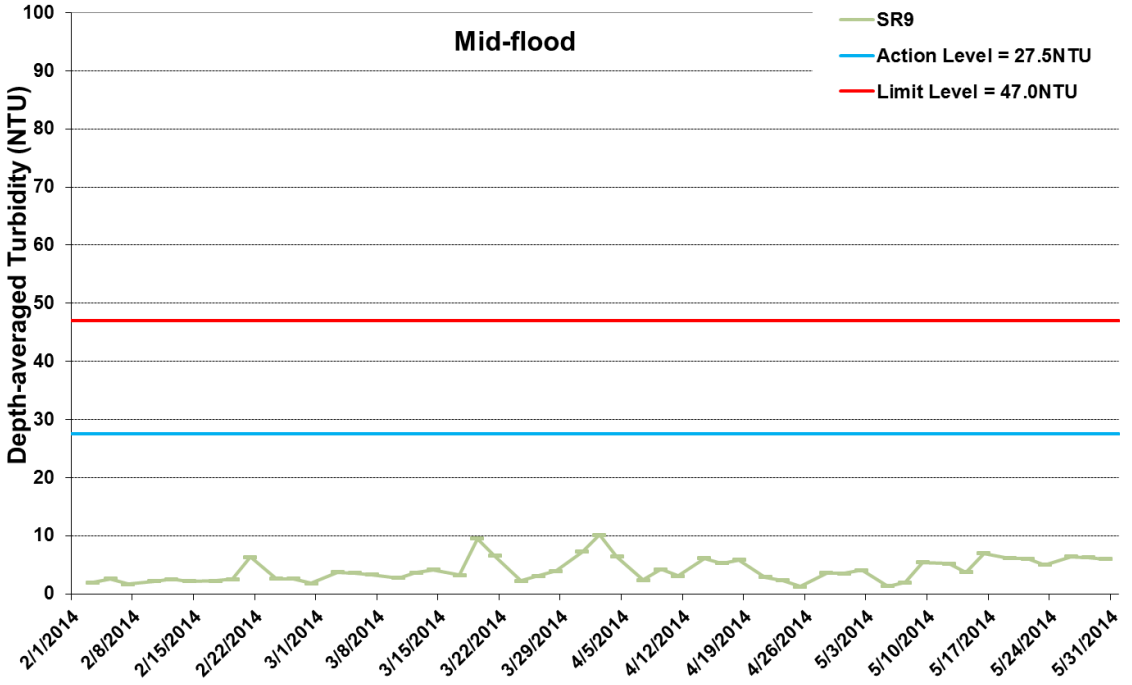

Figure G34 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 February 2014 and 31 May 2014 at SR9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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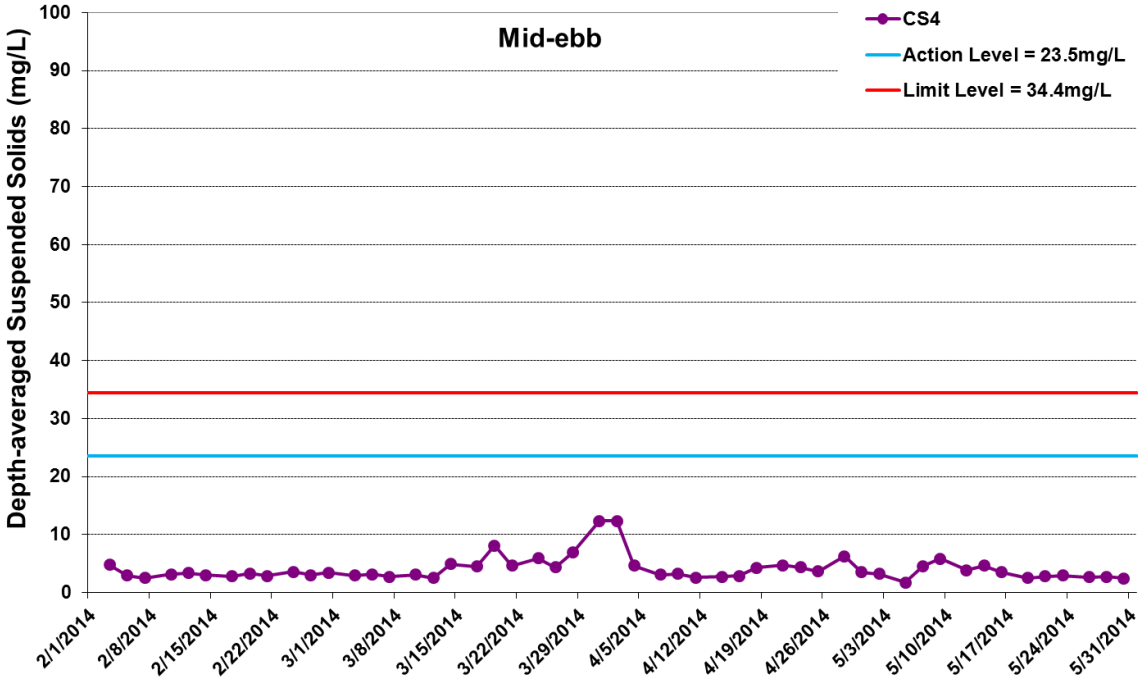

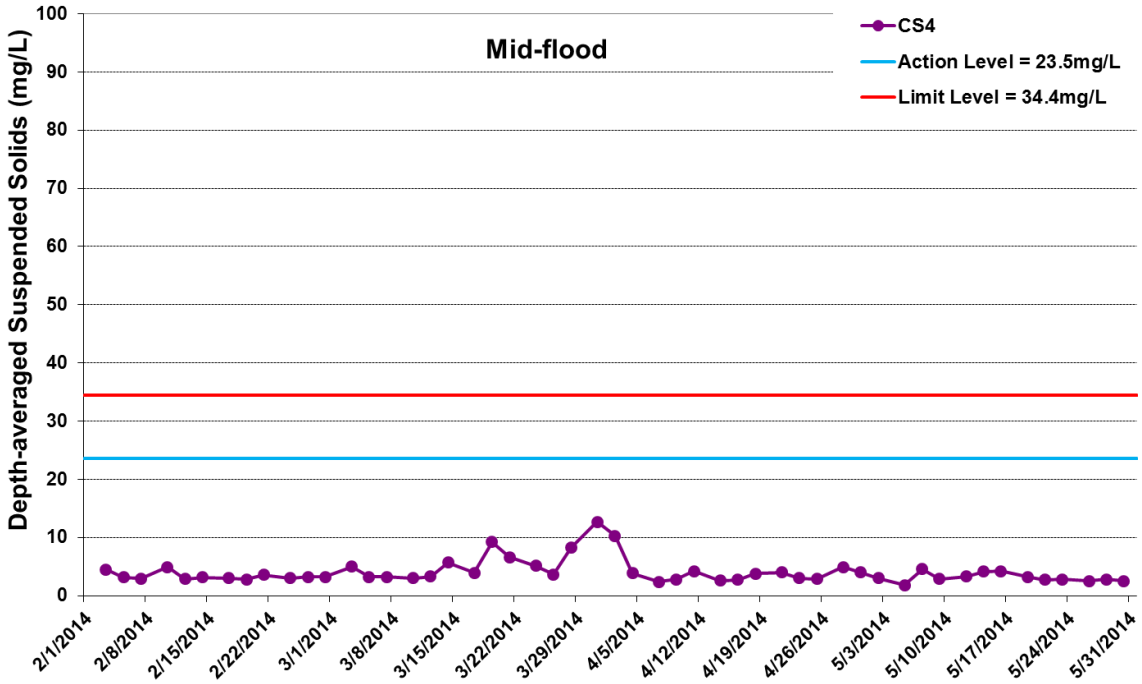

Figure G35 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at CS4. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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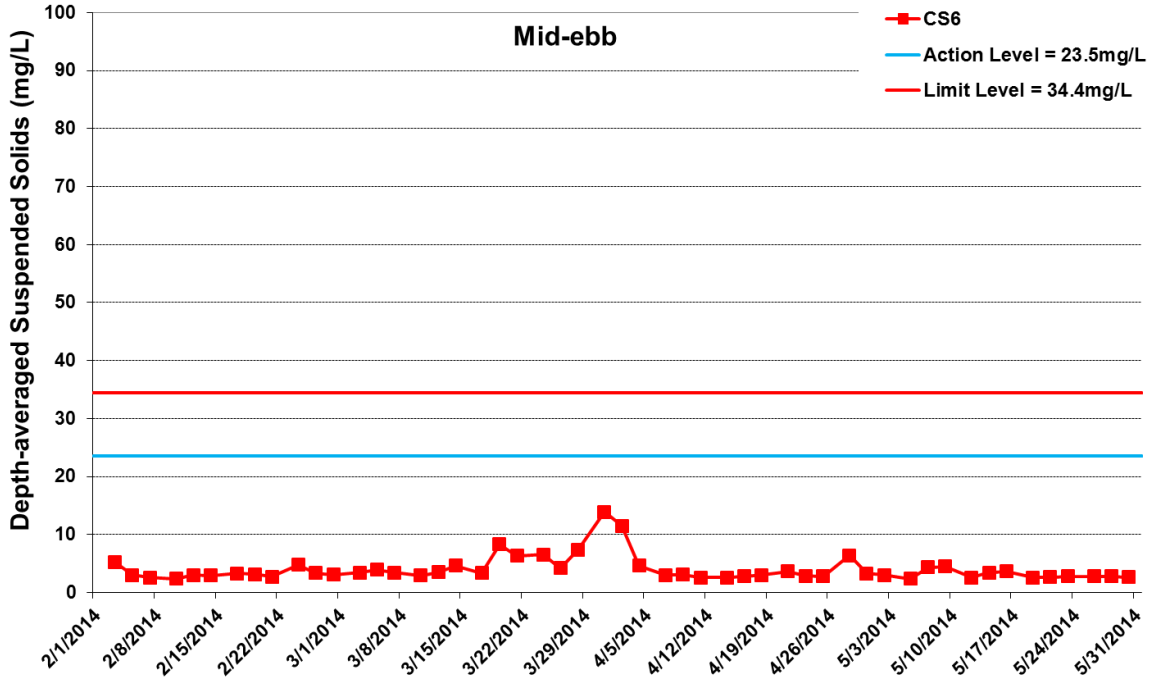

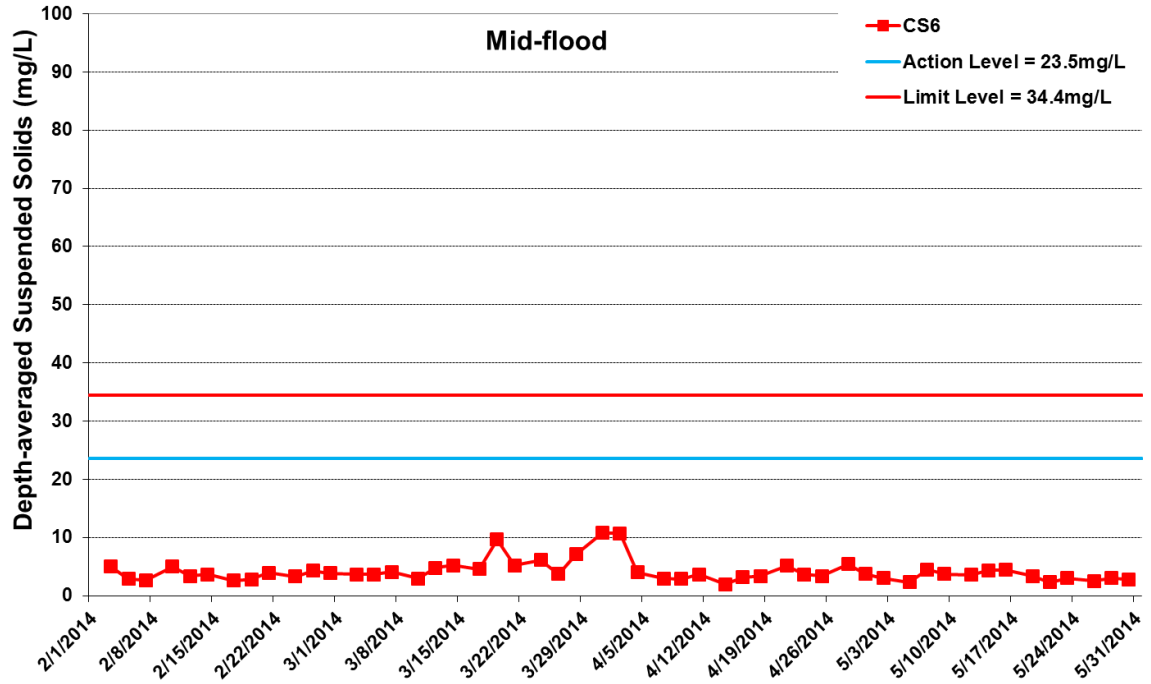

Figure G36 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at CS6. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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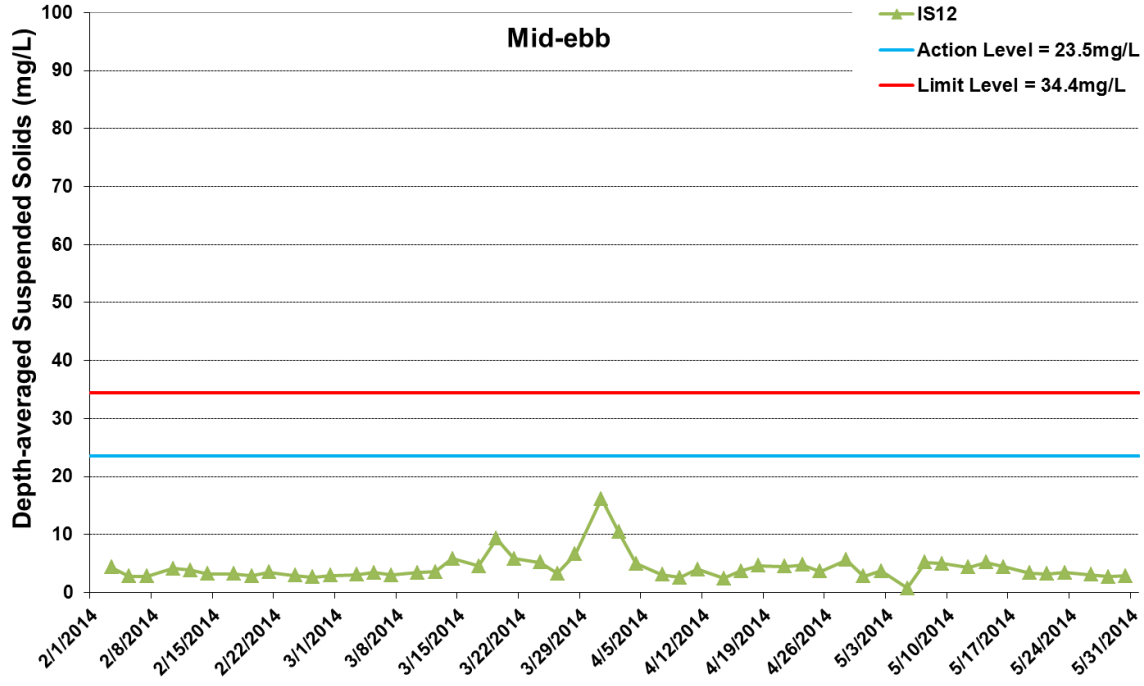

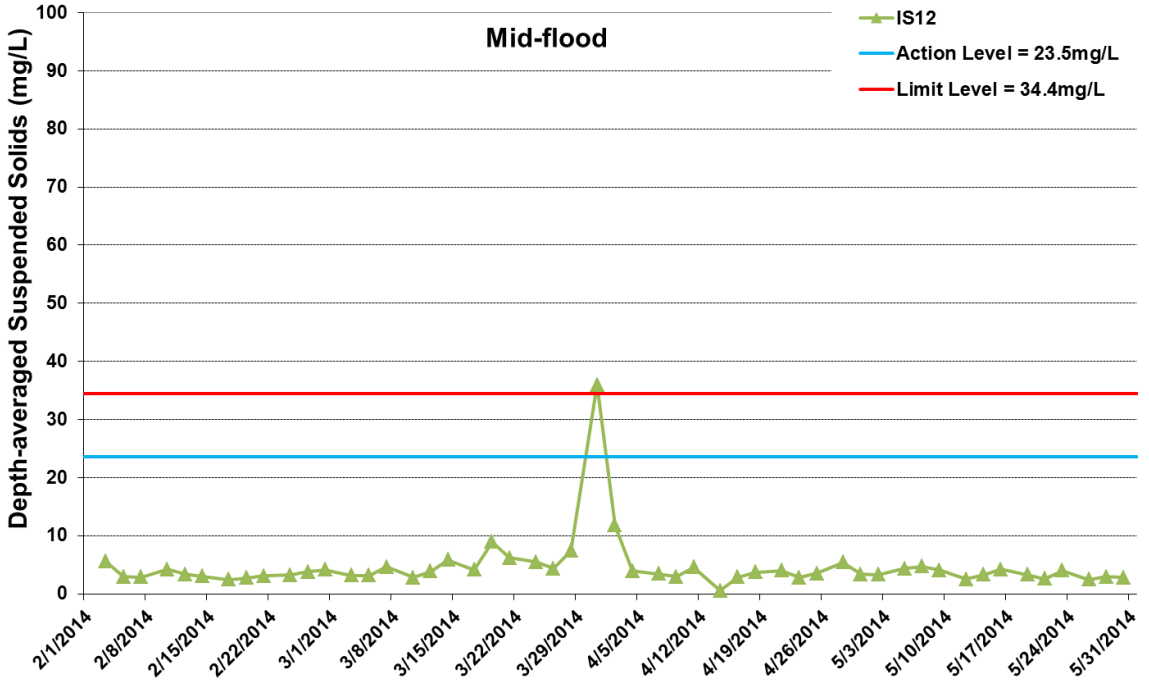

Figure G37 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at IS12. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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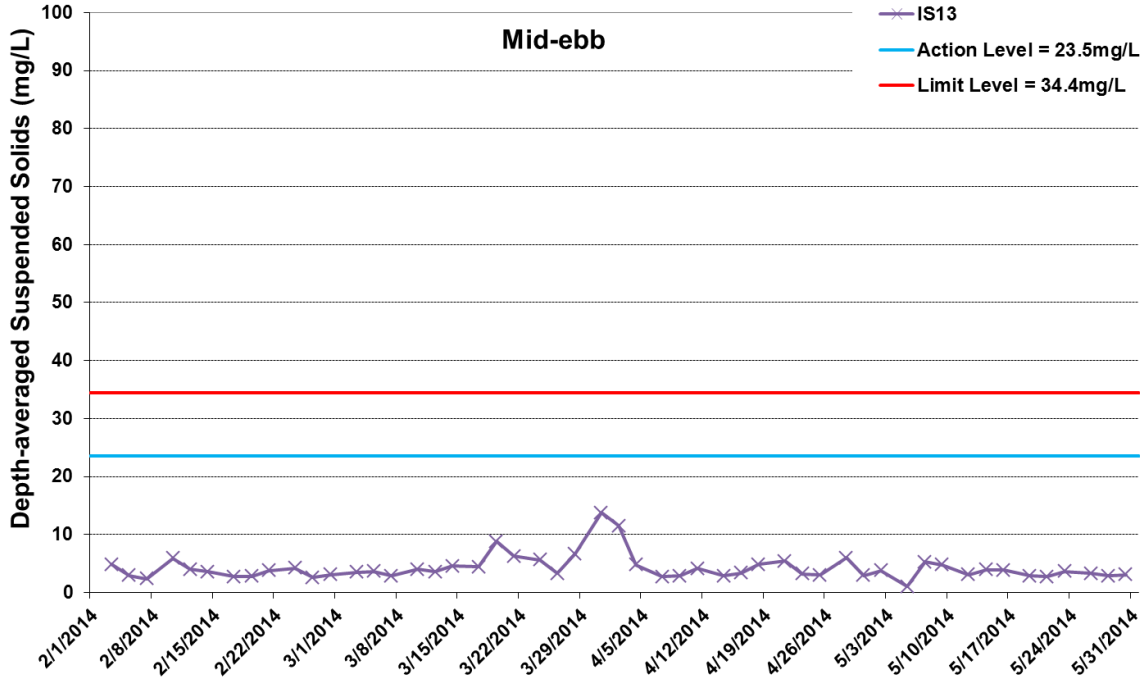

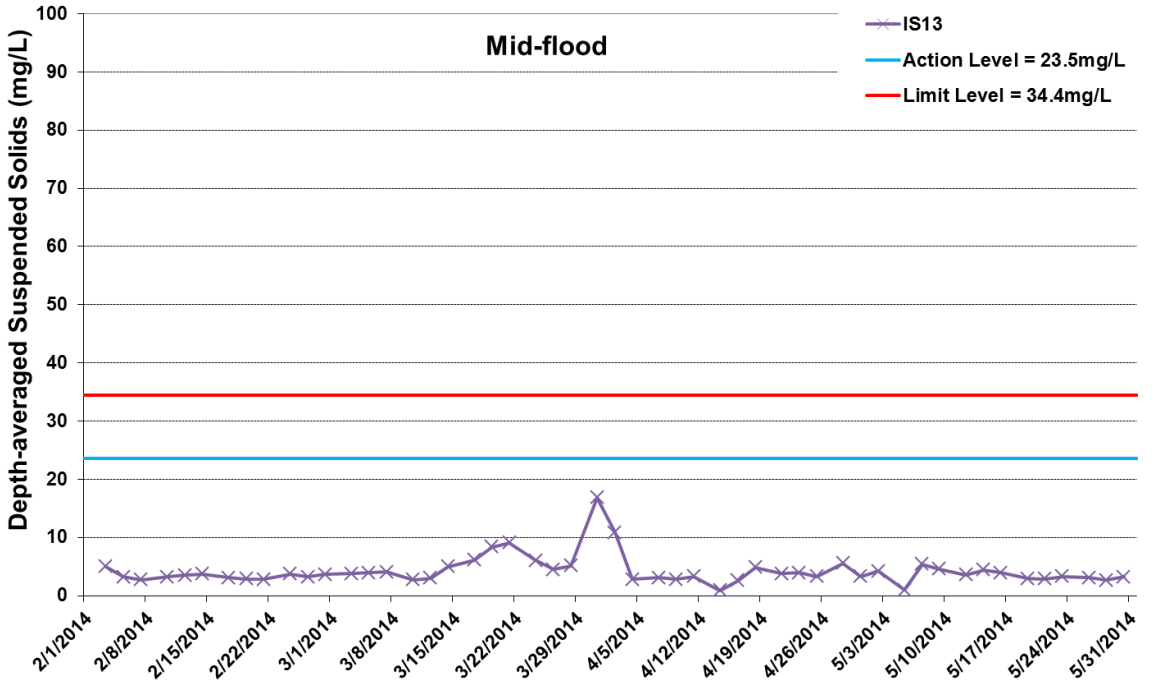

Figure G38 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at IS13. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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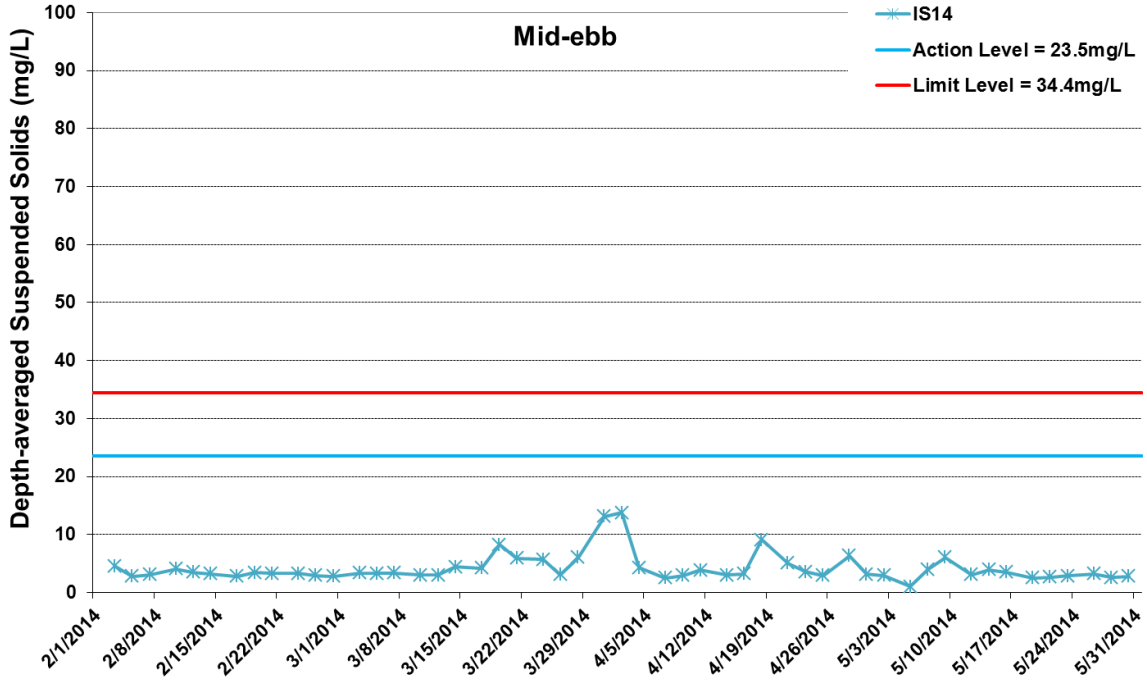

