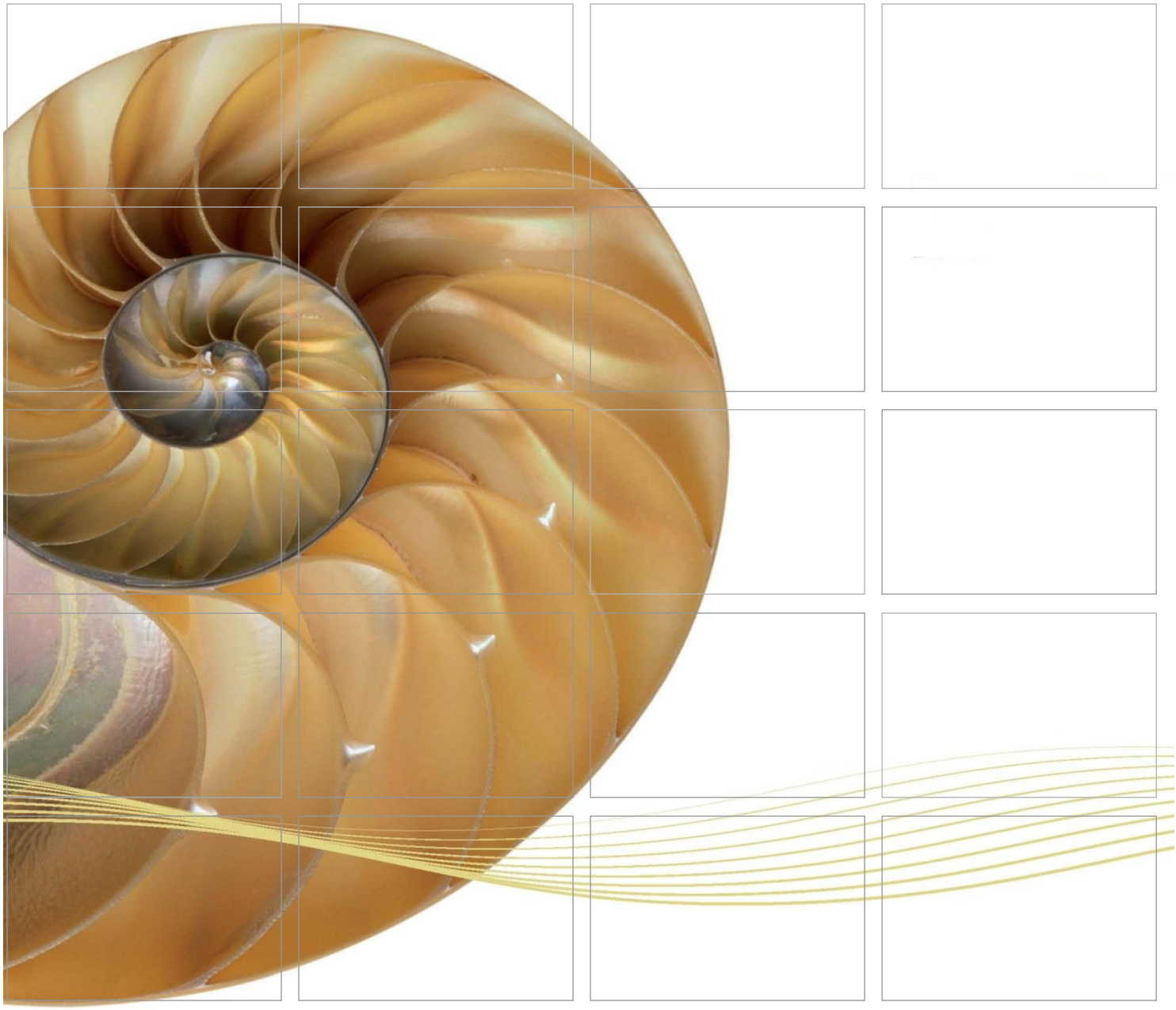
Report



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

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

01 April 2016

Environmental Resources Management
16/F, Berkshire House
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RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_4038L.16 05 April 2016

AECOM By Fax (2293 6300) and By Post
Supervising Officer Representative's Office
No.8 Mong Fat Street, Tuen Mun,
New Territories, Hong Kong

Attention: Messrs. Edwin Ching / Andy Westmoreland

Dear Sirs,

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
Eighth Quarterly EM&A Report (Sep. – Nov. 2015) (EP-354/2009/D)

Reference is made to the Quarterly Environmental Monitoring and Audit (EM&A) Report (Sep. - Nov. 2015) (ET's ref.: "0212330_8th Quarterly EM&A_20160329.doc" dated 1 April 2016) certified by the ET Leader and provided to us via e-mail on 1 April 2016.

Please be informed that we have no adverse comments on the captioned quarterly EM&A report.

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

Yours sincerely,

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

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

Internal: DY, YH, CL, ENPO Site

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Ramboll Environ Hong Kong Limited 英環香港有限公司
Room 2403, 24/F., Jubilee Centre, 18 Fenwick Street, Wanchai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.Ramboll-Environ.com

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

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

Document Code: 0212330_8th Quarterly EM&A_20160329.doc

Environmental Resources Management

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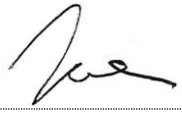
Client: DBJV	Project No: 0212330
Summary: This document presents the Eighth Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.	Date: 01 April 2016 Approved by:  *Mr Craig Reid* *Partner* Certified by:  *Mr Jovy Tam* *ET Leader*

Revision	Description	By	Checked	Approved	Date
	8th Quarterly EM&A Report	VAR	JT	CAR	01/04/16

Distribution

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TABLE OF CONTENTS

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*. Ramboll Environ Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO). Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B*, *EP-354/2009/C and EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

The 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 Eighth Quarterly EM&A report presenting the EM&A works carried out during the period from 1 September 2015 to 30 November 2015 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:

Land-based Works

- Surcharge Removal at Works Area – Portion N-C;
- Box Culvert Extension at Works Area – Portion N-A;
- Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C;
- Installation of Tower Crane at Works Area – Portion N-C;
- TBM Tunnel Works at Works Area – Portions N-B & N-C; and
- Modification and Maintenance Works for Slurry Treatment Plant at Works Area – Portion N-C.

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

24-hour TSP Monitoring	30 sessions
1-hour TSP Monitoring	30 sessions
Impact Dolphin Monitoring	6 sessions
Joint Environmental Site Inspection	13 sessions

Implementation of Marine Mammal Exclusion Zone

There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period. Thus, Passive Acoustic Monitoring (PAM) and the day-time monitoring of Dolphin Exclusion Zone (DEZ) by dolphin observers were not in effect during the reporting period.

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

No exceedances were recorded from the air quality monitoring in this reporting period.

Dolphin Monitoring

Whilst two action Level exceedances were observed for the quarterly dolphin monitoring data between September 2015 and November 2015, 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.

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.

No environmental complaint was received in this reporting period.

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:

Land-based works

- Box Culvert Extension at Works Area – Portion N-A;
- Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C; and
- TBM Tunnel Works at Works Area – Portion N-C.

Future Key Issues

As informed by the Contractor, Phase I Reclamation works for the Northern Landfall was substantially completed in December 2014, a proposal letter was sent to EPD on 21 May 2015 to seek approval for the temporary suspension of Water Quality Monitoring. Subsequently, a letter from EPD on 5 June 2015 stated that they have no strong objection to the temporary suspension of the water quality monitoring. Water Quality Monitoring was suspended from 6 June 2015 effectively and will resume when Phase II Reclamation commences in the fourth quarter of 2016 tentatively.

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are expected to be mainly associated with waste management issues. Although there are no dredging, reclamation and marine works in the coming quarter, other potential environmental impacts such as dust and marine ecology should also be addressed.

1 INTRODUCTION

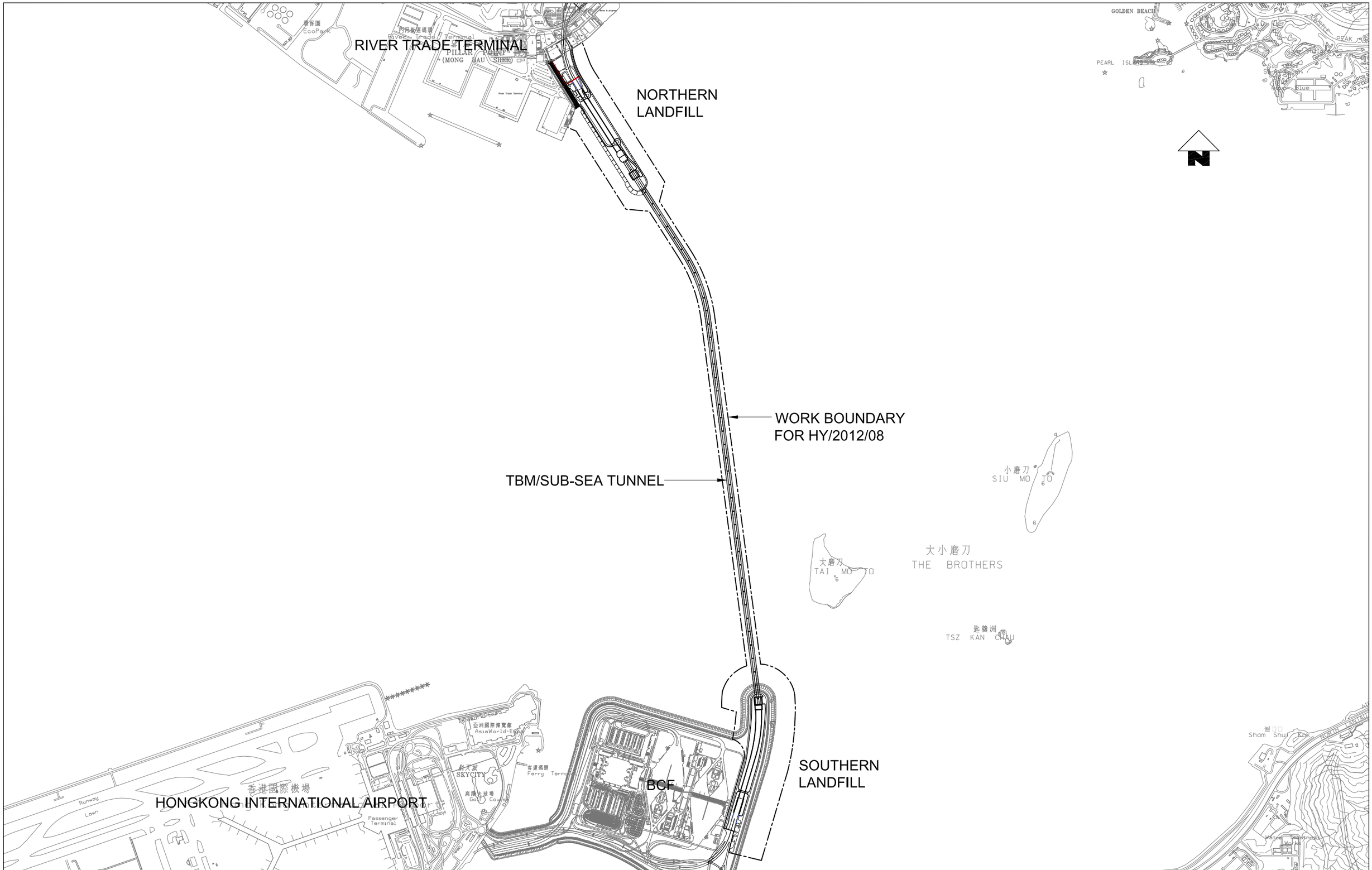
1.1 BACKGROUND

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

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

Under *Contract No. HY/2012/08*, 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. Ramboll 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*.



Rev.	Description	Date	Checked
A	FIRST ISSUE	11SEP13	PKV

Designed By: PKV
Drawn By: DAI
Approved By: SPo PP
Date: 11SEP2013

Main Contractor: Dragages - Bouygues Joint Venture 實嘉 - 布依格聯營

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**

Drawing no.: TMCLKL8-DBJ-GEN-DWG-00174
Scale: 1:25000 @ A3
CADD Ref.: TMCLKL8-DBJ-GEN-DWG-00174-DFT-A
Issue Status: DFT (DRAFT)
Revision: A

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.

1.2 SCOPE OF REPORT

This is the Eighth 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 September 2015 to 30 November 2015.

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 (Ramboll Environ Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3547 2133	3465 2899
	IEC	F. C. Tsang	3547 2134	3465 2899
Contractor (Dragages – Bouygues Joint Venture)	Environmental Manager	C.F. Kwong	2293 7322	2293 7499
	Environmental Officer	Bryan Lee	2293 7323	2293 7499
	24-hour complaint hotline	Rachel Lam	2293 7330	
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*.

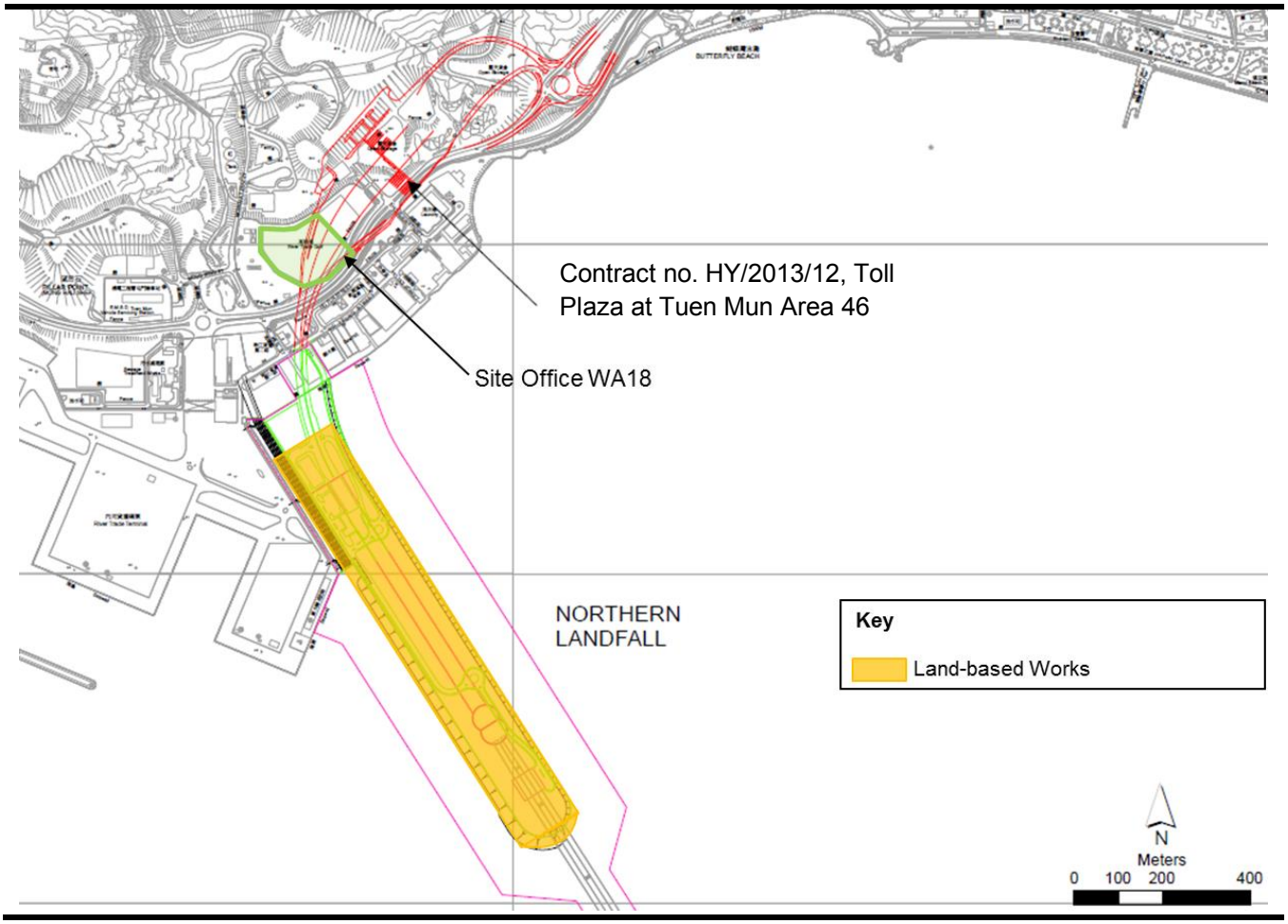
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.3*.

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
Land-based Works
Portion N-A
• Box Culvert Extension
Portion N-B
• TBM Tunnel Works
Portion N-C
• Surcharge Removal
• Construction of capping beam and base slab for Ventilation Shaft
• Installation of Tower Crane
• Modification and Maintenance Works for Slurry Treatment Plant
• TBM Tunnel Works

Figure 1.2 Locations of Construction Activities – September 2015 to November 2015



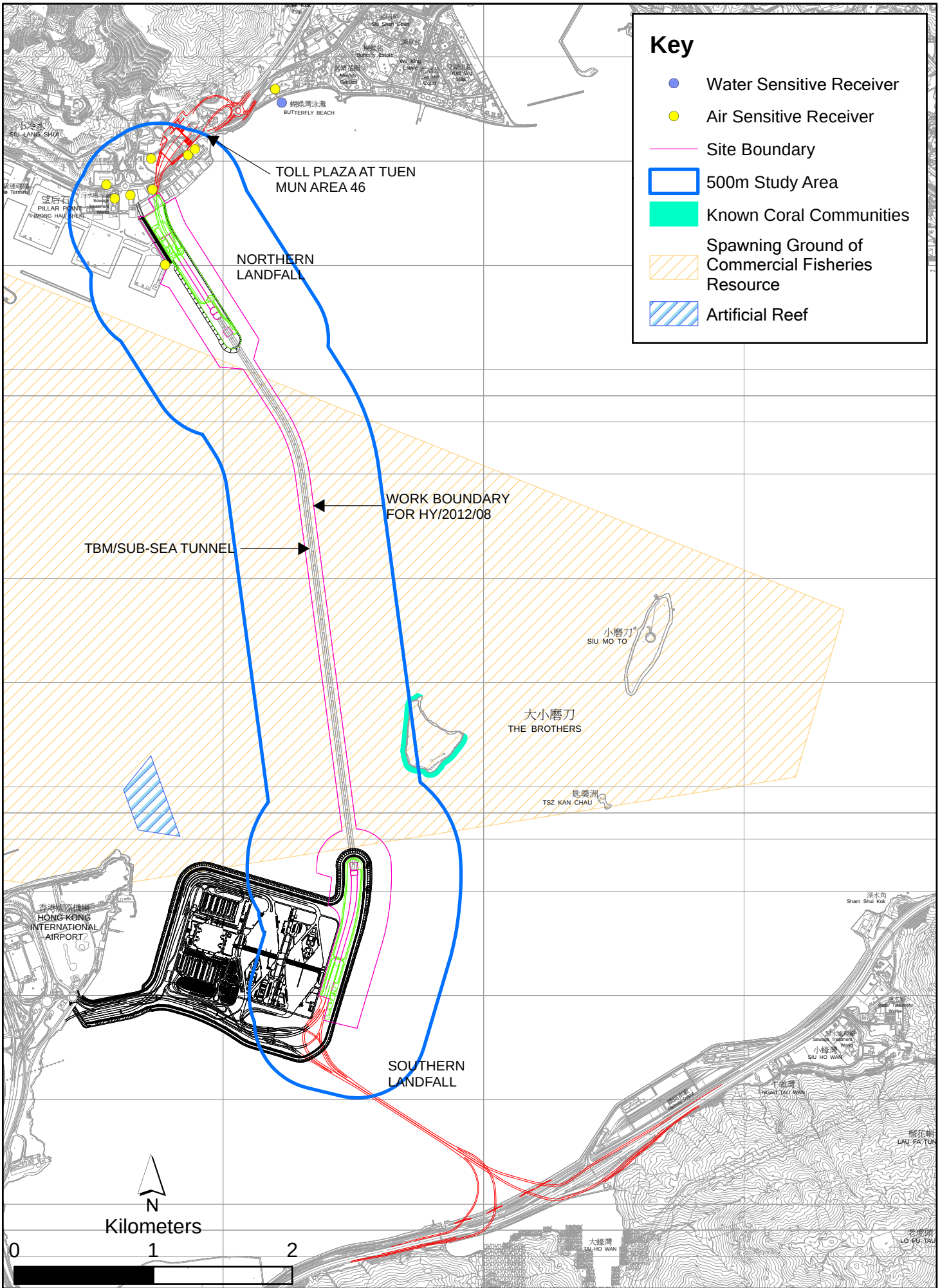


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

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Date: 15/4/2014

Environmental Resources Management

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/D*, 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. 1-hr and 24-hr TSP monitoring frequency was increased to three times per day every three days and daily every three days respectively as excavation works for launching shaft commenced on 24 October 2014.

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.

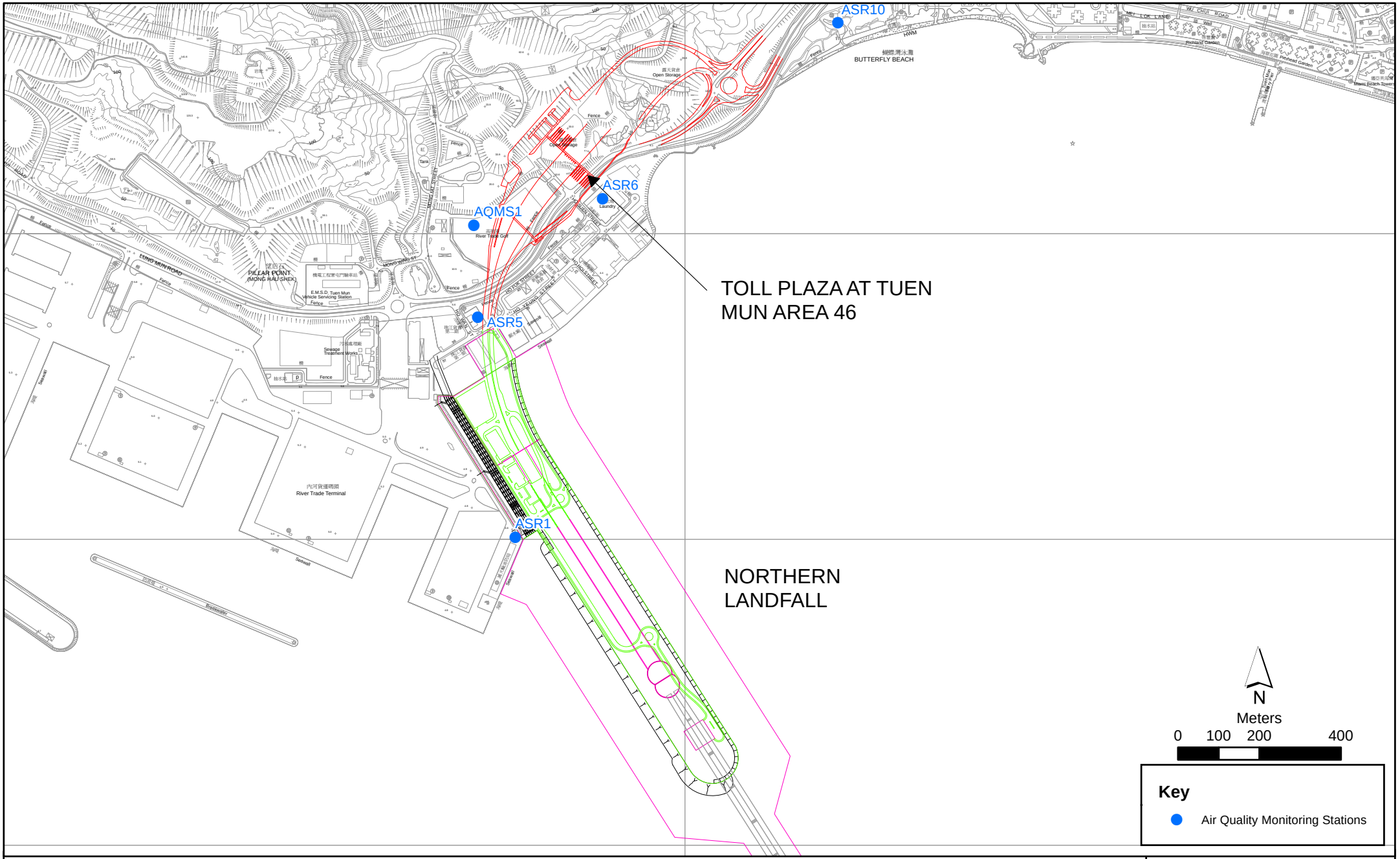

Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

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Date: 21/2/2014

Environmental Resources Management

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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	TSP monitoring • 1-hour Total Suspended Particulates (1-hour TSP, μg/m³), 3 times in every 6 days • 24-hour Total Suspended Particulates (24-hour TSP, μg/m³), daily for 24-hour in every 6 days Enhanced TSP monitoring (commenced on 24 October 2014) • 1-hour Total Suspended Particulates (1-hour TSP, μg/m³), 3 times in every 3 days • 24-hour Total Suspended Particulates (24-hour TSP, μg/m³), daily for 24-hour in every 3 days	2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 September 2015; 2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 October 2015; 1, 4, 7, 10, 13, 16, 19, 22, 25 and 28 November 2015.
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	Davis (Model: Weather Wizard III (S/N: WE90911A30)
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 H*.

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 *Twenty-third* to *Twenty-fifth 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)
September 2015 to November 2015	ASR 1	131	49 - 283	331	500
	ASR 5	143	52 - 293	340	500
	AQMS1	98	49 - 170	335	500
	ASR6	112	44 - 279	338	500
	ASR10	77	42 - 152	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)
September 2015 to November 2015	ASR 1	82	48 - 137	213	260
	ASR 5	87	45 - 124	238	260
	AQMS1	69	48 - 89	213	260
	ASR6	73	43 - 98	238	260
	ASR10	60	45 - 84	214	260

No Action or Limit Level exceedances for 1-hr TSP were recorded. No Action 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 2.7*.

2.2 WATER QUALITY MONITORING

As informed by the Contractor, Phase I Reclamation works for the Northern Landfall was substantially completed in December 2014, a proposal letter was sent to EPD on 21 May 2015 to seek approval for the temporary suspension of Water Quality Monitoring. Subsequently, a letter from EPD on 5 June 2015 stated that they have no strong objection to the temporary suspension of the water quality monitoring. Water Quality Monitoring was suspended from 6 June 2015 effectively and will resume when Phase II Reclamation commences in the fourth quarter of 2016 tentatively.

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 2.5 summarizes the equipment used for the impact dolphin monitoring.

Table 2.5 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 2.2*. The co-ordinates of all transect lines are shown in *Table 2.6* below.

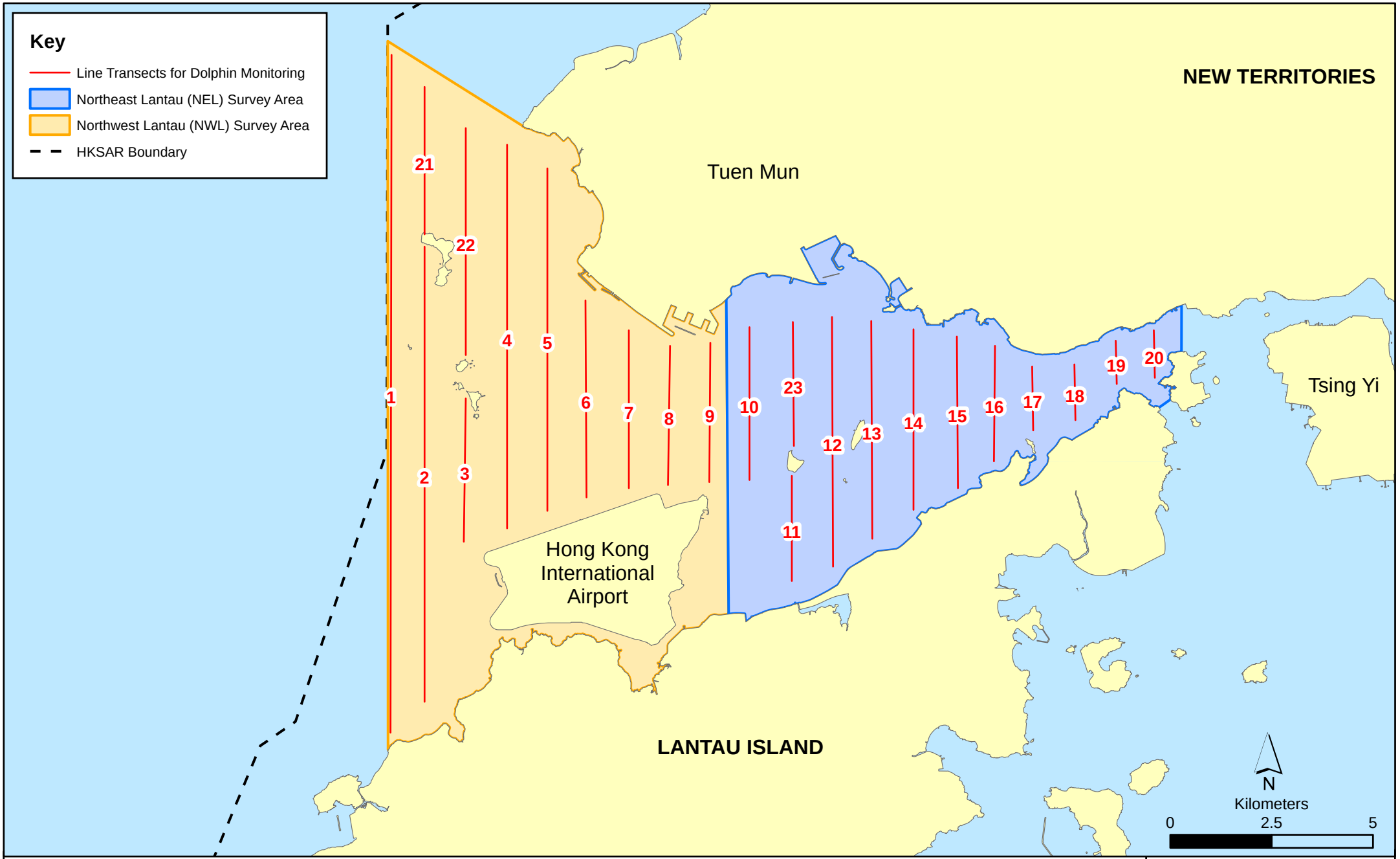

Figure 2.2

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 2.6 Impact Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805475	815913	14	Start Point	817537	820220
2	End Point	805477	826654	14	End Point	817537	824613
3	Start Point	806464	819435	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	819771	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	820220	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	820466	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	820880	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	820872	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807				
12	End Point	815542	824882				

2.3.5 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 H*.

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 902.25 km of survey effort was conducted, with 95.0% 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, 346.64 km and 555.61 km of survey effort were conducted from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 656.41 km and 245.84 km, respectively. The survey efforts are summarized in *Appendix G*.

A total of 18 groups of 95 Chinese White Dolphins sightings were recorded during the six sets of surveys in this reporting quarter. All dolphin sightings were made during on-effort search, and all except one dolphin sightings were made on primary lines. During this reporting quarter, all dolphin groups were sighted in NWL, while none was sighted at all in NEL.

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 2.7* and *2.8*.

Table 2.7 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: Sep 2nd/11th	0.0	0.0
	Set 2: Sep 17th/29th	0.0	0.0
	Set 3: Oct 6nd/13th	0.0	0.0
	Set 4: Oct 19nd /26th	0.0	0.0
	Set 5: Nov 2nd/6th	0.0	0.0
	Set 6: Nov 10th/16th	0.0	0.0
NWL	Set 1: Sep 2nd/11th	5.47	51.95
	Set 2: Sep 17th/29th	4.01	21.38
	Set 3: Oct 6nd/13th	5.86	24.91
	Set 4: Oct 19nd /26th	2.73	10.94
	Set 5: Nov 2nd/6th	3.84	15.38
	Set 6: Nov 10th/16th	1.73	1.73

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 2.8 Quarterly Average Encounter Rates

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	September 2015 – November 2015	**September 2011 – November 2011**	**September 2015 – November 2015**	**September 2011 – November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	3.94 ± 1.57	9.85 ± 5.85	21.05 ± 17.19	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 - 12 individuals per group in North Lantau region during September to November 2015. 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 2.9*.

Table 2.9 Average Dolphin Group Size

	Average Dolphin Group Size	
	September – November 2015	**September 2011 – November 2011**
Overall	5.28 ± 3.54 (n = 18)	3.72 ± 3.13 (n = 66)
Northeast Lantau	N/A (n = 0)	3.18 ± 2.16 (n = 17)
Northwest Lantau	5.28 ± 3.54 (n = 18)	3.92 ± 3.40 (n = 49)

Whilst two action level exceedances were observed for the quarterly dolphin monitoring data between September 2015 and November 2015, 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 *Implementation of Marine Mammal Exclusion Zone*

There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period. Thus, Passive Acoustic Monitoring (PAM) and the day-time monitoring of Dolphin Exclusion Zone (DEZ) by dolphin observers were not in effect during the reporting period.

2.4 *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 2, 9, 16 23 and 30 September 2015; 9, 14, 20 and 28 October 2015; 4, 11, 18 and 25 November 2015.

Key observations during the site inspections in this reporting period are summarized in *Table 2.10*.

Table 2.10 Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Period

Inspection Date	Environmental Observations	Recommendations/ Remarks
2 September 2015	Works Area - Portion N-A • Excess muddy water should be cleared and bunds should be provided to avoid runoff. • Noise cover should be provided during ground breaking works and water spraying should be applied during hydraulic breaking operation. • Chemical labels should be provided for the chemical container. Works Area - Portion N-B • Excess muddy materials should be cleared. Works Area - Portion N-C • Chemical containers should be stored in chemical storage area. • Excess muddy materials should be cleared. • Excess muddy water should be cleared to avoid runoff. • Silt curtain should be applied around the barge.	Works Area - Portion N-A • The Contractor was reminded to clear the excess muddy water and provide bunds to avoid runoff. • The Contractor was reminded to provide noise cover during ground breaking works and apply water spraying during hydraulic breaking operation. • The Contractor was reminded to provide chemical labels for the chemical container. Works Area - Portion N-B. • The Contractor was reminded to clear the excess muddy materials. Works Area - Portion N-C • The Contractor was reminded to store the chemical containers in chemical storage area. • The Contractor was reminded to clear the excess muddy materials. • The Contractor was reminded to clear the excess muddy water to avoid runoff. • The Contractor was reminded to apply silt curtain around the barge.
9 September 2015	Works Area - Portion N-A • Drip tray should be maintained in good capacity.	Works Area - Portion N-A • The Contractor was reminded to clear the water inside the drip tray.

Inspection Date	Environmental Observations	Recommendations/ Remarks
16 September 2015	Works Area - Portion N-B • Water spraying or cover should be provided to the idle stockpile in windy condition. Works Area - Portion N-C • Site drainage system should be maintained to prevent the washout of materials during rainstorm. • Water leakage was observed on the pipe .	Works Area - Portion N-B • The Contractor was reminded to provide water spraying or partially cover on the idle part of the stockpile. Works Area - Portion N-C • The Contractor was reminded to clear the materials in the channels and maintain site drainage. • The Contractor was reminded to fix the water leakage and review the location of the water discharge point.
23 September 2015	Works Area - Portion N-B • Water inside the drip tray should be cleared. Works Area - Portion N-A • Chemical labels should be provided to the oil drum and the oil drum should be placed in drip tray.	Works Area - Portion N-B • The Contractor was reminded to clear the water inside the drip tray. Works Area - Portion N-A • The Contractor was reminded to provide chemical labels to the oil drum and place in drip tray.
30 September 2015	Works Area - Portion N-C • Idle stockpile should be covered. Works Area - Portion N-B • Water spraying should be applied to cover areas where dust is likely to be created.	Works Area - Portion N-C • The Contractor was reminded to cover the idle stockpile. Works Area - Portion N-B • The Contractor was reminded to provide water spraying to areas where dust is likely to be created.
9 October 2015	Works Area – Portion N-B • Water spraying should be applied more frequently during dry conditions. Works Area – Portion N-C • Water inside the drip tray should be cleared to maintain adequate capacity.	Works Area – Portion N-B • The Contractor was reminded to apply water spraying more frequently during dry conditions. Works Area – Portion N-C • The Contractor was reminded to clear the water inside drip tray to maintain adequate capacity.
14 October 2015	Works Area - Portion N-B • Site drainage should be maintained in good conditions.	Works Area - Portion N-B • The Contractor was reminded to clear the muddy materials in the drainage channel.
20 October 2015	Works Area - Portion N-A • Water spraying should be applied at the haul road more frequently during dry condition.	Works Area - Portion N-A • The Contractor was reminded to apply water spraying at the haul road more frequently during dry condition.
28 October 2015	• No major environmental deficiency was observed during the site audit.	• No major environmental deficiency was observed during the site audit.
4 November 2015	Works Area – Portion N-A • Chemical container should be placed in chemical storage area.	Works Area – Portion N-A • The Contractor was reminded to place the chemical container in chemical storage area.
11 November 2015	Works Area - Portion N-A • Cement bags should be covered. • Mortar should be cleared to avoid runoff.	Works Area - Portion N-A • The Contractor was reminded to cover the cement bags. • The Contractor was reminded to clear the mortar to avoid runoff.
18 November 2015	Works Area - Portion N-C • Water spraying should be applied more frequently during dry condition.	Works Area - Portion N-C • The Contractor was reminded to apply water spraying more frequently during dry condition.

Inspection Date	Environmental Observations	Recommendations/ Remarks
25 November 2015	Works Area - Portion N-C • Accumulated general refuse should be cleared.	Works Area - Portion N-C • The Contractor was reminded to clear the accumulated general refuse.

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

2.5 *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) and imported fill. Reference has been made to the waste flow table prepared by the Contractor (*Appendix J*). The quantities of different types of wastes are summarized in *Table 2.5*.

Table 2.11 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
September 2015	9,555	0	0	195	520	0	0	0
October 2015	7,218	0	0	177	300	0	0	0
November 2015	11,578	0	0	93	6,150	0	0	0
Total	28,351	0	0	465	6,970	0	0	0

Notes:

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

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

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

2.6 *ENVIRONMENTAL LICENSES AND PERMITS*

The status of environmental licensing and permit is summarized in *Table 2.6* below.

Table 2.12 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/D	13 March 2015	Throughout the Contract	HyD	Application for VEP on 3 March 2015 to supersede EP-354/2009/C
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	28 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	WT00019248-2014	5 June 2014	30 June 2019	DBJV	For site Portion N6 and Reclamation Area E
Construction Noise Permit	GW-RW0140-15	29 March 2015	28 September 2015	DBJV	For Portion N6
Construction Noise Permit	GW-RW0150-15	1 April 2015	30 September 2015	DBJV	For GI Works at Southern Landfall
Construction Noise Permit	GW-RW0350-15	14 July 2015	13 December 2015	DBJV	For site WA23
Construction Noise Permit	GW-RW0311-15	20 July 2015	19 October 2015	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0474-15	29 September 2015	28 March 2016	DBJV	For Portion N6
Construction Noise Permit	GW-RW1007-15	16 September 2015	13 March 2016	DBJV	For GI Works at Southern Landfall
Construction Noise Permit	GW-RW0512-15	20 October 2015	19 January 2016	DBJV	For Dredging and Reclamation Works

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

2.7 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.

2.8 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

For air quality impact monitoring, a total of thirty monitoring events were undertaken in which no Action Level or Limit Level exceedances for 1-hr TSP; no Action Level exceedances or Limit Level exceedances for 24-hr TSP were recorded in this reporting quarter. (*Table 2.7*).

Table 2.13 Summary of Exceedances for Air Quality Impact Monitoring in this Reporting Quarter

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

Two action level exceedances 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, there is no evidence showing that the sources of impact directly related to the construction works under this Contract that may have affected the dolphin usage in the NEL region. Detailed investigation findings are presented in *Appendix I*.

Cumulative statistics are provided in *Appendix I*.

2.9 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

The Environmental Complaint Handling Procedure is provided in *Figure 2.3*.

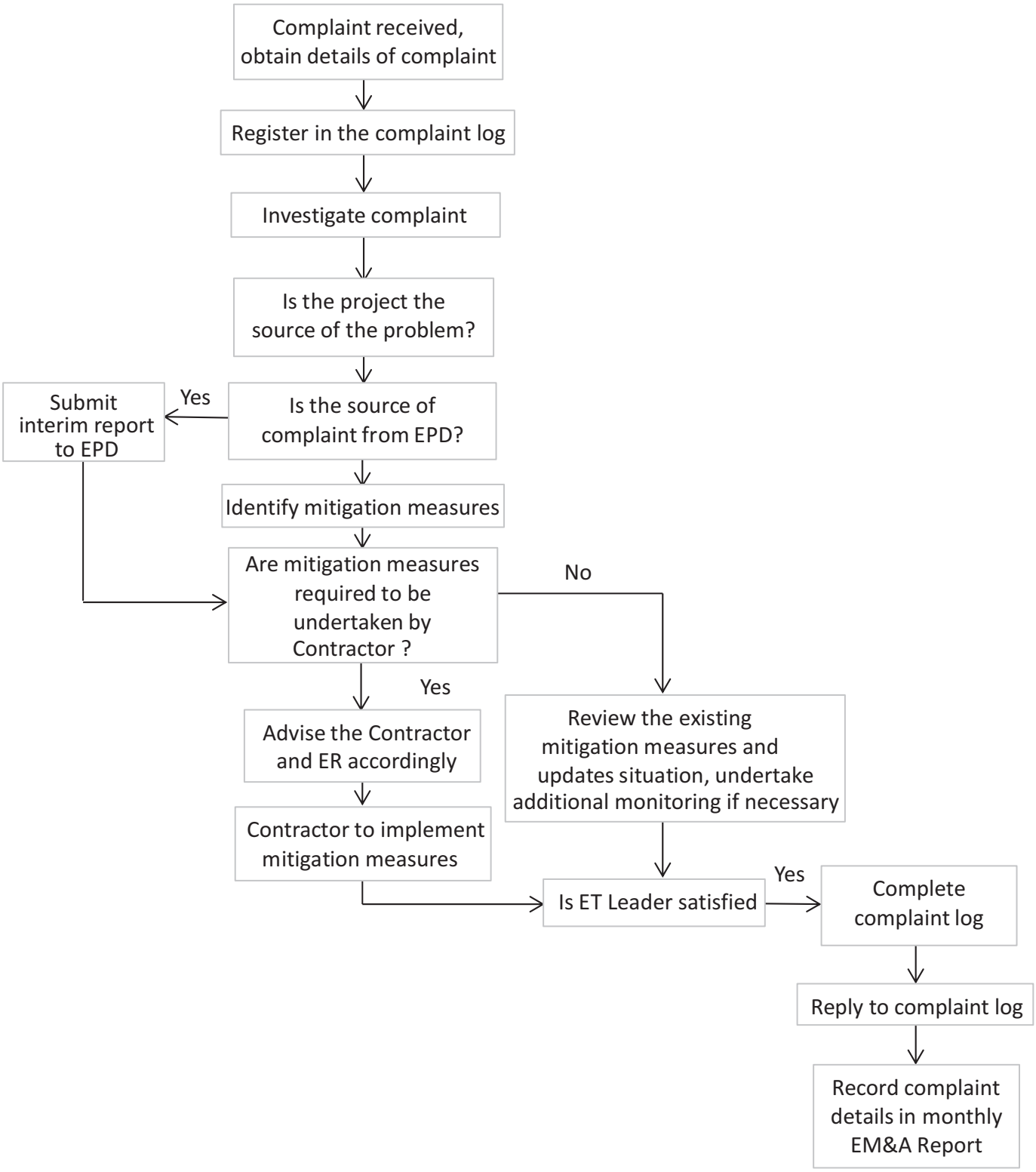

Figure 2.3 Environmental Complaint Handling Procedure

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DATE: 06/12/2013

Environmental Resources Management

ERM

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

No environmental complaint was received in the reporting period.

No summons/ prosecution was received during the reporting period.

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

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
Land-based Works
• Box Culvert Extension at Works Area – Portion N-A; • Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C; and • TBM Tunnel Works at Works Area – Portion N-C.

3.2 KEY ISSUES FOR THE COMING QUARTER

As informed by the Contractor, Phase I Reclamation works for the Northern Landfall was substantially completed in December 2014, a proposal letter was sent to EPD on 21 May 2015 to seek approval for the temporary suspension of Water Quality Monitoring. Subsequently, a letter from EPD on 5 June 2015 stated that they have no strong objection to the temporary suspension of the water quality monitoring. Water Quality Monitoring was suspended from 6 June 2015 effectively and will resume when Phase II Reclamation commences in the fourth quarter of 2016 tentatively.

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are expected to be mainly associated with waste management issues. Although there are no dredging, reclamation and marine works in the coming quarter, other potential environmental impacts such as dust and marine ecology should also be addressed.

3.3 MONITORING SCHEDULE FOR THE COMING QUARTER

Impact monitoring for air quality and marine ecology (include dolphin monitoring) are scheduled to continue for the next reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. 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 Eighth Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 September 2015 to 30 November 2015, in accordance with the Updated EM&A Manual and the requirements of *EP-354/2009/D*.

Air quality (including 1-hour TSP and 24-hour TSP) and dolphin monitoring were carried out in the reporting period. No Action or Limit Level exceedances for 1-hr TSP were recorded. No Action or Limit Level exceedances for 24-hr TSP were record.

A total of 18 groups of 95 Chinese White Dolphin sightings were recorded during the six sets of surveys from September 2015 to November 2015. Whilst two action Level exceedances were recorded for the quarterly dolphin monitoring data between September 2015 and November 2015, 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.

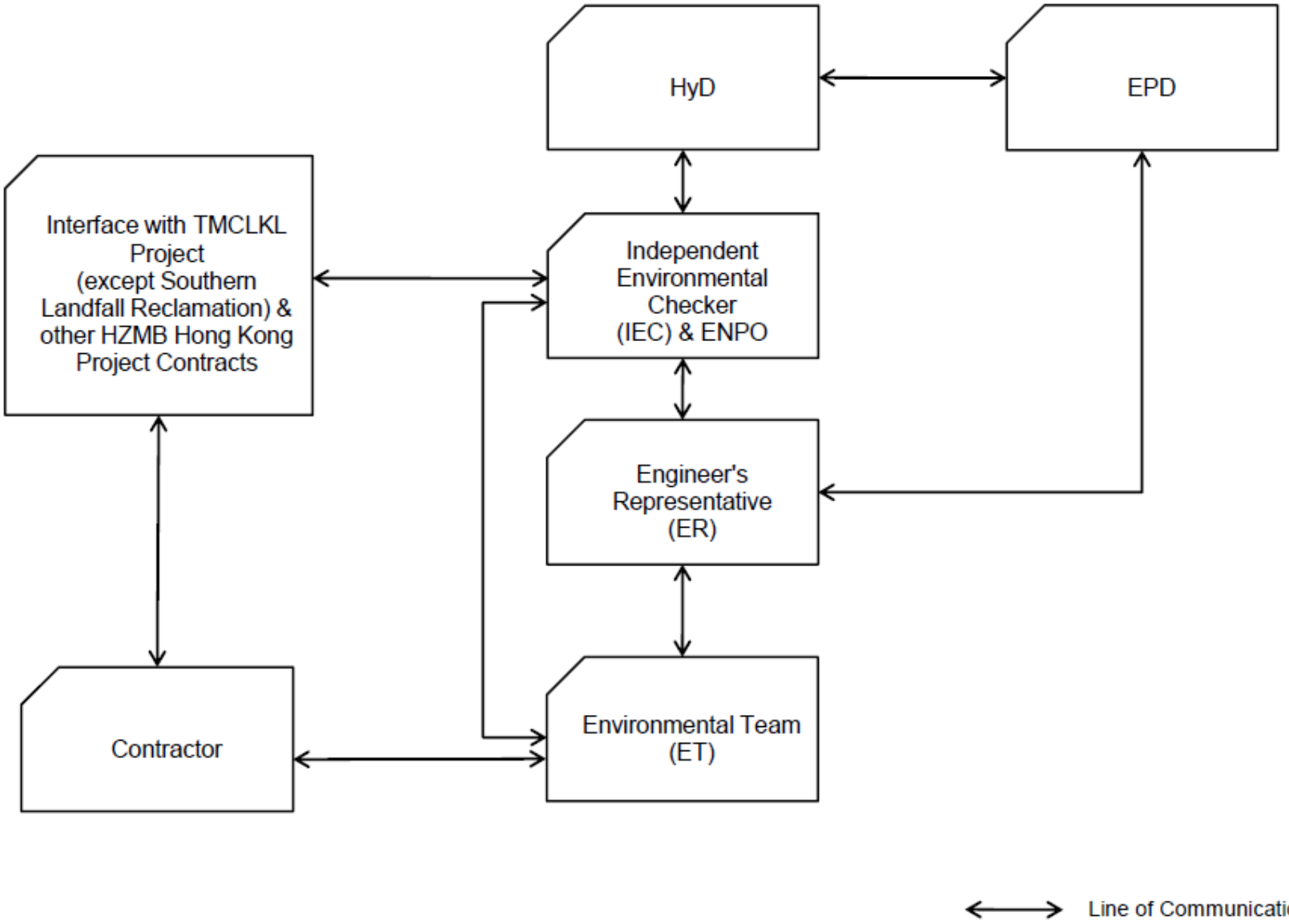
No environmental complaint was received during the reporting period.