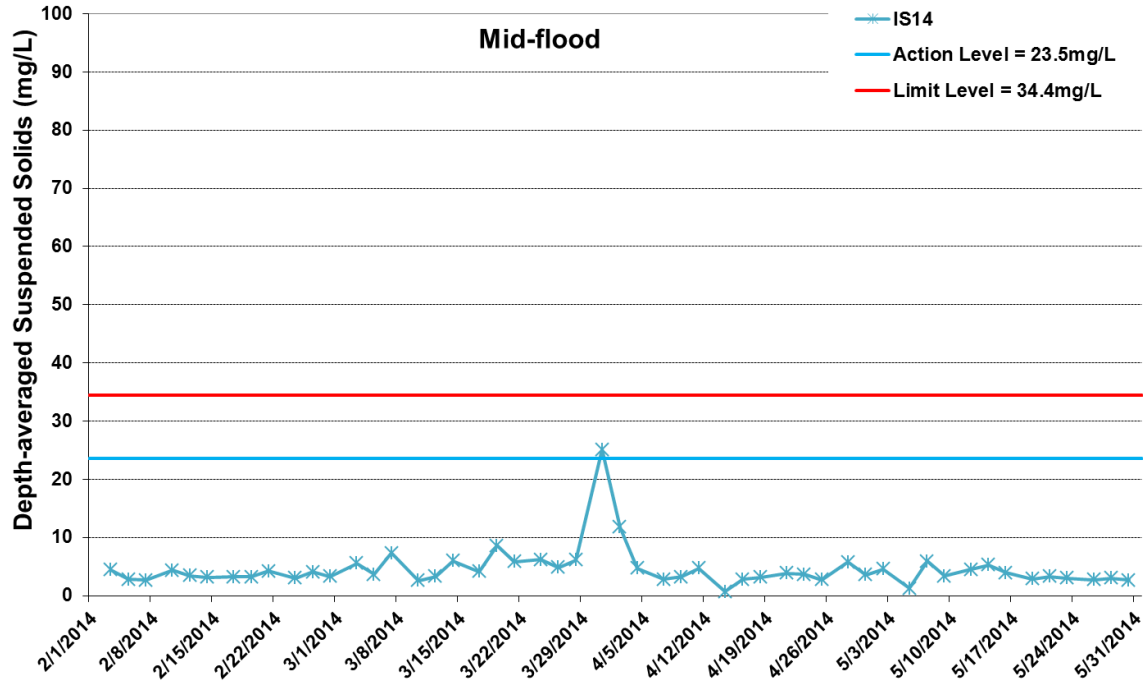

Figure G39 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at IS14. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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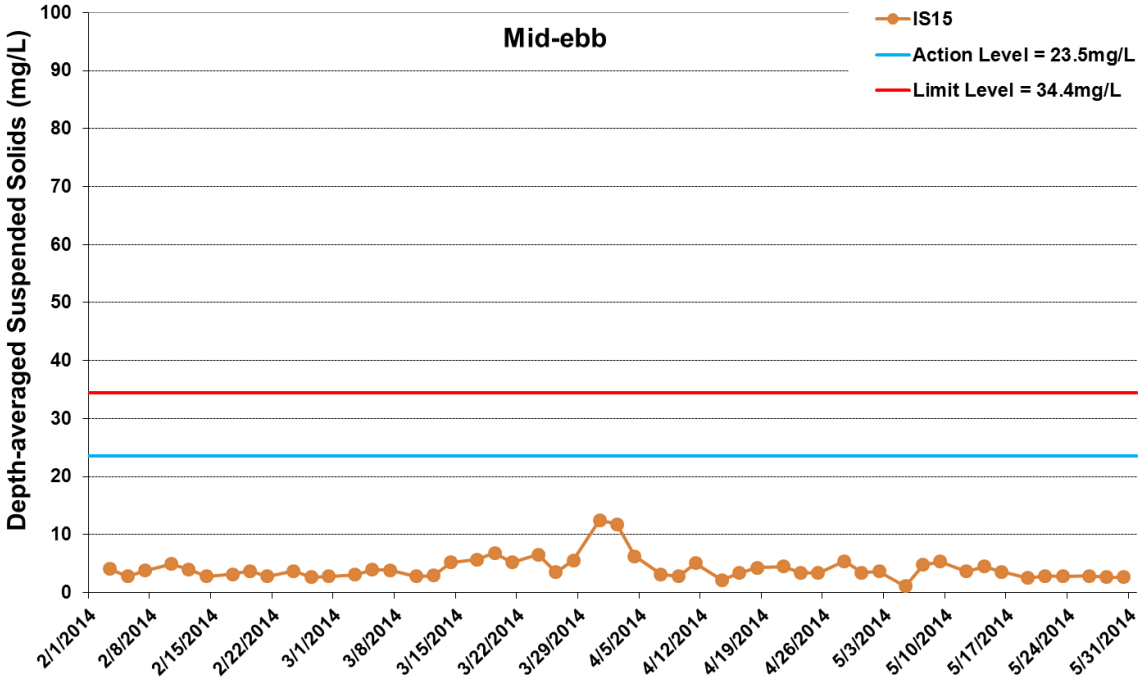

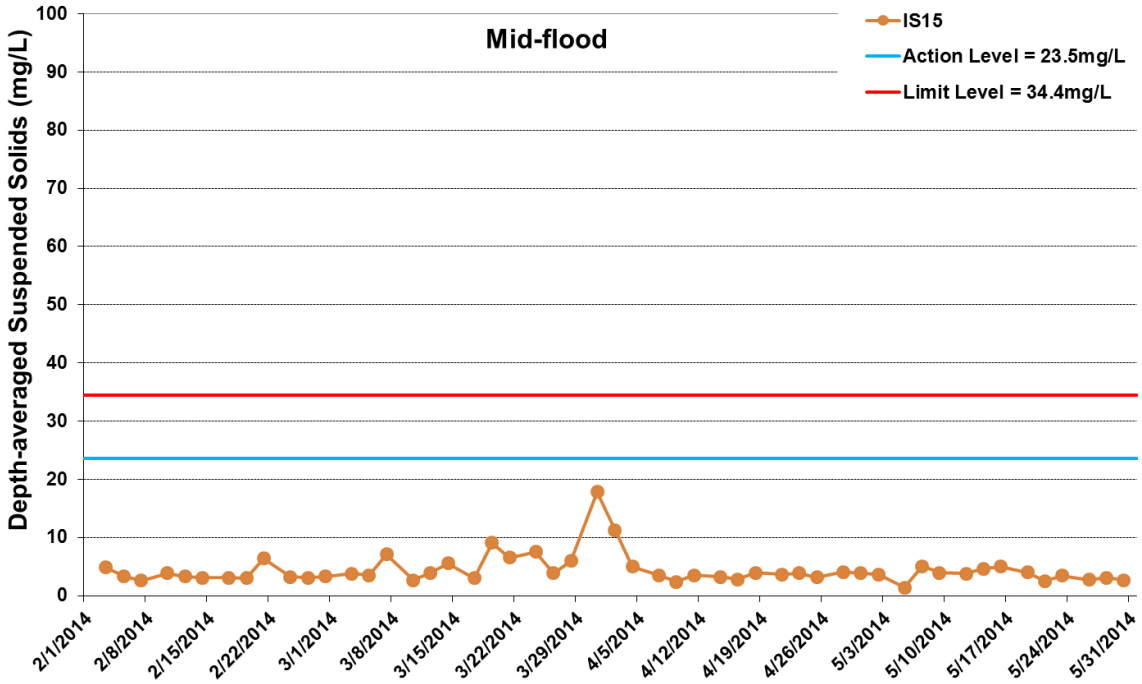

Figure G40 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at IS15. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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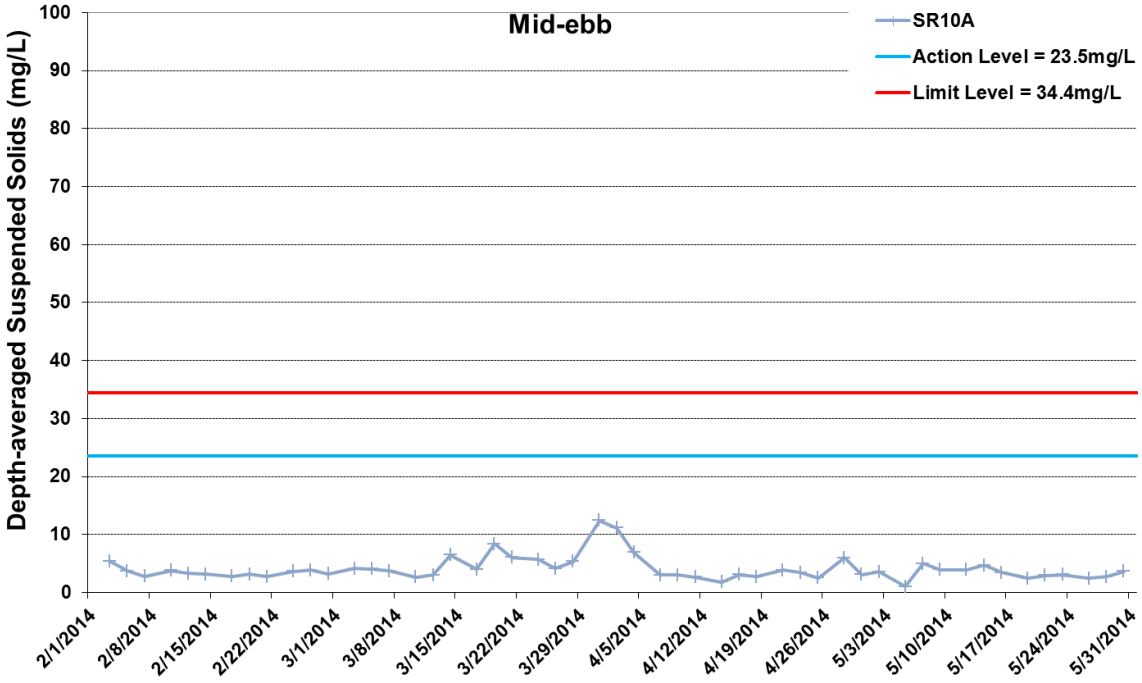

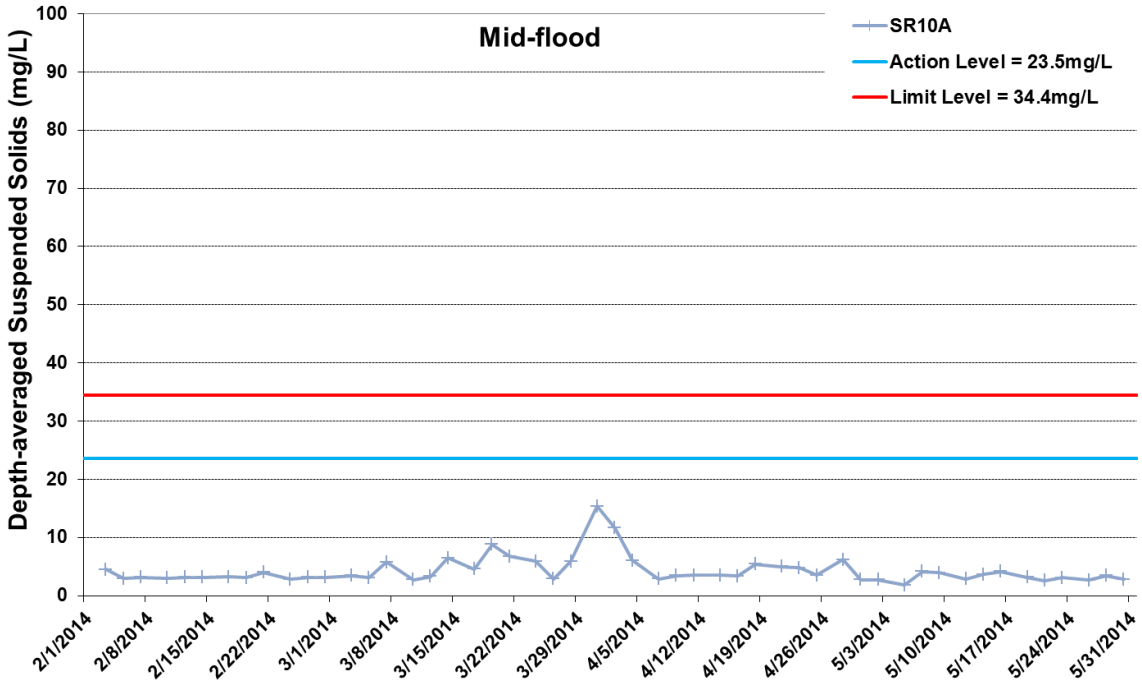

Figure G41 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at SR10A. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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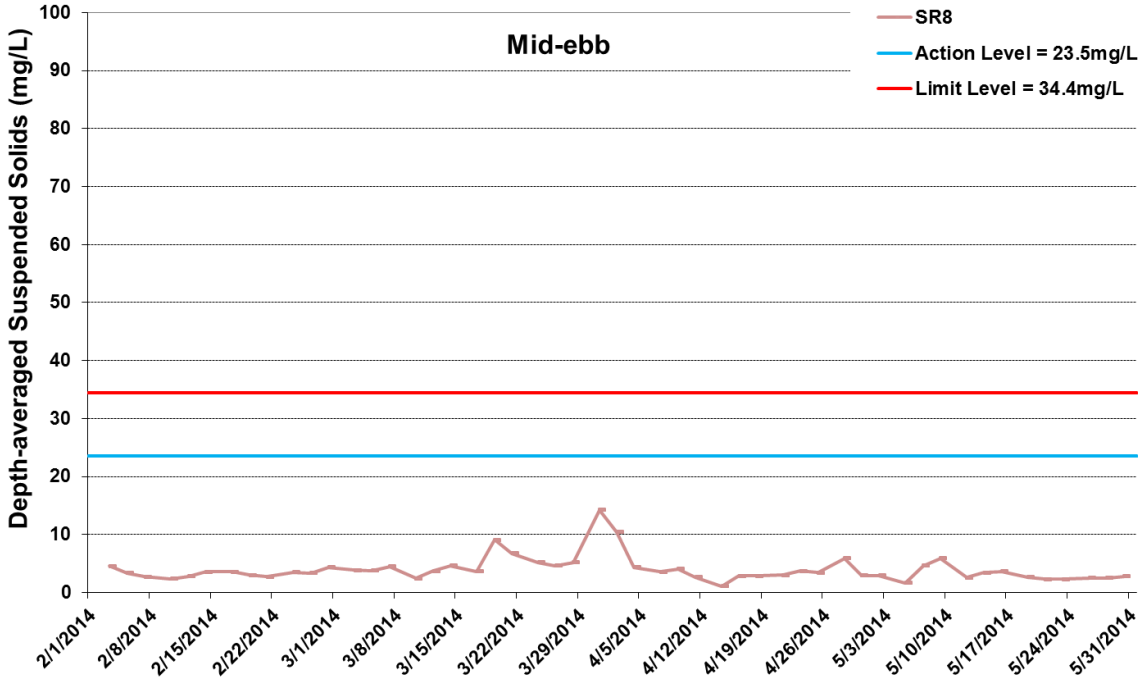

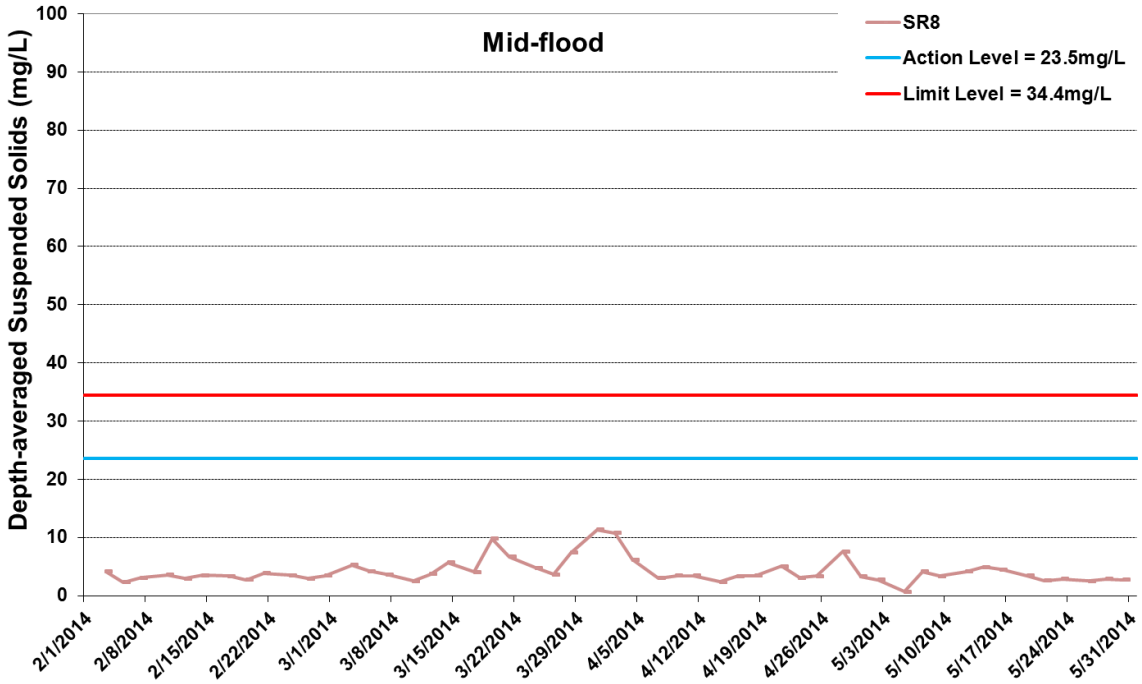

Figure G42 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at SR8. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

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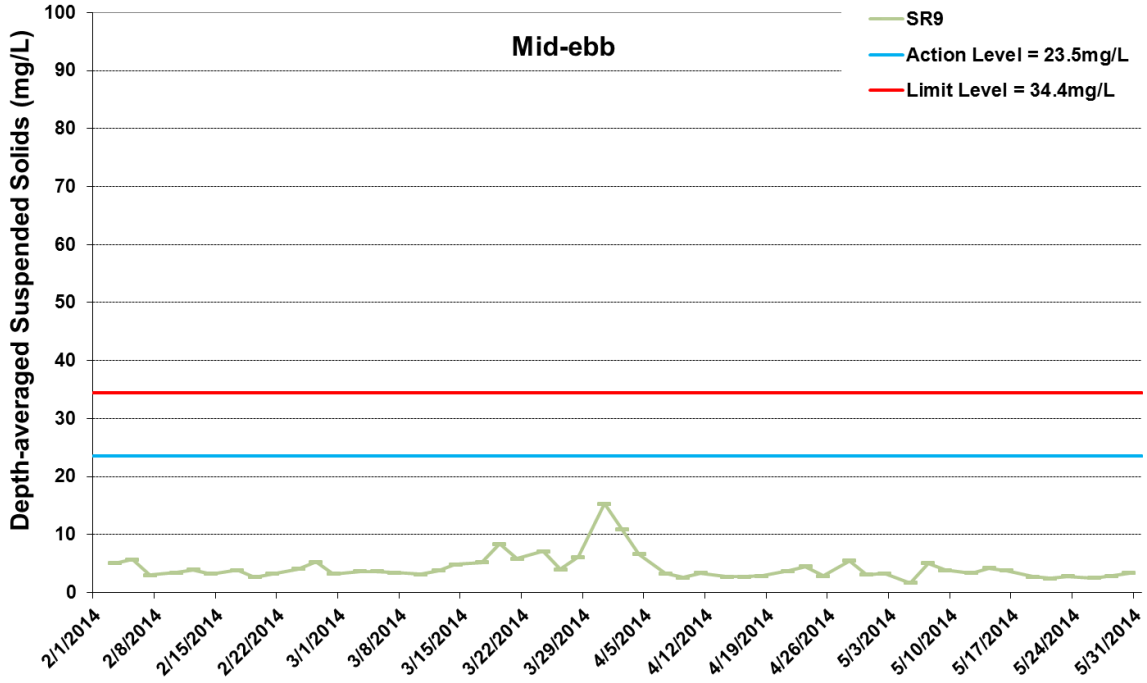

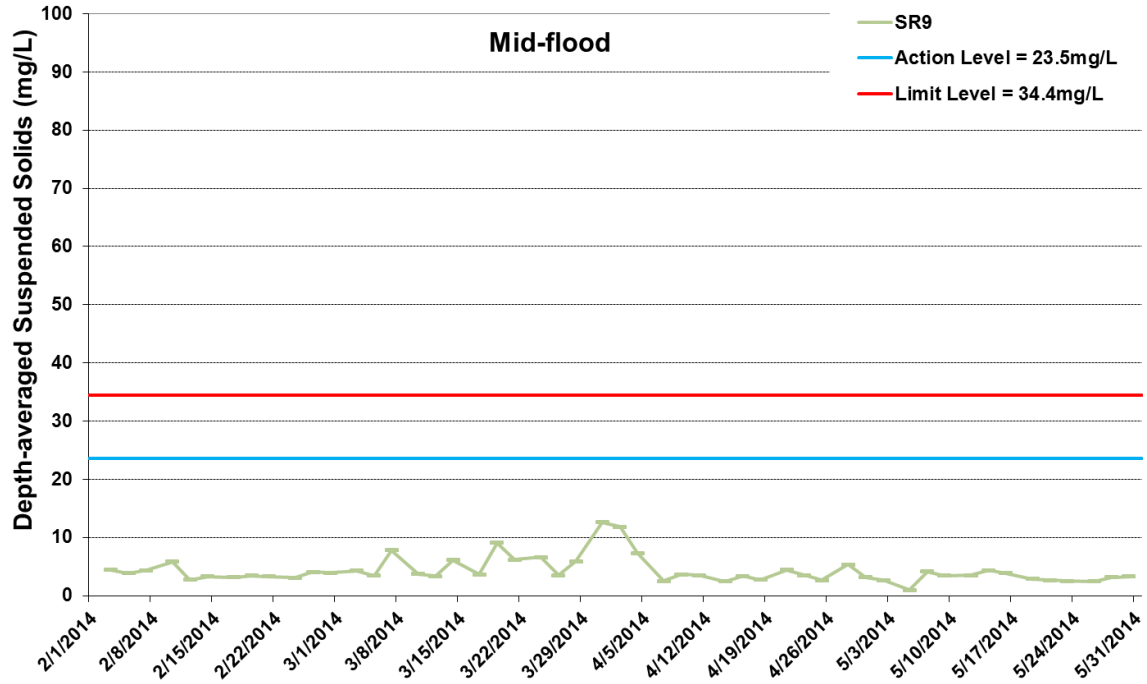

Figure G43 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 February 2014 and 31 May 2014 at SR9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine construction activities included: Dredging (2/1/2014 – 5/31/2014); Construction of Temporary Seawalls (2/1/2013 – 5/31/2014); Sheet Piling (2/1/2014 – 5/31/2014); Filling (3/23/2014 – 5/31/2014).