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

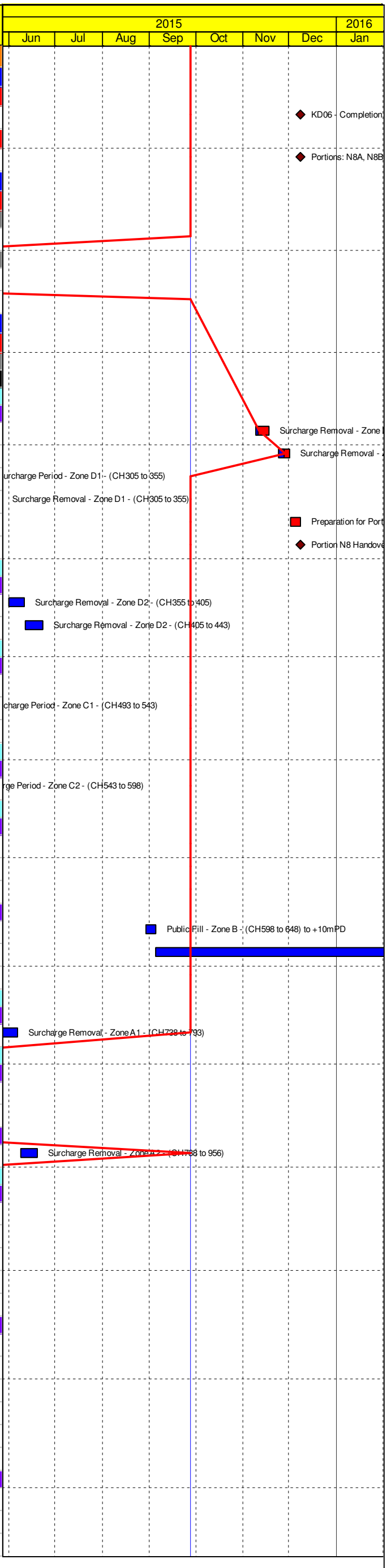
Environmental Resources Management

ERM

Appendix B

Construction Programme

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
TMCLK - Northern Connection Sub-Sea Tunnel Section						
Contract Dates						
Commencement and Completion Dates						
KD060	KD06 - Completion of Section 1B - Portion N8	0		08-Dec-15		02-Mar-16*
Handover Date						
HD020	Portions: N8A, N8B(above +3), N8C	0		08-Dec-15		02-Mar-16*
General Submissions						
General Design Submissions						
(A19) DDA for Roadworks & Project Alignment						
DD68370	SO's Review	35	18-Sep-14	22-Oct-14	22-Dec-14A	15-Jul-15A
(G6) IFA for Tunnel GBP						
DD70750	SO's Review	35	29-Apr-14	02-Jun-14	03-Jul-14A	29-Sep-15
DD70760	SO Approval with Condition Received	0		03-Jun-14		29-Sep-15
Construction						
Northern Landfall						
North Reclamation (Phase 1)						
Construction						
Zone D1						
Reclamation						
NRC15160	Surcharge Removal - Zone D1 - (CH205 to 255) to +6mPD	8	09-Nov-15	17-Nov-15	01-Sep-15A	12-Dec-15
NRC15180	Surcharge Removal - Zone D1 - (CH255 to 305) to +6mPD	7	24-Nov-15	01-Dec-15	19-Dec-15A	24-Dec-15
NRC15190	Surcharge Period - Zone D1 - (CH305 to 355)	180	19-Nov-14	17-May-15	03-Jun-15A	06-Jul-15A
NRC15200	Surcharge Removal - Zone D1 - (CH305 to 355)	7	18-May-15	26-May-15	03-Jun-15A	06-Jul-15A
NRC15201	Preparation for Portion N8 Handover	6	02-Dec-15	08-Dec-15	28-Dec-15	04-Jan-16
NRC15245	Portion N8 Handover	0		08-Dec-15		04-Jan-16
Zone D2						
Reclamation						
NRC15220	Surcharge Removal - Zone D2 - (CH355 to 405)	9	01-Jun-15	10-Jun-15	15-Jun-15A	08-Jul-15A
NRC15240	Surcharge Removal - Zone D2 - (CH405 to 443)	9	11-Jun-15	22-Jun-15	15-Jun-15A	10-Jul-15A
Zone C1						
Reclamation						
NRC15260	Surcharge Removal - Zone C1 - (CH443 to 493)	10	06-May-17	17-May-17	27-Jun-15A	07-Aug-15A
NRC15270	Surcharge Period - Zone C1 - (CH493 to 543)	180	13-Nov-14	12-May-15	31-Dec-14A	28-Jun-15A
NRC15280	Surcharge Removal - Zone C1 - (CH493 to 543)	10	06-May-17	17-May-17	22-Jul-15A	14-Aug-15A
Zone C2						
Reclamation						
NRC15290	Surcharge Period - Zone C2 - (CH543 to 598)	180	05-Nov-14	03-May-15	31-Dec-14A	28-Jun-15A
Zone B						
Vertical Seawall						
NRC11400	VS - Mass Concrete Coping - Zone B - (CH598 to 648)	8	01-Sep-14	10-Sep-14	21-Oct-14A	16-Jul-15A
NRC11410	VS - Mass Concrete Coping - Zone B - (CH648 to 698)	8	11-Sep-14	19-Sep-14	20-Nov-14A	16-Jul-15A
NRC11420	VS - Mass Concrete Coping - Zone B - (CH698 to 738)	8	20-Sep-14	29-Sep-14	02-Dec-14A	16-Jul-15A
Reclamation						
NRC11990	Public Fill - Zone B - (CH598 to 648) to +10mPD	6	29-Aug-15	04-Sep-15	20-Sep-14A	22-Sep-14A
NRC15310	Surcharge Period - Zone B - (CH598 to 648)	180	05-Sep-15	02-Mar-16	22-Sep-14A	20-Mar-15A
NRC15320	Surcharge Removal - Zone B - (CH598 to 648)	10	03-Mar-16	14-Mar-16	29-Sep-15	10-Oct-15
Zone A1						
Reclamation						
NRC15380	Surcharge Removal - Zone A1 - (CH738 to 793)	10	26-May-15	06-Jun-15	16-Jul-15A	16-Jul-15A
Zone A2						
Sloping Seawall						
NRC12760	SS - Armour Rock - Zone A2 - (CH843 to 893)	4	14-Jun-14	19-Jun-14	16-Apr-15A	29-Sep-15
NRC12770	SS - Armour Rock - Zone A2 - (CH893 to 956)	4	19-Jun-14	24-Jun-14	16-Apr-15A	30-Sep-15
Reclamation						
NRC15400	Surcharge Removal - Zone A2 - (CH738 to 956)	10	08-Jun-15	19-Jun-15	08-Jun-15A	02-Sep-15A
Zone F						
CH184 to CH231						
A6416230	F - Anchor wall Installation - CH184 to CH231	4	10-Feb-14	13-Feb-14	29-Sep-15	03-Oct-15
A6416290	F - Backfilling up to 0.0mPD & G2 Installation to Anchor Wall- CH184 to CH231	3	14-Feb-14	16-Feb-14	16-Mar-15A	05-Oct-15
A6416295	F - Backfilling up to +3.0mPD & G1 Installation to Anchor Wall- CH184 to CH231	2	17-Feb-14	18-Feb-14	16-Mar-15A	06-Oct-15
A6416300	F - Backfilling up to +6.0mPD to Anchor Wall - CH184 to CH231	2	19-Feb-14	20-Feb-14	07-Oct-15	08-Oct-15
A6416400	F - Backfilling to +6.0mPD to Existing Seawall - CH184 to CH231	1	21-Feb-14	21-Feb-14	09-Oct-15	09-Oct-15
CH231 to CH278						
A6416280	F - Backfilling up to +6.0mPD - CH231 to CH278	2	17-Apr-14	18-Apr-14	03-Oct-15	04-Oct-15
A6416310	F - Anchor wall Installation - CH231 to CH278	4	22-Apr-14	25-Apr-14	05-Oct-15	08-Oct-15
A6416480	F - Backfilling up to 0.0mPD & G2 Installation to Anchor Wall- CH231 to CH278	3	26-Apr-14	28-Apr-14	03-Mar-15A	09-Oct-15
A6416490	F - Backfilling up to +3.0mPD & G1 Installation to Anchor Wall - CH231 to CH278	2	29-Apr-14	30-Apr-14	10-Mar-15A	10-Oct-15
A6416500	F - Backfilling up to +6.0mPD to Anchor Wall - CH231 to CH278	2	01-May-14	02-May-14	11-Oct-15	12-Oct-15
A6416510	F - Backfilling to +6.0mPD to Existing Seawall - CH231 to CH278	1	03-May-14	03-May-14	13-Oct-15	13-Oct-15
CH278 to CH327						
A6416220	F - Backfilling up to +6.0mPD - CH278 to CH327	2	12-Apr-14	13-Apr-14	01-Oct-15	02-Oct-15
A6416340	F - Anchor wall Installation - CH278 to CH327	4	26-Apr-14	30-Apr-14	09-Oct-15	13-Oct-15
A6416520	F - Backfilling up to 0.0mPD & G2 Installation to Anchor Wall - CH278 to CH327	3	01-May-14	03-May-14	03-Mar-15A	14-Oct-15



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

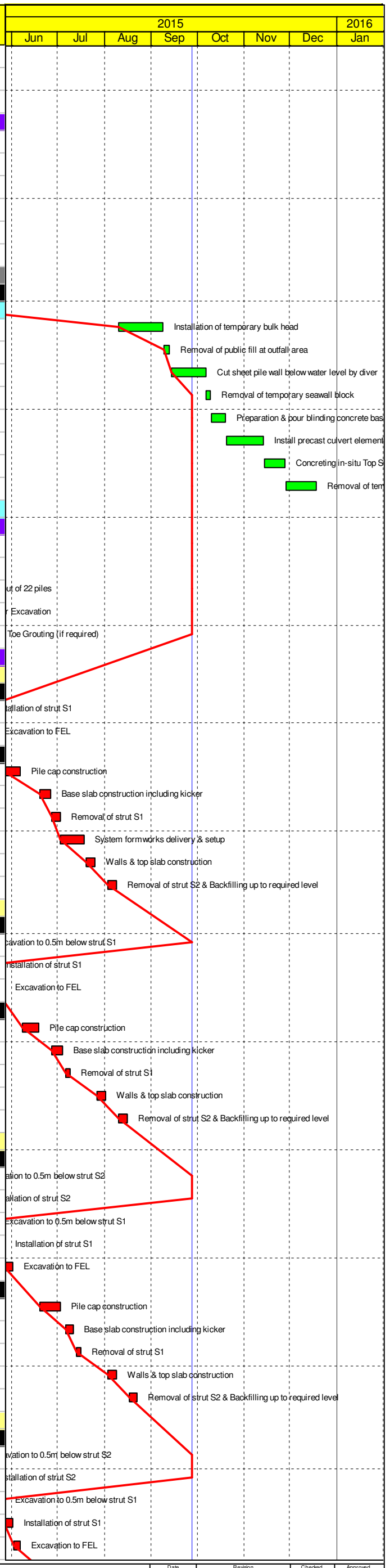
Detailed Works Programme (Rev. F) - Three Months Rolling Programme

Progress as of 27-Sep-15

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

Date	Revision	Checked	Approved
12-Feb-14	TMCLK/DBJ/GEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJ/GEN/PRG/98507 Rev.B	SPa	WYu
28-Aug-14	TMCLK/DBJ/GEN/PRG/98507 Rev.C	CLa	WYu
10-Jun-15	TMCLK/DBJ/GEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
A6416530	F - Backfilling up to +3.0mPD & G1 Installation to Anchor Wall - CH278 to CH327	3	04-May-14	06-May-14	10-Mar-15A	15-Oct-15
A6416540	F - Backfilling up to +6.0mPD to Anchor Wall - CH278 to CH327	3	07-May-14	09-May-14	16-Oct-15	18-Oct-15
A6416550	F - Backfilling to +6.0mPD to Existing Seawall - CH278 to CH327	1	10-May-14	10-May-14	19-Oct-15	19-Oct-15
CH327 to CH381						
A6416170	F - Backfilling up to +6.0mPD - CH327 to CH381	3	04-Apr-14	06-Apr-14	28-Sep-15	30-Sep-15
A6416370	F - Anchor wall Installation - CH327 to CH381	3	02-May-14	05-May-14	14-Oct-15	16-Oct-15
A6416560	F - Backfilling up to 0.0mPD & G2 Installation to Anchor Wall - CH327 to CH381	3	06-May-14	08-May-14	03-Mar-15A	17-Oct-15
A6416570	F - Backfilling up to +3.0mPD & G1 Installation to Anchor Wall - CH327 to CH381	3	09-May-14	11-May-14	10-Mar-15A	18-Oct-15
A6416580	F - Backfilling up to +6.0mPD to Anchor Wall - CH327 to CH381	2	12-May-14	13-May-14	19-Oct-15	20-Oct-15
A6416590	F - Backfilling to +6.0mPD to Existing Seawall - CH327 to CH381	1	14-May-14	14-May-14	21-Oct-15	21-Oct-15
Box Culvert Extension						
Construction						
Ch000-010 Culvert Outfall						
A1000	Installation of temporary bulk head	26	10-Aug-15	08-Sep-15	30-Dec-15	29-Jan-16
A1010	Removal of public fill at outfall area	4	09-Sep-15	12-Sep-15	30-Jan-16	03-Feb-16
A1020	Cut sheet pile wall below water level by diver	18	14-Sep-15	06-Oct-15	04-Feb-16	02-Mar-16
A1030	Removal of temporary seawall block	3	07-Oct-15	09-Oct-15	03-Mar-16	05-Mar-16
A1040	Preparation & pour blinding concrete base of box culvert outfall	8	10-Oct-15	19-Oct-15	07-Mar-16	15-Mar-16
A1050	Install precast culvert element by barge (5 nos.)	21	20-Oct-15	13-Nov-15	16-Mar-16	13-Apr-16
A1060	Concreting in-situ Top Slab and sticth joint	12	14-Nov-15	27-Nov-15	14-Apr-16	27-Apr-16
A1070	Removal of temporary bulk head	18	28-Nov-15	18-Dec-15	28-Apr-16	20-May-16
CH000-150 Land Section						
ELS Foundation						
A6416890	Bored Pile Construction - A33 toA54 (3 Rigs) - 20 out of 22 piles	21	17-Oct-14	10-Nov-14	03-Oct-14A	30-Nov-15A
A6416891	Bored Pile Construction - A33 toA54 (3 Rigs) - 22 out of 22 piles	11	11-Nov-14	22-Nov-14	27-Jul-15A	07-Aug-15A
A6416891 EOT	Inclement Weather - Bored Pile Construction - A33 to A54 (3 Rigs) - 22 out of 22 piles	5	24-Nov-14	28-Nov-14	08-Aug-15A	13-Aug-15A
A6418180	Ch010-100 - Pump test for Excavation	24	12-Feb-15	18-Mar-15	27-Jul-15A	22-Aug-15A
A6418190	Ch010-100 - Toe Grouting (if required)	24	19-Mar-15	20-Apr-15	24-Aug-15A	19-Sep-15A
ELS & Structure						
Pile A43/A41 CJ to Pile A41/A39 CJ						
ELS						
A1610	Installation of strut S1	5	08-May-15	13-May-15	20-Aug-15A	02-Oct-15
A1620	Excavation to FEL	5	14-May-15	19-May-15	03-Oct-15	08-Oct-15
Box Culvert Structure						
A1630	Pile cap construction	10	27-May-15	06-Jun-15	15-Oct-15	27-Oct-15
A1640	Base slab construction including kicker	6	19-Jun-15	26-Jun-15	09-Nov-15	14-Nov-15
A1641	Removal of strut S1	4	27-Jun-15	02-Jul-15	16-Nov-15	19-Nov-15
A1642	System formworks delivery & setup	14	03-Jul-15	18-Jul-15	20-Nov-15	05-Dec-15
A1650	Walls & top slab construction	6	20-Jul-15	25-Jul-15	07-Dec-15	12-Dec-15
A1660	Removal of strut S2 & Backfilling up to required level	6	03-Aug-15	08-Aug-15	21-Dec-15	29-Dec-15
Pile A45/A43 CJ to Pile A43/A41 CJ						
ELS						
A1510	Excavation to 0.5m below strut S1	5	08-May-15	13-May-15	07-Aug-15A	18-Aug-15A
A1520	Installation of strut S1	5	14-May-15	19-May-15	18-Aug-15A	06-Oct-15
A1530	Excavation to FEL	5	20-May-15	26-May-15	09-Oct-15	14-Oct-15
Box Culvert Structure						
A1540	Pile cap construction	10	08-Jun-15	18-Jun-15	28-Oct-15	07-Nov-15
A1550	Base slab construction including kicker	6	27-Jun-15	04-Jul-15	16-Nov-15	21-Nov-15
A1551	Removal of strut S1	4	06-Jul-15	09-Jul-15	23-Nov-15	26-Nov-15
A1560	Walls & top slab construction	6	27-Jul-15	01-Aug-15	14-Dec-15	19-Dec-15
A1570	Removal of strut S2 & Backfilling up to required level	6	10-Aug-15	15-Aug-15	30-Dec-15	06-Jan-16
Pile A47/A45 CJ to Pile A45/A43 CJ						
ELS						
A1400	Excavation to 0.5m below strut S2	4	30-Apr-15	05-May-15	21-Jul-15A	25-Jul-15A
A1410	Installation of strut S2	5	06-May-15	11-May-15	22-Jul-15A	28-Jul-15A
A1420	Excavation to 0.5m below strut S1	5	14-May-15	19-May-15	29-Sep-15	05-Oct-15
A1430	Installation of strut S1	5	20-May-15	26-May-15	07-Oct-15	12-Oct-15
A1440	Excavation to FEL	5	27-May-15	01-Jun-15	15-Oct-15	20-Oct-15
Box Culvert Structure						
A1450	Pile cap construction	10	19-Jun-15	02-Jul-15	09-Nov-15	19-Nov-15
A1460	Base slab construction including kicker	6	06-Jul-15	11-Jul-15	23-Nov-15	28-Nov-15
A1461	Removal of strut S1	4	13-Jul-15	16-Jul-15	30-Nov-15	03-Dec-15
A1470	Walls & top slab construction	6	03-Aug-15	08-Aug-15	21-Dec-15	29-Dec-15
A1480	Removal of strut S2 & Backfilling up to required level	6	17-Aug-15	22-Aug-15	07-Jan-16	13-Jan-16
Pile A49/A47 CJ to Pile A47/A45 CJ						
ELS						
A1310	Excavation to 0.5m below strut S2	4	06-May-15	09-May-15	18-Jul-15A	25-Jul-15A
A1320	Installation of strut S2	5	11-May-15	15-May-15	21-Jul-15A	21-Jul-15A
A1330	Excavation to 0.5m below strut S1	5	20-May-15	26-May-15	06-Oct-15	10-Oct-15
A1340	Installation of strut S1	5	27-May-15	01-Jun-15	13-Oct-15	17-Oct-15
A1350	Excavation to FEL	5	02-Jun-15	06-Jun-15	22-Oct-15	27-Oct-15



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

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Progress as of 27-Sep-15

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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12-Feb-14	TMCLK/DBJ/GEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJ/GEN/PRG/98507 Rev.B	SPa	WYu
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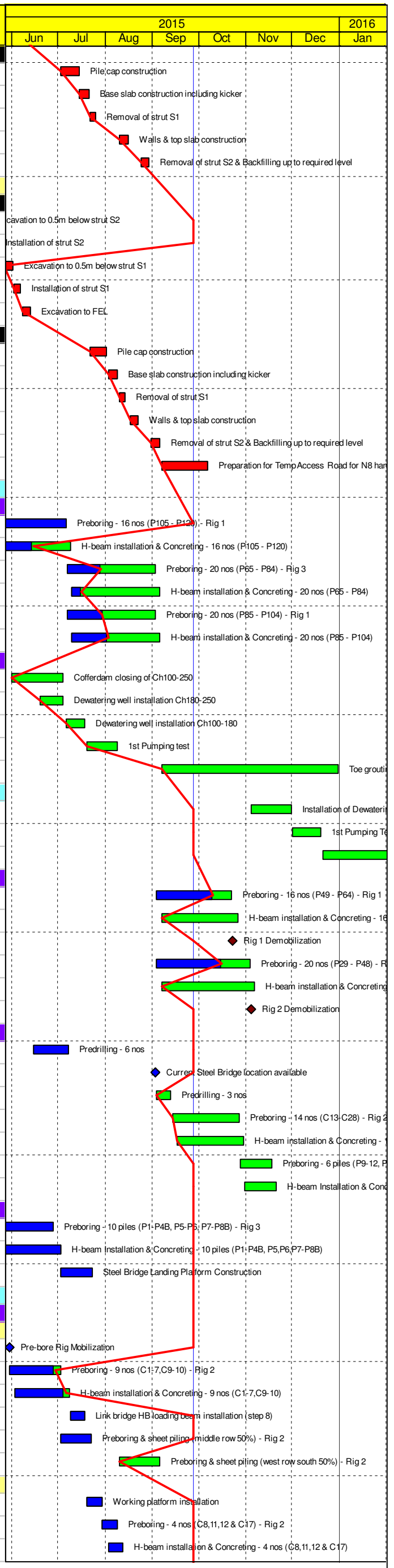
10-Jun-15	TMCLK/DBJ/GEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
Box Culvert Structure						
A1360	Pile cap construction	10	03-Jul-15	14-Jul-15	20-Nov-15	01-Dec-15
A1370	Base slab construction including kicker	6	15-Jul-15	21-Jul-15	02-Dec-15	08-Dec-15
A1371	Removal of strut S1	4	22-Jul-15	25-Jul-15	09-Dec-15	12-Dec-15
A1380	Walls & top slab construction	6	10-Aug-15	15-Aug-15	30-Dec-15	06-Jan-16
A1390	Removal of strut S2 & Backfilling up to required level	6	24-Aug-15	29-Aug-15	14-Jan-16	20-Jan-16
Pile A52/A49 CJ to Pile A49/A47 CJ						
ELS						
A1220	Excavation to 0.5m below strut S2	4	11-May-15	14-May-15	16-Jul-15A	18-Jul-15A
A1230	Installation of strut S2	5	15-May-15	20-May-15	17-Jul-15A	25-Jul-15A
A1240	Excavation to 0.5m below strut S1	5	27-May-15	01-Jun-15	12-Oct-15	16-Oct-15
A1250	Installation of strut S1	5	02-Jun-15	06-Jun-15	19-Oct-15	24-Oct-15
A1260	Excavation to FEL	5	08-Jun-15	12-Jun-15	28-Oct-15	02-Nov-15
Box Culvert Structure						
A1270	Pile cap construction	10	22-Jul-15	01-Aug-15	09-Dec-15	19-Dec-15
A1280	Base slab construction including kicker	6	03-Aug-15	08-Aug-15	21-Dec-15	29-Dec-15
A1281	Removal of strut S1	4	10-Aug-15	13-Aug-15	30-Dec-15	04-Jan-16
A1290	Walls & top slab construction	6	17-Aug-15	22-Aug-15	07-Jan-16	13-Jan-16
A1300	Removal of strut S2 & Backfilling up to required level	6	31-Aug-15	05-Sep-15	21-Jan-16	27-Jan-16
A1670	Preparation for Temp Access Road for N8 handvoer	24	07-Sep-15	06-Oct-15	28-Jan-16	02-Mar-16
Ch150-250 Marine Section						
Foundation						
A1296	Preboring - 16 nos (P105 - P120) - Rig 1	40	18-May-15	06-Jul-15	02-Jul-15A	11-Aug-15 A
A1297	H-beam installation & Concreting - 16 nos (P105 - P120)	40	21-May-15	09-Jul-15	21-Sep-15A	23-Oct-15
A1445	Preboring - 20 nos (P65 - P84) - Rig 3	50	07-Jul-15	02-Sep-15	03-Aug-15A	05-Nov-15
A1455	H-beam installation & Concreting - 20 nos (P65 - P84)	50	10-Jul-15	05-Sep-15	23-Sep-15A	15-Dec-15
A4200	Preboring - 20 nos (P85 - P104) - Rig 1	50	07-Jul-15	02-Sep-15	10-Aug-15A	04-Nov-15
A4210	H-beam installation & Concreting - 20 nos (P85 - P104)	50	10-Jul-15	05-Sep-15	21-Sep-15A	07-Nov-15
ELS & Structure						
A4201	Cofferdam closing of Ch100-250	28	01-Jun-15	04-Jul-15	29-Sep-15	02-Nov-15
A4202	Dewatering well installation Ch180-250	12	19-Jun-15	04-Jul-15	19-Oct-15	02-Nov-15
A4203	Dewatering well installation Ch100-180	12	06-Jul-15	18-Jul-15	03-Nov-15	16-Nov-15
A4204	1st Pumping test	18	20-Jul-15	08-Aug-15	17-Nov-15	07-Dec-15
A4211	Toe grouting Ch100-250	95	07-Sep-15	31-Dec-15	16-Dec-15	19-Apr-16
Ch250-380 Marine Section						
A4251	Installation of Dewatering & Observation Well Ch 250-380	23	04-Nov-15	30-Nov-15	24-Nov-15	19-Dec-15
A4450	1st Pumping Test & Analysis	17	01-Dec-15	19-Dec-15	21-Dec-15	12-Jan-16
A4451	Toe Grouting	106	21-Dec-15	07-May-16	13-Jan-16	28-May-16
Ch250-320 Prebored H-piles						
A1302	Preboring - 16 nos (P49 - P64) - Rig 1	40	03-Sep-15	22-Oct-15	20-Aug-15A	16-Nov-15
A1304	H-beam installation & Concreting - 16 nos (P49 - P64)	40	07-Sep-15	26-Oct-15	05-Nov-15	21-Dec-15
A1306	Rig 1 Demobilization	0	23-Oct-15		17-Nov-15	
A4230	Preboring - 20 nos (P29 - P48) - Rig 3	50	03-Sep-15	03-Nov-15	06-Nov-15A	23-Nov-15
A4240	H-beam installation & Concreting - 20 nos (P29 - P48)	50	07-Sep-15	06-Nov-15	10-Nov-15	09-Jan-16
A4250	Rig 2 Demobilization	0	04-Nov-15		24-Nov-15	
Ch320-360 Prebored H-piles						
A1307	Predrilling - 6 nos	18	15-Jun-15	07-Jul-15	15-Jun-15A	07-Jul-15A
A1308	Current Steel Bridge location available	0		02-Sep-15		26-Sep-15A
A1309	Predrilling - 3 nos	9	03-Sep-15	12-Sep-15	12-Oct-15	22-Oct-15
A1312	Preboring - 14 nos (C13-C28) - Rig 2	35	14-Sep-15	27-Oct-15	14-Nov-15	24-Dec-15
A1314	H-beam installation & Concreting - 14 nos (C13-C28)	35	17-Sep-15	30-Oct-15	18-Nov-15	30-Dec-15
A1315	Preboring - 6 piles (P9-12, P15-16) - Rig 2	18	28-Oct-15	17-Nov-15	28-Dec-15	18-Jan-16
A1316	H-beam Installation & Concreting - 6 piles (P9-12, P15-16)	18	31-Oct-15	20-Nov-15	31-Dec-15	21-Jan-16
Ch360-380 Prebored H-piles						
A1034	Preboring - 10 piles (P1-P4B, P5-P6, P7-P8B) - Rig 3	36	15-May-15	27-Jun-15	22-Jul-15A	12-Aug-15A
A1035	H-beam Installation & Concreting - 10 piles (P1-P4B, P5,P6,P7-P8B)	36	19-May-15	02-Jul-15	15-Aug-15A	21-Aug-15A
A1065	Steel Bridge Landing Platform Construction	18	03-Jul-15	23-Jul-15	25-Aug-15A	25-Sep-15A
Ch380-399 Connection Section						
Foundation & ELS						
Stage 1						
A1090	Pre-bore Rig Mobilization	0	30-May-15		07-Sep-15A	
A1100	Preboring - 9 nos (C1-7,C9-10) - Rig 2	27	30-May-15	02-Jul-15	30-May-15A	02-Oct-15
A1105	H-beam installation & Concreting - 9 nos (C1-7,C9-10)	29	03-Jun-15	08-Jul-15	11-Aug-15 A	08-Oct-15
A1120	Link bridge HB loading beam installation (step 8)	9	09-Jul-15	18-Jul-15	15-Aug-15A	20-Aug-15A
A4320	Preboring & sheet piling (middle row 50%) - Rig 2	17	03-Jul-15	22-Jul-15	14-Sep-15A	19-Sep-15A
A4330	Preboring & sheet piling (west row south 50%) - Rig 2	24	10-Aug-15	05-Sep-15	09-Oct-15	06-Nov-15
Stage 2						
A4340	Working platform installation	9	20-Jul-15	29-Jul-15	20-Aug-15A	24-Aug-15A
A4350	Preboring - 4 nos (C8,11,12 & C17) - Rig 2	9	30-Jul-15	08-Aug-15	24-Aug-15A	28-Aug-15A
A4351	H-beam installation & Concreting - 4 nos (C8,11,12 & C17)	9	03-Aug-15	12-Aug-15	26-Aug-15A	31-Aug-15A



Project ID: TMCLK_DWPF 15W39

Data Date: 27-Sep-15

Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
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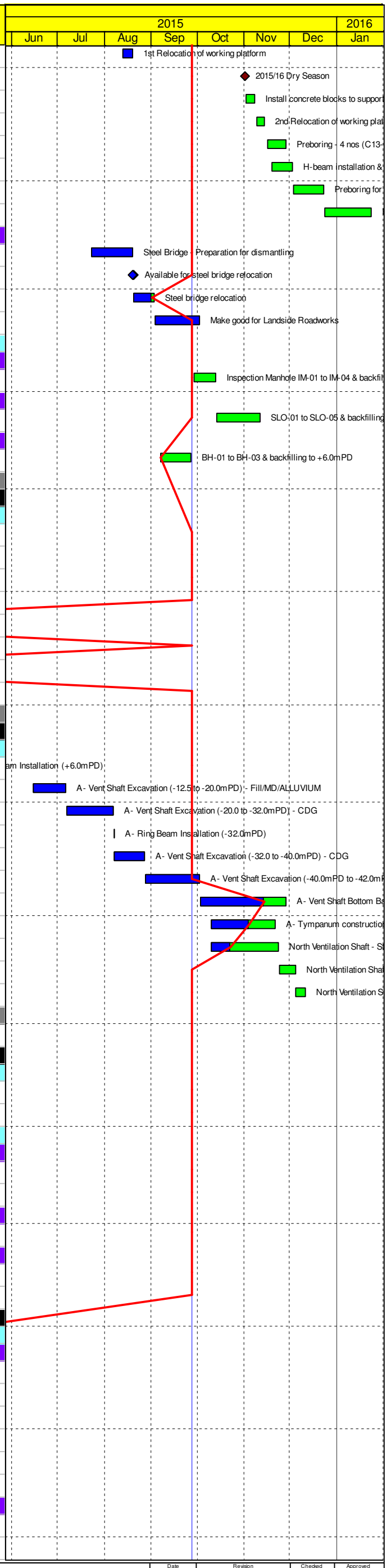
10-Jun-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
A4360	1st Relocation of working platform	6	13-Aug-15	19-Aug-15	01-Sep-15A	01-Sep-15A
A4361	2015/16 Dry Season	0	01-Nov-15		01-Nov-15*	
A4370	Install concrete blocks to support working platform	6	02-Nov-15	07-Nov-15	02-Nov-15	07-Nov-15
A4380	2nd Relocation of working platform	6	09-Nov-15	14-Nov-15	09-Nov-15	14-Nov-15
A4390	Preboring - 4 nos (C13-C16) - Rig 2	12	16-Nov-15	28-Nov-15	05-Jan-16	18-Jan-16
A4400	H-beam installation & Concreting - 4 nos (C13-C16)	12	19-Nov-15	02-Dec-15	08-Jan-16	21-Jan-16
A4410	Preboring for sheet piling (middle row north 50%) - Rig 2	18	03-Dec-15	23-Dec-15	22-Jan-16	18-Feb-16
A4411	Preboring for sheet piling (west row north 50%) - Rig 2	24	24-Dec-15	23-Jan-16	19-Feb-16	17-Mar-16
Land Access route for CKS						
A1185	Steel Bridge - Preparation for dismantling	24	23-Jul-15	19-Aug-15	14-Sep-15A	25-Sep-15A
A4420	Available for steel bridge relocation	0	20-Aug-15		26-Sep-15A	
A4430	Steel bridge relocation	12	20-Aug-15	02-Sep-15	26-Sep-15A	10-Oct-15
A4431	Make good for Landside Roadworks	24	03-Sep-15	02-Oct-15	18-Sep-15A	23-Sep-15A
Miscellaneous works						
Inspection Manhole (IM)						
A6418270	Inspection Manhole IM-01 to IM-04 & backfilling to +6.0mPD	12	29-Sep-15	13-Oct-15	25-Feb-16	09-Mar-16
Stop Log Opening (SLO)						
A6418370	SLO-01 to SLO-05 & backfilling to +6.0mPD	24	14-Oct-15	11-Nov-15	10-Mar-16	11-Apr-16
Balance Hole (BH)						
A6418330	BH-01 to BH-03 & backfilling to +6.0mPD	18	07-Sep-15	26-Sep-15	28-Jan-16	24-Feb-16
North Launching Shaft						
Design Submission						
(C1) DDA for North Approach Ramp Permanent Structure						
DD70810	Designer to Reply RtC + Update Submission	15	06-Oct-14	22-Oct-14	28-May-15A	27-Aug-15A
DD70820	Submit Updated DDA to SO/ ICE/ IPs	0	23-Oct-14		27-Aug-15A	
DD70830	ICE Approval & Issue Check Cert	18	23-Oct-14	12-Nov-14	20-Aug-15A	27-Aug-15A
DD70840	Submit ICE Check Cert to SO	0		12-Nov-14		27-Aug-15A
DD70850	IPs Review	28	23-Oct-14	19-Nov-14	27-Aug-15A	01-Oct-15
DD70860	IP's No Objection Received	0		19-Nov-14		01-Oct-15
DD70870	SO's Review	35	23-Oct-14	26-Nov-14	27-Aug-15A	03-Oct-15
DD70880	SO Approval with Condition Received	0		26-Nov-14		03-Oct-15
North Ventilation Shaft						
Construction						
North Ventilation Shaft Excavation & Base Slab						
A6415810	A- Capping Beam Installation (+6.0mPD)	0	15-Apr-15	15-Apr-15	04-May-15A	02-Jul-15A
A6415855	A- Vent Shaft Excavation (-12.5 to -20.0mPD) - Fill/MD/ALLUVIUM	17	15-Jun-15	06-Jul-15	15-Jun-15A	06-Jul-15A
A6415860	A- Vent Shaft Excavation (-20.0 to -32.0mPD) - CDG	27	07-Jul-15	06-Aug-15	10-Jun-15A	20-Jun-15A
A6415870	A- Ring Beam Installation (-32.0mPD)	0	07-Aug-15	07-Aug-15	21-Jun-15A	24-Jun-15A
A6415875	A- Vent Shaft Excavation (-32.0 to -40.0mPD) - CDG	18	07-Aug-15	27-Aug-15	18-Aug-15A	07-Sep-15A
A6415880	A- Vent Shaft Excavation (-40.0mPD to -42.0mPD) - Rock	29	28-Aug-15	02-Oct-15	24-Jun-15A	17-Jul-15A
A6415890	A- Vent Shaft Bottom Base Slab for TBM Re-launching	48	03-Oct-15	28-Nov-15	17-Jul-15A	14-Oct-15
A6415990	A- Tympanum construction for TBM break-in/out	36	10-Oct-15	21-Nov-15	14-Jul-15A	17-Oct-15
A6416345	North Ventilation Shaft - Steel Bell Installation	37	10-Oct-15	23-Nov-15	08-Sep-15A	31-Oct-15
A6416350	North Ventilation Shaft - Steel Bell Backfilling for S882 Crossing	10	24-Nov-15	04-Dec-15	02-Nov-15	12-Nov-15
A6416360	North Ventilation Shaft - Shaft Flooding for S880 Arrival	6	05-Dec-15	11-Dec-15	13-Nov-15	19-Nov-15
TMCLK VO-008 - Construction of Viaduct Foundations at Portion N6A						
TMCLK-N6-101	Variation Order V-008 - Issued from SOR	0		29-Apr-14		27-Jul-15A
Viaduct Bored Pile Construction						
Method Statement						
TMCLK-N6-85	Final Method Statement	4	08-May-14	12-May-14	03-Aug-15A	06-Aug-15A
TMCLK-N6-86	Method Statement - Submission for SOR Approval	0		12-May-14		06-Aug-15A
Bored Pile Construction						
G1b-7						
TMCLK-N60	Pile 7 - Excavation	3	20-May-14	22-May-14	14-Aug-15A	17-Aug-15A
TMCLK-N61	Pile 7 - RCD Installation	2	23-May-14	24-May-14	18-Aug-15A	19-Aug-15A
H1b-13						
TMCLK-N72	Pile 13 - RCD Socket Drilling	4	31-May-14	05-Jun-14	26-Aug-15A	29-Aug-15A
G1c-6						
TMCLK-N655	Pile 6 - RCD Socket Drilling	14	14-Jul-14	29-Jul-14	08-Oct-15A	24-Oct-15A
TMCLK-N657	Pile 6 - Concreting	1	01-Aug-14	01-Aug-14	01-Aug-14A	29-Jul-15A
Viaduct Pile Cap						
Construction						
Pier G1c						
TMCLK-N636	Pile Cap G1c - Preparation for ELS	6	24-Oct-14	30-Oct-14	29-Sep-15	06-Oct-15
TMCLK-N637	Pile Cap G1c - Removal of Existing ground slab	6	31-Oct-14	06-Nov-14	07-Oct-15	13-Oct-15
TMCLK-N638	Pile Cap G1c - Excavation & ELS Installation	12	07-Nov-14	20-Nov-14	14-Oct-15	28-Oct-15
TMCLK-N639	Pile Cap G1c - Blinding Concrete	3	21-Nov-14	24-Nov-14	29-Oct-15	31-Oct-15
TMCLK-N640	Pile Cap G1c - Rebar & Concreting	18	25-Nov-14	15-Dec-14	02-Nov-15	21-Nov-15
TMCLK-N641	Pile Cap G1c - Backfilling & Temp Reinstatement	6	16-Dec-14	22-Dec-14	23-Nov-15	28-Nov-15
Pier H1c						
TMCLK-N642	Pile Cap H1c - Preparation for ELS	6	23-Dec-14	31-Dec-14	30-Nov-15	05-Dec-15
TMCLK-N643	Pile Cap H1c - Removal of Existing ground slab	6	02-Jan-15	08-Jan-15	07-Dec-15	12-Dec-15



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Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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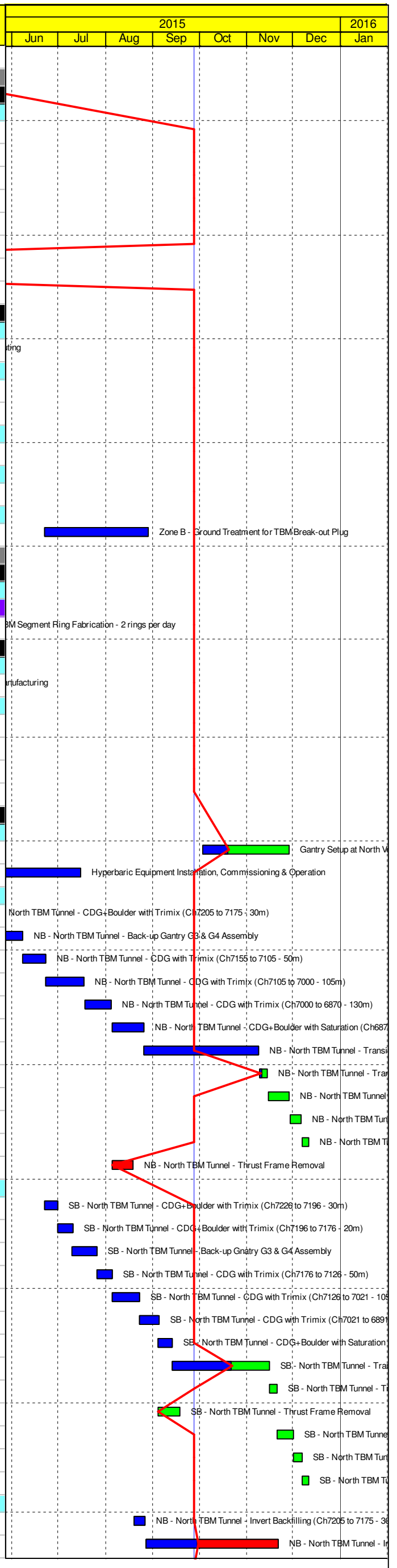
12-Feb-14	TMCLK/DBJ/GEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJ/GEN/PRG/98507 Rev.B	SPa	WYu
28-Aug-14	TMCLK/DBJ/GEN/PRG/98507 Rev.C	CLa	WYu
10-Jun-15	TMCLK/DBJ/GEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
TMCLK-N644	Pile Cap H1c - Excavation & ELS Installation	12	09-Jan-15	22-Jan-15	14-Dec-15	29-Dec-15
North Surface works for TBM Tunnelling						
Design Submission						
(D1) IFA for Temp. Access to Portion N8A, N8B & N8C incl. Temp. Lighting						
AP01535	Designer to Prepare RtC & Updated AIP	18	07-Apr-14	30-Apr-14	16-May-15A	22-Aug-15A
AP01540	Submisson of AIP to SO/ ICE together with Reply To Comment (RTC)	0		30-Apr-14		22-Aug-15A
AP01545	Reply to IPs Comments in RTC	0		30-Apr-14		22-Aug-15A
AP01550	ICE Approval & Issue of Design Check Cert.	18	02-May-14	23-May-14	22-Aug-15A	10-Sep-15A
AP01555	Check Cert to SO	0		23-May-14		10-Sep-15A
AP01560	No Objection or Further Minor Comments from IPs Received	0		23-May-14		10-Sep-15A
AP01565	SO Review (35 Days)	35	02-May-14	05-Jun-14	22-Aug-15A	29-Sep-15
AP01570	SO Approval with Condition Received	0		05-Jun-14		29-Sep-15
Construction						
Zone E						
A6416450 EOT	Inclement Weather - Zone E - Jet Grouting	2	16-Feb-15	17-Feb-15	30-Jul-15A	01-Aug-15A
Zone D1						
NRC13960 EOT	Inclement Weather - Zone D1 - Vibro-compaction (CH305 to 355)	4	28-Aug-14	31-Aug-14	27-Jul-15A	30-Jul-15A
NRC14020 EOT	Inclement Weather - Zone D1 - Ground Treatment for CP54	2	05-Sep-14	06-Sep-14	27-Jul-15A	28-Jul-15A
Zone D2						
NRC14110 EOT	Inclement Weather - Zone D2 - Ground Treatment for CP53	2	14-Oct-14	16-Oct-14	29-Jul-15A	30-Jul-15A
Zone C2						
NRC1202155 EOT	Inclement Weather - Zone C2 - Rock Fissue Grouting for CP51	2	20-Oct-14	21-Oct-14	27-Jul-15A	28-Jul-15A
Zone B						
A6415920	Zone B - Ground Treatment for TBM Break-out Plug	58	22-Jun-15	28-Aug-15	18-Mar-15A	11-Apr-15 A
North Approach TBM Tunnelling & Cross Passage						
Major Procurement						
Precast Segment						
Precast Segment ID15.60 - Production for NB North TBM Tunnel						
A6417970	ID15.60 TBM Segment Ring Fabrication - 2 rings per day	148	30-Sep-14	25-Apr-15	25-Sep-14A	18-Jul-15A
Design Submission						
(G2) DDA for TBM Tunnel Lining Structural Design - North Approach						
DD01055	Northern TBM Segment Ring Manufacturing	173	01-Aug-14	04-Mar-15	25-Aug-14A	18-Jul-15A
(G5) DDA for Cross Passage - Permanent works - incl. Detailed Geotechnical Assessment - North						
DD67518	IPs Review	28	09-Jan-15	05-Feb-15	11-Mar-15 A	02-Jul-15A
DD67528	IP's No Objection Received	0		05-Feb-15		02-Jul-15A
DD67609*	SO's Review	35	09-Jan-15	12-Feb-15	11-Mar-15 A	02-Jul-15A
DD67610	SO Approval with Condition Received	0		12-Feb-15		02-Jul-15A
Construction						
Northern Landfall Surface Setup for TBM operation						
A6415970	Gantry Setup at North Ventilation Shaft	48	03-Oct-15	28-Nov-15	21-Aug-15A	09-Nov-15
A6416000	Hyperbaric Equipment Installation, Commissioning & Operation	59	05-May-15	15-Jul-15	04-May-15A	17-Aug-15A
North Approach TBM Tunnel - NB ID15.60m - S880						
TBM10005	NB - North TBM Tunnel - CDG+Boulder with Trimix (Ch7205 to 7175 - 30m)	12	28-Apr-15	09-May-15	26-Apr-15A	16-Jul-15A
TBM10015	NB - North TBM Tunnel - Back-up Gantry G3 & G4 Assembly	14	25-May-15	07-Jun-15	12-Jun-15A	06-Jul-15A
TBM10020	NB - North TBM Tunnel - CDG with Trimix (Ch7155 to 7105 - 50m)	14	08-Jun-15	22-Jun-15	06-Jul-15A	10-Jul-15A
TBM10030	NB - North TBM Tunnel - CDG with Trimix (Ch7105 to 7000 - 105m)	24	23-Jun-15	17-Jul-15	10-Jul-15A	20-Jul-15A
TBM10040	NB - North TBM Tunnel - CDG with Trimix (Ch7000 to 6870 - 130m)	18	18-Jul-15	04-Aug-15	20-Jul-15A	07-Aug-15A
TBM10050	NB - North TBM Tunnel - CDG+Boulder with Saturation (Ch6870 to 6840 - 30m)	20	05-Aug-15	25-Aug-15	07-Aug-15A	15-Aug-15A
TBM10060	NB - North TBM Tunnel - Transition with Saturation (Ch6840 to 6708 - 132m)	75	26-Aug-15	08-Nov-15	15-Aug-15A	25-Sep-15A
TBM10070	NB - North TBM Tunnel - Transition with Saturation (Ch6708 to 6688 - 20m)	6	09-Nov-15	14-Nov-15	26-Sep-15A	18-Oct-15
TBM10072	NB - North TBM Tunnel - Transition with Saturation (Ch6688 to 6640 - 48m)	14	15-Nov-15	28-Nov-15	19-Oct-15	01-Nov-15
TBM10074	NB - North TBM Tunnel - CDG+Boulder with Saturation (Ch6640 to 6600 - 40m)	8	29-Nov-15	06-Dec-15	02-Nov-15	09-Nov-15
TBM10076	NB - North TBM Tunnel - CDG with Saturation (Ch6600 to 6560 - 40m)	5	07-Dec-15	11-Dec-15	10-Nov-15	14-Nov-15
TBM11020	NB - North TBM Tunnel - Thrust Frame Removal	12	05-Aug-15	18-Aug-15	14-Oct-15	28-Oct-15
North Approach TBM Tunnel - SB ID12.40m - S882						
TBM10485	SB - North TBM Tunnel - CDG+Boulder with Trimix (Ch7226 to 7196 - 30m)	8	22-Jun-15	30-Jun-15	22-Jun-15A	30-Jun-15A
TBM10490	SB - North TBM Tunnel - CDG+Boulder with Trimix (Ch7196 to 7176 - 20m)	10	30-Jun-15	10-Jul-15	30-Jun-15A	10-Jul-15A
TBM10495	SB - North TBM Tunnel - Back-up Gnatry G3 & G4 Assembly	15	10-Jul-15	26-Jul-15	25-Oct-15A	08-Nov-15A
TBM10500	SB - North TBM Tunnel - CDG with Trimix (Ch7176 to 7126 - 50m)	10	26-Jul-15	05-Aug-15	15-Jun-15A	22-Jul-15A
TBM10510	SB - North TBM Tunnel - CDG with Trimix (Ch7126 to 7021 - 105m)	17	05-Aug-15	23-Aug-15	23-Jul-15A	16-Aug-15A
TBM10520	SB - North TBM Tunnel - CDG with Trimix (Ch7021 to 6891 - 130m)	12	23-Aug-15	04-Sep-15	17-Aug-15A	28-Aug-15A
TBM10530	SB - North TBM Tunnel - CDG+Boulder with Saturation (Ch6891 to 6861 - 30m)	9	04-Sep-15	13-Sep-15	29-Aug-15A	07-Sep-15A
TBM10540	SB - North TBM Tunnel - Transition with Saturation (Ch6861 to 6729 - 132m)	63	13-Sep-15	15-Nov-15	07-Sep-15A	23-Oct-15
TBM10550	SB - North TBM Tunnel - Transition with Saturation (Ch6729 to 6709 - 20m)	5	15-Nov-15	20-Nov-15	24-Oct-15	28-Oct-15
TBM11030	SB - North TBM Tunnel - Thrust Frame Removal	12	04-Sep-15	18-Sep-15	30-Sep-15	14-Oct-15
TBM11040	SB - North TBM Tunnel - Transition with Saturation (Ch6709 to 6661 - 48m)	11	20-Nov-15	01-Dec-15	29-Oct-15	08-Nov-15
TBM11050	SB - North TBM Tunnel - Transition with Saturation (Ch6661 to 6621 - 40m)	6	01-Dec-15	07-Dec-15	09-Nov-15	14-Nov-15
TBM11060	SB - North TBM Tunnel - Transition with Saturation (Ch6621 to 6581 - 40m)	4	07-Dec-15	11-Dec-15	15-Nov-15	18-Nov-15
North Approach Tunnel Internal Structure - NB						
ISIG0990	NB - North TBM Tunnel - Invert Backfilling (Ch7205 to 7175 - 30m) Stage 1	8	19-Aug-15	26-Aug-15	07-Sep-15A	10-Sep-15A
ISIG1000	NB - North TBM Tunnel - Invert Backfilling (Ch7175 to 6870 - 305m) Stage 1	87	27-Aug-15	21-Nov-15	07-Sep-15A	20-Dec-15



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

Detailed Works Programme (Rev. F) - Three Months Rolling Programme

Progress as of 27-Sep-15

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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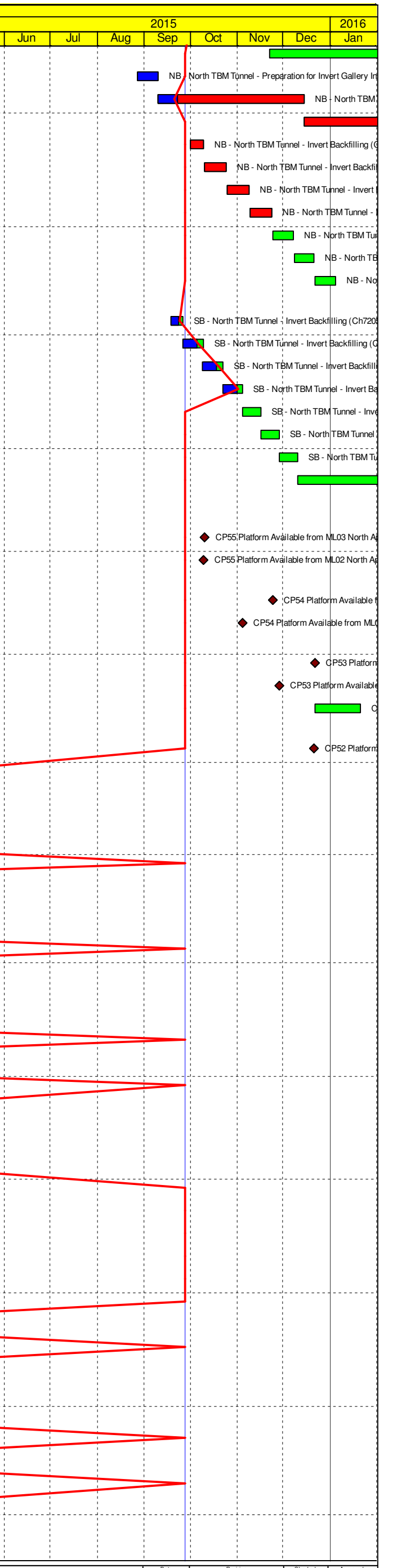
Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
ISIG1015	NB - North TBM Tunnel - Invert Backfilling (Ch6870 to 6688 - 182m) Stage 1	77	22-Nov-15	06-Feb-16	21-Dec-15	09-Mar-16
ISIG1020	NB - North TBM Tunnel - Preparation for Invert Gallery Installation	14	27-Aug-15	09-Sep-15	21-Sep-15A	25-Sep-15A
ISIG1030	NB - North TBM Tunnel - Invert Precast Gallery Installation (Ch7205 to 6870 - 335m)	96	10-Sep-15	14-Dec-15	01-Sep-15A	22-Jan-16
ISIG1040	NB - North TBM Tunnel - Invert Precast Gallery Installation (Ch6870 to 6688 - 182m)	77	15-Dec-15	03-Mar-16	23-Jan-16	14-Apr-16
ISIG1045	NB - North TBM Tunnel - Invert Backfilling (Ch7205 to 7175 - 30m) Stage 2	9	01-Oct-15	09-Oct-15	29-Oct-15	06-Nov-15
ISIG1050	NB - North TBM Tunnel - Invert Backfilling (Ch7175 to 7125 - 50m) Stage 2	15	10-Oct-15	24-Oct-15	07-Nov-15	21-Nov-15
ISIG1060	NB - North TBM Tunnel - Invert Backfilling (Ch7125 to 7075 - 50m) Stage 2	15	25-Oct-15	08-Nov-15	22-Nov-15	06-Dec-15
ISIG1070	NB - North TBM Tunnel - Invert Backfilling (Ch7075 to 7025 - 50m) Stage 2	15	09-Nov-15	23-Nov-15	07-Dec-15	21-Dec-15
ISIG1080	NB - North TBM Tunnel - Invert Backfilling (Ch7025 to 6975 - 50m) Stage 2	14	24-Nov-15	07-Dec-15	22-Dec-15	04-Jan-16
ISIG1090	NB - North TBM Tunnel - Invert Backfilling (Ch6975 to 6925- 50m) Stage 2	14	08-Dec-15	21-Dec-15	05-Jan-16	18-Jan-16
ISIG1100	NB - North TBM Tunnel - Invert Backfilling (Ch6925 to 6870 - 55m) Stage 2	14	22-Dec-15	04-Jan-16	19-Jan-16	01-Feb-16
North Approach Tunnel Internal Structure - SB						
ISIG1115	SB - North TBM Tunnel - Invert Backfilling (Ch7205 to 7175 - 30m)	8	18-Sep-15	26-Sep-15	14-Sep-15A	16-Oct-15
ISIG1120	SB - North TBM Tunnel - Invert Backfilling (Ch7175 to 7125 - 50m)	13	26-Sep-15	09-Oct-15	16-Sep-15A	19-Oct-15
ISIG1130	SB - North TBM Tunnel - Invert Backfilling (Ch7125 to 7075 - 50m)	13	09-Oct-15	22-Oct-15	18-Sep-15A	22-Oct-15
ISIG1140	SB - North TBM Tunnel - Invert Backfilling (Ch7075 to 7025 - 50m)	13	22-Oct-15	04-Nov-15	20-Sep-15A	25-Oct-15
ISIG1150	SB - North TBM Tunnel - Invert Backfilling (Ch7025 to 6975 - 50m)	12	04-Nov-15	16-Nov-15	26-Oct-15	06-Nov-15
ISIG1160	SB - North TBM Tunnel - Invert Backfilling (Ch6975 to 6925- 50m)	12	16-Nov-15	28-Nov-15	07-Nov-15	18-Nov-15
ISIG1170	SB - North TBM Tunnel - Invert Backfilling (Ch6925 to 6870 - 55m)	12	28-Nov-15	10-Dec-15	19-Nov-15	30-Nov-15
ISIG1180	SB - North TBM Tunnel - Invert Backfilling (Ch6870 to 6688 - 182m)	77	10-Dec-15	28-Feb-16	01-Dec-15	18-Feb-16
North Approach Cross Passage						
CP55 - Traditional Method						
A6418390	CP55 Platform Available from ML03 North Approach Tunnel Backfilling	0	10-Oct-15		07-Nov-15	
A6418440	CP55 Platform Available from ML02 North Approach Tunnel Backfilling	0	09-Oct-15		20-Oct-15	
CP54 - Traditional Method						
A6418380	CP54 Platform Available from ML03 North Approach Tunnel Backfilling	0	24-Nov-15		22-Dec-15	
A6418450	CP54 Platform Available from ML02 North Approach Tunnel Backfilling	0	04-Nov-15		26-Oct-15	
CP53 - Pipe Jacking Method						
A6418400	CP53 Platform Available from ML03 North Approach Tunnel Backfilling	0	22-Dec-15		19-Jan-16	
A6418460	CP53 Platform Available from ML02 North Approach Tunnel Backfilling	0	28-Nov-15		19-Nov-15	
CP10100	CP - Pipe Jacking TBM - Delivery, Assembly & Setup	23	22-Dec-15	20-Jan-16	19-Jan-16	20-Feb-16
CP52 - Pipe Jacking Method						
A6418470	CP52 Platform Available from ML02 North Approach Tunnel Backfilling	0	21-Dec-15		12-Dec-15	
North Ventilation Building						
Design Submission						
(A10) ACABAS Submissions						
GS01650	ACABAS Approval	28	16-Mar-14	12-Apr-14	27-Aug-15A	29-Sep-15
(A11) Submissons to Design Advisory Panel of ArchSD						
GS01730	Prepare Re-submission	18	19-May-14	09-Jun-14	22-Jul-14A	18-Sep-15A
GS01740	ArchSD's comment	30	10-Jun-14	09-Jul-14	18-Sep-15A	17-Oct-15
(I1) DDA for North Vent.Bldgs. GBP & Arch.Submission						
DD01235	Designer to Reply RtC + Update Submission	21	28-Jul-14	20-Aug-14	02-May-15A	17-Oct-15
DD01240	Submit Updated DDA to SO/ ICE/ IPs	0	21-Aug-14		19-Oct-15	
DD01245	ICE Approval & Issue Check Cert	12	21-Aug-14	03-Sep-14	19-Oct-15	02-Nov-15
DD01250	Submit ICE Check Cert to SO	6	04-Sep-14	11-Sep-14	03-Nov-15	09-Nov-15
DD01255	IPs Review	28	21-Aug-14	17-Sep-14	19-Oct-15	15-Nov-15
DD01260	IP's No Objection Received	0		17-Sep-14		15-Nov-15
DD01265	SO's Review	35	21-Aug-14	24-Sep-14	19-Oct-15	22-Nov-15
DD01270	SO Approval with Condition Received	0		24-Sep-14		23-Nov-15
(I1) DDA for North & South Vent.Bldg. ABWF works						
DD67638	Preparation of DDA North & South ABWF	18	25-Sep-14	17-Oct-14	23-Nov-15	12-Dec-15
DD67648	Review & Comment by JV	24	18-Oct-14	14-Nov-14	14-Dec-15	13-Jan-16
(I2) DDA for North Vent.Bldgs.Structural Design incl.Vent.Connections						
DD68018	Review & Comment by JV	18	27-Sep-14	20-Oct-14	02-Apr-15A	03-Aug-15A
DD68020	Designer prepare DDA	10	21-Oct-14	31-Oct-14	04-Aug-15A	10-Aug-15A
DD68028	Formal Submission of DDA to ICE/ IPs	0		31-Oct-14		10-Aug-15A
DD68030	Advanced Submission to SO	0		31-Oct-14		10-Aug-15A
DD68038	IPs/ SO's Advance Comments/ ICE Comments	28	01-Nov-14	28-Nov-14	10-Aug-15A	10-Sep-15A
DD68040	Comments Received	0		28-Nov-14		10-Sep-15A
DD68048	Designer to Reply RtC + Update Submission	21	29-Nov-14	23-Dec-14	10-Sep-15A	06-Oct-15
DD68058	Submit Updated DDA to SO/ ICE/ IPs	0	24-Dec-14		07-Oct-15	
DD68068	ICE Approval & Issue Check Cert	12	24-Dec-14	09-Jan-15	07-Oct-15	20-Oct-15
DD68078	Submit ICE Check Cert to SO	6	10-Jan-15	16-Jan-15	22-Oct-15	28-Oct-15
DD68088	IPs Review	28	24-Dec-14	20-Jan-15	07-Oct-15	03-Nov-15
DD68098	IP's No Objection Received	0		20-Jan-15		03-Nov-15
DD68210	SO's Review	35	24-Dec-14	27-Jan-15	07-Oct-15	10-Nov-15
DD68220	SO Approval with Condition Received	0		27-Jan-15		10-Nov-15
(I3) DDA for North & South Vent.Bldgs. Service and E&M Provision						
DD01600	Preparation of DDA Nth VB Service and E&MS Provision	18	12-Sep-14	04-Oct-14	01-Jul-15A	30-Sep-15
DD01605	Review & Comment by JV	24	06-Oct-14	01-Nov-14	02-Oct-15	30-Oct-15