Ref: 0212330_Impact-WQM_Mar_May2014_graphs_Rev a.xls

Appendix H

Impact Dolphin Monitoring Survey

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

2nd Quarterly Progress Report (March-May 2014)
submitted to Dragages – Bouygues Joint Venture & ERM Hong Kong Ltd.

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

8 July 2014

1. Introduction

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

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

1.3. In November 2013, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by ERM Hong Kong Limited as the dolphin specialist for the TM-CLKL Northern Connection Sub-sea Tunnel Section EM&A project. He is responsible for the dolphin monitoring study, including the data collection on Chinese White

Dolphins during the construction phase (i.e. impact period) of the TM-CLKL project in Northwest Lantau (NWL) and Northeast Lantau (NEL) survey areas.

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

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

1.6. This report is the second quarterly progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Contractor, summarizing the results of the surveys findings during the period of March to May 2014 utilizing the survey data collected by HKLR03 project.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in NEL and NWL survey areas (see Figure 1) twice per month throughout the entire construction period. The co-ordinates of all transect lines conducted during the HKLR03 dolphin monitoring surveys 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	814577		13	Start Point	816506	819480
1	End Point	804671	831404		13	End Point	816506	824859
2	Start Point	805475	815457		14	Start Point	817537	820220
2	End Point	805477	826654		14	End Point	817537	824613
3	Start Point	806464	819435		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	819771		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209
5	Start Point	808504	820220		17	Start Point	820451	822125
5	End Point	808504	828602		17	End Point	820451	823671
6	Start Point	809490	820466		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	820690		19	Start Point	822513	823268
7	End Point	810499	824613		19	End Point	822513	824321

8	Start Point	811508	820847		20	Start Point	823477	823402
8	End Point	811508	824254		20	End Point	823477	824613
9	Start Point	812516	820892		21	Start Point	805476	827081
9	End Point	812516	824254		21	End Point	805476	830562
10	Start Point	813525	820872		22	Start Point	806464	824033
10	End Point	813525	824657		22	End Point	806464	829598
11	Start Point	814556	818449		23	Start Point	814559	821739
11	End Point	814556	820992		23	End Point	814559	824768
12	Start Point	815542	818807					
12	End Point	815542	824882					

2.1.2. The HKLR03 survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 16 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2012, 2013). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

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

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

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

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

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

2.2. Photo-identification Work

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

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

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

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

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

2.3. Data Analysis

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

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

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

Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the quarterly period of March to May 2014.

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) x 100) / SA%
DPSE = ((D / E) x 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 March to May 2014, 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 891.87 km of survey effort was collected, with 87.4% 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, 350.40 km and 541.47 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 642.67 km, while the effort on secondary lines was 249.20 km. Both survey effort conducted on primary and secondary lines were considered as on-effort survey data. Summary table of the survey effort is shown in Appendix I.

3.1.4. During the six sets of HKLR03 monitoring surveys from March to May 2014, a total of 31 groups of 103 Chinese White Dolphins were sighted. All except one sighting were made during on-effort search. Twenty-five on-effort sightings were made on primary

lines, while another five on-effort sightings were made on secondary lines. In this quarterly period, all dolphin groups were sighted in NWL, while none was sighted in NEL. Summary table of the dolphin sightings is shown in Appendix II.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during the HKLR03 monitoring surveys in March to May 2014 is shown in Figure 1. The majority of dolphin sightings were made in the northwestern portion of the North Lantau region. Dolphin sightings were particularly concentrated to the northern and northeastern sides of Lung Kwu Chau, and at the mouth of Deep Bay near Black Point (Figure 1). Other dolphin sightings were scattered between Lung Kwu Chau and Sha Chau, near Pillar Point, Tap Shek Kok and the airport platform. No dolphin was sighted in NEL survey area during the present quarterly period (Figure 1).

3.2.2. Notably, none of the dolphin groups were sighted in the vicinity of TMCLKL northern landfall or southern viaduct section, and the HKLR03/HKBCF reclamation site (Figure 1).

3.2.3. Sighting distribution of the present impact phase monitoring period (March to May 2014) was compared to the one during the baseline monitoring period (September to November 2011). In the present quarter, dolphin disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1).

3.2.4. Dolphin occurrence in the northwestern portion of North Lantau region was largely similar between the baseline and impact phase quarters. However, during the present impact monitoring period, there appeared to be much fewer dolphins occurred in the middle portion of North Lantau region, where dolphins supposedly moved between their core areas around Lung Kwu Chau and the Brothers Islands (Figure 1). Moreover, a number of dolphin sightings were made to the west of Chek Lap Kok airport (especially near the HKLR09 alignment) during the baseline period, but only one sighting was made there during the present impact phase period.

3.2.5. As the baseline monitoring period was in the autumn season while the present monitoring period was in the spring season, a direct comparison in dolphin distribution between the two quarterly periods of spring months in 2013 and 2014 was also made to avoid the potential bias in seasonal variation (Figure 2).

3.2.6. Between the two spring periods, none of the dolphin sightings was made in NEL in spring 2014, while there were two sightings made in spring 2013. Moreover, more dolphin sightings were made in the middle portion of North Lantau waters and to the west of the airport platform (especially near the HKLR09 alignment) in spring 2013 than in spring 2014.

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 March – May 2014 deduced from HKLR03 monitoring surveys

SURVEY AREA	HKLR03 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 (5 & 11 Mar 2014)	0.00	0.00
	Set 2 (17 & 25 Mar 2014)	0.00	0.00
	Set 3 (4 & 14 Apr 2014)	0.00	0.00
	Set 4 (16 & 24 Apr 2014)	0.00	0.00
	Set 5 (2 & 19 May 2014)	0.00	0.00
	Set 6 (21 & 26 May 2014)	0.00	0.00
Northwest Lantau	Set 1 (5 & 11 Mar 2014)	6.43	23.57
	Set 2 (17 & 25 Mar 2014)	13.15	24.83
	Set 3 (4 & 14 Apr 2014)	4.89	26.88
	Set 4 (16 & 24 Apr 2014)	4.94	11.54
	Set 5 (2 & 19 May 2014)	5.47	18.24
	Set 6 (21 & 26 May 2014)	4.18	9.75

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (March – May 2014) and baseline monitoring period (September – November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	March – May 2014	September - November 2011	March – May 2014	September - November 2011
Northeast Lantau	0.00	6.00 ± 5.05	0.00	22.19 ± 26.81
Northwest Lantau	6.51 ± 3.34	9.85 ± 5.85	19.14 ± 7.19	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 6.00 sightings and 17.34 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were both zero as no

sighting was made in this area.

3.3.3. In NEL, the average dolphin encounter rates (both STG and ANI) in the present three-month impact phase were zero, which was the lowest since the HKLR03 dolphin monitoring commenced in October 2012.

3.3.4. On the other hand, the average dolphin encounter rates (STG and ANI) in NWL during the present impact phase monitoring period were much lower (reductions of 34% and 57% respectively) than the ones recorded in the 3-month baseline period, indicating a reduced dolphin usage of this survey area during the present construction period..

3.3.5. 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).

3.3.6. For the comparison between the baseline period and the present quarter (sixth quarter of the impact phase being assessed), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.0337 and 0.0535 respectively. If the alpha value is set at 0.1, significant difference was detected between the baseline and present quarters in both dolphin encounter rates of STG and ANI.

3.3.7. For the comparison between the baseline period and the cumulative quarters in impact phase (i.e. first six quarters of the impact phase being assessed), the p-value for the differences in average dolphin encounter rates of STG and ANI were 0.0080 and 0.0032 respectively. Even if the alpha value is set at 0.01, significant differences were detected in both the average dolphin encounter rates of STG and ANI (i.e. between the two periods and the locations).

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from 1-13 individuals per group in North Lantau region during March – May 2014. 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 4.

3.4.2. The average dolphin group sizes in the entire North Lantau region as well as in NWL waters during March – May 2014 were lower than the ones recorded during the three-month baseline period (Table 4). In fact, 21 of the 31 groups were composed of 1-3 individuals only, while only one group of dolphins was composed of more than 10 individuals.

Table 4. Comparison of average dolphin group sizes from impact monitoring period (March – May 2014) and baseline monitoring period (September – November 2011)

	Average Dolphin Group Size	
	March – May 2014	**September – November 2011**
Overall	3.32 ± 2.87 (n = 31)	3.72 ± 3.13 (n = 66)
Northeast Lantau	0.0	3.18 ± 2.16 (n = 17)
Northwest Lantau	3.32 ± 2.87 (n = 31)	3.92 ± 3.40 (n = 49)

3.4.3. Distribution of dolphins with larger group sizes (five individuals or more per group) during the present quarter is shown in Figure 3, with comparison to the one in baseline period. In spring 2014, all larger dolphin groups were clustered to the south and north of Lung Kwu Chau (Figure 3). This distribution pattern was quite different from the baseline period, when the larger dolphin groups were distributed more evenly in NWL waters and a few more in NEL waters with no particular concentration (Figure 3).

3.5. Habitat use

3.5.1. From March to May 2014, the most heavily utilized habitats by Chinese White Dolphins mainly concentrated to the north and northeast of Lung Kwu Chau (Figures 4a and 4b). None of the grids in NEL recorded the presence of dolphins. Moreover, all grids near TMCLKL alignment, HKLR03/HKBCF reclamation sites or HKLR09 alignment did not record any presence of dolphins during on-effort search in the present quarterly period.

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 will be presented 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 was dramatically different from the present impact monitoring period (Figure 5). During the baseline period, nine grids between Siu Mo To and Shum Shui Kok recorded moderately high to high dolphin densities, which was in contrast to the complete absence of dolphins during the present impact phase period (Figure 5).

3.5.4. On the other hand, the density patterns between the baseline and impact phase monitoring periods were also different in NWL, with higher dolphin usage near Sha Chau, between Pillar Point and airport platform, and along the west boundary of Hong Kong territorial waters during the baseline period (Figure 5).

3.6. Mother-calf pairs

3.6.1. During the three-month study period, a total of five unspotted juveniles (UJ) were sighted

in NWL survey areas. These young calves comprised of 4.9% of all animals sighted, which was lower than the percentage recorded during the baseline monitoring period (6.8%).

3.6.2. These young calves were only present near Lung Kwu Chau or at the mouth of Deep Bay (Figure 6), which was very different from their distribution pattern during the baseline period when young calves were sighted throughout the NWL survey area as well as a few sighted in NEL waters. None of these young calves were sighted in the vicinity of the HKBCF/HKLR03 reclamation sites and HKLR09/TMCLKL alignments during the present quarter (Figure 6).

3.7. Activities and associations with fishing boats

3.7.1. A total of five dolphin sightings were associated with feeding and socializing activities during the three-month study period. The percentage of feeding activities comprised of 9.7% of the total number of dolphin sightings, which was slightly lower than the one recorded during the baseline period (11.6%). On the contrary, the percentage of socializing activities during the present impact phase monitoring period (6.5%) was slightly higher than the one recorded during the baseline period (5.4%). None of the dolphin groups was engaged in traveling or milling/resting activity during the present impact monitoring period.

3.7.2. Distribution of dolphins engaged in feeding and socializing activities during the present three-month period is shown in Figure 7. The sightings associated with these activities were only found near Lung Kwu Chau but not elsewhere in North Lantau waters, which was drastically different from the distribution pattern of these activities during the baseline period (Figure 7).

3.7.3. During the three-month period, none of the 31 dolphin groups was found to be associated with an operating fishing vessels in North Lantau waters. The rare events of fishing boat association in the present and previous quarters were consistently found, and were likely related to the recent trawl ban being implemented in December 2012 in Hong Kong waters.

3.8. Summary of photo-identification works

3.8.1. From March to May 2014, over 3,000 digital photographs of Chinese White Dolphins were taken during the impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 45 individuals sighted 74 times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). All of these re-sightings were made in NWL.

3.8.3. Most identified individuals were sighted only once or twice during the three-month period, with the exception of six individuals being sighted thrice, and another two individuals (NL48 and NL261) being sighted four to five times.

3.8.4. Six well-recognized females (NL33, NL46, NL104, NL145, NL202 and NL233) were accompanied with their calves during their re-sightings. All of these mothers were

frequently sighted with their calves throughout the HKLR03 impact phase monitoring period since October 2012.

3.9. Individual range use

3.9.1. Ranging patterns of the 45 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

3.9.2. All individuals sighted in this quarter were utilizing their range use in NWL (especially around Lung Kwu Chau) but have avoided NEL, where some of these individuals 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 during the baseline period.

3.9.3. For many individuals that have previously utilized the Brothers Islands as their major core area of activities, they have apparently shifted their range use away from this important habitat (e.g. EL01, NL24, NL33, NL120, NL191, NL260; Appendix V). Such shifts of range use and core area use were also well documented by Hung (2014).

4. Conclusion

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

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

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

5. References

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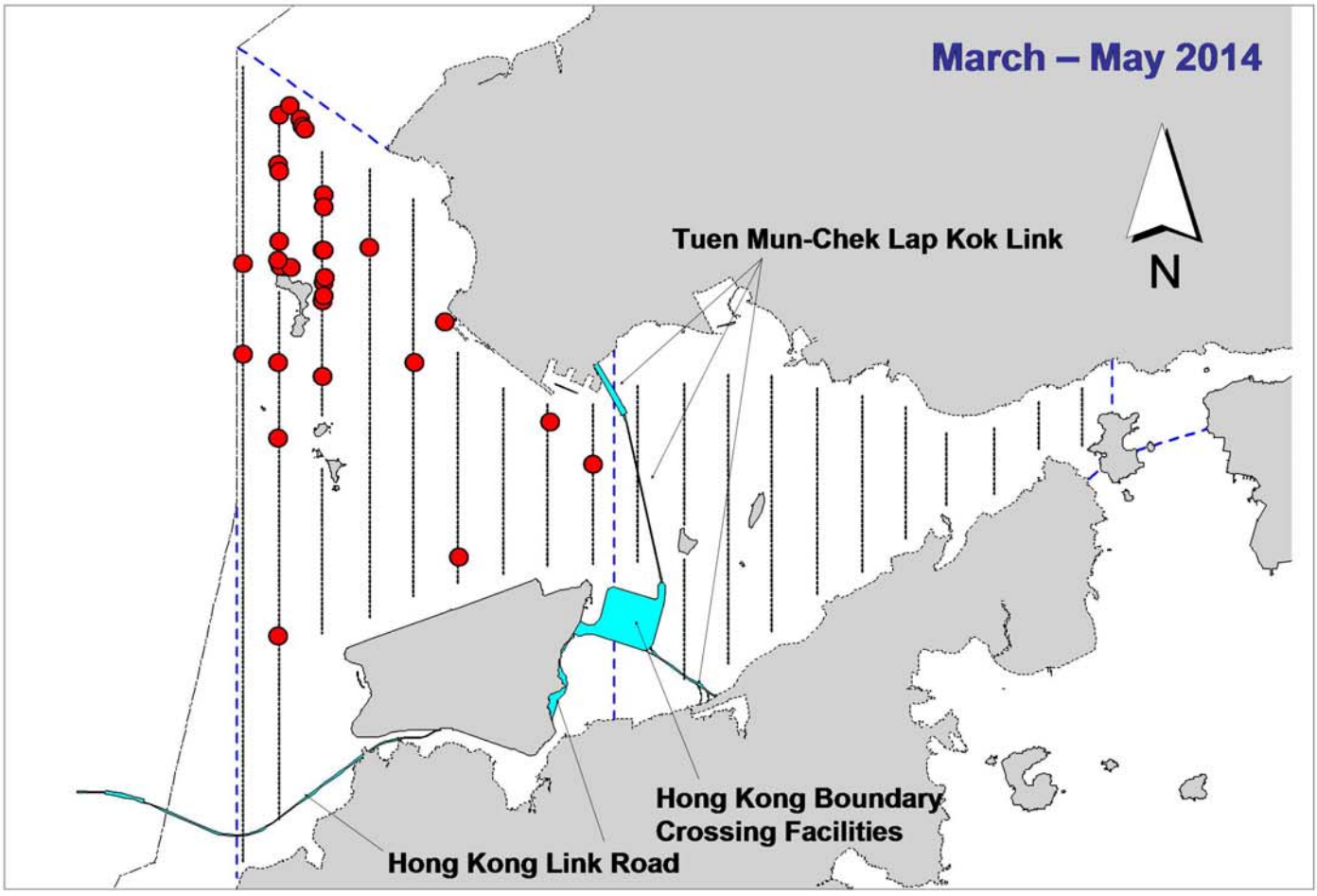


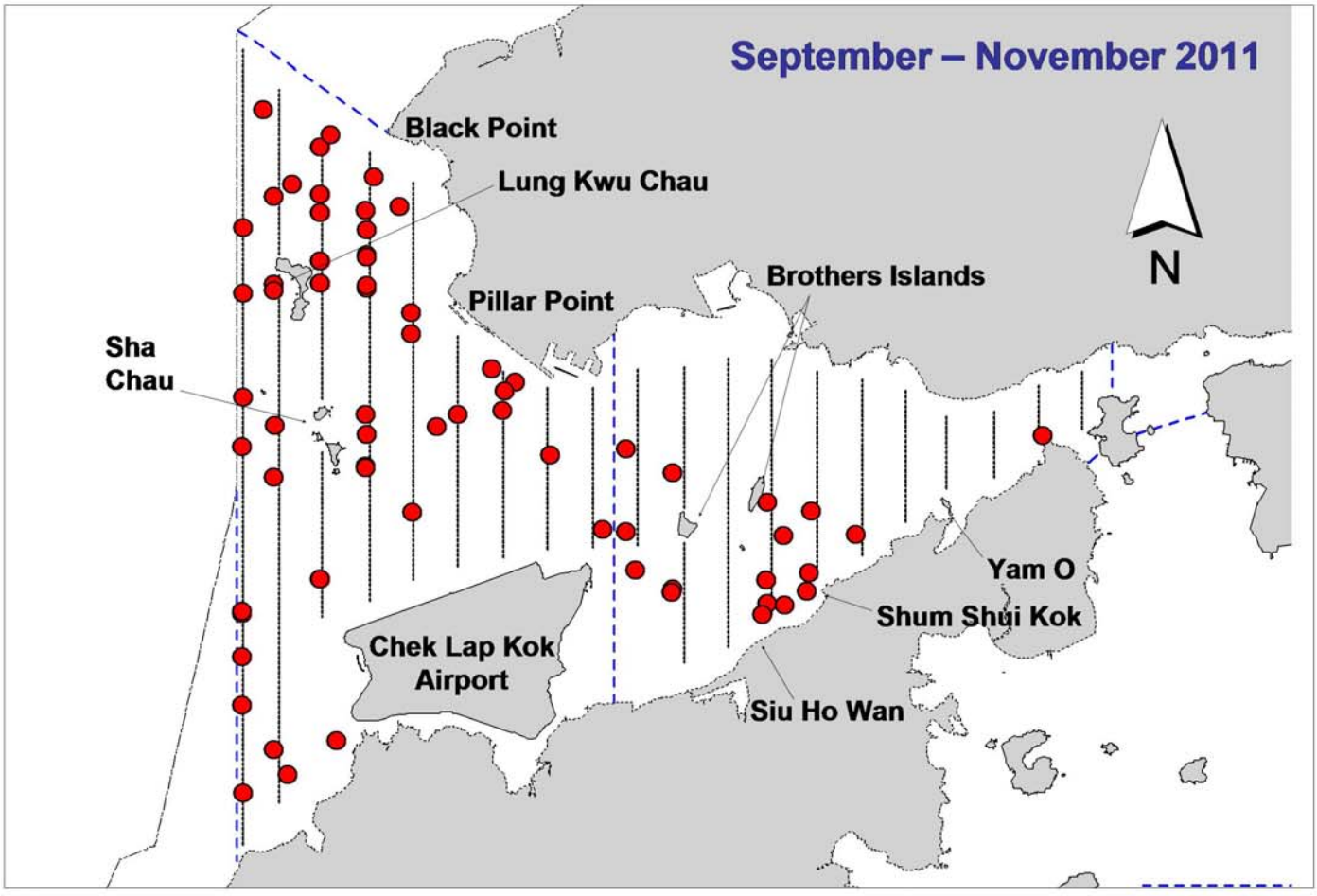
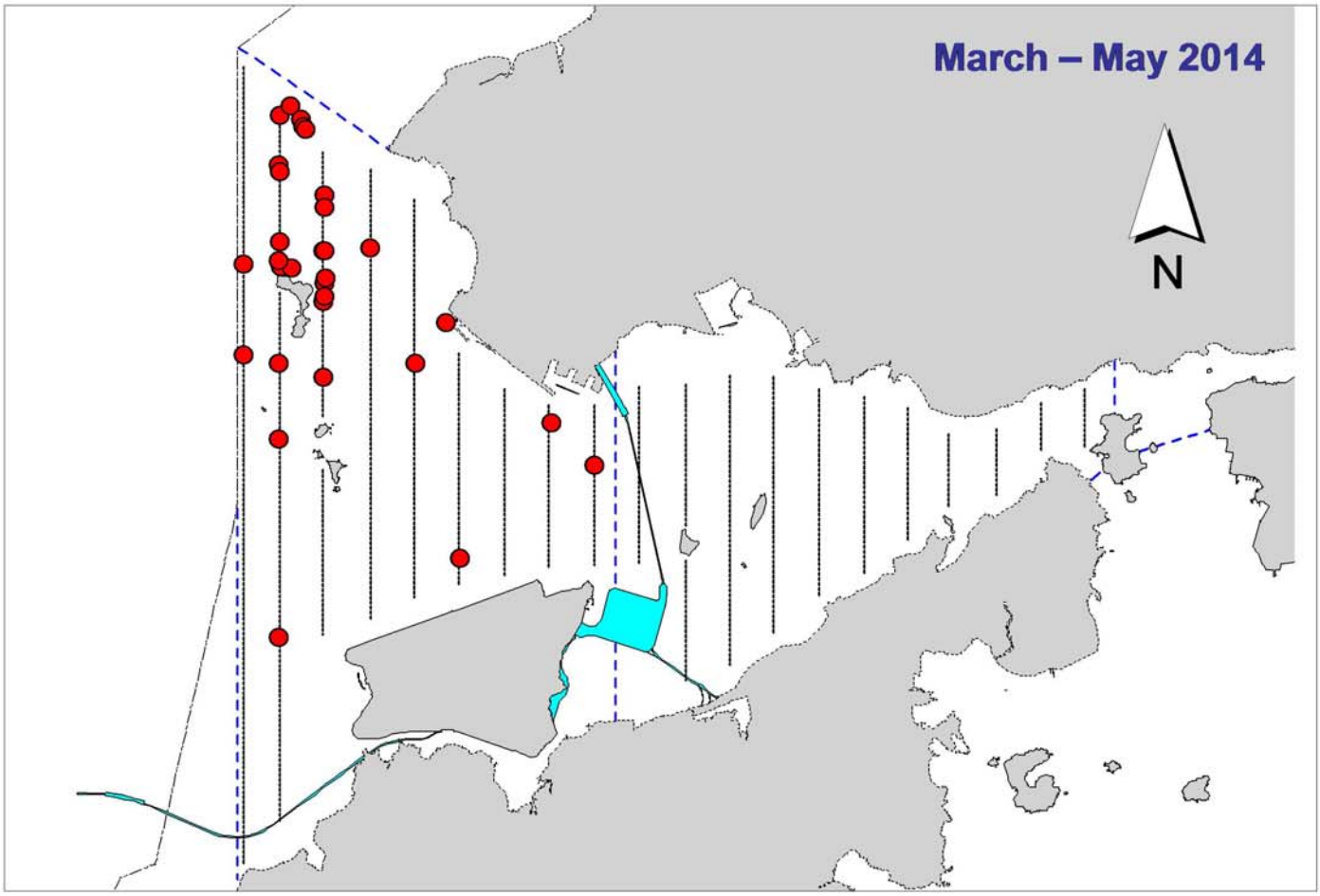