Project ID: TMCLK_DWPF 15W39

Data Date: 27-Sep-15

Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

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Progress as of 27-Sep-15

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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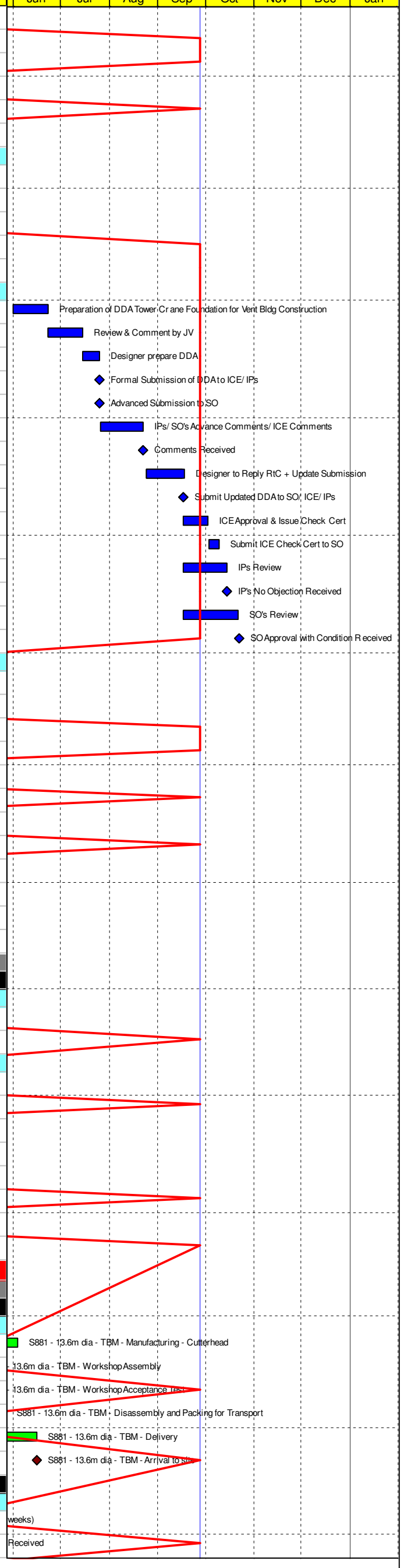
10-Jun-15	TMCLK/DBJ/GEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
DD01610	Designer prepare DDA	15	03-Nov-14	19-Nov-14	31-Oct-15	17-Nov-15
DD01615	Formal Submission of DDA to ICE/ IPs	0		19-Nov-14		17-Nov-15
DD01620	Advanced Submission to SO	0		19-Nov-14		17-Nov-15
DD01625	IPs/ SO's Advance Comments/ ICE Comments	28	20-Nov-14	17-Dec-14	18-Nov-15	15-Dec-15
DD01630	Comments Received	0		17-Dec-14		15-Dec-15
DD01635	Designer to Reply RtC + Update Submission	21	18-Dec-14	14-Jan-15	16-Dec-15	12-Jan-16
(J1) DDA Temp.works for Construction of Nth.Vent.Bldg.						
DD04470	ICE Approval & Issue Check Cert	12	09-Jan-15	22-Jan-15	29-Sep-15	13-Oct-15
DD04480	Submit ICE Check Cert to SO	6	23-Jan-15	29-Jan-15	14-Oct-15	20-Oct-15
DD04490	IPs Review	28	09-Jan-15	05-Feb-15	28-Sep-15	25-Oct-15
DD04500	IP's No Objection Received	0		05-Feb-15		25-Oct-15
DD04550	SO Approval with Condition Received	0		12-Feb-15		27-Oct-15
(J2) Tower Crane Foundation for Ventilation Building						
DD70480	Preparation of DDA Tower Crane Foundation for Vent Bldg Construction	18	01-Jun-15	22-Jun-15	01-Jul-15A	06-Jul-15A
DD70490	Review & Comment by JV	18	23-Jun-15	14-Jul-15	06-Jul-15A	09-Jul-15A
DD70500	Designer prepare DDA	10	15-Jul-15	25-Jul-15	09-Jul-15A	09-Jul-15A
DD70510	Formal Submission of DDA to ICE/ IPs	0		25-Jul-15		09-Jul-15A
DD70520	Advanced Submission to SO	0		25-Jul-15		09-Jul-15A
DD70530	IPs/ SO's Advance Comments/ ICE Comments	28	26-Jul-15	22-Aug-15	09-Jul-15A	22-Jul-15A
DD70540	Comments Received	0		22-Aug-15		22-Jul-15A
DD70550	Designer to Reply RtC + Update Submission	21	24-Aug-15	16-Sep-15	22-Jul-15A	22-Jul-15A
DD70560	Submit Updated DDA to SO/ ICE/ IPs	0	17-Sep-15		22-Jul-15A	
DD70570	ICE Approval & Issue Check Cert	12	17-Sep-15	02-Oct-15	22-Jul-15A	22-Jul-15A
DD70580	Submit ICE Check Cert to SO	6	03-Oct-15	09-Oct-15	22-Jul-15A	22-Jul-15A
DD70590	IPs Review	28	17-Sep-15	14-Oct-15	22-Jul-15A	22-Jul-15A
DD70600	IP's No Objection Received	0		14-Oct-15		22-Jul-15A
DD70640	SO's Review	35	17-Sep-15	21-Oct-15	22-Jul-15A	22-Jul-15A
DD70650	SO Approval with Condition Received	0		22-Oct-15		22-Jul-15A
(C3) DDA for North Vent Shaft & Duct Permanent Structure						
DD67278	Review & Comment by JV	18	28-Aug-14	18-Sep-14	08-Apr-15A	30-Sep-15
DD67280	Designer prepare DDA	10	19-Sep-14	30-Sep-14	02-Oct-15	13-Oct-15
DD67288	Formal Submission of DDA to ICE/ IPs	0		30-Sep-14		13-Oct-15
DD67290	Advanced Submission to SO	0		30-Sep-14		13-Oct-15
DD67298	IPs/ SO's Advance Comments/ ICE Comments	28	01-Oct-14	28-Oct-14	14-Oct-15	10-Nov-15
DD67300	Comments Received	0		28-Oct-14		10-Nov-15
DD67308	Designer to Reply RtC + Update Submission	21	29-Oct-14	21-Nov-14	11-Nov-15	04-Dec-15
DD67318	Submit Updated DDA to SO/ ICE/ IPs	0	22-Nov-14		05-Dec-15	
DD67328	ICE Approval & Issue Check Cert	12	22-Nov-14	05-Dec-14	05-Dec-15	18-Dec-15
DD67338	Submit ICE Check Cert to SO	6	06-Dec-14	12-Dec-14	19-Dec-15	28-Dec-15
DD67348	IPs Review	28	22-Nov-14	19-Dec-14	05-Dec-15	01-Jan-16
DD67368	SO's Review	35	22-Nov-14	26-Dec-14	05-Dec-15	08-Jan-16
North Surface Roadworks, Utility & Drainage works						
Design Submission						
(A20) DDA for Traffic Sign, Road Marking, Street Furnitures, Sign Gantry & etc						
DD01755	SO's Review	35	11-Dec-14	14-Jan-15	10-Apr-15A	30-Sep-15
DD01760	SO Approval with Condition Received	0		14-Jan-15		30-Sep-15
(C2) DDA for Sewerage, Drainage, Waterworks & Utility works for North Landfall						
DD02135	Designer to Reply RtC + Update Submission	21	15-Oct-14	07-Nov-14	09-Feb-15A	30-Sep-15
DD02140	Submit Updated DDA to SO/ ICE/ IPs	0	08-Nov-14		02-Oct-15	
DD02145	ICE Approval & Issue Check Cert	12	08-Nov-14	21-Nov-14	02-Oct-15	15-Oct-15
DD02150	Submit ICE Check Cert to SO	6	22-Nov-14	28-Nov-14	16-Oct-15	23-Oct-15
DD02155	IPs Review	28	08-Nov-14	05-Dec-14	02-Oct-15	29-Oct-15
DD02160	IP's No Objection Received	0		05-Dec-14		29-Oct-15
DD02165	SO's Review	35	08-Nov-14	12-Dec-14	02-Oct-15	05-Nov-15
DD02170	SO Approval with Condition Received	0		12-Dec-14		05-Nov-15
Sub-sea Tunnel						
Sub-sea TBM Tunnelling						
Major Procurement						
S881 -						
PO103360	S881 - 13.6m dia - TBM - Manufacturing - Cutterhead	257	18-Jul-14	03-Jun-15	18-Jul-14A	14-Oct-15
PO103430	S881 - 13.6m dia - TBM - Workshop Assembly	70	02-Feb-15	06-May-15	10-Mar-15A	05-Oct-15
PO103440	S881 - 13.6m dia - TBM - Workshop Acceptance Test	0		06-May-15		05-Oct-15
PO103450	S881 - 13.6m dia - TBM - Disassembly and Packing for Transport	16	07-May-15	26-May-15	10-Jul-15A	14-Oct-15
PO103460	S881 - 13.6m dia - TBM - Delivery	20	27-May-15	15-Jun-15	15-Oct-15	03-Nov-15
PO103470	S881 - 13.6m dia - TBM - Arrival to site	0		15-Jun-15		03-Nov-15
Design Submission						
(B6) Risk Assessment of Submarine Cable - Tunnelling Works						
GS01460	CLP Review (4 weeks)	28	17-Mar-15	13-Apr-15	08-May-15A	29-Sep-15
GS01465	CLP Comment Received	0		13-Apr-15		29-Sep-15



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

Detailed Works Programme (Rev. F) - Three Months Rolling Programme

Progress as of 27-Sep-15

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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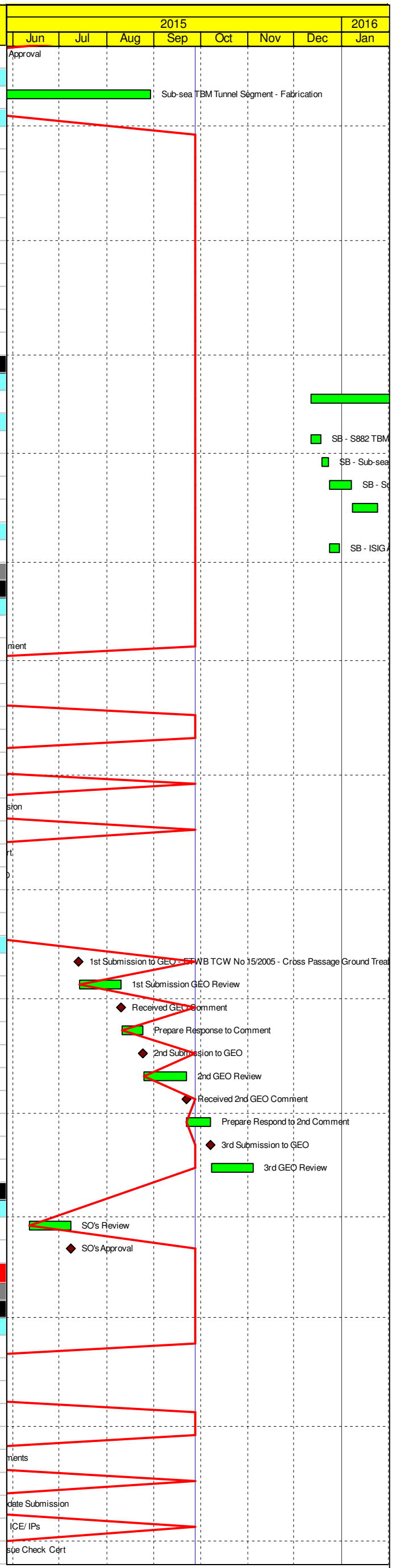
12-Feb-14	TMCLK/DBJ/GEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJ/GEN/PRG/98507 Rev.B	SPa	WYu
28-Aug-14	TMCLK/DBJ/GEN/PRG/98507 Rev.C	CLa	WYu
10-Jun-15	TMCLK/DBJ/GEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
GS01467	SO's Condition Approval	35	12-Mar-15	15-Apr-15	08-May-15A	02-Oct-15
(G1) DDA for TBM Tunnel Lining Structural Design - Sub-sea tunnel						
DD6670	Sub-sea TBM Tunnel Segment - Fabrication	265	06-Oct-14	29-Aug-15	29-Nov-14A	25-May-16
(G1) DDA for TBM Tunnel Lining Settlement Anlysis & Confinement Pressure - Sub-sea tunnel						
DD6720	IPs/ SO's Advance Comments/ ICE Comments	28	25-Oct-14	21-Nov-14	10-May-15A	23-Jul-15A
DD67258	Comments Received	0		21-Nov-14		23-Jul-15A
DD6730	Designer to Reply RtC + Update Submission	21	22-Nov-14	16-Dec-14	23-Jul-15A	28-Jul-15A
DD6740	Submit Updated DDA to SO/ ICE/ IPs	0	17-Dec-14		28-Jul-15A	
DD6750	ICE Approval & Issue Check Cert	12	17-Dec-14	02-Jan-15	28-Jul-15A	28-Jul-15A
DD6760	Submit ICE Check Cert to SO	6	03-Jan-15	09-Jan-15	28-Jul-15A	28-Jul-15A
DD6770	IPs Review	28	17-Dec-14	13-Jan-15	28-Jul-15A	10-Sep-15A
DD6780	IP's No Objection Received	0		13-Jan-15		10-Sep-15A
DD6830	SO's Review	35	17-Dec-14	20-Jan-15	28-Jul-15A	10-Sep-15A
DD6840	SO Approval with Condition Received	0		20-Jan-15		10-Sep-15A
Construction						
Sub-sea TBM Tunnel - NB ID12.2m - S881						
TBM10080	NB TBM Change diameter at North Ventilation Shaft	87	12-Dec-15	10-Mar-16	20-Nov-15	17-Feb-16
Sub-sea TBM Tunnel - SB ID12.2m - S882						
TBM10560	SB - S882 TBM Crossing within NVS Steel bell	7	12-Dec-15	18-Dec-15	20-Nov-15	26-Nov-15
TBM10600	SB - Sub-sea TBM Tunnel - Transition with Saturation (Ch6543 to 6521 - 22m)	5	19-Dec-15	23-Dec-15	27-Nov-15	01-Dec-15
TBM10610	SB - Sub-sea TBM Tunnel - Transition with Saturation (Ch6521 to 6451 - 70m)	15	24-Dec-15	07-Jan-16	02-Dec-15	16-Dec-15
TBM10620	SB - Sub-sea TBM Tunnel - Transition with Saturation (Ch6451 to 6371 - 80m)	17	08-Jan-16	24-Jan-16	17-Dec-15	02-Jan-16
Sub-sea TBM Tunnel - SB - Precast Invert Gallery						
ISIG1605	SB - ISIG Assembly for Sub-sea TBM Tunnel	7	24-Dec-15	30-Dec-15	02-Dec-15	08-Dec-15
Sub-sea Tunnel Cross Passage & Internal Structure						
Design Submission						
(G4) DDA for Cross Passage - Permanent works - incl. Geotechnical Assessment - Sub-sea tunnel						
AN1180	Early DDA Sub-sea Cross Passage Lining & CP Opening	151	03-Jun-14	29-Nov-14	03-Jun-14A	13-Jul-15A
DD01100	Preparation of DDA Cross Passage incl. Detailed Geotechnical Assessment	0	01-Dec-14	01-Dec-14	13-Jul-15A	13-Jul-15A
DD01105	Review & Comment by JV	6	01-Dec-14	06-Dec-14	13-Jul-15A	29-Sep-15
DD01110	Designer prepare DDA	12	08-Dec-14	20-Dec-14	30-Sep-15	14-Oct-15
DD01115	Formal Submission of DDA to ICE/ IPs	0		20-Dec-14		14-Oct-15
DD01120	Advanced Submission to SO	0		20-Dec-14		14-Oct-15
DD01125	IPs/ SO's Advance Comments/ ICE Comments	28	21-Dec-14	17-Jan-15	15-Oct-15	11-Nov-15
DD01130	Comments Received	0		17-Jan-15		11-Nov-15
DD01135	Designer to Reply RtC + Update Submission	21	19-Jan-15	11-Feb-15	12-Nov-15	05-Dec-15
DD01140	Submit Updated DDA to SO/ ICE/ IPs	0	12-Feb-15		07-Dec-15	
DD01145	ICE Approval & Issue Check Cert	12	12-Feb-15	04-Mar-15	07-Dec-15	19-Dec-15
DD01150	Submit ICE Check Cert to SO	6	05-Mar-15	11-Mar-15	21-Dec-15	29-Dec-15
DD01155	IPs Review	28	12-Feb-15	11-Mar-15	07-Dec-15	03-Jan-16
DD01180	SO's Review	35	12-Feb-15	18-Mar-15	07-Dec-15	10-Jan-16
ETWB TCW No 15/2005 - Cross Passage Ground Treatment for Sub-sea TBM Tunnel						
GEO1270	1st Submission to GEO - ETWB TCW No 15/2005 - Cross Passage Ground Treatment for Sub-sea TBM Tunnel	0		13-Jul-15		29-Sep-15
GEO1275	1st Submission GEO Review	28	14-Jul-15	10-Aug-15	29-Sep-15	26-Oct-15
GEO1280	Received GEO Comment	0		10-Aug-15		26-Oct-15
GEO1285	Prepare Response to Comment	12	11-Aug-15	24-Aug-15	27-Oct-15	09-Nov-15
GEO1290	2nd Submission to GEO	0		24-Aug-15		09-Nov-15
GEO1295	2nd GEO Review	28	25-Aug-15	21-Sep-15	10-Nov-15	07-Dec-15
GEO1490	Received 2nd GEO Comment	0		21-Sep-15		07-Dec-15
GEO1495	Prepare Respond to 2nd Comment	12	22-Sep-15	07-Oct-15	08-Dec-15	21-Dec-15
GEO1500	3rd Submission to GEO	0		07-Oct-15		21-Dec-15
GEO1505	3rd GEO Review	28	08-Oct-15	04-Nov-15	22-Dec-15	18-Jan-16
Method Statement Submission						
Method Statement of Cross Passage Formwork						
MS2640	SO's Review	28	11-Jun-15	08-Jul-15	09-Apr-16	06-May-16
MS2650	SO's Approval	0		08-Jul-15		06-May-16
Southern Landfall						
South Cut & Cover Tunnel						
Design Submission						
(E2) DDA for South C&C Box & Approach Ramp						
DD00460	Preparation DDA Sth C&C Box and Approach Ramp	18	18-Nov-14	08-Dec-14	02-Jul-15A	31-Jul-15A
DD00470	Review & Comment by JV	18	09-Dec-14	31-Dec-14	31-Jul-15A	30-Sep-15
DD00480	Designer prepare DDA	10	02-Jan-15	13-Jan-15	02-Oct-15	13-Oct-15
DD00490	Formal Submission of DDA to ICE/ IPs	0		13-Jan-15		13-Oct-15
DD00500	Advanced Submission to SO	0		13-Jan-15		13-Oct-15
DD00510	IPs/ SO's Advance Comments/ ICE Comments	28	14-Jan-15	10-Feb-15	14-Oct-15	10-Nov-15
DD00520	Comments Received	0		10-Feb-15		10-Nov-15
DD00530	Designer to Reply RtC + Update Submission	21	11-Feb-15	13-Mar-15	11-Nov-15	04-Dec-15
DD00540	Submit Updated DDA to SO/ ICE/ IPs	0	14-Mar-15		05-Dec-15	
DD00550	ICE Approval & Issue Check Cert	18	14-Mar-15	08-Apr-15	05-Dec-15	28-Dec-15