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)



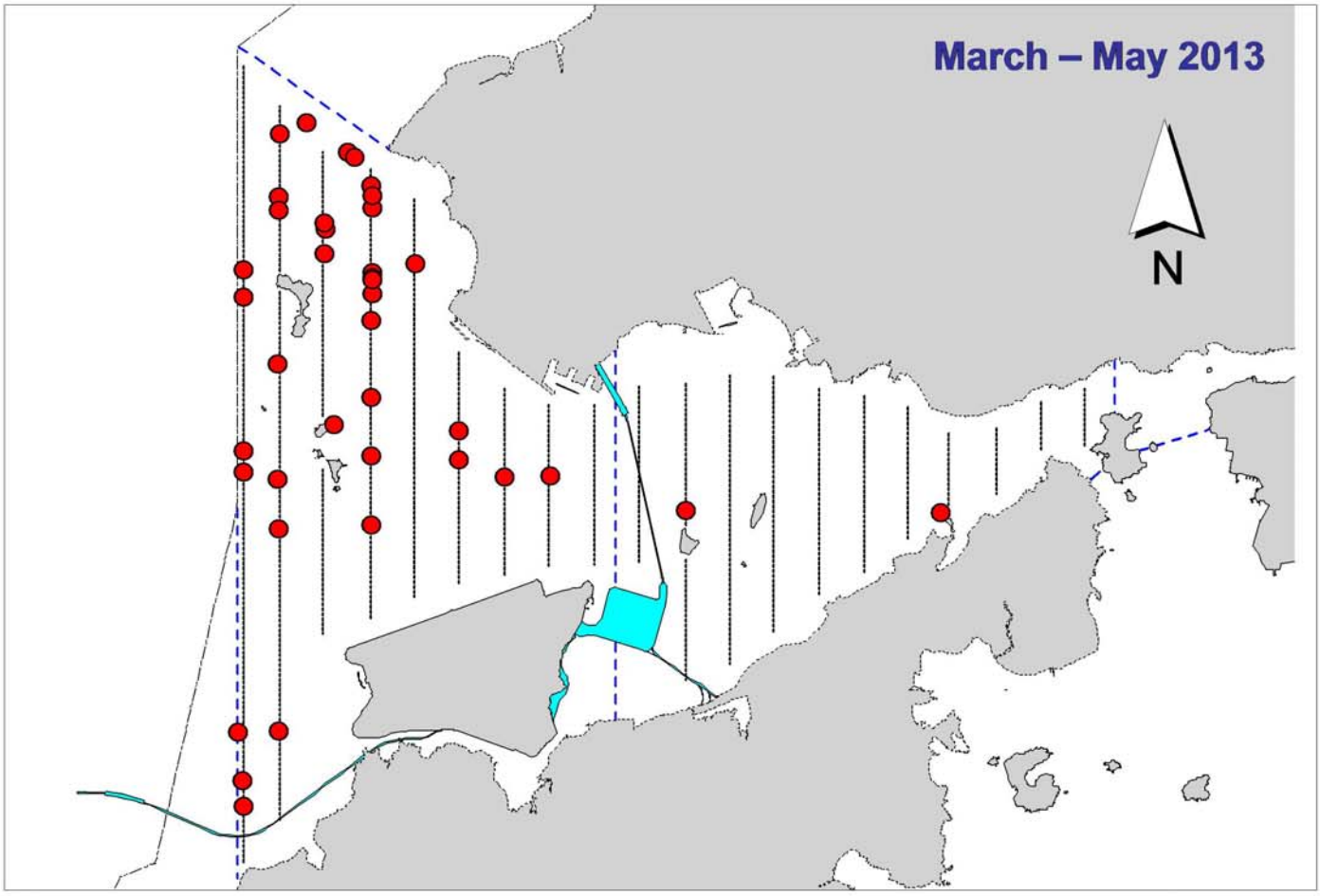


Figure 2. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during the same spring quarter of HKLR03 impact phase in 2014 (top) and 2013 (bottom)

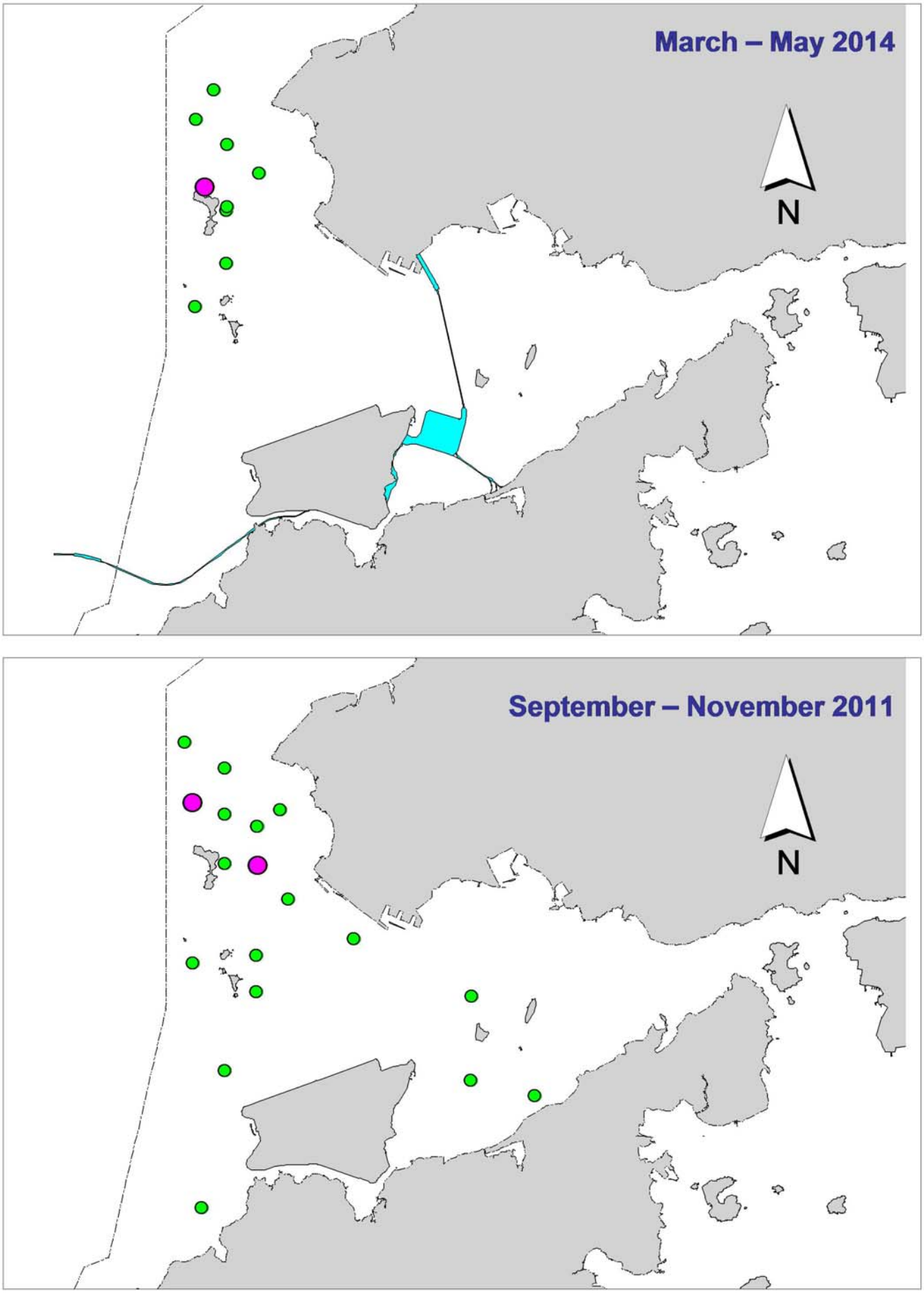


Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR03 impact phase (top) and baseline monitoring surveys (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

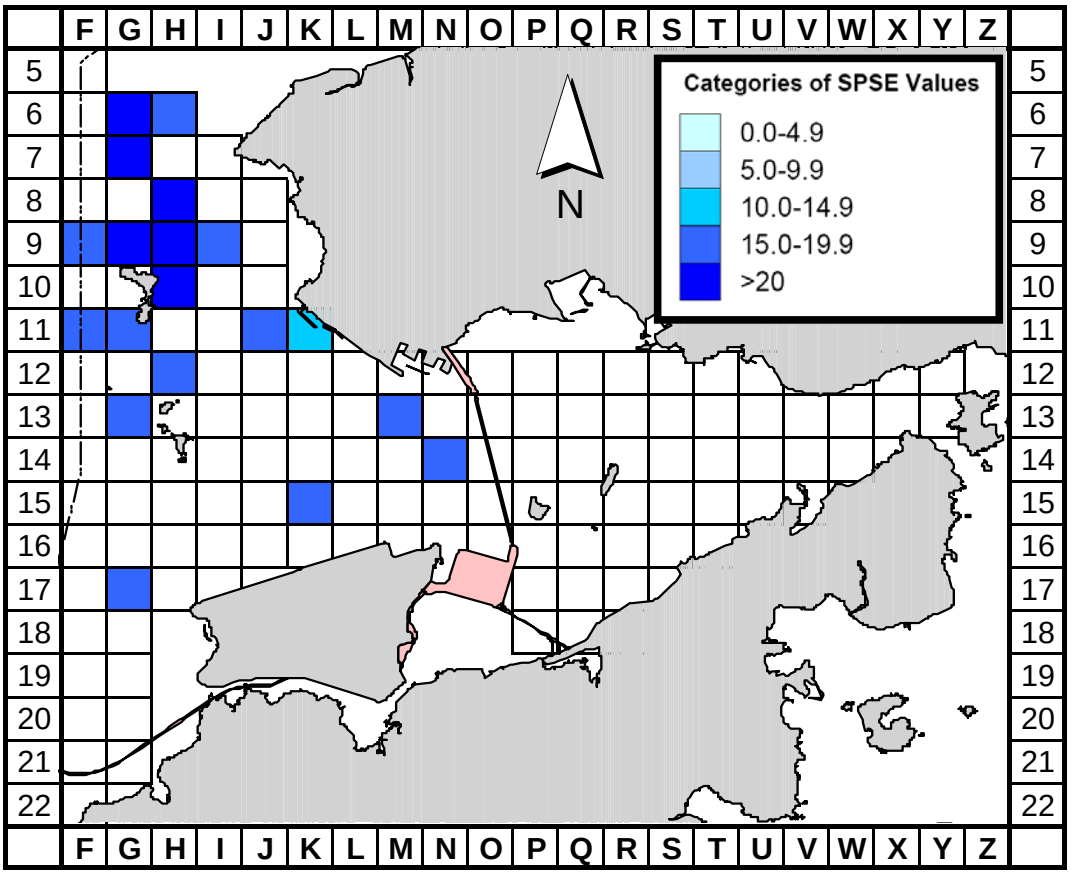


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (Mar-May 14) (SPSE = no. of on-effort sightings per 100 units of survey effort)

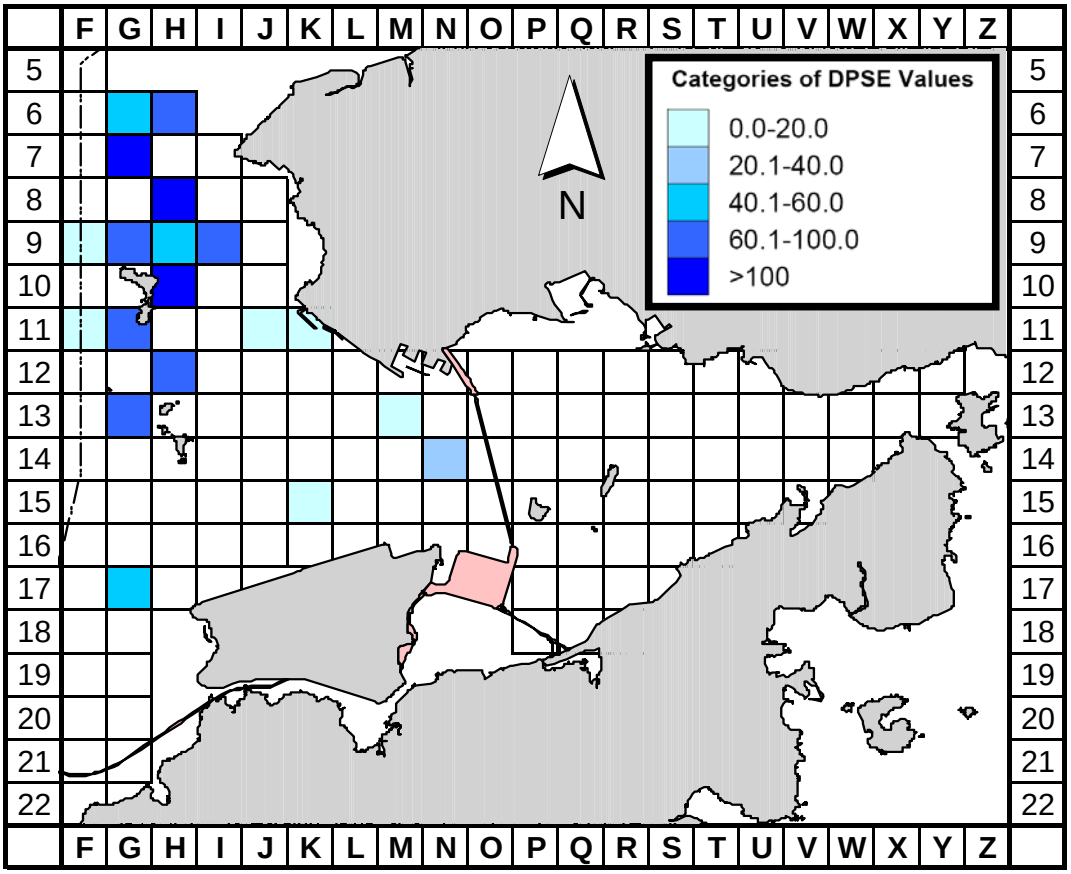


Figure 4b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (Mar-May 14) (DPSE = no. of dolphins per 100 units of survey effort)

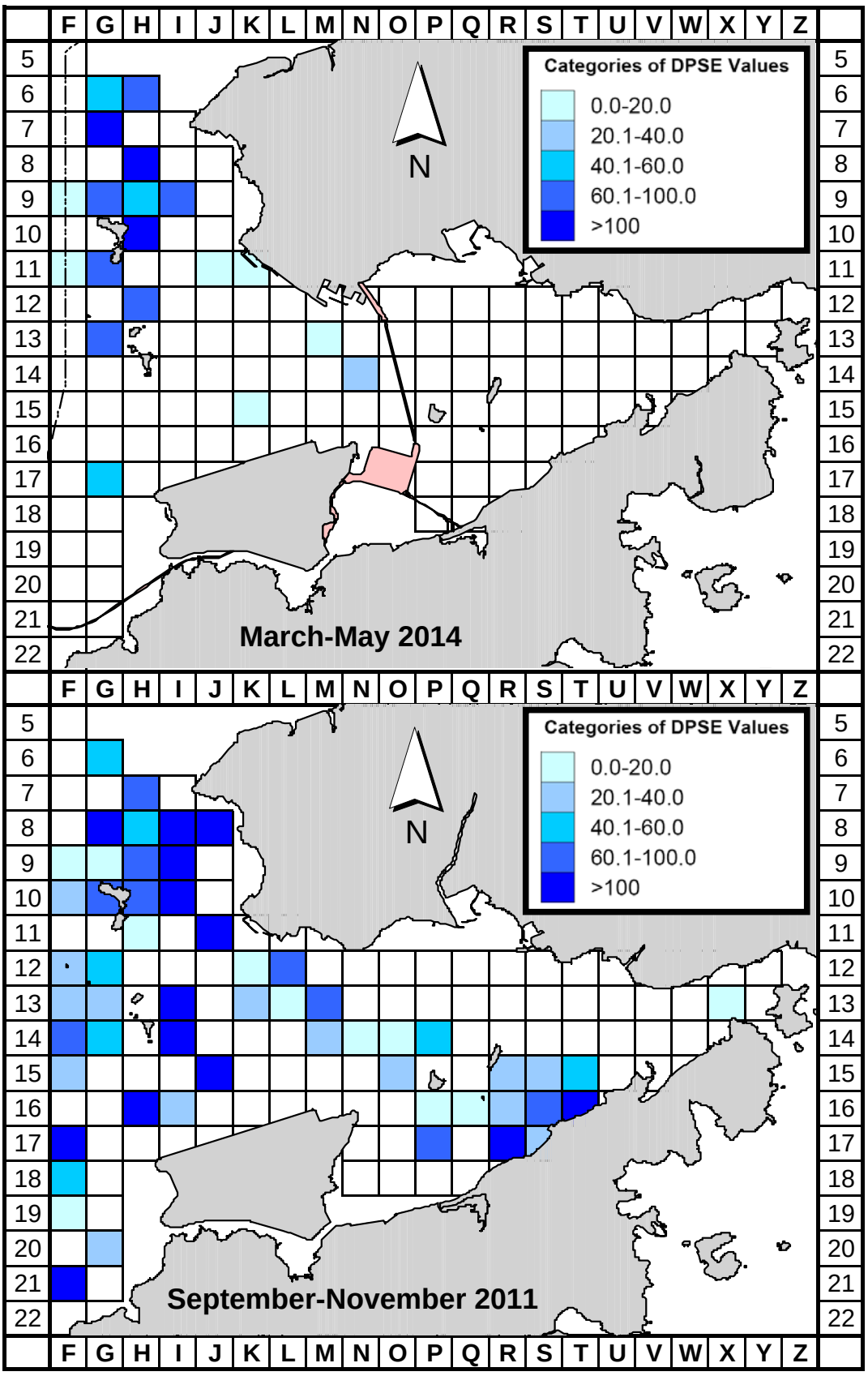


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between the impact monitoring period (March-May 2014) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)

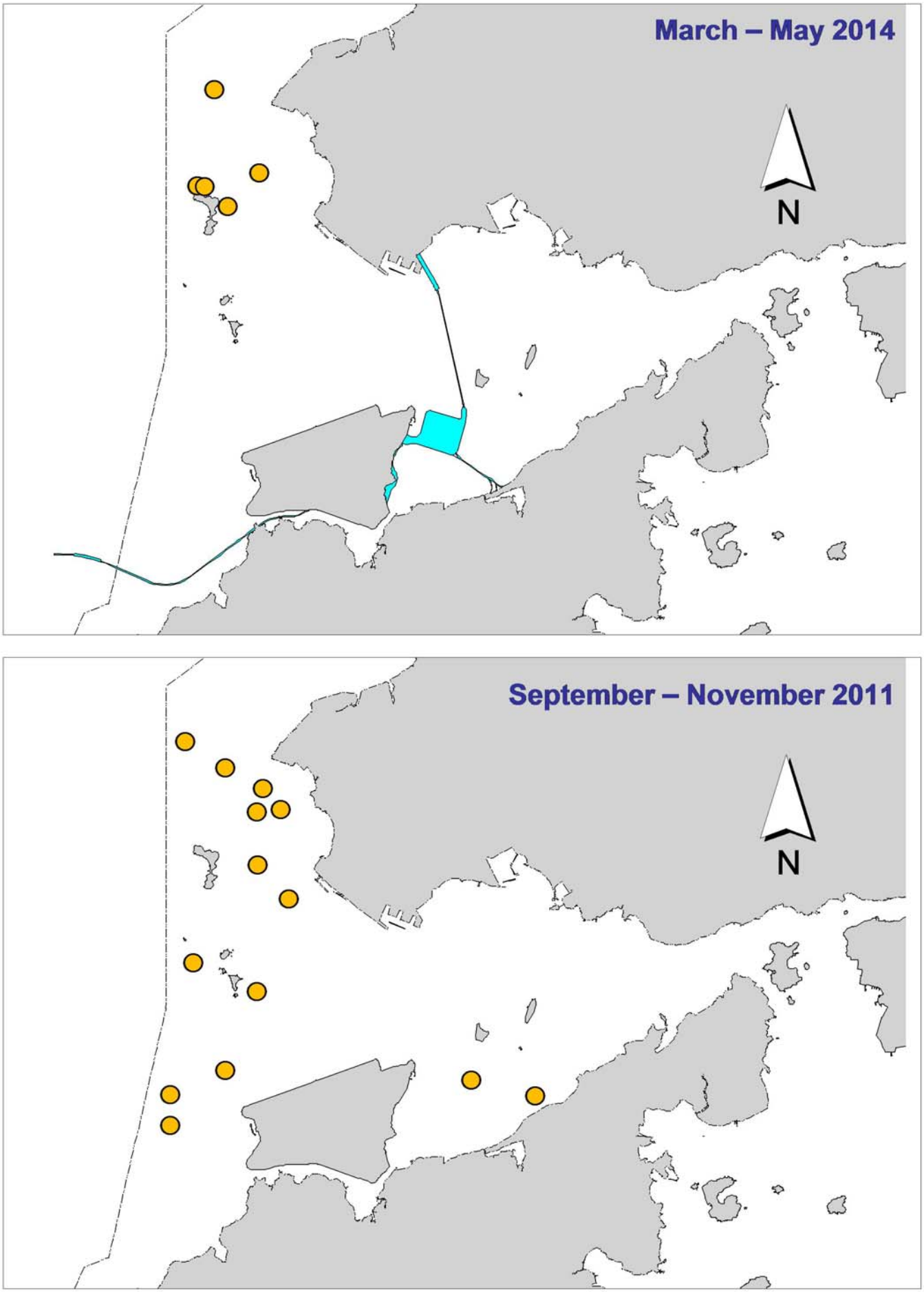


Figure 6. Distribution of young calves of Chinese white dolphins during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

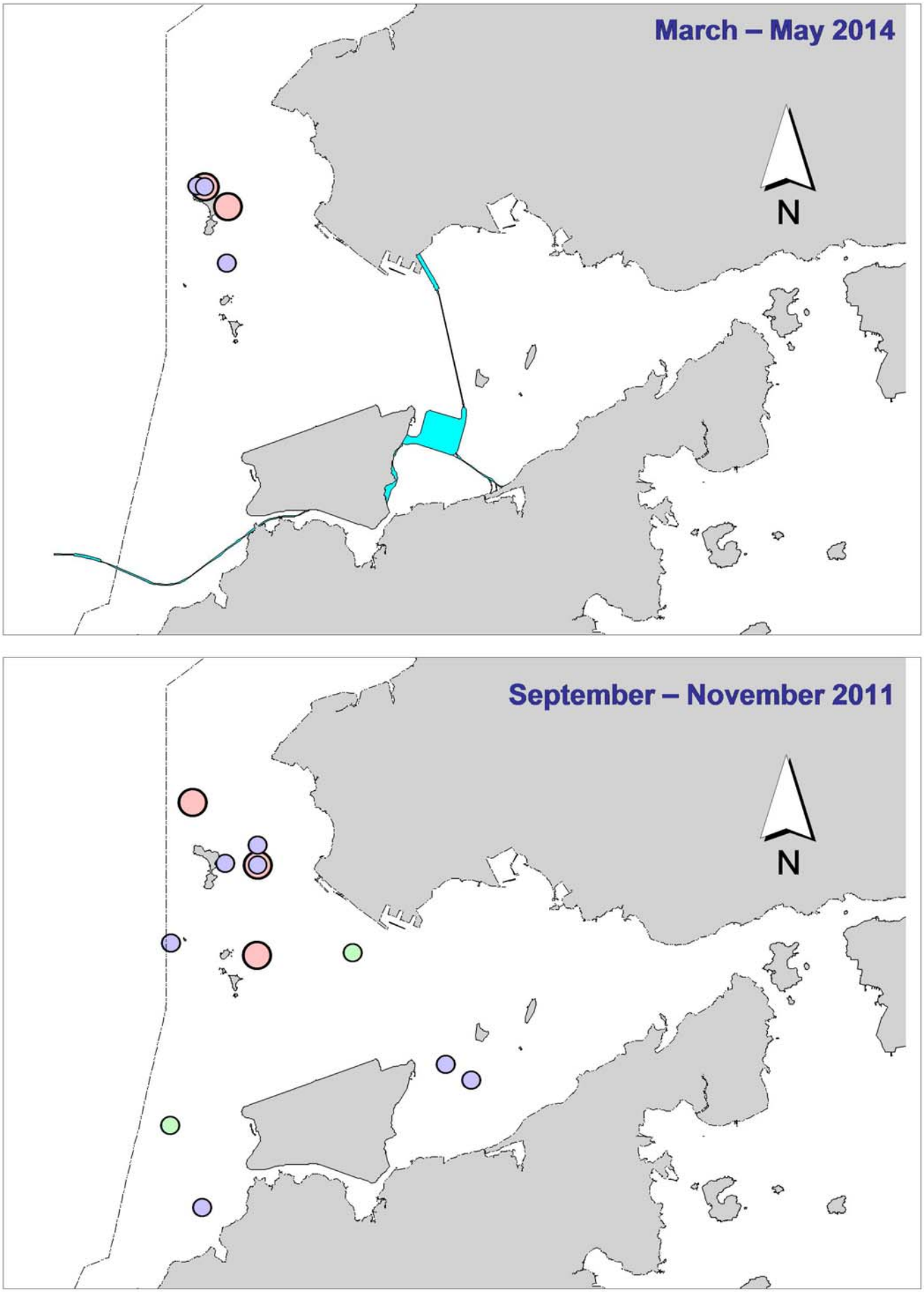


Figure 7. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

Appendix I. HKLR03 Survey Effort Database (March-May 2014)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
5-Mar-14	NW LANTAU	1	3.88	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NW LANTAU	2	20.76	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NW LANTAU	3	5.93	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NW LANTAU	2	5.25	SPRING	STANDARD31516	HKLR	S
5-Mar-14	NW LANTAU	3	1.96	SPRING	STANDARD31516	HKLR	S
5-Mar-14	NE LANTAU	2	17.99	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NE LANTAU	3	1.69	SPRING	STANDARD31516	HKLR	P
5-Mar-14	NE LANTAU	2	11.02	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NE LANTAU	2	1.40	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NE LANTAU	3	11.82	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NE LANTAU	4	2.90	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NE LANTAU	2	6.16	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NE LANTAU	3	4.12	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NE LANTAU	4	1.40	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NW LANTAU	1	1.70	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	2	5.31	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	3	9.08	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	4	18.01	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	5	6.14	SPRING	STANDARD31516	HKLR	P
11-Mar-14	NW LANTAU	2	6.91	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NW LANTAU	3	1.40	SPRING	STANDARD31516	HKLR	S
11-Mar-14	NW LANTAU	4	4.25	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NW LANTAU	0	4.79	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NW LANTAU	1	25.88	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NW LANTAU	2	8.51	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NW LANTAU	0	2.51	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NW LANTAU	1	7.24	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NW LANTAU	2	3.21	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NE LANTAU	1	14.20	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NE LANTAU	2	2.36	SPRING	STANDARD31516	HKLR	P
17-Mar-14	NE LANTAU	1	9.07	SPRING	STANDARD31516	HKLR	S
17-Mar-14	NE LANTAU	2	2.17	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NE LANTAU	1	13.41	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NE LANTAU	2	6.67	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NE LANTAU	1	6.73	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NE LANTAU	2	4.19	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NW LANTAU	1	7.45	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NW LANTAU	2	22.31	SPRING	STANDARD31516	HKLR	P
25-Mar-14	NW LANTAU	1	0.96	SPRING	STANDARD31516	HKLR	S
25-Mar-14	NW LANTAU	2	6.58	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NW LANTAU	1	1.41	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	2	8.57	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	3	14.93	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	4	3.00	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NW LANTAU	2	3.16	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NW LANTAU	3	3.00	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NW LANTAU	4	1.00	SPRING	STANDARD31516	HKLR	S
4-Apr-14	NE LANTAU	2	0.80	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NE LANTAU	3	15.53	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NE LANTAU	4	4.16	SPRING	STANDARD31516	HKLR	P
4-Apr-14	NE LANTAU	2	2.20	SPRING	STANDARD31516	HKLR	S

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
4-Apr-14	NE LANTAU	3	8.51	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NE LANTAU	2	0.90	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NE LANTAU	3	9.61	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NE LANTAU	4	6.20	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NE LANTAU	2	1.80	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NE LANTAU	3	6.39	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NE LANTAU	4	2.90	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NW LANTAU	2	1.40	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NW LANTAU	3	14.62	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NW LANTAU	4	23.91	SPRING	STANDARD31516	HKLR	P
14-Apr-14	NW LANTAU	2	2.10	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NW LANTAU	3	7.86	SPRING	STANDARD31516	HKLR	S
14-Apr-14	NW LANTAU	4	2.99	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NW LANTAU	2	4.27	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NW LANTAU	3	24.56	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NW LANTAU	4	2.91	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NW LANTAU	2	2.45	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NW LANTAU	3	4.20	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NE LANTAU	2	3.94	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NE LANTAU	3	15.37	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NE LANTAU	4	1.10	SPRING	STANDARD31516	HKLR	P
16-Apr-14	NE LANTAU	2	1.20	SPRING	STANDARD31516	HKLR	S
16-Apr-14	NE LANTAU	3	9.49	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NW LANTAU	2	1.91	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NW LANTAU	3	29.94	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NW LANTAU	4	8.44	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NW LANTAU	2	0.80	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NW LANTAU	3	9.72	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NW LANTAU	4	2.20	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NE LANTAU	2	5.03	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NE LANTAU	3	10.14	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NE LANTAU	4	1.31	SPRING	STANDARD31516	HKLR	P
24-Apr-14	NE LANTAU	2	7.37	SPRING	STANDARD31516	HKLR	S
24-Apr-14	NE LANTAU	3	3.65	SPRING	STANDARD31516	HKLR	S
2-May-14	NW LANTAU	1	8.33	SPRING	STANDARD31516	HKLR	P
2-May-14	NW LANTAU	2	20.71	SPRING	STANDARD31516	HKLR	P
2-May-14	NW LANTAU	3	11.20	SPRING	STANDARD31516	HKLR	P
2-May-14	NW LANTAU	1	8.11	SPRING	STANDARD31516	HKLR	S
2-May-14	NW LANTAU	2	2.77	SPRING	STANDARD31516	HKLR	S
2-May-14	NW LANTAU	3	1.30	SPRING	STANDARD31516	HKLR	S
2-May-14	NE LANTAU	2	8.93	SPRING	STANDARD31516	HKLR	P
2-May-14	NE LANTAU	3	8.38	SPRING	STANDARD31516	HKLR	P
2-May-14	NE LANTAU	2	7.68	SPRING	STANDARD31516	HKLR	S
2-May-14	NE LANTAU	3	2.51	SPRING	STANDARD31516	HKLR	S
19-May-14	NE LANTAU	1	2.45	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	2	13.17	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	3	2.63	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	4	1.40	SPRING	STANDARD31516	HKLR	P
19-May-14	NE LANTAU	1	1.44	SPRING	STANDARD31516	HKLR	S
19-May-14	NE LANTAU	2	4.97	SPRING	STANDARD31516	HKLR	S
19-May-14	NE LANTAU	3	3.94	SPRING	STANDARD31516	HKLR	S
19-May-14	NW LANTAU	3	14.57	SPRING	STANDARD31516	HKLR	P
19-May-14	NW LANTAU	4	16.43	SPRING	STANDARD31516	HKLR	P

Appendix I. (cont'd)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
19-May-14	NW LANTAU	3	4.87	SPRING	STANDARD31516	HKLR	S
19-May-14	NW LANTAU	4	2.01	SPRING	STANDARD31516	HKLR	S
21-May-14	NW LANTAU	1	1.40	SPRING	STANDARD31516	HKLR	P
21-May-14	NW LANTAU	2	13.43	SPRING	STANDARD31516	HKLR	P
21-May-14	NW LANTAU	3	16.59	SPRING	STANDARD31516	HKLR	P
21-May-14	NW LANTAU	1	0.60	SPRING	STANDARD31516	HKLR	S
21-May-14	NW LANTAU	2	4.20	SPRING	STANDARD31516	HKLR	S
21-May-14	NW LANTAU	3	2.50	SPRING	STANDARD31516	HKLR	S
21-May-14	NE LANTAU	2	13.25	SPRING	STANDARD31516	HKLR	P
21-May-14	NE LANTAU	3	6.78	SPRING	STANDARD31516	HKLR	P
21-May-14	NE LANTAU	2	9.07	SPRING	STANDARD31516	HKLR	S
21-May-14	NE LANTAU	3	1.50	SPRING	STANDARD31516	HKLR	S
26-May-14	NW LANTAU	2	21.21	SPRING	STANDARD31516	HKLR	P
26-May-14	NW LANTAU	3	19.14	SPRING	STANDARD31516	HKLR	P
26-May-14	NW LANTAU	2	3.70	SPRING	STANDARD31516	HKLR	S
26-May-14	NW LANTAU	3	9.05	SPRING	STANDARD31516	HKLR	S
26-May-14	NE LANTAU	1	3.10	SPRING	STANDARD31516	HKLR	P
26-May-14	NE LANTAU	2	13.43	SPRING	STANDARD31516	HKLR	P
26-May-14	NE LANTAU	2	10.87	SPRING	STANDARD31516	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (March-May 2014)

(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)

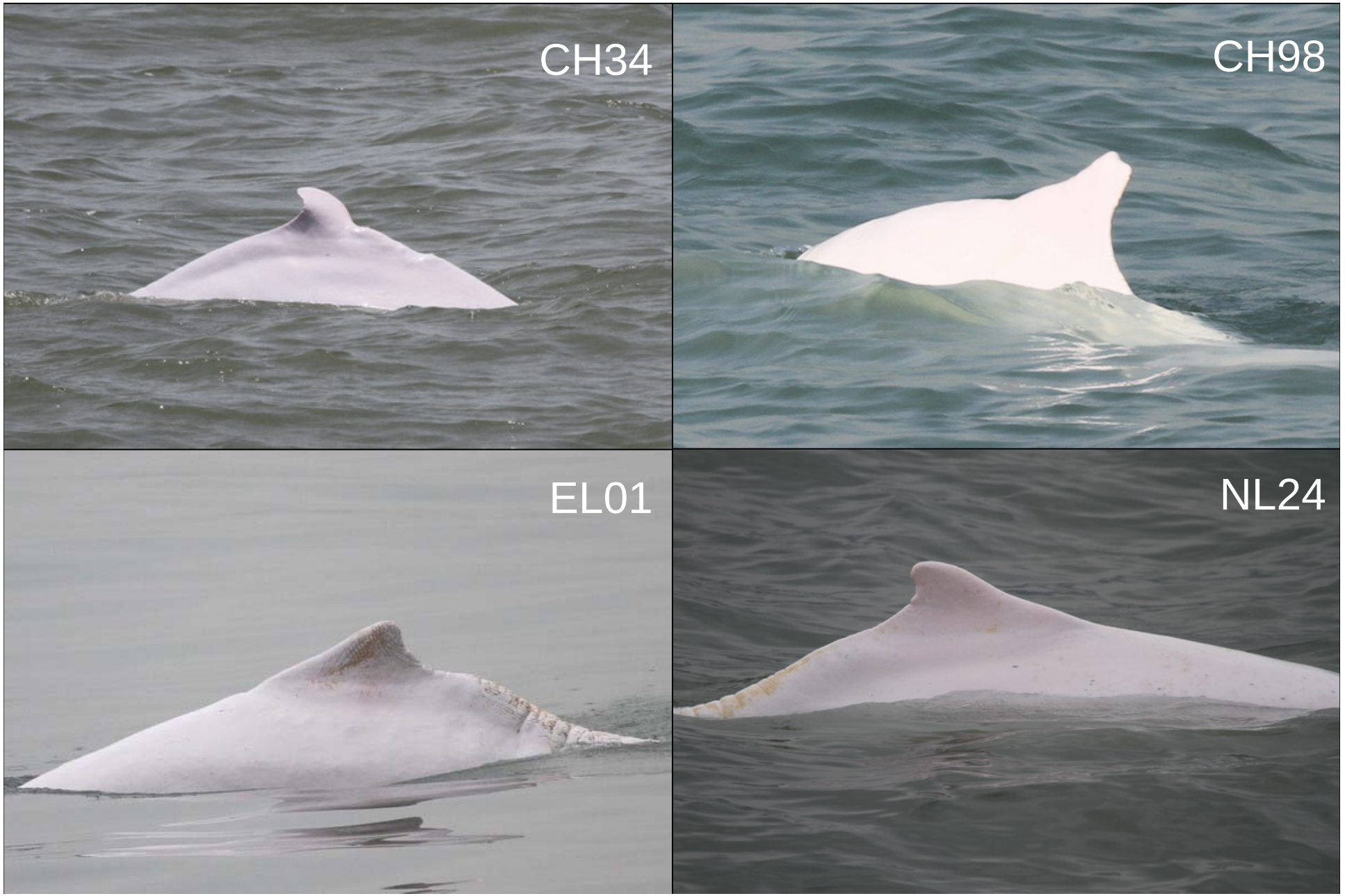
DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
5-Mar-14	1	1053	3	NW LANTAU	2	64	ON	HKLR	827173	805499	SPRING	NONE	P
5-Mar-14	2	1126	13	NW LANTAU	2	ND	OFF	HKLR	827150	805736	SPRING	NONE	
5-Mar-14	3	1323	6	NW LANTAU	2	28	ON	HKLR	827568	807488	SPRING	NONE	P
11-Mar-14	1	1518	2	NW LANTAU	3	86	ON	HKLR	827525	806437	SPRING	NONE	P
17-Mar-14	1	1159	2	NW LANTAU	2	151	ON	HKLR	822985	812516	SPRING	NONE	P
17-Mar-14	2	1411	5	NW LANTAU	1	277	ON	HKLR	824834	806452	SPRING	NONE	P
17-Mar-14	3	1439	1	NW LANTAU	1	36	ON	HKLR	826839	806456	SPRING	NONE	P
17-Mar-14	4	1509	2	NW LANTAU	2	72	ON	HKLR	830273	805938	SPRING	NONE	S
17-Mar-14	5	1541	1	NW LANTAU	1	194	ON	HKLR	827219	804675	SPRING	NONE	P
17-Mar-14	6	1551	1	NW LANTAU	1	125	ON	HKLR	825325	804672	SPRING	NONE	P
25-Mar-14	1	1249	1	NW LANTAU	2	131	ON	HKLR	821041	809495	SPRING	NONE	P
25-Mar-14	2	1452	2	NW LANTAU	2	72	ON	HKLR	826927	806498	SPRING	NONE	P
25-Mar-14	3	1535	3	NW LANTAU	2	299	ON	HKLR	829321	805462	SPRING	NONE	P
25-Mar-14	4	1549	1	NW LANTAU	2	349	ON	HKLR	827693	805469	SPRING	NONE	P
04-Apr-14	1	1021	3	NW LANTAU	3	43	ON	HKLR	819355	805442	SPRING	NONE	P
14-Apr-14	1	1438	8	NW LANTAU	3	94	ON	HKLR	826451	806445	SPRING	NONE	P
14-Apr-14	2	1517	2	NW LANTAU	4	273	ON	HKLR	830117	806010	SPRING	NONE	S
16-Apr-14	1	1048	4	NW LANTAU	2	541	ON	HKLR	825124	805454	SPRING	NONE	P
16-Apr-14	2	1113	1	NW LANTAU	2	385	ON	HKLR	827306	805458	SPRING	NONE	P
16-Apr-14	3	1137	2	NW LANTAU	2	17	ON	HKLR	830362	805465	SPRING	NONE	P
16-Apr-14	4	1150	9	NW LANTAU	2	49	ON	HKLR	830073	806051	SPRING	NONE	S
24-Apr-14	1	1328	1	NW LANTAU	3	123	ON	HKLR	825992	809184	SPRING	NONE	S
02-May-14	1	1128	3	NW LANTAU	3	22	ON	HKLR	830572	805712	SPRING	NONE	S
02-May-14	2	1154	2	NW LANTAU	2	27	ON	HKLR	828677	806460	SPRING	NONE	P
02-May-14	3	1213	7	NW LANTAU	2	522	ON	HKLR	826540	806456	SPRING	NONE	P
02-May-14	4	1333	1	NW LANTAU	1	1233	ON	HKLR	825129	808503	SPRING	NONE	P
19-May-14	1	1405	5	NW LANTAU	4	177	ON	HKLR	829177	805472	SPRING	NONE	P
19-May-14	2	1451	5	NW LANTAU	4	28	ON	HKLR	823530	805461	SPRING	NONE	P
21-May-14	1	1257	1	NW LANTAU	2	242	ON	HKLR	823873	811529	SPRING	NONE	P
26-May-14	1	1209	5	NW LANTAU	3	362	ON	HKLR	828433	806460	SPRING	NONE	P
26-May-14	2	1232	1	NW LANTAU	3	1066	ON	HKLR	827514	806458	SPRING	NONE	P

Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in March-May 2014

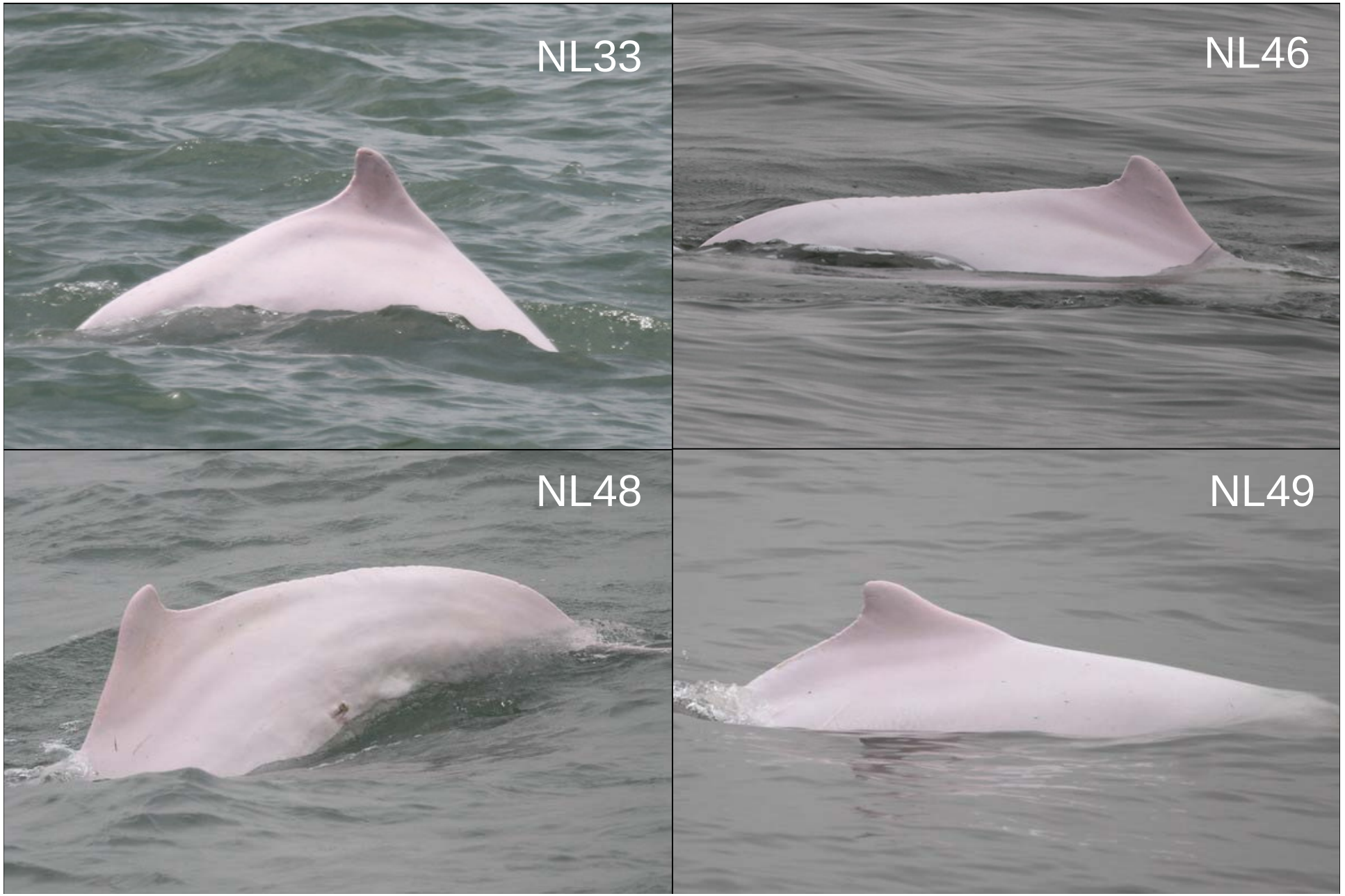
ID#	DATE	STG#	AREA
CH34	26/05/14	1	NW LANTAU
CH98	25/03/14	3	NW LANTAU
EL01	17/03/14	1	NW LANTAU
	16/04/14	2	NW LANTAU
	21/05/14	1	NW LANTAU
NL24	05/03/14	3	NW LANTAU
	14/04/14	1	NW LANTAU
NL33	02/05/14	3	NW LANTAU
NL46	05/03/14	2	NW LANTAU
	19/05/14	1	NW LANTAU
NL48	11/03/14	1	NW LANTAU
	25/03/14	4	NW LANTAU
	16/04/14	4	NW LANTAU
	02/05/14	1	NW LANTAU
NL49	05/03/14	2	NW LANTAU
NL104	05/03/14	2	NW LANTAU
	05/03/14	3	NW LANTAU
	16/04/14	4	NW LANTAU
NL120	14/04/14	1	NW LANTAU
NL136	11/03/14	1	NW LANTAU
	17/03/14	2	NW LANTAU
	25/03/14	3	NW LANTAU
NL145	16/04/14	1	NW LANTAU
	02/05/14	3	NW LANTAU
NL165	05/03/14	2	NW LANTAU
NL182	24/04/14	1	NW LANTAU
NL191	25/03/14	1	NW LANTAU
NL202	16/04/14	4	NW LANTAU
NL210	02/05/14	2	NW LANTAU
NL213	25/03/14	3	NW LANTAU
NL214	16/04/14	3	NW LANTAU
	02/05/14	1	NW LANTAU
NL220	05/03/14	3	NW LANTAU
NL224	16/04/14	3	NW LANTAU
	02/05/14	1	NW LANTAU
NL226	04/04/14	1	NW LANTAU
NL233	05/03/14	1	NW LANTAU
NL236	05/03/14	2	NW LANTAU
NL259	04/04/14	1	NW LANTAU
	16/04/14	4	NW LANTAU
NL260	19/05/14	2	NW LANTAU