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

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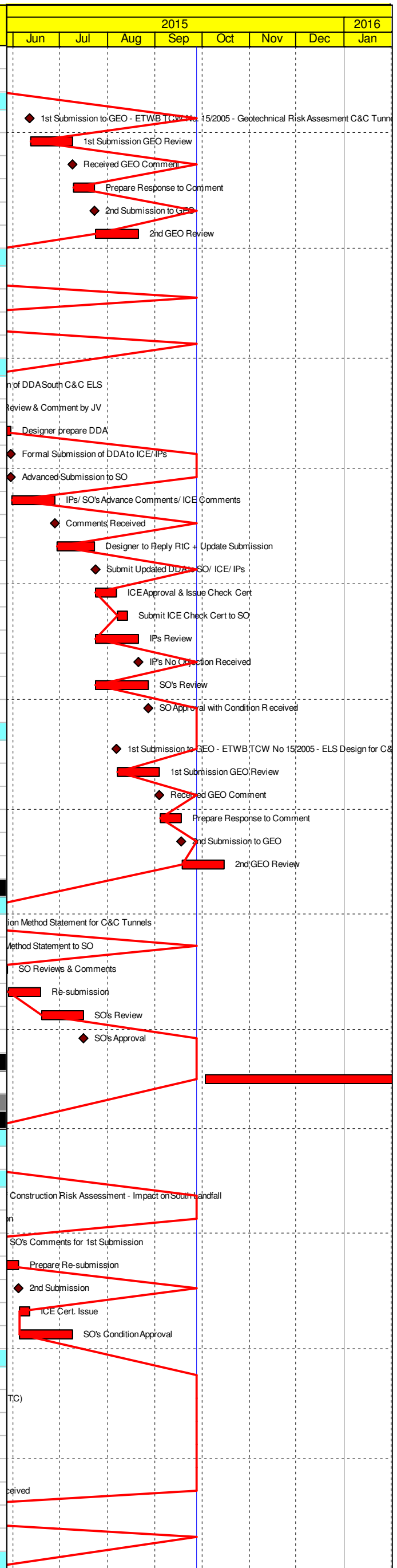
10-Jun-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
DD00570	IPs Review	28	14-Mar-15	10-Apr-15	05-Dec-15	01-Jan-16
DD00620	SO's Review	35	14-Mar-15	17-Apr-15	05-Dec-15	08-Jan-16
ETWB TCW No. 15/2005 - Geotechnical Risk Assessment C&C Tunnels at Southern Landfall						
GEO1300	1st Submission to GEO - ETWB TCW No. 15/2005 - Geotechnical Risk Assesment C&C Tunnels at Souththern Landfall	0		11-Jun-15		18-Nov-15
GEO1305	1st Submission GEO Review	28	12-Jun-15	09-Jul-15	19-Nov-15	16-Dec-15
GEO1310	Received GEO Comment	0		09-Jul-15		16-Dec-15
GEO1315	Prepare Response to Comment	12	10-Jul-15	23-Jul-15	17-Dec-15	02-Jan-16
GEO1320	2nd Submission to GEO	0		23-Jul-15		02-Jan-16
GEO1325	2nd GEO Review	28	24-Jul-15	20-Aug-15	03-Jan-16	30-Jan-16
(F3) AIP Temp.Support for South.C&C, Portal & ELS						
DD69690	IPs Review	28	10-Jan-15	06-Feb-15	04-Jun-15A	29-Sep-15
DD69700	IP's No Objection Received	0		06-Feb-15		29-Sep-15
DD69710	SO's Review	35	10-Jan-15	13-Feb-15	04-Jun-15A	01-Oct-15
DD69720	SO Approval with Condition Received	0		13-Feb-15		02-Oct-15
(F3) DDA Temp.Support for South.C&C, Portal & ELS						
DD04000	Preparation of DDA South C&C ELS	18	01-Apr-15	25-Apr-15	02-Oct-15	23-Oct-15
DD04010	Review & Comment by JV	18	27-Apr-15	18-May-15	24-Oct-15	13-Nov-15
DD04020	Designer prepare DDA	10	19-May-15	30-May-15	14-Nov-15	25-Nov-15
DD04030	Formal Submission of DDA to ICE/ IPs	0		30-May-15		25-Nov-15
DD04040	Advanced Submission to SO	0		30-May-15		25-Nov-15
DD04050	IPs/ SO's Advance Comments/ ICE Comments	28	31-May-15	27-Jun-15	26-Nov-15	23-Dec-15
DD04060	Comments Received	0		27-Jun-15		23-Dec-15
DD04070	Designer to Reply RtC + Update Submission	21	29-Jun-15	23-Jul-15	24-Dec-15	20-Jan-16
DD04080	Submit Updated DDA to SO/ ICE/ IPs	0	24-Jul-15		21-Jan-16	
DD04090	ICE Approval & Issue Check Cert	12	24-Jul-15	06-Aug-15	21-Jan-16	03-Feb-16
DD04100	Submit ICE Check Cert to SO	6	07-Aug-15	13-Aug-15	04-Feb-16	17-Feb-16
DD04110	IPs Review	28	24-Jul-15	20-Aug-15	21-Jan-16	17-Feb-16
DD04120	IP's No Objection Received	0		20-Aug-15		17-Feb-16
DD04160	SO's Review	35	24-Jul-15	27-Aug-15	21-Jan-16	24-Feb-16
DD04170	SO Approval with Condition Received	0		27-Aug-15		24-Feb-16
ETWB TCW No 15/2005 - ELS Design for C&C Tunnel at Southern Landfall						
GEO1390	1st Submission to GEO - ETWB TCW No 15/2005 - ELS Design for C&C Tunnel at Southern Landfall	0		06-Aug-15		03-Feb-16
GEO1395	1st Submission GEO Review	28	07-Aug-15	03-Sep-15	04-Feb-16	02-Mar-16
GEO1400	Received GEO Comment	0		03-Sep-15		02-Mar-16
GEO1405	Prepare Response to Comment	12	04-Sep-15	17-Sep-15	03-Mar-16	16-Mar-16
GEO1410	2nd Submission to GEO	0		17-Sep-15		16-Mar-16
GEO1415	2nd GEO Review	28	18-Sep-15	15-Oct-15	17-Mar-16	13-Apr-16
Method Statement Submission						
Method Statement of Construction Methodology of C&C Tunnels						
MS1700	Preparation Method Statement for C&C Tunnels	25	28-Mar-15	30-Apr-15	29-Sep-15	29-Oct-15
MS1710	Submit Method Statement to SO	0		30-Apr-15		29-Oct-15
MS1720	SO Reviews & Comments	28	01-May-15	28-May-15	30-Oct-15	26-Nov-15
MS1730	Re-submission	18	29-May-15	18-Jun-15	27-Nov-15	17-Dec-15
MS1740	SO's Review	28	19-Jun-15	16-Jul-15	18-Dec-15	14-Jan-16
MS1750	SO's Approval	0		16-Jul-15		14-Jan-16
Construction						
DDP11520	South C&C Tunnel - Diaphragm Wall	120	03-Oct-15	02-Mar-16	25-Feb-16	22-Jul-16
South Retrieval Shaft						
Design Submission						
(B5) AIP Construction Risk Assessment - Impact on South Landfall						
GS01250	SO's Condition Approval	35	27-Jan-15	02-Mar-15	03-Jun-15A	29-Sep-15
(B5) DDA Construction Risk Assessment - Impact on South Landfall						
DD68500	Preparation of Construction Risk Assessment - Impact on South Landfall	36	03-Mar-15	17-Apr-15	01-Sep-15A	24-Sep-15A
DD68510	1st Submission	0		17-Apr-15		24-Sep-15A
DD68520	SO's Comments for 1st Submission	35	18-Apr-15	22-May-15	24-Sep-15A	30-Oct-15
DD68530	Prepare Re-submission	10	23-May-15	04-Jun-15	31-Oct-15	11-Nov-15
DD68540	2nd Submission	0		04-Jun-15		11-Nov-15
DD68550	ICE Cert. Issue	6	05-Jun-15	11-Jun-15	12-Nov-15	18-Nov-15
DD68600	SO's Condition Approval	35	05-Jun-15	09-Jul-15	12-Nov-15	16-Dec-15
(F1) AIP Temp.works - Retrieval Shaft on Southern Landfall inc. break-out						
AP01635	Designer to Prepare RtC & Updated AIP	18	25-Nov-14	15-Dec-14	28-Apr-15A	30-Jun-15A
AP01640	Submisson of AIP to SO/ ICE together with Reply To Comment (RTC)	0		15-Dec-14		30-Jun-15A
AP01645	Reply to IPs Comments in RTC	0		15-Dec-14		30-Jun-15A
AP01650	ICE Approval & Issue of Design Check Cert.	18	16-Dec-14	08-Jan-15	20-Jun-15A	30-Jun-15A
AP01655	Check Cert to SO	0		08-Jan-15		30-Jun-15A
AP01660	No Objection or Further Minor Comments from IPs Received	0		08-Jan-15		30-Jun-15A
AP01680	SO Review (35 Days)	35	17-Dec-14	20-Jan-15	30-Jun-15A	30-Sep-15
AP01685	SO Approval with Condition Received	0		20-Jan-15		30-Sep-15
(F1) DDA Temp.works - Retrieval Shaft on Southern Landfall inc. break-out						



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

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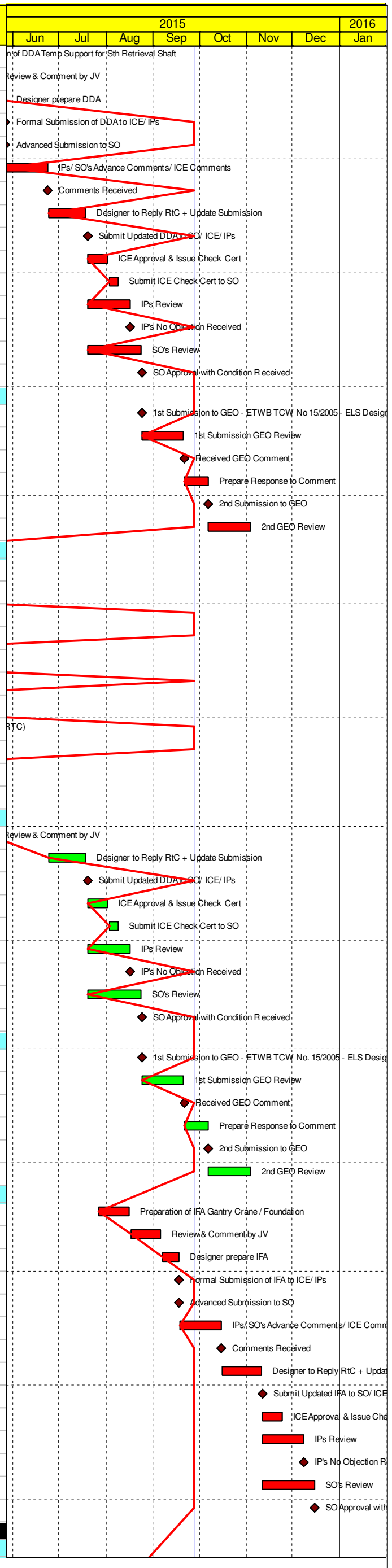
10-Jun-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
DD03510	Preparation of DDA Temp Support for Sth Retrieval Shaft	18	01-Apr-15	25-Apr-15	02-Oct-15	23-Oct-15
DD03520	Review & Comment by JV	18	27-Apr-15	18-May-15	24-Oct-15	13-Nov-15
DD03530	Designer prepare DDA	6	19-May-15	26-May-15	14-Nov-15	20-Nov-15
DD03540	Formal Submission of DDA to ICE/ IPs	0		26-May-15		20-Nov-15
DD03550	Advanced Submission to SO	0		26-May-15		20-Nov-15
DD03560	IPs/ SO's Advance Comments/ ICE Comments	28	27-May-15	23-Jun-15	21-Nov-15	18-Dec-15
DD03570	Comments Received	0		23-Jun-15		18-Dec-15
DD03580	Designer to Reply RtC + Update Submission	21	24-Jun-15	18-Jul-15	19-Dec-15	15-Jan-16
DD03590	Submit Updated DDA to SO/ ICE/ IPs	0	20-Jul-15		16-Jan-16	
DD03600	ICE Approval & Issue Check Cert	12	20-Jul-15	01-Aug-15	16-Jan-16	29-Jan-16
DD03610	Submit ICE Check Cert to SO	6	03-Aug-15	08-Aug-15	30-Jan-16	05-Feb-16
DD03620	IPs Review	28	20-Jul-15	16-Aug-15	16-Jan-16	12-Feb-16
DD03630	IP's No Objection Received	0		16-Aug-15		12-Feb-16
DD03670	SO's Review	35	20-Jul-15	23-Aug-15	16-Jan-16	19-Feb-16
DD03680	SO Approval with Condition Received	0		24-Aug-15		19-Feb-16
ETWB TCW No 15/2005 - ELS Design for TBM Retrieval Shaft at Southern Landfall						
GEO1330	1st Submission to GEO - ETWB TCW No 15/2005 - ELS Design for TBM Retrieval Shaft at Southern Landfall	0		24-Aug-15		19-Feb-16
GEO1335	1st Submission GEO Review	28	24-Aug-15	20-Sep-15	20-Feb-16	18-Mar-16
GEO1340	Received GEO Comment	0		21-Sep-15		18-Mar-16
GEO1345	Prepare Response to Comment	12	21-Sep-15	06-Oct-15	19-Mar-16	06-Apr-16
GEO1350	2nd Submission to GEO	0		06-Oct-15		06-Apr-16
GEO1355	2nd GEO Review	28	07-Oct-15	03-Nov-15	07-Apr-16	04-May-16
(F2) AIP Temp works of Ground Treatment for TBMs passing under Southern Landfall						
AP01905	Review & Comment by JV	18	23-Sep-14	15-Oct-14	15-Apr-15A	02-Oct-15
AP01910	Designer Prepare AIP	12	16-Oct-14	29-Oct-14	03-Oct-15	16-Oct-15
AP01915	Formal Submission of AIP to ICE/IPs	0		29-Oct-14		16-Oct-15
AP01920	Advanced Submission of AIP to SO	0		29-Oct-14		16-Oct-15
AP01925	Review & Comment by SO/ ICE/ IPs	28	30-Oct-14	26-Nov-14	17-Oct-15	13-Nov-15
AP01930	Advance Commants from SO/ Comments from ICE/ IPs Received	0		26-Nov-14		13-Nov-15
AP01935	Designer to Prepare RtC & Updated AIP	18	27-Nov-14	17-Dec-14	14-Nov-15	04-Dec-15
AP01940	Submisson of AIP to SO/ ICE together with Reply To Comment (RTC)	0		17-Dec-14		04-Dec-15
AP01945	Reply to IPs Comments in RTC	0		17-Dec-14		04-Dec-15
AP01950	ICE Approval & Issue of Design Check Cert.	18	18-Dec-14	10-Jan-15	05-Dec-15	28-Dec-15
AP01980	SO Review (35 Days)	35	19-Dec-14	22-Jan-15	06-Dec-15	09-Jan-16
(F2) DDA Temp works of Ground Treatment for TBMs passing under Southern Landfall						
DD04750	Review & Comment by JV	18	27-Apr-15	18-May-15	15-Apr-15A	12-Jan-16
DD04810	Designer to Reply RtC + Update Submission	21	24-Jun-15	18-Jul-15	17-Feb-16	11-Mar-16
DD04820	Submit Updated DDA to SO/ ICE/ IPs	0	20-Jul-15		12-Mar-16	
DD04830	ICE Approval & Issue Check Cert	12	20-Jul-15	01-Aug-15	12-Mar-16	29-Mar-16
DD04840	Submit ICE Check Cert to SO	6	03-Aug-15	08-Aug-15	30-Mar-16	06-Apr-16
DD04850	IPs Review	28	20-Jul-15	16-Aug-15	12-Mar-16	08-Apr-16
DD04860	IP's No Objection Received	0		16-Aug-15		08-Apr-16
DD04900	SO's Review	35	20-Jul-15	23-Aug-15	12-Mar-16	15-Apr-16
DD04910	SO Approval with Condition Received	0		24-Aug-15		15-Apr-16
ETWB TCW No 15/2005 - ELS Design for Temporary Measures for Ground Improvement						
GEO1360	1st Submission to GEO - ETWB TCW No. 15/2005 - ELS Design for Gournd Improvement at Southern Landfall	0		24-Aug-15		15-Apr-16
GEO1365	1st Submission GEO Review	28	24-Aug-15	20-Sep-15	16-Apr-16	13-May-16
GEO1370	Received GEO Comment	0		21-Sep-15		13-May-16
GEO1375	Prepare Response to Comment	12	21-Sep-15	06-Oct-15	16-May-16	28-May-16
GEO1380	2nd Submission to GEO	0		06-Oct-15		28-May-16
GEO1385	2nd GEO Review	28	07-Oct-15	03-Nov-15	29-May-16	25-Jun-16
(F4) Gantry Crane Support/Foundations in Southern Landfall						
DD69730	Preparation of IFA Gantry Crane / Foundation	18	27-Jul-15	15-Aug-15	18-Feb-16	09-Mar-16
DD69740	Review & Comment by JV	18	17-Aug-15	05-Sep-15	10-Mar-16	02-Apr-16
DD69750	Designer prepare IFA	10	07-Sep-15	17-Sep-15	05-Apr-16	15-Apr-16
DD69760	Formal Submission of IFA to ICE/ IPs	0		17-Sep-15		15-Apr-16
DD69770	Advanced Submission to SO	0		17-Sep-15		15-Apr-16
DD69780	IPs/ SO's Advance Comments/ ICE Comments	28	18-Sep-15	15-Oct-15	16-Apr-16	13-May-16
DD69790	Comments Received	0		15-Oct-15		13-May-16
DD69800	Designer to Reply RtC + Update Submission	21	16-Oct-15	10-Nov-15	16-May-16	08-Jun-16
DD69810	Submit Updated IFA to SO/ ICE/ IPs	0	11-Nov-15		10-Jun-16	
DD69820	ICE Approval & Issue Check Cert	12	11-Nov-15	24-Nov-15	10-Jun-16	23-Jun-16
DD69830	IPs Review	28	11-Nov-15	08-Dec-15	10-Jun-16	07-Jul-16
DD69840	IP's No Objection Received	0		08-Dec-15		07-Jul-16
DD69850	SO's Review	35	11-Nov-15	15-Dec-15	10-Jun-16	14-Jul-16
DD69860	SO Approval with Condition Received	0		15-Dec-15		14-Jul-16
Method Statement Submission						
Method Statement of Construction Methodology of Retrieval Shaft						



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

Detailed Works Programme (Rev. F) - Three Months Rolling Programme

Progress as of 27-Sep-15

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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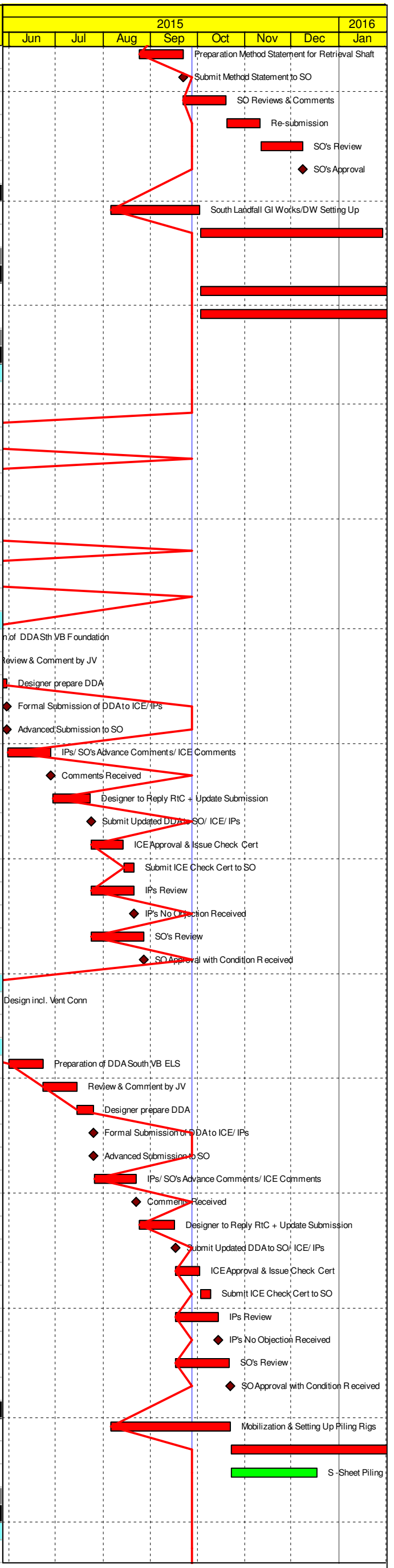
10-Jun-15	TMCLK/DBJ/GEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
MS1600	Preparation Method Statement for Retrieval Shaft	25	24-Aug-15	21-Sep-15	20-Feb-16	19-Mar-16
MS1610	Submit Method Statement to SO	0		21-Sep-15		19-Mar-16
MS1620	SO Reviews & Comments	28	22-Sep-15	19-Oct-15	20-Mar-16	16-Apr-16
MS1630	Re-submission	18	20-Oct-15	10-Nov-15	18-Apr-16	09-May-16
MS1640	SO's Review	28	11-Nov-15	08-Dec-15	10-May-16	06-Jun-16
MS1650	SO's Approval	0		08-Dec-15		06-Jun-16
Construction						
DDP11430	South Landfall GI Works/DW Setting Up	48	06-Aug-15	02-Oct-15	17-Dec-15	20-Feb-16
DDP11450	South Retrieval Shaft - Diaphragm Wall	98	03-Oct-15	29-Jan-16	14-Mar-16	14-Jul-16
South Approach Ramp						
Construction						
DDP11840	Appoach Ramp (CH1580-1850) - Pipe Pile/Sheet Piles Wall	126	03-Oct-15	09-Mar-16	22-Feb-16	26-Jul-16
DDP11850	Appoach Ramp (CH1580-1850) - Tension Piles	103	03-Oct-15	04-Feb-16	22-Feb-16	28-Jun-16
South Ventilation Building						
Design Submission						
(I1) DDA for South Vent.Bldg. GBP & Arch.Submission						
DD01425	IPs/ SO's Advance Comments/ ICE Comments	28	30-Oct-14	26-Nov-14	25-Feb-15A	30-Jun-15A
DD01430	Comments Received	0		26-Nov-14		30-Jun-15A
DD01435	Designer to Reply RtC + Update Submission	21	27-Nov-14	20-Dec-14	30-Jun-15A	22-Oct-15
DD01440	Submit Updated DDA to SO/ ICE/ IPs	0	22-Dec-14		23-Oct-15	
DD01445	ICE Approval & Issue Check Cert	18	22-Dec-14	14-Jan-15	23-Oct-15	12-Nov-15
DD01450	Submit ICE Check Cert to SO	6	15-Jan-15	21-Jan-15	13-Nov-15	19-Nov-15
DD01455	IPs Review	28	22-Dec-14	18-Jan-15	23-Oct-15	19-Nov-15
DD01460	IP's No Objection Received	0		18-Jan-15		19-Nov-15
DD01465	SO's Review	35	22-Dec-14	25-Jan-15	23-Oct-15	26-Nov-15
DD01470	SO Approval with Condition Received	0		26-Jan-15		26-Nov-15
(I2) DDA for South Vent.Bldg. Foundation Design						
DD01500	Preparation of DDA Sth VB Foundation	18	01-Apr-15	25-Apr-15	23-Oct-15	12-Nov-15
DD01505	Review & Comment by JV	18	27-Apr-15	18-May-15	13-Nov-15	03-Dec-15
DD01510	Designer prepare DDA	10	19-May-15	30-May-15	04-Dec-15	15-Dec-15
DD01515	Formal Submission of DDA to ICE/ IPs	0		30-May-15		15-Dec-15
DD01520	Advanced Submission to SO	0		30-May-15		15-Dec-15
DD01525	IPs/ SO's Advance Comments/ ICE Comments	28	31-May-15	27-Jun-15	16-Dec-15	12-Jan-16
DD01530	Comments Received	0		27-Jun-15		12-Jan-16
DD01535	Designer to Reply RtC + Update Submission	21	29-Jun-15	23-Jul-15	13-Jan-16	05-Feb-16
DD01540	Submit Updated DDA to SO/ ICE/ IPs	0	24-Jul-15		06-Feb-16	
DD01545	ICE Approval & Issue Check Cert	18	24-Jul-15	13-Aug-15	06-Feb-16	04-Mar-16
DD01550	Submit ICE Check Cert to SO	6	14-Aug-15	20-Aug-15	05-Mar-16	11-Mar-16
DD01555	IPs Review	28	24-Jul-15	20-Aug-15	06-Feb-16	04-Mar-16
DD01560	IP's No Objection Received	0		20-Aug-15		04-Mar-16
DD01580	SO's Review	35	24-Jul-15	27-Aug-15	06-Feb-16	11-Mar-16
DD01585	SO Approval with Condition Received	0		27-Aug-15		11-Mar-16
(I2) DDA for South Vent.Bldg.Structural Design incl.Vent.Connections						
DD67808	Preparation of DDA Sth VB Structural Design incl. Vent Conn	18	28-Jan-15	17-Feb-15	27-Nov-15	17-Dec-15
DD67818	Review & Comment by JV	18	18-Feb-15	17-Mar-15	18-Dec-15	11-Jan-16
(J1) DDA Temp.works for Construction of Sth.Vent.Bldg.						
DD04560	Preparation of DDA South VB ELS	18	01-Jun-15	22-Jun-15	16-Dec-15	08-Jan-16
DD04570	Review & Comment by JV	18	23-Jun-15	14-Jul-15	09-Jan-16	29-Jan-16
DD04580	Designer prepare DDA	10	15-Jul-15	25-Jul-15	30-Jan-16	17-Feb-16
DD04590	Formal Submission of DDA to ICE/ IPs	0		25-Jul-15		17-Feb-16
DD04600	Advanced Submission to SO	0		25-Jul-15		17-Feb-16
DD04610	IPs/ SO's Advance Comments/ ICE Comments	28	26-Jul-15	22-Aug-15	18-Feb-16	16-Mar-16
DD04620	Comments Received	0		22-Aug-15		16-Mar-16
DD04630	Designer to Reply RtC + Update Submission	21	24-Aug-15	16-Sep-15	17-Mar-16	14-Apr-16
DD04640	Submit Updated DDA to SO/ ICE/ IPs	0	17-Sep-15		15-Apr-16	
DD04650	ICE Approval & Issue Check Cert	12	17-Sep-15	02-Oct-15	15-Apr-16	28-Apr-16
DD04660	Submit ICE Check Cert to SO	6	03-Oct-15	09-Oct-15	29-Apr-16	06-May-16
DD04670	IPs Review	28	17-Sep-15	14-Oct-15	15-Apr-16	12-May-16
DD04680	IP's No Objection Received	0		14-Oct-15		12-May-16
DD04720	SO's Review	35	17-Sep-15	21-Oct-15	15-Apr-16	19-May-16
DD04730	SO Approval with Condition Received	0		22-Oct-15		19-May-16
Construction						
DDP11930	Mobilization & Setting Up Piling Rigs	64	06-Aug-15	22-Oct-15	29-Sep-15	14-Dec-15
DDP11940	S - Piling (Socket H-piles)	132	23-Oct-15	08-Apr-16	20-May-16	26-Oct-16
DDP11960	S -Sheet Piling	48	23-Oct-15	17-Dec-15	15-Dec-15	18-Feb-16
South Surface Roadworks, Utility & Drainage works						
Design Submission						
(E1) AIP - Southern Landfall Seawall Modification						
AP00900	Designer Prepare AIP - Southern Landfall Seawall Modification	36	08-Nov-16	19-Dec-16	08-Jun-15A	08-Jul-15A



Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
Progress Milestone

TMCLK - Northern Connection Sub-Sea Tunnel Section

Detailed Works Programme (Rev. F) - Three Months

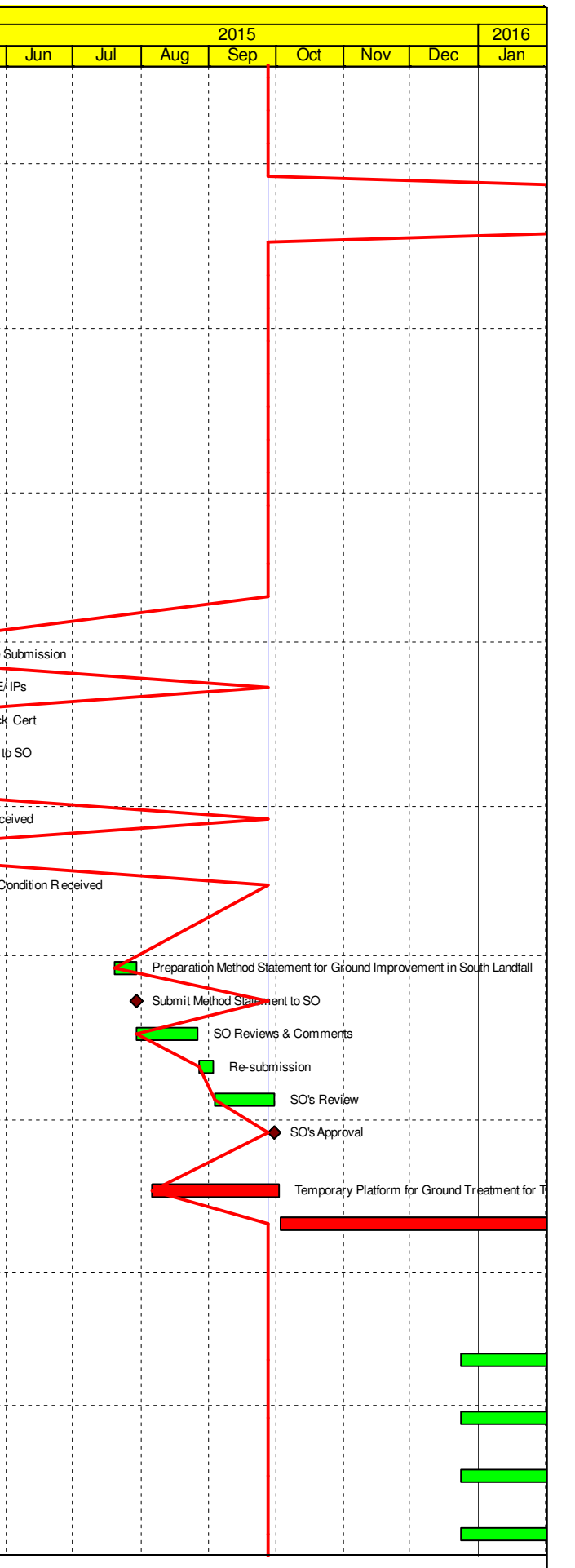
Rolling Programme

Progress as of 27-Sep-15

Dragages HongKong 香港寶嘉
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
12-Feb-14	TMCLK/DBJGEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJGEN/PRG/98507 Rev.B	SPa	WYu
28-Aug-14	TMCLK/DBJGEN/PRG/98507 Rev.C	CLa	WYu
10-Jun-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity ID	Activity Name	Orig Dur	Planned Start	Planned Finish	Current Start	Current Finish
AP00905	Review & Comment by JV	12	20-Dec-16	05-Jan-17	08-Jul-15A	13-Jul-15A
AP00910	Designer prepare AIP	6	06-Jan-17	12-Jan-17	13-Jul-15A	16-Jul-15A
AP00915	Formal Submission of AIP to ICE/IPs	0		12-Jan-17		16-Jul-15A
AP00920	Advanced Submission of AIP to SO	0		12-Jan-17		16-Jul-15A
AP00925	Review & Comment by SO/ ICE/ IPs	28	13-Jan-17	09-Feb-17	16-Jul-15A	30-Sep-15
AP00930	Advance Commants from SO/ Comments from ICE/ IPs Received	0		09-Feb-17		30-Sep-15
AP00935	Designer to Prepare RtC & Updated AIP	18	10-Feb-17	02-Mar-17	02-Oct-15	23-Oct-15
AP00940	Submisson of AIP to SO/ ICE together with Reply To Comment (RTC)	0		02-Mar-17		23-Oct-15
AP00945	Reply to IPs Comments in RTC	0		02-Mar-17		23-Oct-15
AP00950	ICE Approval & Issue of Design Check Cert.	18	03-Mar-17	23-Mar-17	24-Oct-15	13-Nov-15
AP00955	Check Cert to SO	0		23-Mar-17		13-Nov-15
AP00960	No Objection or Further Minor Comments from IPs Received	0		23-Mar-17		13-Nov-15
AP00980	SO Review (35 Days)	35	03-Mar-17	06-Apr-17	24-Oct-15	27-Nov-15
AP00985	SO Approval with Condition Received	0		06-Apr-17		27-Nov-15
(E1) DDA - Southern Landfall Seawall Modification						
DD01900	Preparation of DDA Modification of Seawall at Sth Landfall	18	07-Apr-17	02-May-17	28-Nov-15	18-Dec-15
DD01905	Review & Comment by JV	18	04-May-17	24-May-17	19-Dec-15	12-Jan-16
(E3) DDA for Sewerage, Drainage, Waterworks & Utility works for South Landfall						
DD05880	Designer to Reply RtC + Update Submission	21	02-Feb-15	04-Mar-15	19-Jun-15A	03-Oct-15
DD05890	Submit Updated DDA to SO/ ICE/ IPs	0	05-Mar-15		05-Oct-15	
DD05900	ICE Approval & Issue Check Cert	12	05-Mar-15	18-Mar-15	05-Oct-15	17-Oct-15
DD05910	Submit ICE Check Cert to SO	6	19-Mar-15	25-Mar-15	19-Oct-15	26-Oct-15
DD05920	IPs Review	28	05-Mar-15	01-Apr-15	05-Oct-15	01-Nov-15
DD05930	IP's No Objection Received	0		01-Apr-15		01-Nov-15
DD05940	SO's Review	35	05-Mar-15	08-Apr-15	05-Oct-15	08-Nov-15
DD05950	SO Approval with Condition Received	0		08-Apr-15		09-Nov-15
Method Statement Submission						
Method Statement of Ground Treatment for TBMs Passing under Southern Landfall Seawall						
MS2700	Preparation Method Statement for Ground Improvement in South Landfall	9	20-Jul-15	29-Jul-15	12-Mar-16	22-Mar-16
MS2710	Submit Method Statement to SO	0		29-Jul-15		22-Mar-16
MS2720	SO Reviews & Comments	28	30-Jul-15	26-Aug-15	23-Mar-16	19-Apr-16
MS2730	Re-submission	6	27-Aug-15	02-Sep-15	20-Apr-16	26-Apr-16
MS2740	SO's Review	28	03-Sep-15	30-Sep-15	27-Apr-16	24-May-16
MS2750	SO's Approval	0		30-Sep-15		24-May-16
Construction						
DDP11435	Temporary Platform for Ground Treatment for TBM passing under Southern Seawall	48	06-Aug-15	02-Oct-15	29-Sep-15	25-Nov-15
DDP11440	Grouting Treatment for TBM passing under Southern Seawall	339	03-Oct-15	25-Nov-16	26-Nov-15	20-Jan-17
Testing & Commissioning/Inspection & Handover						
Final Inspection & Handover						
Design Submission						
(A12) Maintenance Matrix						
GS02000	Preparation of Maintenance Matrix	35	24-Dec-15	05-Feb-16	24-Dec-15	05-Feb-16
(A13) Operation & Maintenance Manual						
GS02100	Preparation of Operation and Maintenance Manual	48	24-Dec-15	27-Feb-16	24-Dec-15	27-Feb-16
(A14) As-built & As-fabricated Drawings						
GS02200	Preparation of As-built and As-fabricated Drawings	48	24-Dec-15	27-Feb-16	24-Dec-15	27-Feb-16
(A15) Health & Safety File incl.As-built Dwgs & Records,Maintenance Schedules,O&M Manual						
GS02310	Preparation of Health and Safety File including as-built drawings and records, maintenance schedules, operation and mai	48	24-Dec-15	27-Feb-16	24-Dec-15	27-Feb-16



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Planned Bar - Critical
Planned Milestone
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TMCLK - Northern Connection Sub-Sea Tunnel Section

Detailed Works Programme (Rev. F) - Three Months Rolling Programme

Progress as of 27-Sep-15

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

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12-Feb-14	TMCLK/DBJGEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJGEN/PRG/98507 Rev.B	SPa	WYu
28-Aug-14	TMCLK/DBJGEN/PRG/98507 Rev.C	CLa	WYu
10-Jun-15	TMCLK/DBJGEN/PRG/98507 Rev.F	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

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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	-	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

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	
					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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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	
					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 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 D3 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 - September 2015

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Sep	2-Sep	public holiday 3-Sep	4-Sep	5-Sep
			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
6-Sep	7-Sep	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep
	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-Sep	21-Sep	22-Sep	23-Sep	24-Sep	25-Sep	26-Sep
1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
27-Sep	public holiday 28-Sep	29-Sep	30-Sep			
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM				

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - October 2015

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				public holiday 1-Oct	2-Oct	3-Oct
					1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
4-Oct	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct
	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-Oct	12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct
1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
18-Oct	19-Oct	20-Oct	public holiday 21-Oct	22-Oct	23-Oct	24-Oct
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
25-Oct	26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - November 2015