ID#	DATE	STG#	AREA
NL261	05/03/14	3	NW LANTAU
	17/03/14	1	NW LANTAU
	16/04/14	4	NW LANTAU
	02/05/14	3	NW LANTAU
	19/05/14	1	NW LANTAU
NL262	05/03/14	3	NW LANTAU
	16/04/14	4	NW LANTAU
	19/05/14	1	NW LANTAU
NL269	19/05/14	2	NW LANTAU
NL272	05/03/14	2	NW LANTAU
	02/05/14	3	NW LANTAU
NL284	17/03/14	2	NW LANTAU
	19/05/14	1	NW LANTAU
NL286	16/04/14	4	NW LANTAU
NL287	16/04/14	1	NW LANTAU
	02/05/14	3	NW LANTAU
NL295	05/03/14	2	NW LANTAU
	19/05/14	2	NW LANTAU
	26/05/14	1	NW LANTAU
NL296	05/03/14	1	NW LANTAU
	05/03/14	2	NW LANTAU
	26/05/14	1	NW LANTAU
NL300	26/05/14	1	NW LANTAU
NL302	19/05/14	1	NW LANTAU
NL303	19/05/14	1	NW LANTAU
NL306	16/04/14	1	NW LANTAU
NL307	17/03/14	2	NW LANTAU
WL04	05/03/14	2	NW LANTAU
WL05	05/03/14	2	NW LANTAU
WL11	05/03/14	2	NW LANTAU
WL17	17/03/14	2	NW LANTAU
	16/04/14	1	NW LANTAU
WL199	05/03/14	2	NW LANTAU

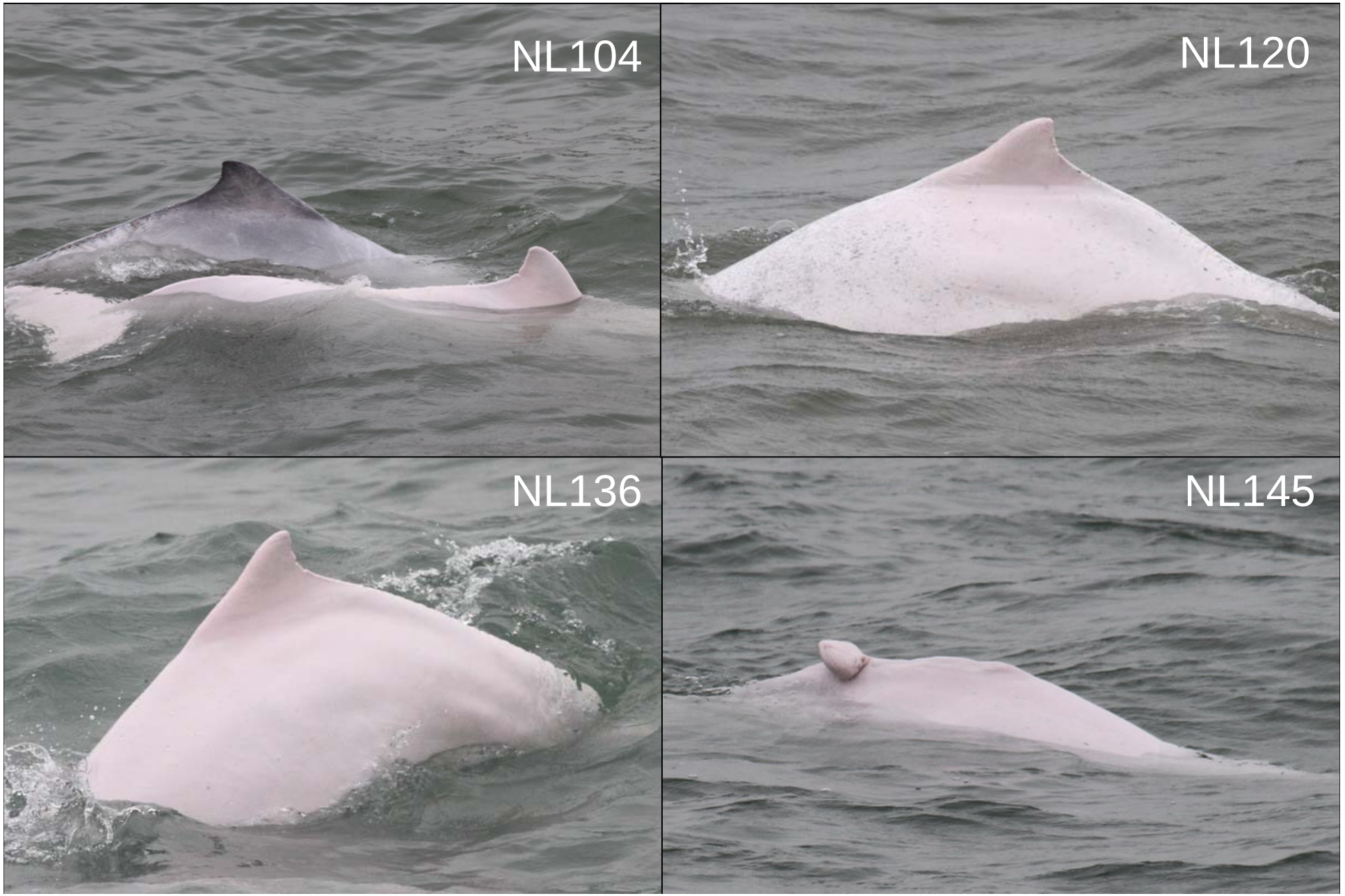
Appendix IV. Forty-five individual dolphins that were identified during March-May 2014 under HKLR03 impact phase monitoring surveys



Appendix IV. (cont'd)



Appendix IV. (cont'd)



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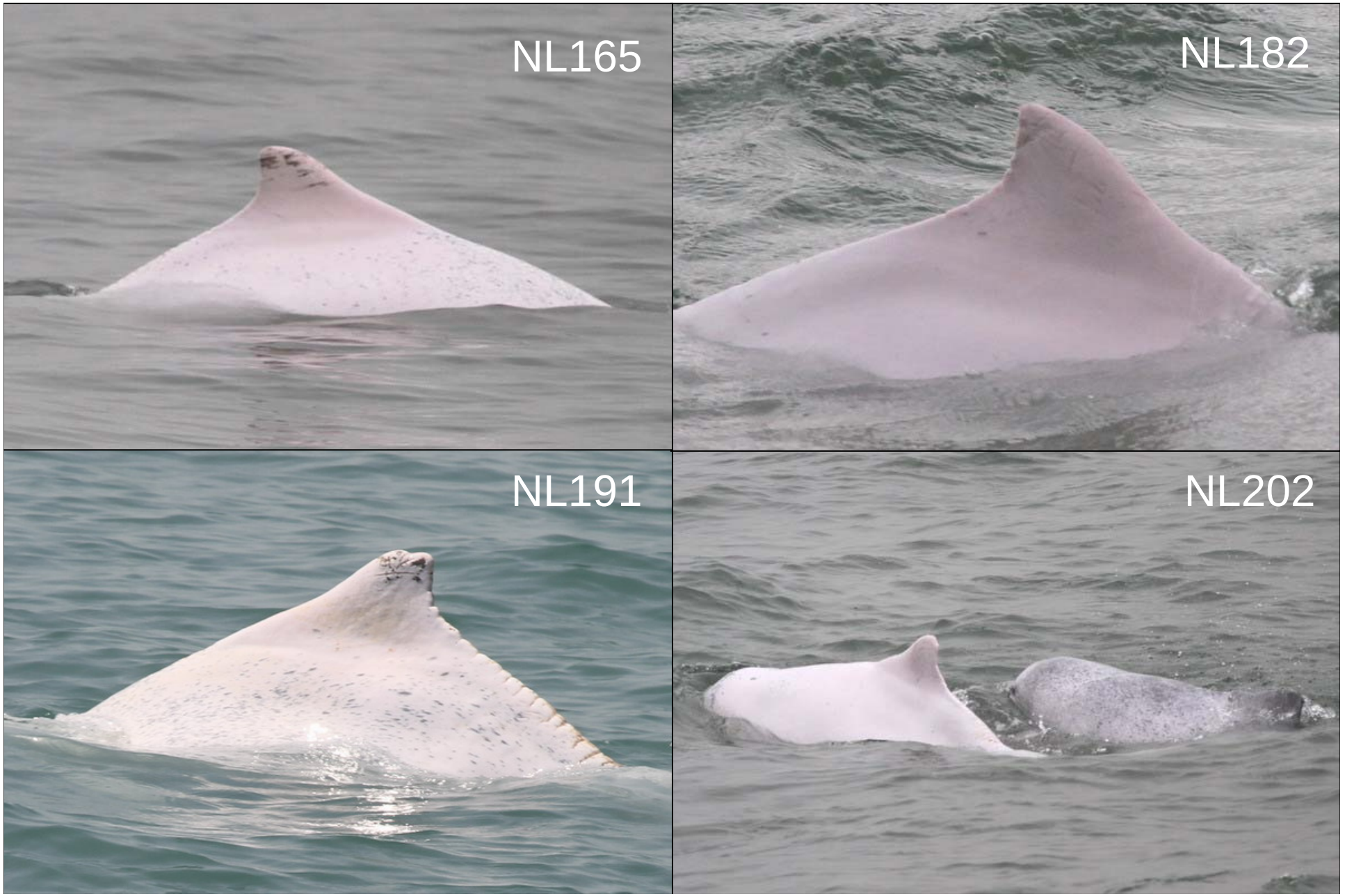
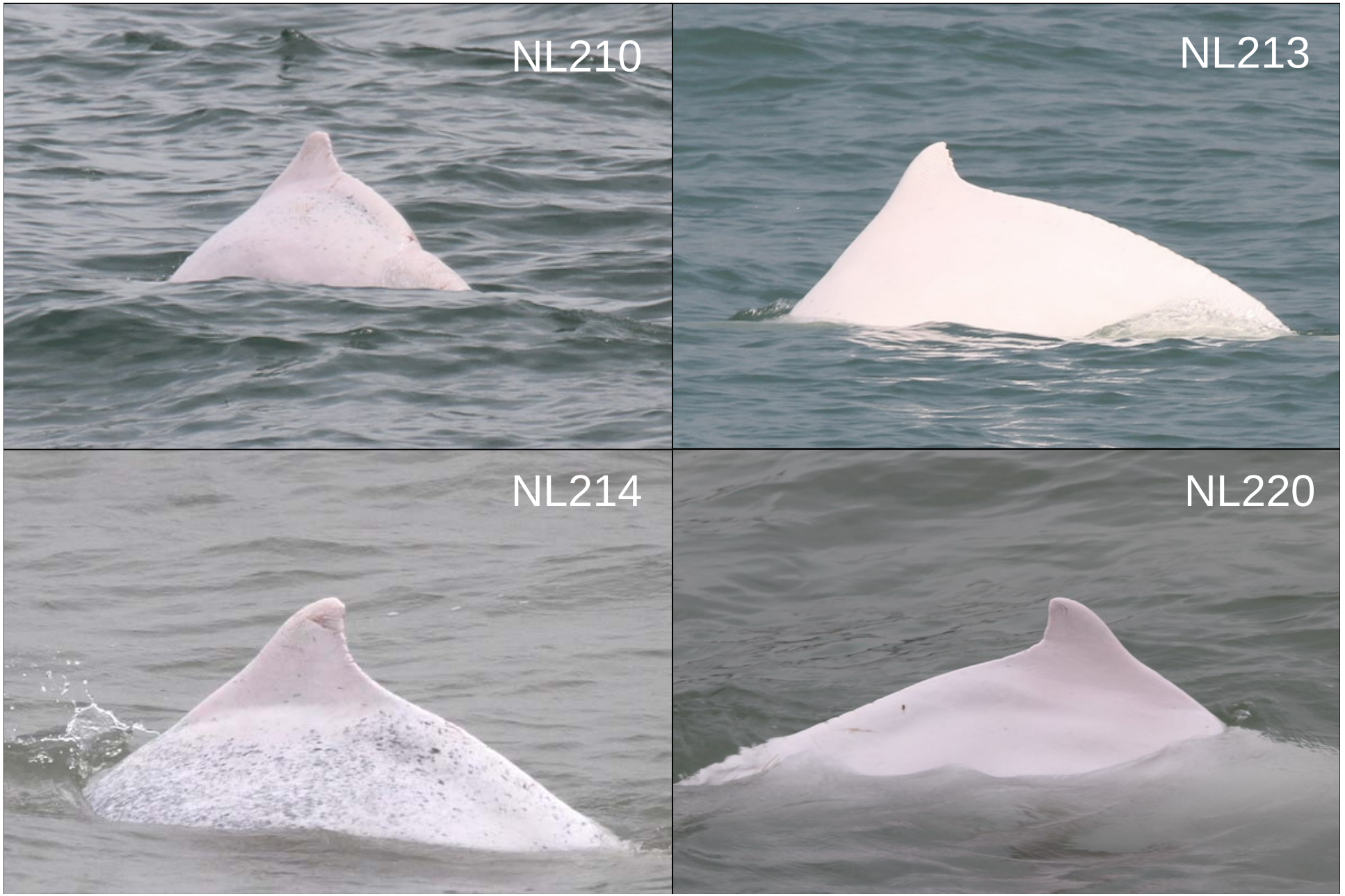
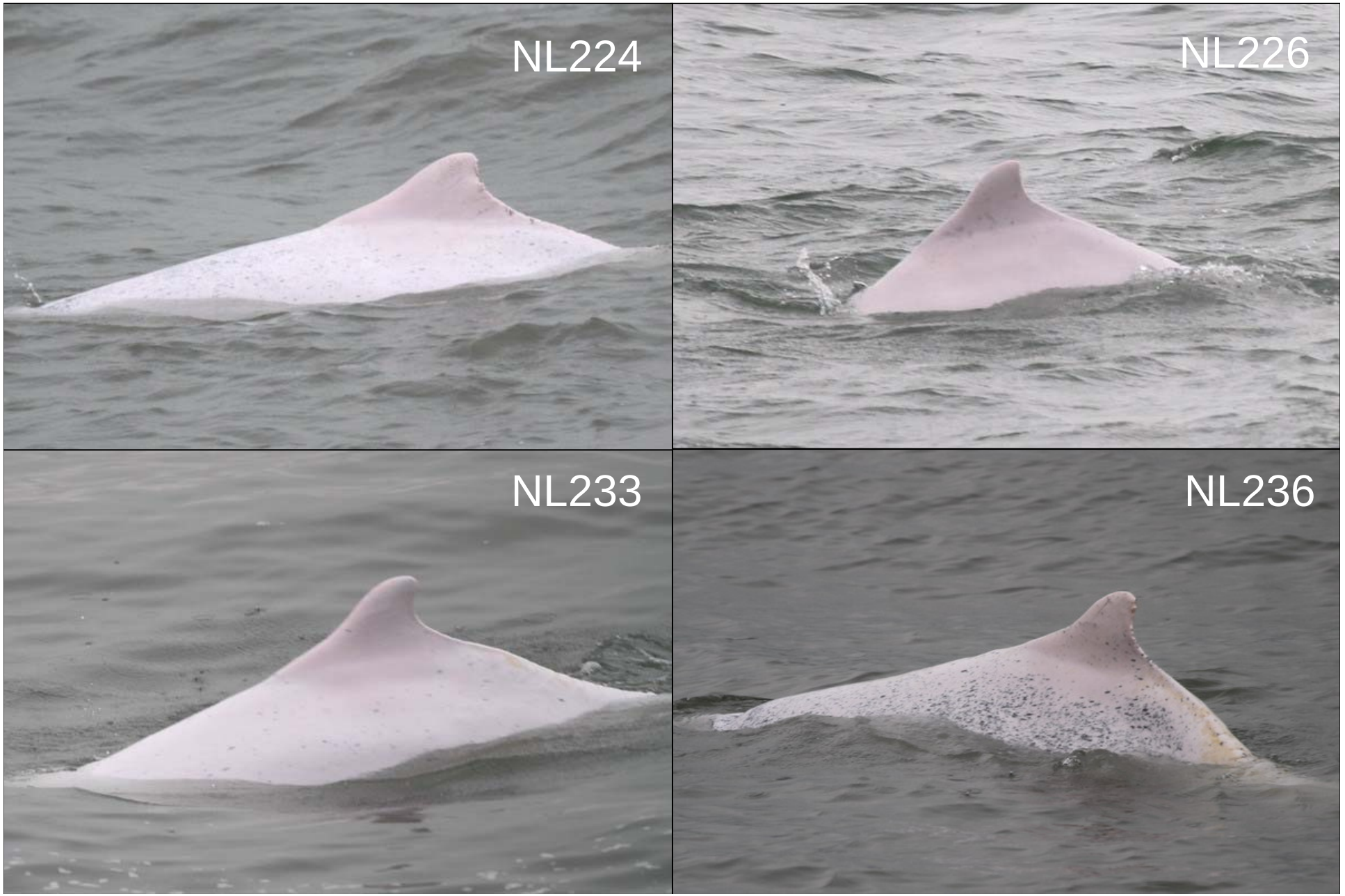


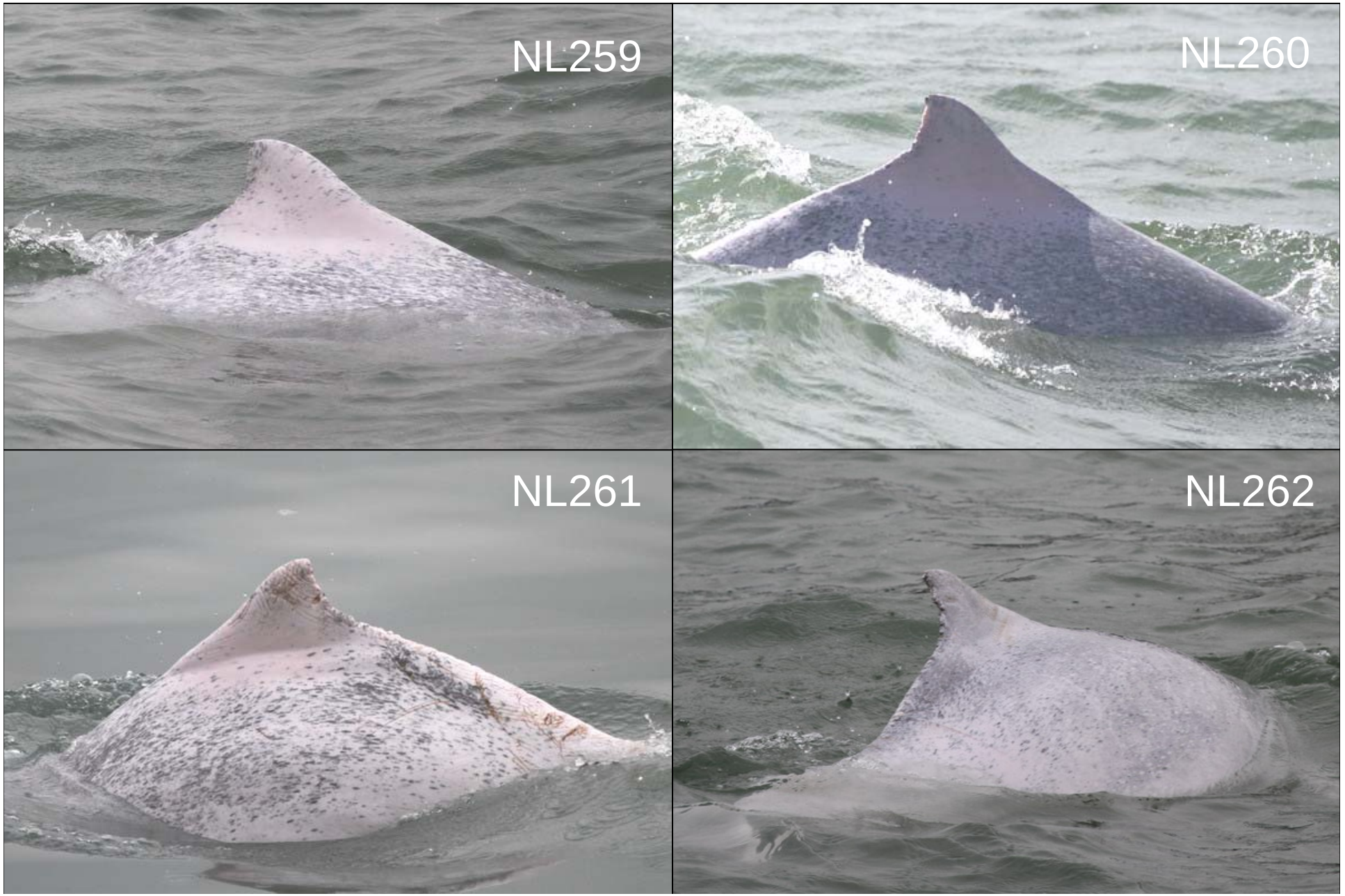
Appendix IV. (cont'd)



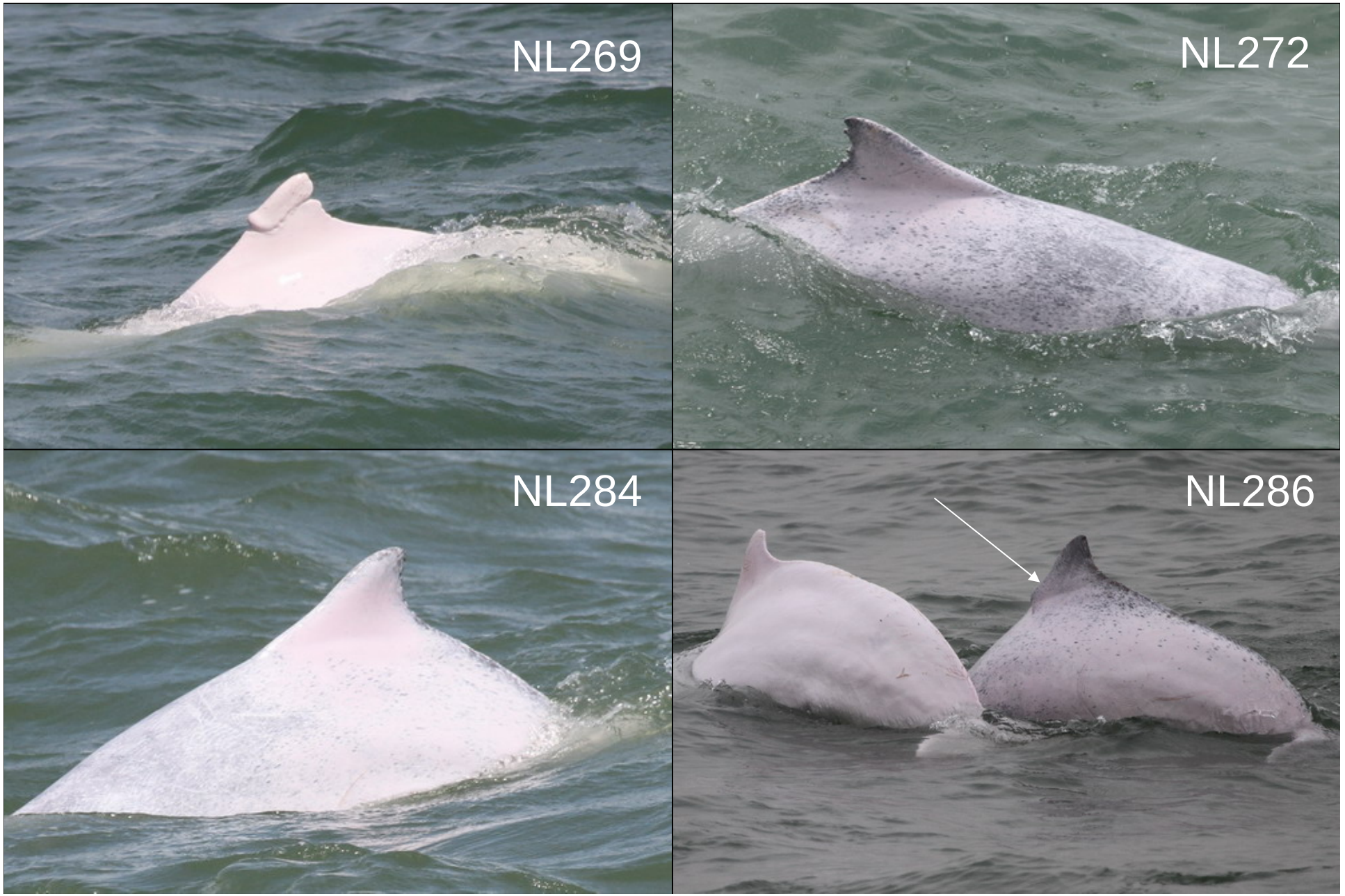
Appendix IV. (cont'd)



Appendix IV. (cont'd)



Appendix IV. (cont'd)



Appendix IV. (cont'd)

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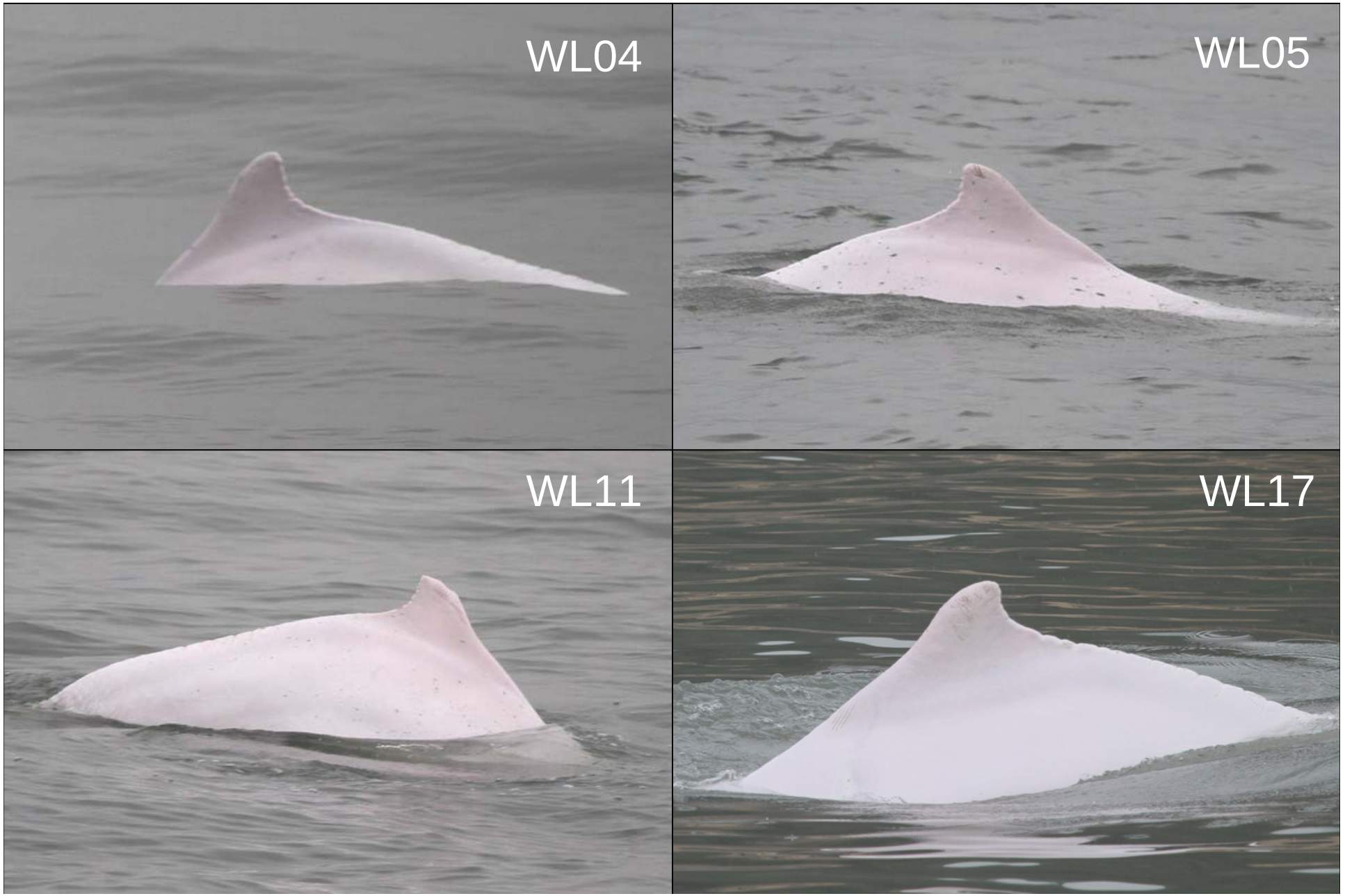
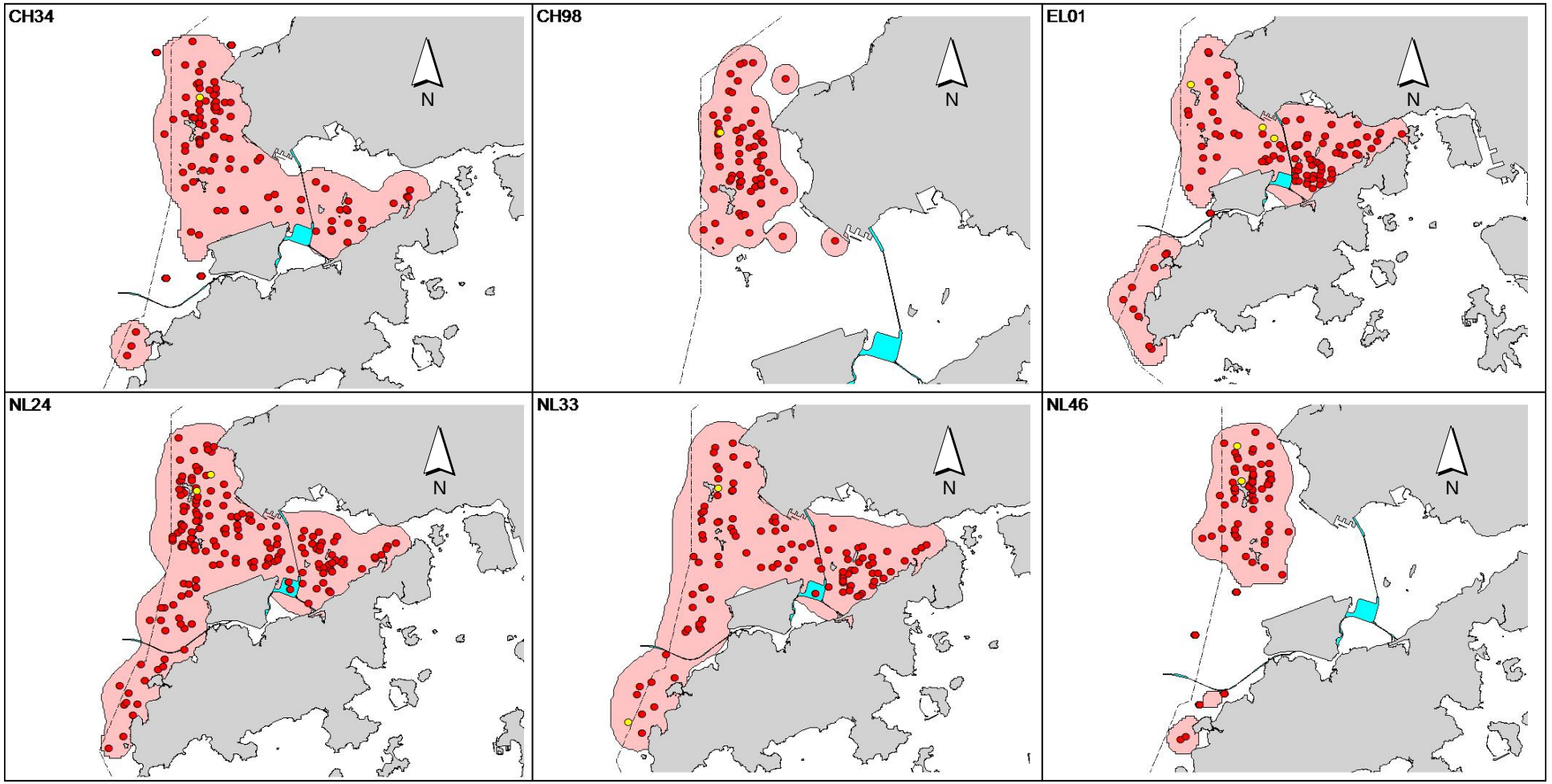
Appendix IV. (cont'd)

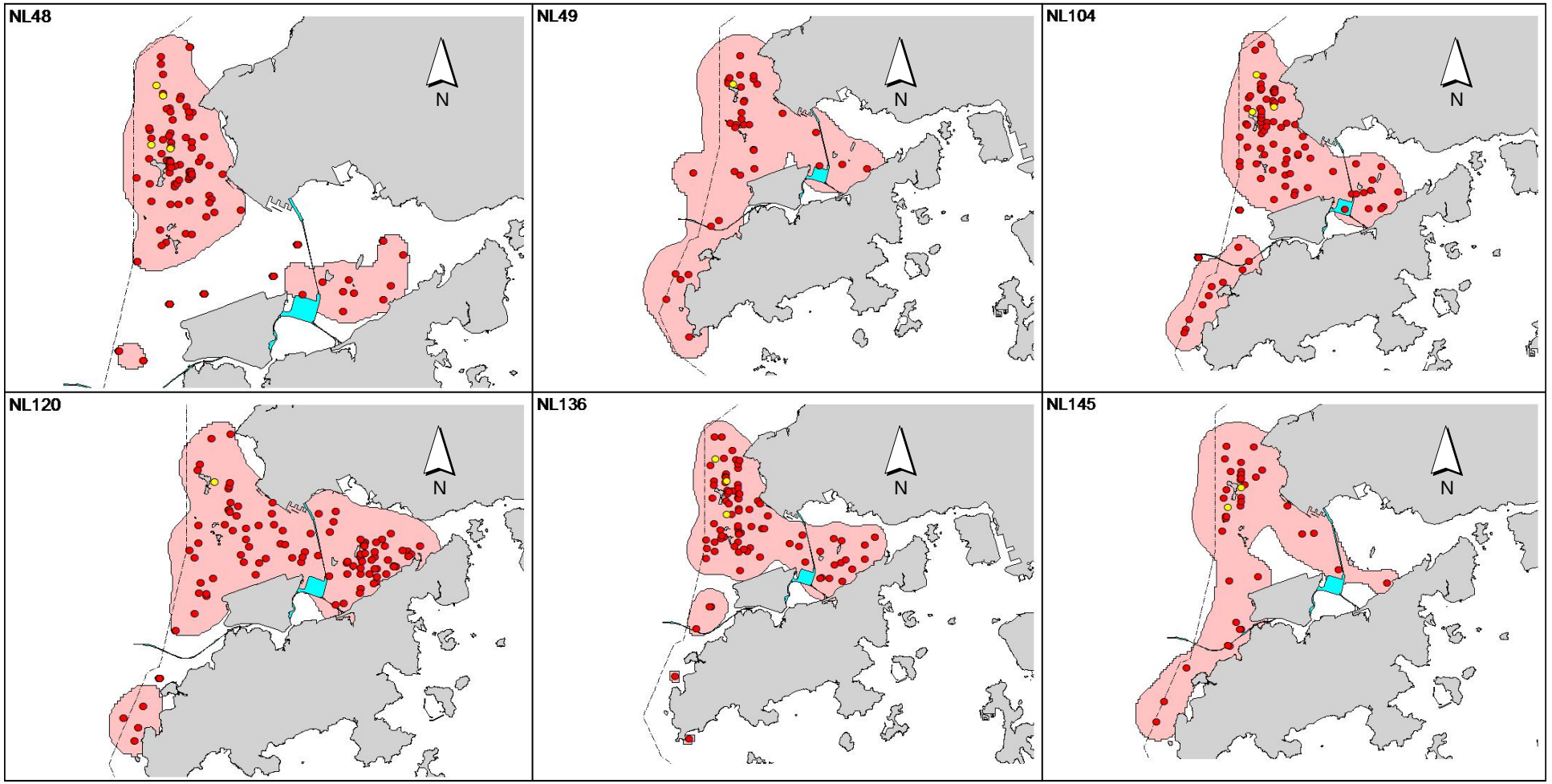


Appendix IV. (cont'd)

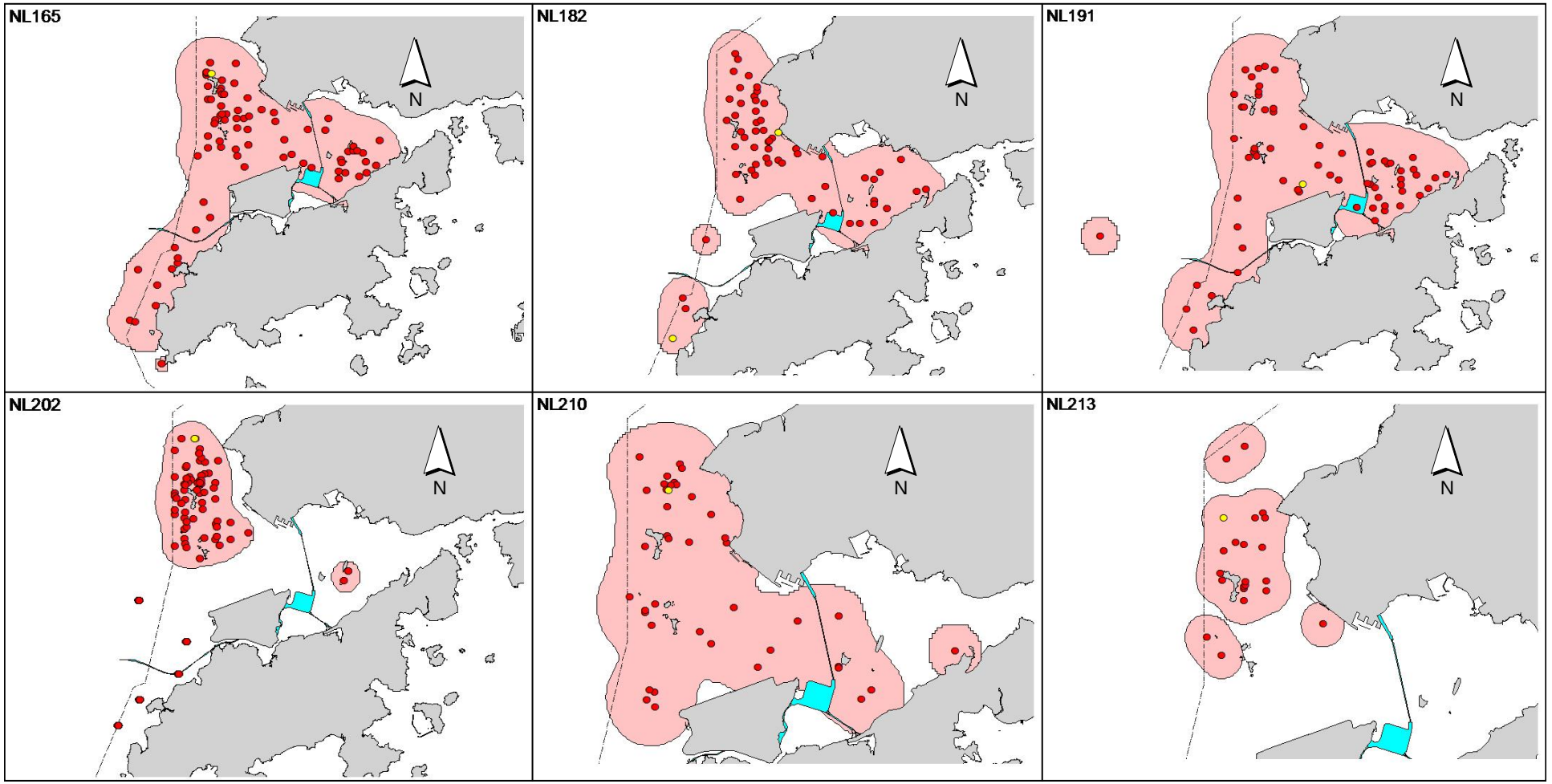
Appendix V. Ranging patterns (95% kernel ranges) of 45 individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicates sightings made in March-May 2014)



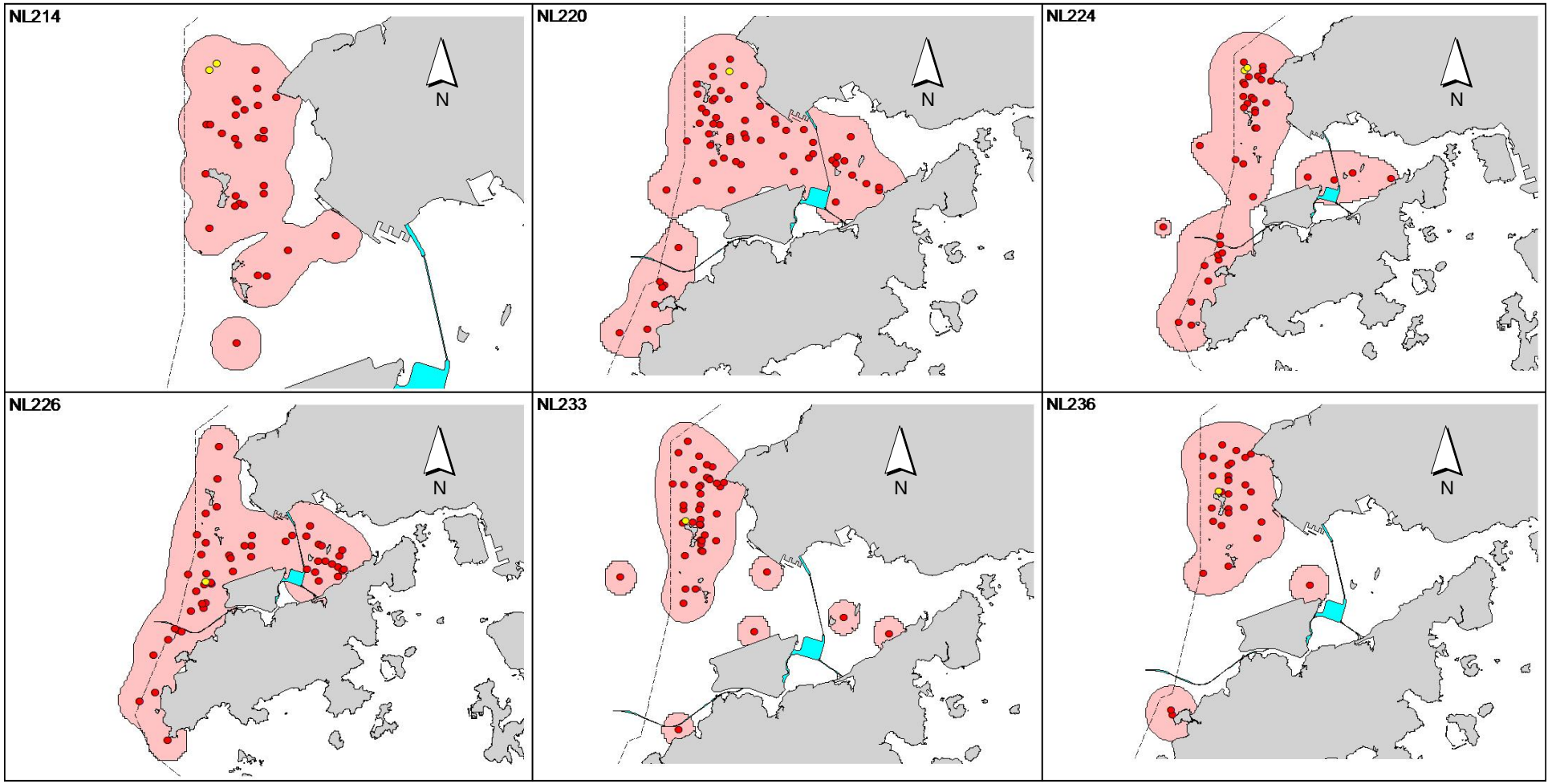
Appendix V. (cont'd)



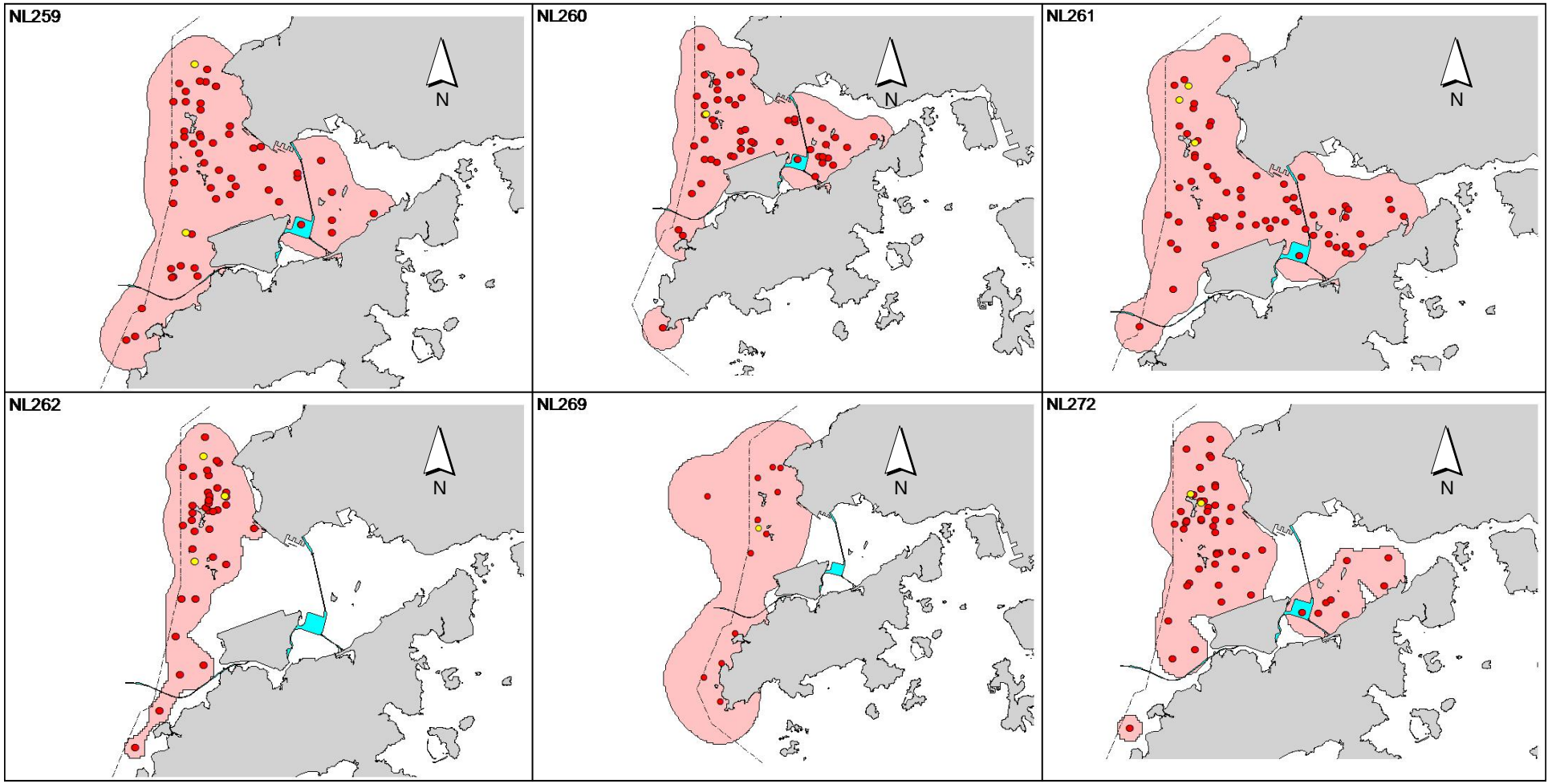
Appendix V. (cont'd)



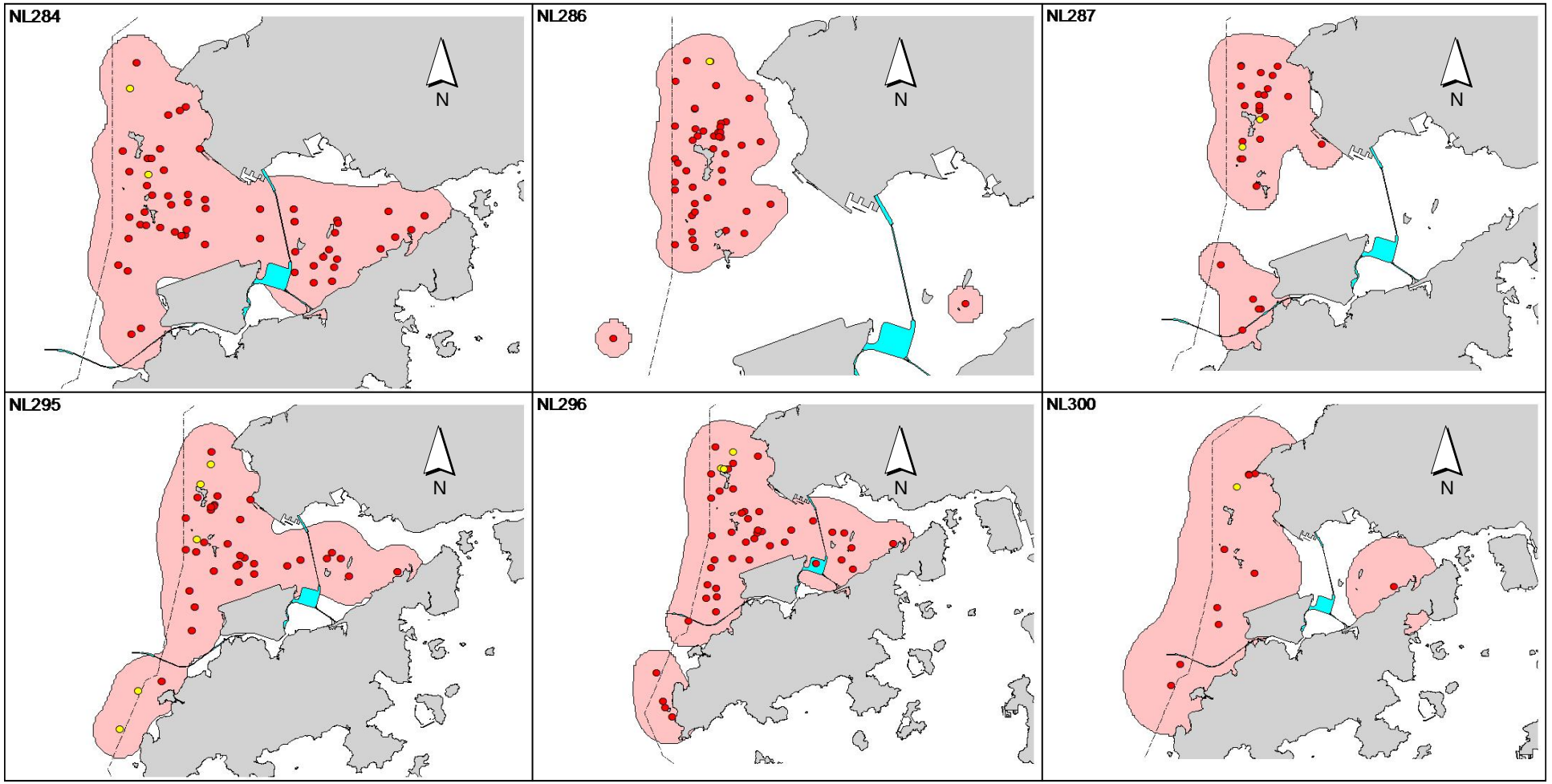
Appendix V. (cont'd)



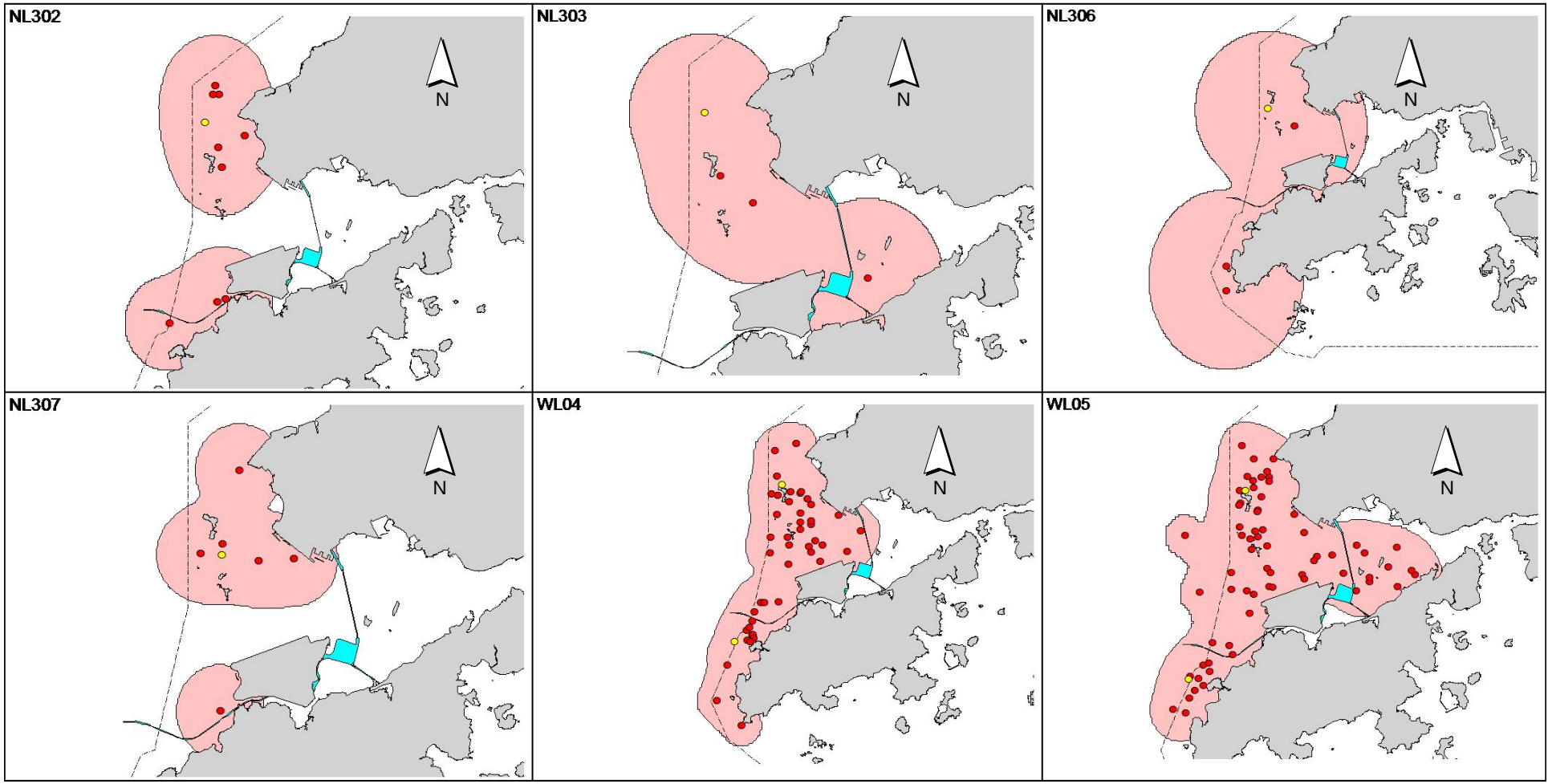
Appendix V. (cont'd)



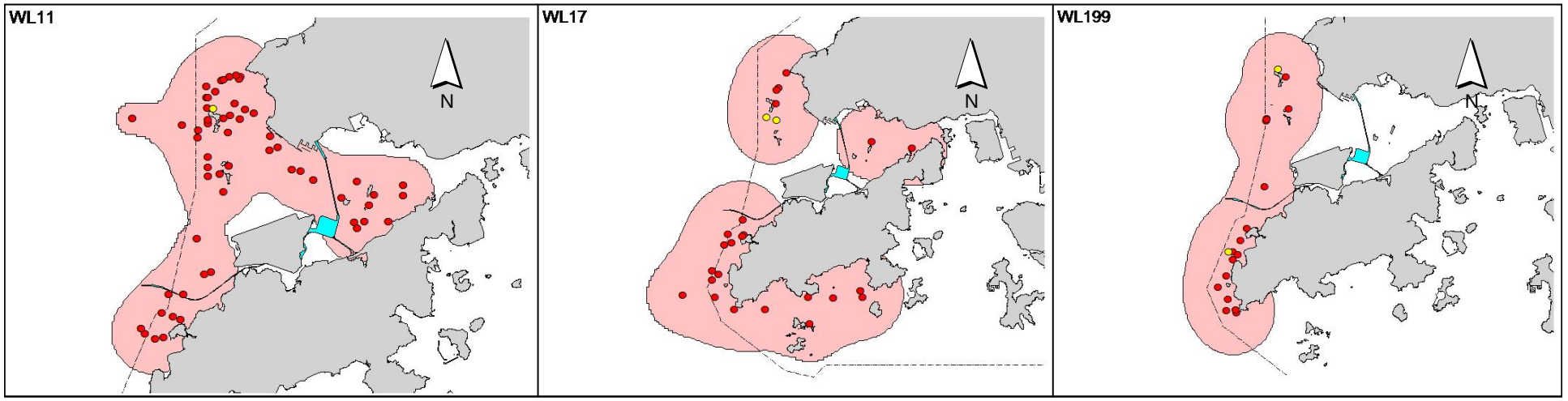
Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix I

Event and Action Plan

Event and Action Plan for Impact Air Monitoring

	Action			
	ET [a]	**IEC** [a]	**SOR** [a]	**Contractor(s)**
Action Level				
Exceedance recorded	1. Identify the source. 2. Repeat measurement to confirm finding. If two consecutive measurements exceed Action Level, the exceedance is then confirmed. 3. Inform the IEC and the SOR. 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Discuss with the IEC and the Contractor on remedial actions required. 7. If exceedance continues, arrange meeting with the IEC and the SOR. 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET. 2. Check the Contractor's working method. 3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR on the effectiveness of the proposed remedial measures. 5. Supervisor implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	1. Rectify any unacceptable practice 2. Amend working methods if appropriate 3. If the exceedance is confirmed to be Project related, submit proposals for remedial actions to IEC within 3 working days of notification 4. Implement the agreed proposals 5. Amend proposal if appropriate

	Action			
	ET [(a)]	**IEC [(a)]**	**SOR [(a)]**	**Contractor(s)**
Limit Level				
Exceedance recorded	1. Identify the source. 2. Repeat measurement to confirm finding. If two consecutive measurements exceed Limit Level, the exceedance is then confirmed. 3. Inform the IEC, the SOR, the DEP and the Contractor. 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 7. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken. 8. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results. 9. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR on the effectiveness of the proposed remedial measures. 5. Supervisor implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. If the exceedance is confirmed to be Project related after investigation, in consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. If the exceedance is confirmed to be Project related after investigation, submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate. 5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated.

Note: (a) ET – Environmental Team; IEC – Independent Environmental Checker; SOR – Supervising Officer's Representative

Event & Action Plan for Water Quality

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

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

Note: ET – Environmental Team, IEC – Independent Environmental Checker, SOR – Supervising Officer's Representative

Event / Action Plan for Impact Dolphin Monitoring

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

EVENT	ACTION*			
	ET	IEC	SOR	Contractor
	3. Identify source(s) of impact; 4. Inform the IEC, SOR and Contractor of findings; 5. Check monitoring data; 6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, 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.	Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise SOR the results and findings accordingly.	proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

Appendix J

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

Table J1 *Cumulative Statistics on Exceedances*

Monitoring Parameters	Action/Limit Level	Total No. recorded in this reporting quarter	Total No. recorded since project commencement
1-Hr TSP	Action	3	26
	Limit	0	2
24-Hr TSP	Action	0	5
	Limit	0	1
Water Quality	Action	1	6
	Limit	1	1
Impact Dolphin Monitoring	Action	2	3
	Limit	0	0

Table J2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Period (Mar 2014 to May 2014)	1	0	0
Total No. received since project commencement	1	0	0

Email message

Environmental Resources Management

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

To	ENVIRON - Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Impact Dolphin Monitoring
Date	24 July 2014

ERM

Dear Sir or Madam,

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

0212330_Mar2014/May2014_dolphin_STG&ANI_NEL
0212330_Mar2014/May2014_dolphin_STG&ANI_NWL

A total of two action level exceedances were recorded in the quarterly impact dolphin monitoring data between March 2014 and May 2014.

Regards,

Mr Jovy Tam
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK – NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Impact Dolphin Monitoring
Notification of Exceedance

Log No.	**0212330_Mar2014/May2014_dolphin_STG&ANI_NEL** **0212330_Mar2014/May2014_dolphin_STG&ANI_NWL** **[Total No. of Exceedances = 2]**	
Date	March 2014 to May 2014 (monitored) 08 July 2014 (results received by ERM)	
Monitoring Area	Northeast Lantau (NEL) and Northwest Lantau (NWL)	
Parameter(s) with Exceedance(s)	Quarterly encounter rate of dolphin sightings (STG) Quarterly encounter rate of total number of dolphins (ANI)	
Action Levels	North Lantau Social cluster	NEL: STG < 4.2 & ANI < 15.5 or NWL: STG < 6.9 & ANI < 31.3
Limit Levels		NEL: STG < 2.4 & ANI < 8.9 and NWL: STG < 3.9 & ANI < 17.9
Recorded Levels	NEL	STG = 0.0 & ANI = 0.0
	NWL	STG = 6.5 & ANI = 19.1
	Two Action Level Exceedances are recorded in the quarterly impact dolphin monitoring at NEL and NWL between March 2014 and May 2014. The exceedances were reported in the approved *Seventh Monthly EM&A Report* dated 13 June 2014.	
Statistical Analyses	Further to the review of the available and relevant dolphin monitoring data in the EM&A under this Contract, statistical analyses were conducted as follows: • A two-way ANOVA with repeated measures and unequal sample size was conducted using Period (2 levels: baseline vs impact – present quarter, March to May 2014) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the averages encounter rates between the baseline and present impact monitoring quarter. By setting $\alpha = 0.1$ as the significance level in the statistical tests, significant difference in STG ($p = 0.0337$) and in ANI ($p = 0.0535$) between Period were detected. • A two-way ANOVA with repeated measures and unequal sample size was conducted using Cumulative Period (2 levels: baseline vs impact – cumulative quarters*, October 2012 to February 2014) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the averages encounter rates between the baseline and present impact monitoring quarter. By setting $\alpha = 0.1$ as the significance level in the statistical tests, significant difference in STG ($p = 0.0080$) and in ANI ($p = 0.0032$) between Cumulative Period and Location were detected. *Note: The commencement date under *Contract No. HY/2012/08* is 1 November 2013.	
Works Undertaken (in the monitoring quarter)	In the quarter between March 2014 and May 2014, the major marine works under *Contract No. HY/2012/08* included: • Dredging works at Portions N-B and N-C • Vertical seawall and sloping seawall constructions at Portions N-B and N-C • Reclamation Filling at Portion N-A • Marine sheet piling for box culvert extension at Portion N-A	

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are considered not caused by the Project, in view of the following: • According to the long-term monitoring results of marine mammals collected by AFCD, the Chinese White Dolphin (CWD) *Sousa chinensis* in spring months (March to May) are usually ranging in waters in north Lantau and outer Deep Bay, but less frequently in NEL. • The *Monitoring of Marine Mammals in Hong Kong Waters (2013 – 14)* (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 project), which is likely a contributing factor for the decrease in dolphin abundances in NEL. • As per the findings from the EIA report (Section 8.11.9), the major influences on the CWD are marine traffics, dredging works and reclamation/filling works. The Contractor has implemented the marine traffic control as per the requirements in the EP-354/2009/B and the updated EM&A Manual. Likewise, dredging works were undertaken within the working rate described in the EP and the approved EIA Report by a closed grab dredger with silt curtains being deployed throughout the dredging period. Filling works were undertaken within 200m leading seawall throughout the filling period and the working rate described in the EP and the approved EIA Report were strictly followed. After reviewing of the daily dredging and filling records, all daily dredging and filling work rates in this quarter are under the maximum work rate described in the EP. During this quarter of dolphin monitoring, no adverse impact on CWD due to the activities under this Contract was observed. • According to the findings of the approved EIA report (Section 8.11.9), dredging and filling works are expected to increase the level of suspended solids (SS) in the vicinity waters of the project, which would lead to indirect loss of prey availability and increase in level of bioaccumulative contaminants in CWD. According to the findings in the quarterly water monitoring results between March and May 2014, the impact mean level of SS (Mid-ebb: 4.3 mg/L; Mid-flood: 4.5 mg/L) in this quarter is well below of the baseline mean level of SS (Mid-ebb: 10.0 mg/L; Mid-flood: 10.3 mg/L). This would imply that no unacceptable impact on SS levels was associated with the marine works under this Contract, and thus no indirect impacts on marine habitat quality due to change in water quality is observed in this Contract. • Seasonal variation in individual ranging pattern which has been well documented in the literatures (2) (3).
Actions Taken / To Be Taken	With reference to the site inspection records in this quarter, the respective marine ecological mitigation measures (including 250 m dolphin exclusion zone, passive acoustic monitoring, underwater acoustic decoupling plan and marine traffic control) have been implemented properly by the Contractor throughout the marine works period. No immediate additional action is considered necessary. The ET will monitor for future trends in exceedance(s).
Remarks	The results of impact water quality and impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved *Fifth* to *Seventh EM&A Monthly Reports*.

(1) Hung SKY (2014). Prepared for AFCD. Available from: http://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/con_mar_chi_chi.html

(2) Jefferson & Hung (2010) A review of the status of the Indo-Pacific Humpback Dolphin (*Sousa chinensis*) in Chinese Waters. Aquatic Mammals (30): 149 – 158.

(3) Chen et al., (2010) Distribution, abundance, and individual movements of Indo-Pacific humpback dolphins (*Sousa chinensis*) in the Pearl River Estuary, China. Mammalia (74): 117 – 125.

Appendix K

Waste Flow Table

Name of Department: HyD **Contract No. / Works Order No.:** HY/2012/08

Monthly Summary Waste Flow Table for May 2014 [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
2013 Sub-total	3.718	0.000	0.000	0.000	3.718
Jan	9.012	0.000	0.000	0.000	9.012
Feb	0.000	0.000	0.000	0.000	0.000
Mar	0.105	0.000	0.000	0.000	0.105
Apr	0.022	0.000	0.000	0.000	0.022
May	1.016	0.000	0.000	0.000	1.016
Jun					
Sub-total					
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	13.873	0.000	0.000	0.000	13.873

Month	**Actual Quantities of <u>Inert</u> Construction Waste Generated Monthly**							
	Imported Fill to WA 23 & Reclamation Area (Rockfill 400)	Imported Fill to WA 23 & Reclamation Area (Rockfill 200)	Imported Fill to WA 23 & Reclamation Area (Rockfill Type A)	Imported Fill to Reclamation Area (Public Fill) (by Barge)	Imported Fill to Reclamation Area (Public Fill) (by Truck)	Imported Fill to Barging Point	Marine Disposal (Cat. L)	Marine Disposal (Cat. M_P &M_F)
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 m^3)	(in '000 m^3)
2013 Sub-total	211.541	2.508	19.460	0.000	0.000	45.472	61.600	18.200
Jan	177.300	4.050	8.544	0.000	0.000	124.412	34.000	12.500
Feb	143.891	27.825	5.371	0.000	0.000	81.296	18.500	24.500
Mar	257.304	53.388	27.958	113.789	0.000	63.961	37.300	40.450
Apr	198.245	10.186	41.702	191.094	0.000	26.640	28.600	15.400
May	236.816	4.612	65.308	150.749	43.718	15.165	18.700	29.150
Jun								
Sub-total								
Jul								
Aug								
Sep								
Oct								
Nov								
Dec								
Total	1225.097	102.569	168.343	455.632	43.718	356.946	198.700	140.200

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
2013 Sub-total	0.000	0.000	0.380	0.380	0.000	0.000	0.000	0.000	0.172
Jan	0.000	0.000	0.130	0.130	0.000	0.000	0.000	0.000	0.045
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.020	0.028
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
Apr	0.000	0.000	0.160	0.160	0.000	0.000	0.000	0.000	0.026
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042
Jun									
Sub-total									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Total	0.000	0.000	0.670	0.670	0.000	0.000	0.020	0.020	0.349

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*							
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill	Imported Fill	Marine Disposal (Cat. L)	Marine Disposal (Cat. M)
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 m^3)	(in '000 m^3)
5.000	0.000	0.000	0.000	5.000	180.000	5.000	40.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
0.000	0.050	0.000	0.000	0.100

Notes:
(1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
(2) The waste flow table shall also include C&D materials to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m^3. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).