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

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - September 2015

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - October 2015

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - November 2015

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

Appendix F

Impact Air Quality Monitoring Results

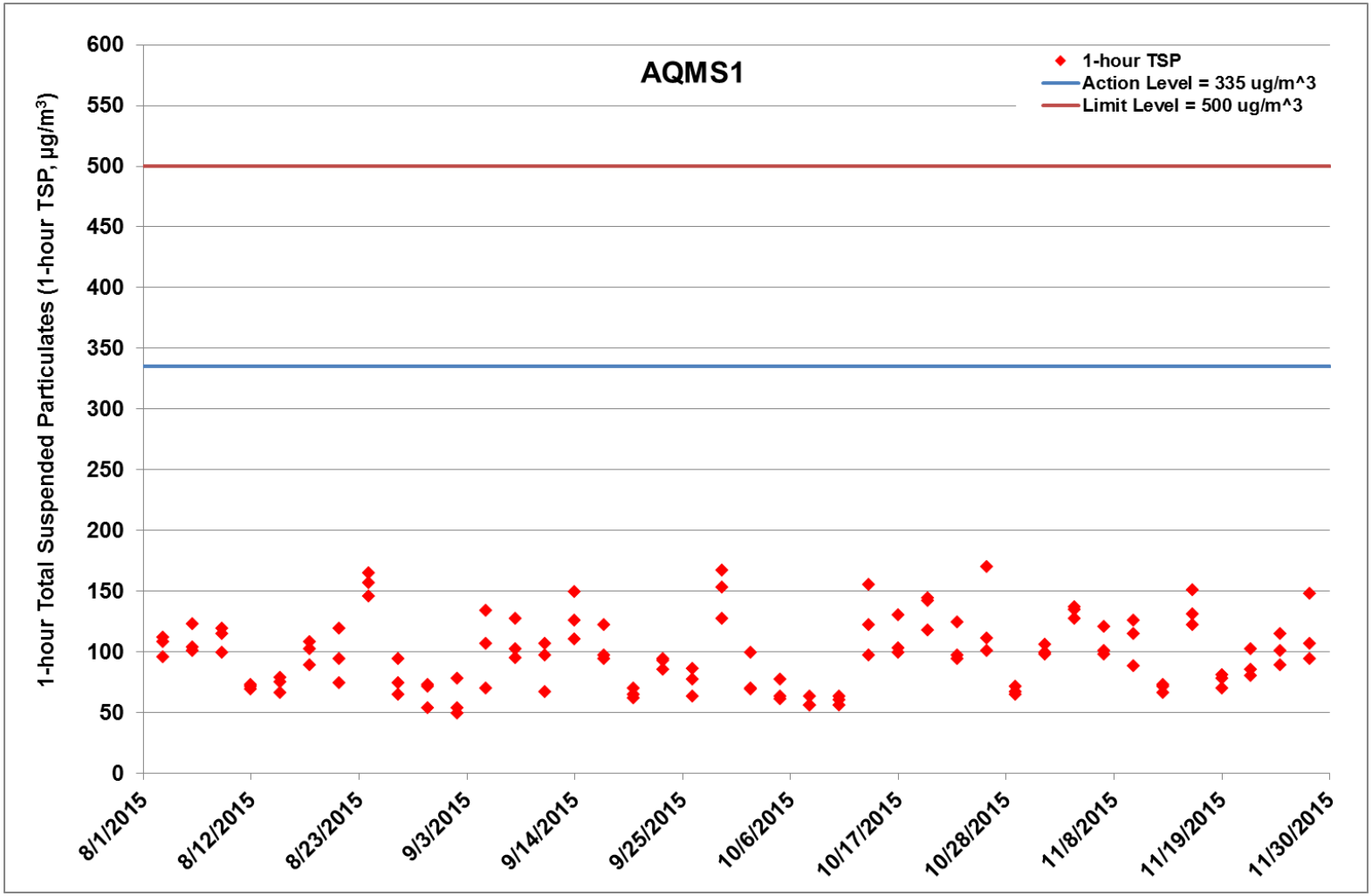

Figure F.1 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

ERM

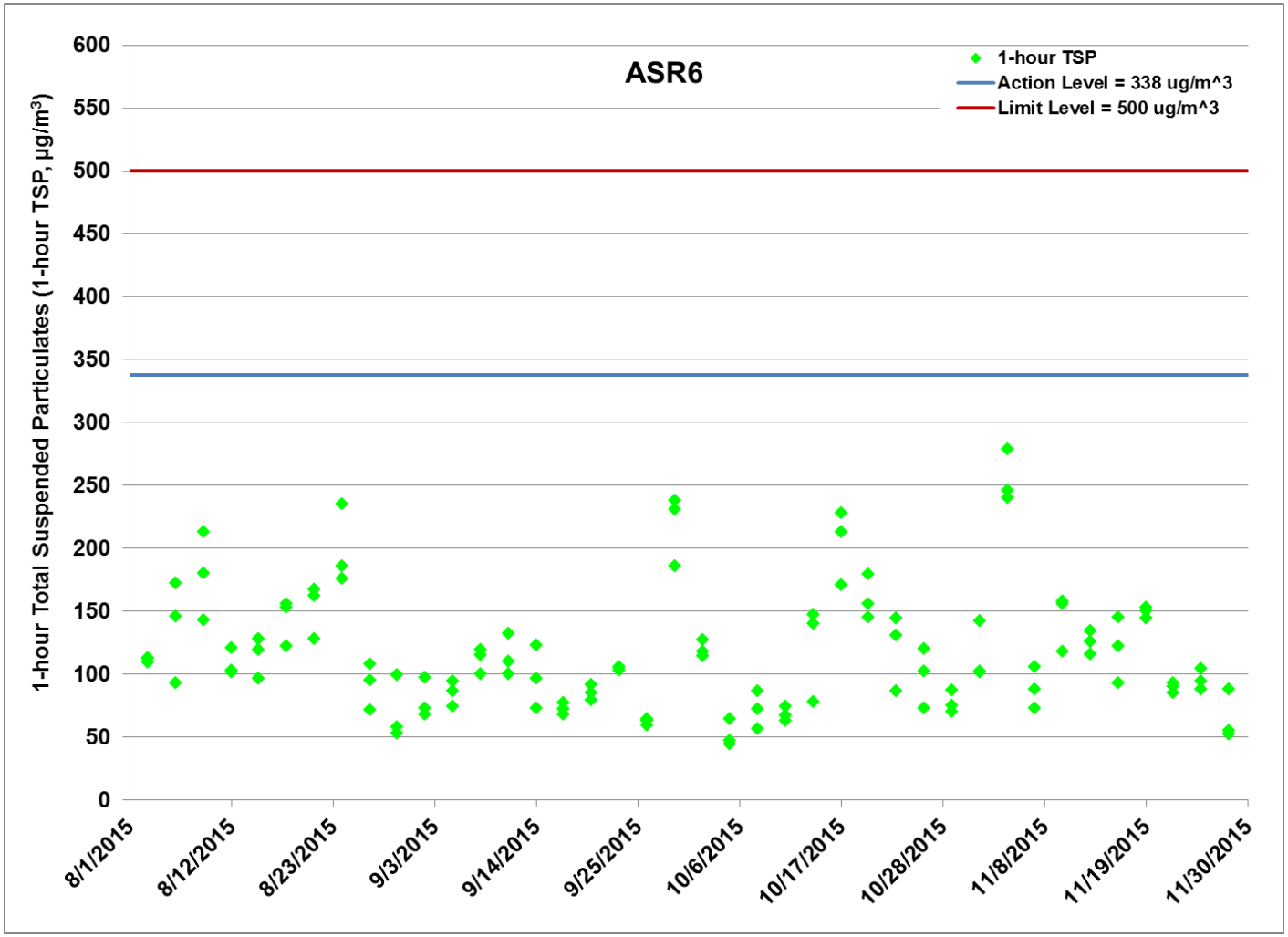

Figure F.2 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

ERM

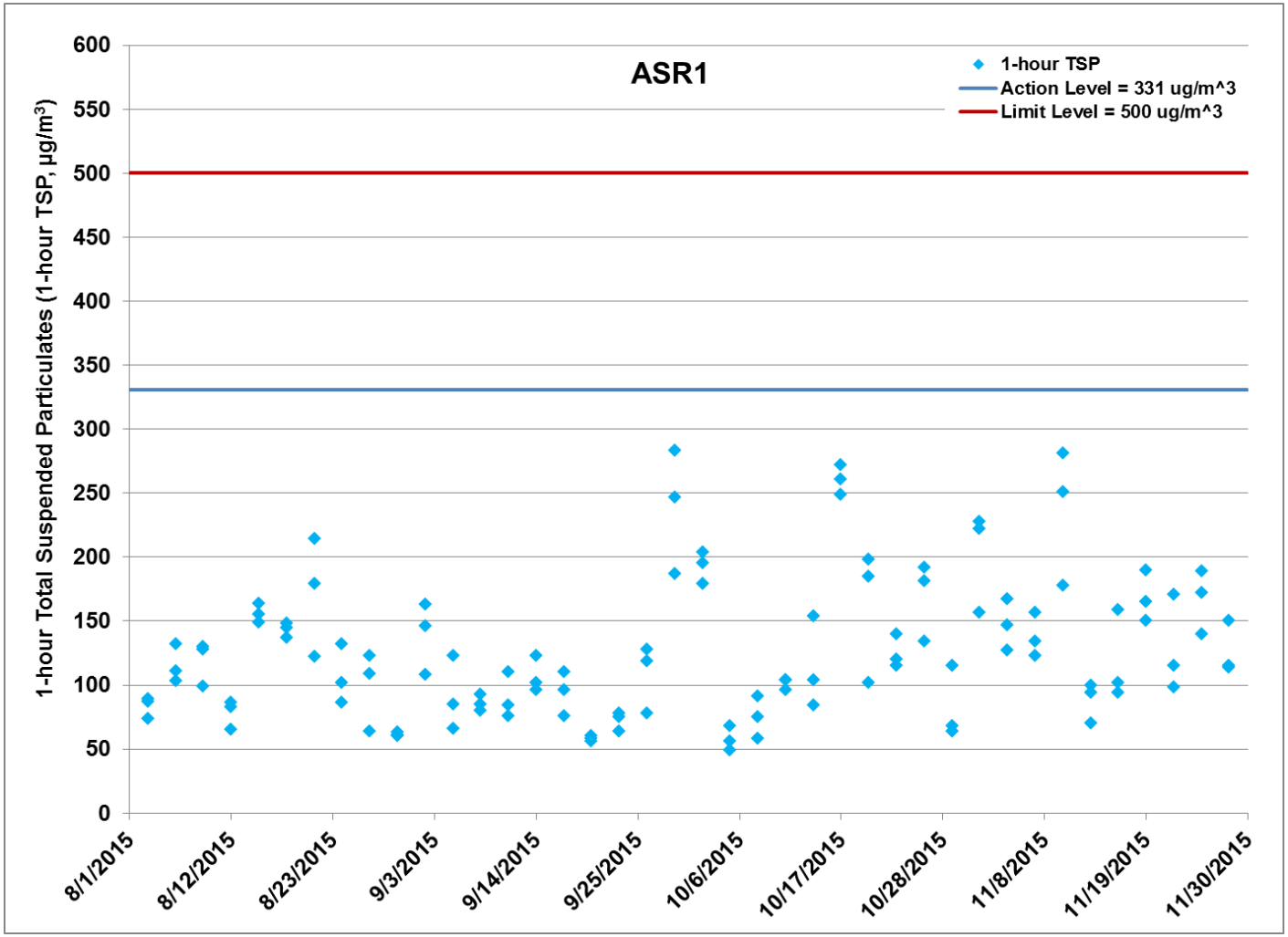

Figure F.3 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

ERM

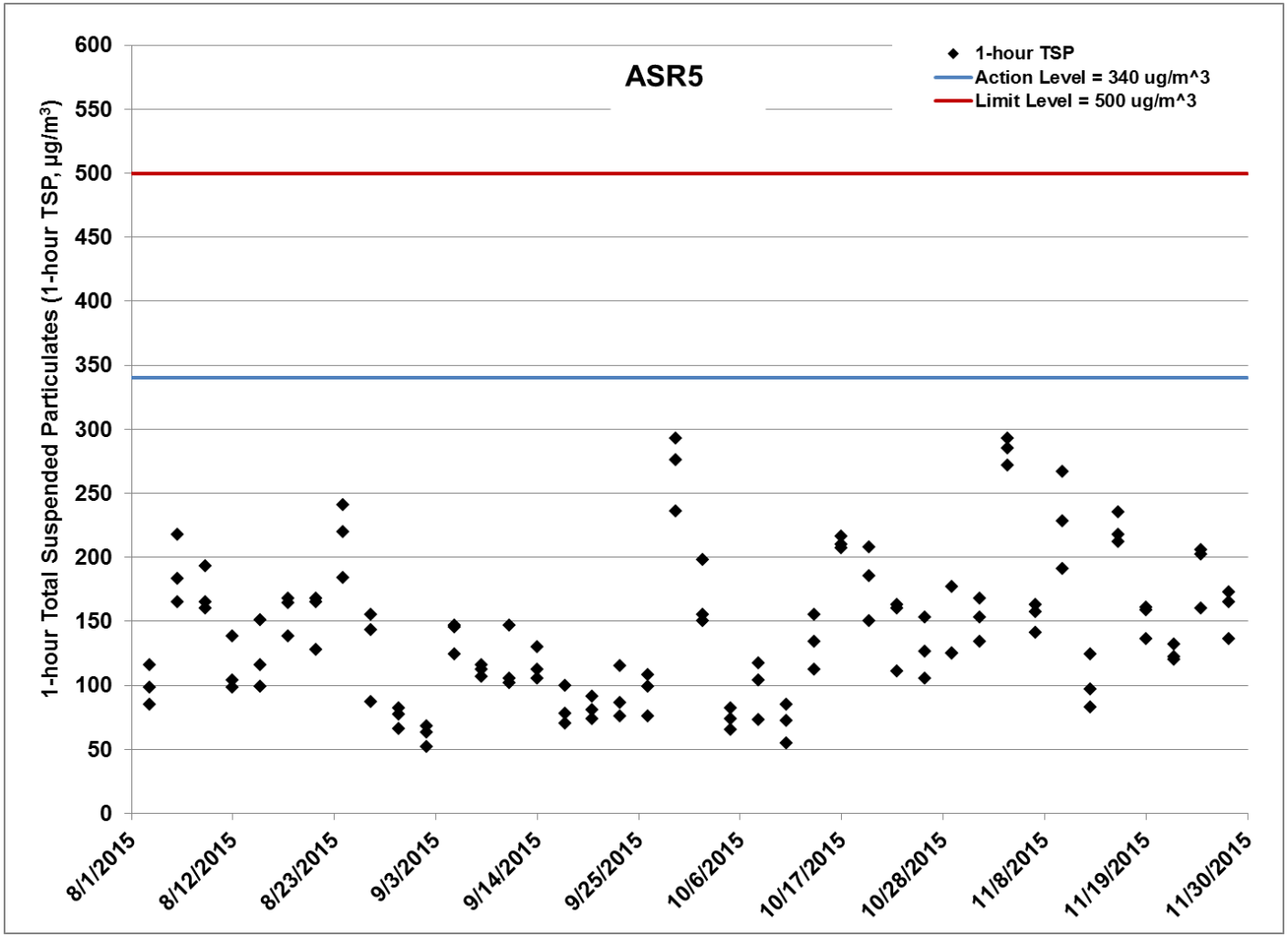

Figure F.4 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

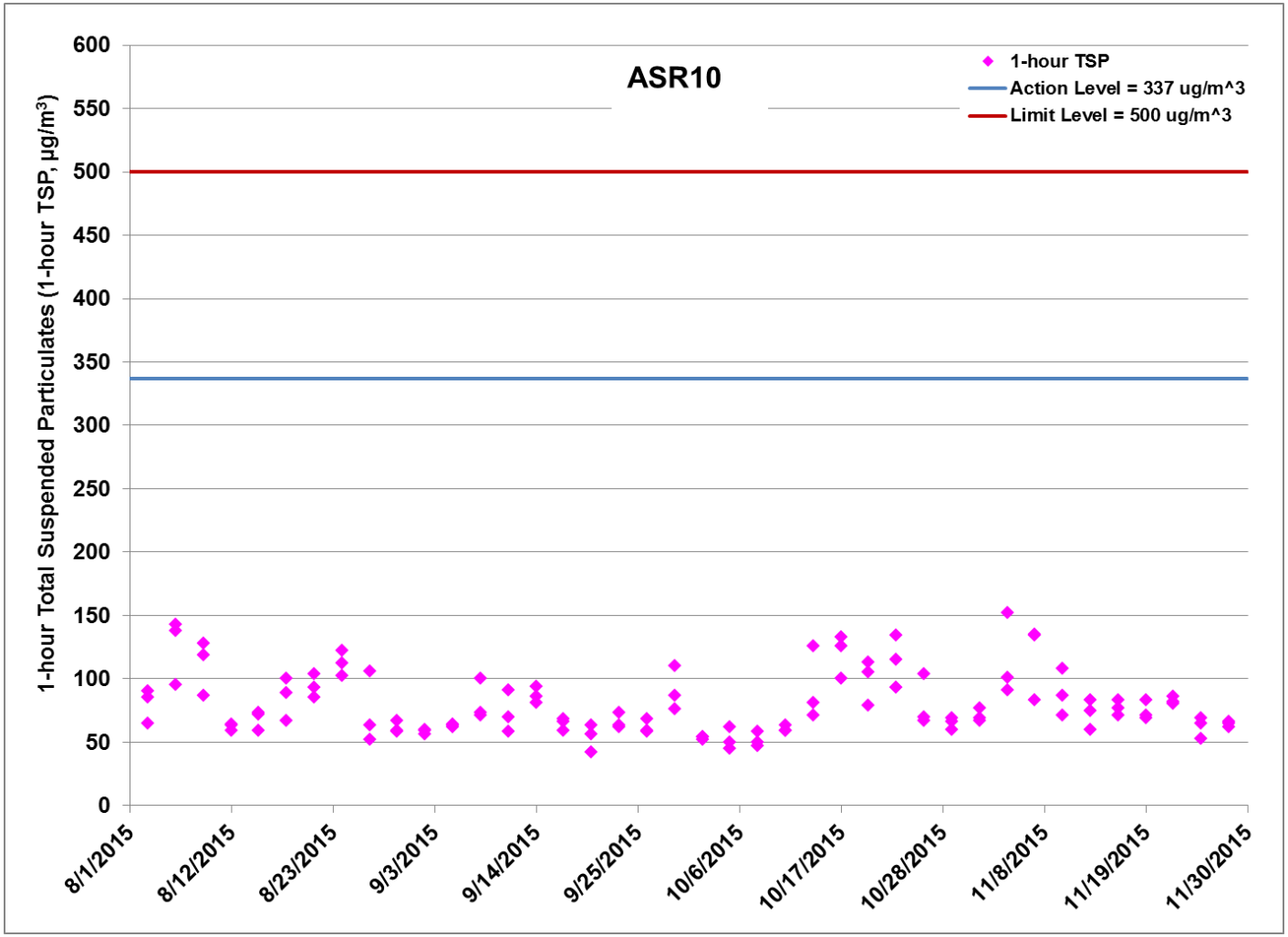

Figure F.5 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

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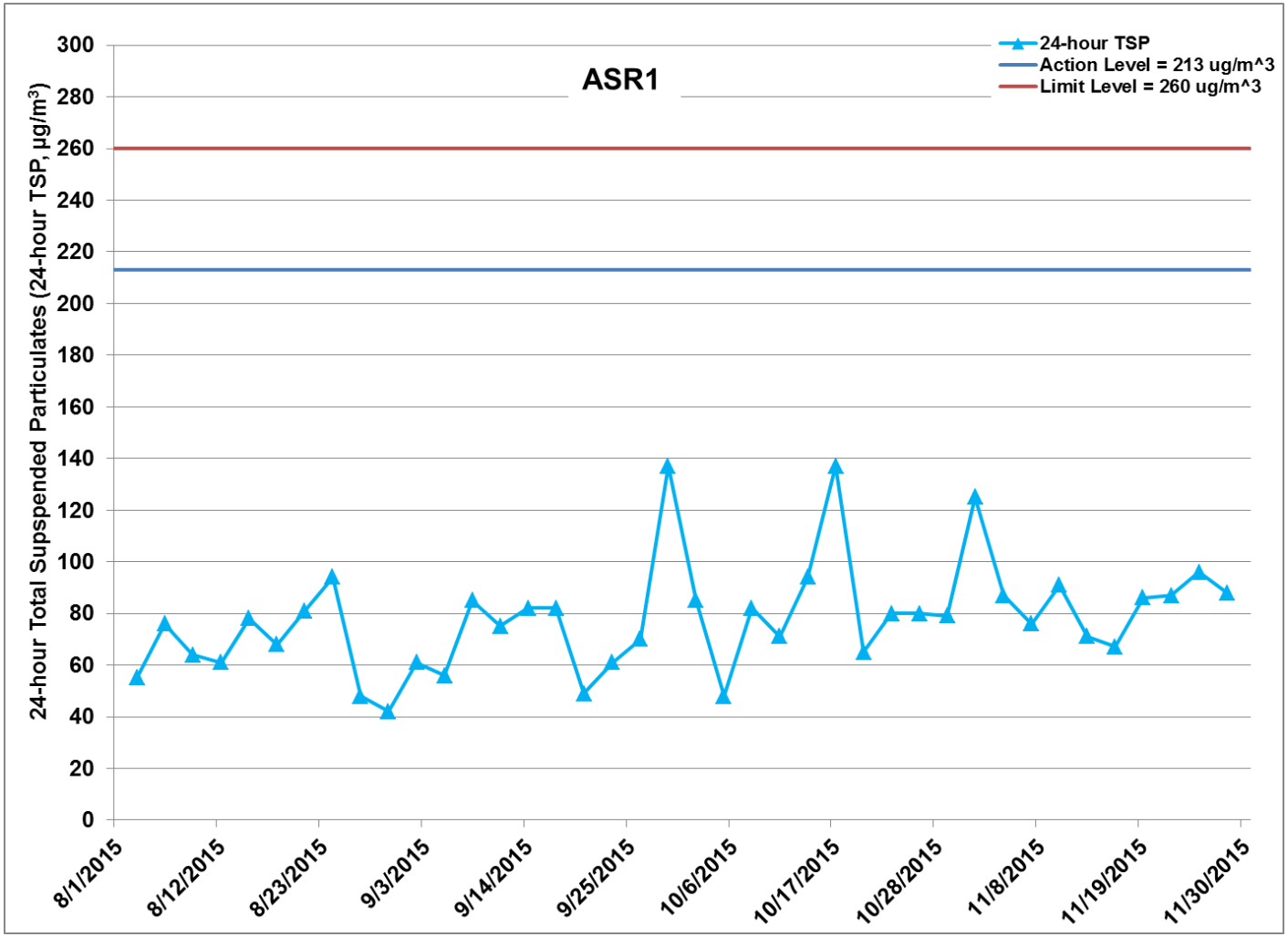

Figure F.6 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

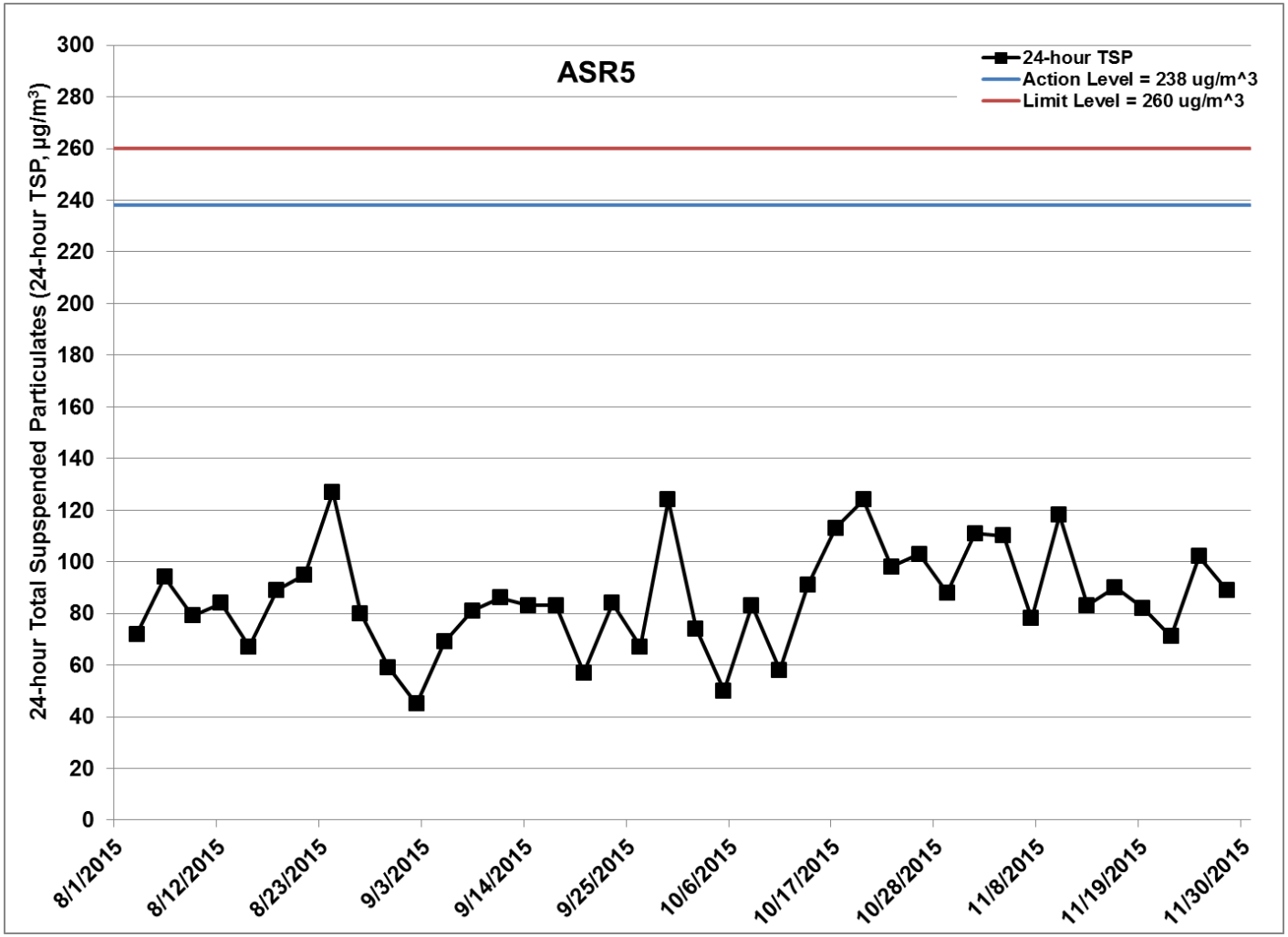

Figure F.7 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

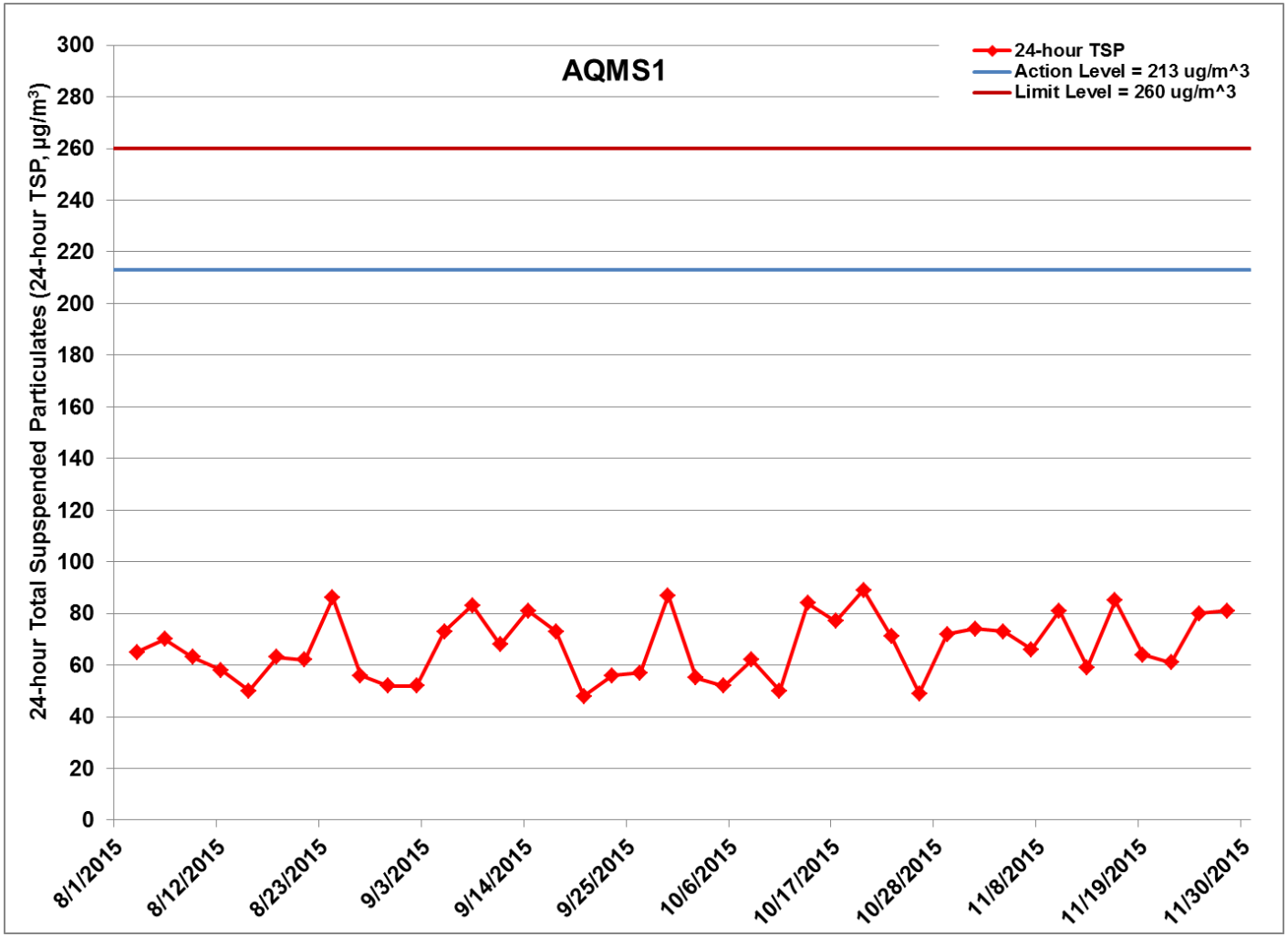

Figure F.8 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

ERM

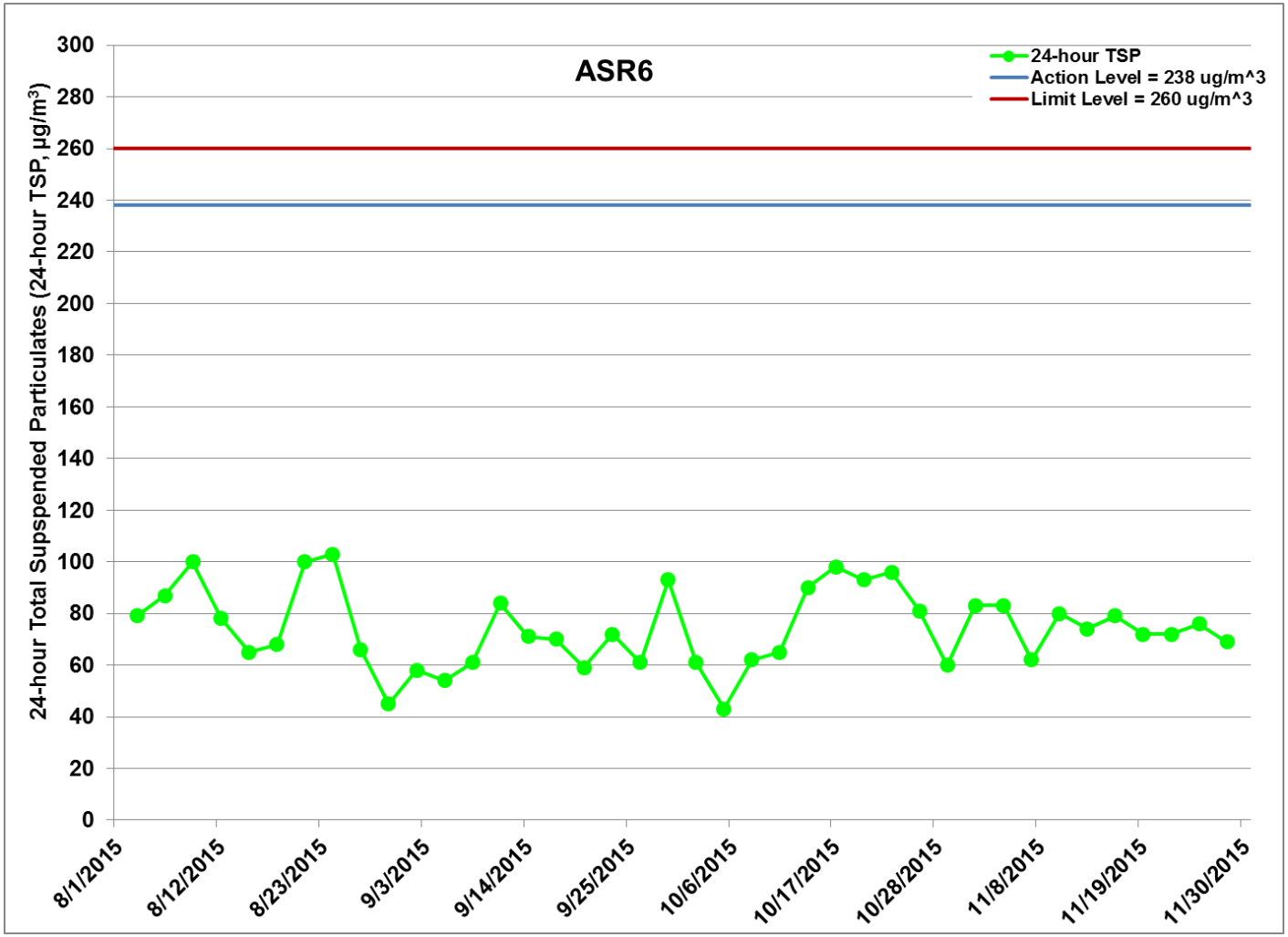

Figure F.9 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

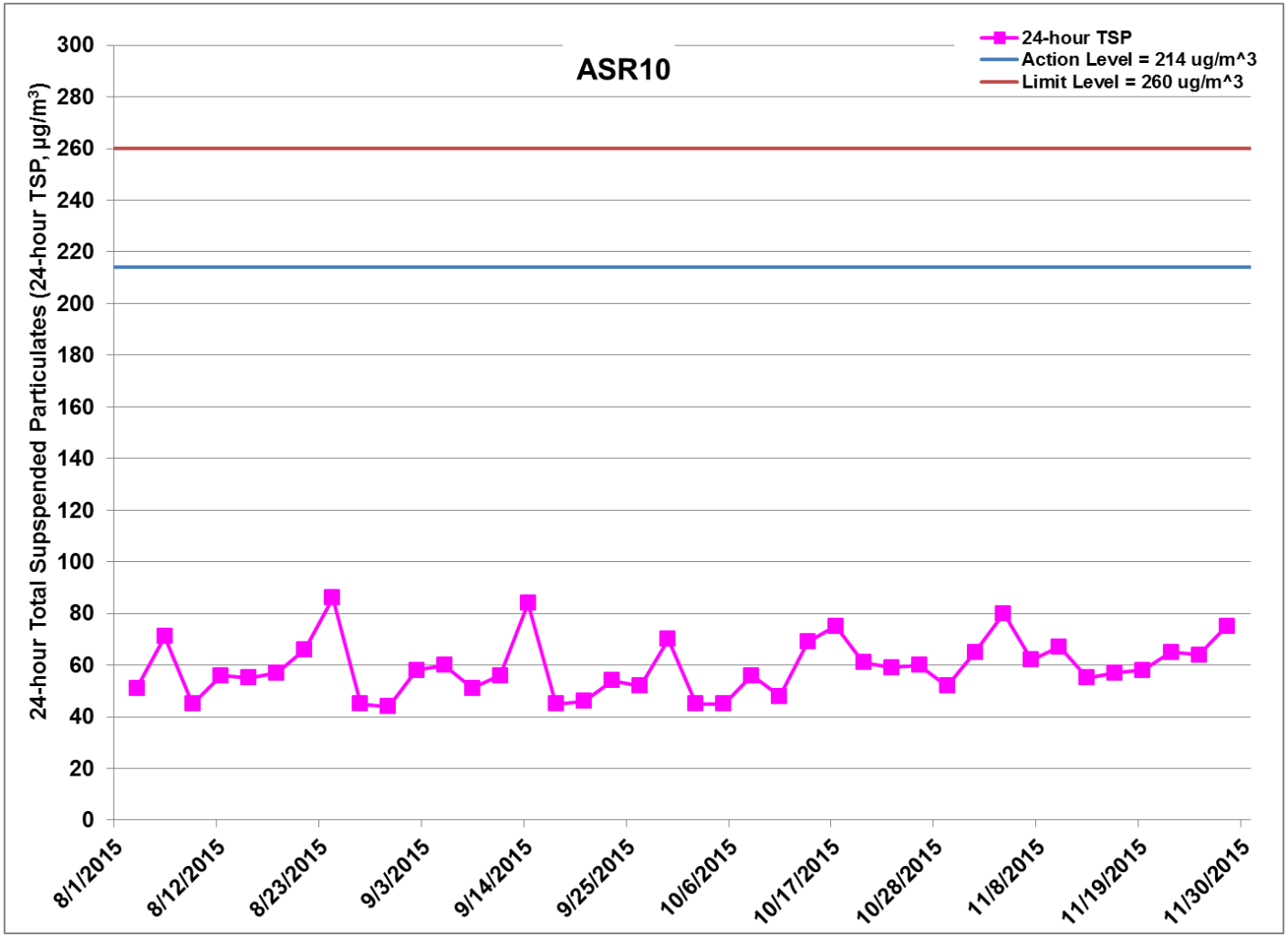

Figure F.10 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 August 2015 and 30 November 2015 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Construction of capping beam and base slab for Ventilation Shaft at Works Area – Portion N-C (1/8/2015 – 30/11/2015) and Box Culvert Extension (1/8/2015 – 30/11/2015). *Ref: 0212330_Impact AQM graphs_November 2015_REV a.xlsx*

Appendix G

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

8th Quarterly Progress Report (September-November 2015)
submitted to Dragages – Bouygues Joint Venture & ERM Hong Kong Ltd.

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

7 January 2016

1. Introduction

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

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

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

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

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

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

1.6. This report is the eighth 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 September to November 2015, utilizing the survey data collected by HKLR03 project.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in NEL and NWL survey areas (see Figure 1) twice per month throughout the entire construction period. The co-ordinates of all transect lines are shown in Table 1. The coordinates of several starting points have been revised due to the obstruction of the permanent structures in association to the construction works of HKLR and the southern viaduct of TM-CLKL, as well as provision of adequate buffer distance from the Airport Restricted Areas. The EPD issued a memo and confirmed that they had no objection on the revised transect lines on 19 August 2015, and the revised coordinates are in red and marked with an asterisk in Table 1.

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

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	804671	815456*		13	Start Point	816506	819480
1	End Point	804671	831404		13	End Point	816506	824859
2	Start Point	805475	815913*		14	Start Point	817537	820220
2	End Point	805477	826654		14	End Point	817537	824613
3	Start Point	806464	819435		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	819771		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209
5	Start Point	808504	820220		17	Start Point	820451	822125

5	End Point	808504	828602		17	End Point	820451	823671
6	Start Point	809490	820466		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	820880*		19	Start Point	822513	823268
7	End Point	810499	824613		19	End Point	822513	824321
8	Start Point	811508	821123*		20	Start Point	823477	823402
8	End Point	811508	824254		20	End Point	823477	824613
9	Start Point	812516	821303*		21	Start Point	805476	827081
9	End Point	812516	824254		21	End Point	805476	830562
10	Start Point	813525	820872		22	Start Point	806464	824033
10	End Point	813525	824657		22	End Point	806464	829598
11	Start Point	814556	818853*		23	Start Point	814559	821739
11	End Point	814556	820992		23	End Point	814559	824768
12	Start Point	815542	818807					
12	End Point	815542	824882					

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

2.1.2. The HKLR03 survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 16 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2013, 2014). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{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 present quarterly period.

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

The newly-derived unit for sighting density was termed SPSE, representing the number of

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

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

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

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

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

3. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

3.1.1. During the period of September to November 2015, 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 902.25 km of survey effort was collected, with 95.0% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 346.64 km and 555.61 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 656.41 km, while the effort on secondary lines was 245.84 km. Survey effort conducted on both primary and secondary lines were considered as on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.4. During the six sets of HKLR03 monitoring surveys in September-November 2015, a total of 18 groups of 95 Chinese White Dolphins were sighted. All dolphin sightings were made during on-effort search, and all except one dolphin sightings were made on primary lines. In this quarterly period, all dolphin groups were sighted in NWL, while none was sighted at all in NEL. A summary table of the dolphin sightings is shown in Appendix II.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during HKLR03 monitoring surveys in September to November 2015 is shown in Figure 1. Dolphin sightings made in the present quarter were mostly clustered around Lung Kwu Chau (Figure 1). A few other sightings were also made near Sha Chau and to the west of the airport platform (Figure 1).

3.2.2. Notably, all dolphin groups were sighted far away from the alignment of TMCLKL northern landfall or southern viaduct section, as well as the HKLR03/HKBCF reclamation sites (Figure 1). On the other hand, two sightings with five dolphins were made in the vicinity of the HKLR09 alignment (Figure 1).

3.2.3. Sighting distribution of the present impact phase monitoring period (September to November 2015) was compared to the one during the baseline monitoring period (September to November 2011). In the present quarter, dolphins have disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands, near Shum Shui Kok and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1). The nearly complete abandonment of NEL region by the dolphins has been consistently recorded in the past monitoring quarters, which has resulted in zero to extremely low dolphin encounter rates in this area.

3.2.4. In NWL survey area, dolphin occurrence was also drastically different between the baseline and impact phase periods. During the present impact monitoring period, fewer dolphins occurred in this survey area than during the baseline period, when many of the dolphin sightings were concentrated between Lung Kwu Chau and Black Point, around Sha Chau, near Pillar Point and to the west of the Chek Lap Kok Airport (Figure 1).

3.2.5. Another comparison in dolphin distribution was made between the three quarterly periods of autumn months in 2013, 2014 and 2015 (Figure 2). Among the three autumn periods, no dolphin was sighted at all in NEL in both 2014 and 2015, while two sightings were made there in 2013 (Figure 2).

3.2.6. On the other hand, dramatic changes in dolphin distribution in NWL waters were also observed in the autumn months during the three-year period (Figure 2). In 2013, dolphins regularly occurred throughout the NWL survey area, with higher concentrations

of sightings around Sha Chau, Lung Kwu Chau, near Black Point and Pillar Point. In 2014, dolphins still frequently occurred around Sha Chau and Lung Kwu Chau, but less frequently in the middle portion of the North Lantau region. In 2015, they infrequently occurred in NWL survey area with the only concentration of sightings around Lung Kwu Chau, while they generally absent for the rest of this area. Similar temporal changes in dolphin distribution were also observed in the spring and summer periods of 2013-15. The temporal trend indicated that dolphin usage in the NWL region has progressively diminished in recent years.

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).

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 3.31 sightings and 17.52 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were both nil for this quarter.

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during September-November 2015

SURVEY AREA	DOLPHIN MONITORING DATES	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	Primary Lines Only
Northeast Lantau	Set 1 (2 & 11 Sep 2015)	0.00	0.00
	Set 2 (17 & 29 Sep 2015)	0.00	0.00
	Set 3 (6 & 13 Oct 2015)	0.00	0.00
	Set 4 (19 & 26 Oct 2015)	0.00	0.00
	Set 5 (2 & 6 Nov 2015)	0.00	0.00
	Set 6 (10 & 16 Nov 2015)	0.00	0.00
Northwest Lantau	Set 1 (2 & 11 Sep 2015)	5.47	51.95
	Set 2 (17 & 29 Sep 2015)	4.01	21.38
	Set 3 (6 & 13 Oct 2015)	5.86	24.91
	Set 4 (19 & 26 Oct 2015)	2.73	10.94
	Set 5 (2 & 6 Nov 2015)	3.84	15.38
	Set 6 (10 & 16 Nov 2015)	1.73	1.73

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (September – November 2015) and baseline monitoring period (September – November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	September - November 2015	**September - November 2011**	**September - November 2015**	**September - November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	3.94 ± 1.57	9.85 ± 5.85	21.05 ± 17.19	44.66 ± 29.85

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

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

3.3.3. In NEL, the average dolphin encounter rates (both STG and ANI) in the present three-month impact monitoring period were zero with no sighting made, and such low occurrence of dolphins in NEL have been consistently recorded in the past eleven quarters of HKLR03 monitoring (Table 4). This is a serious concern as the dolphin occurrence in

NEL in the last eleven quarters (0.0-1.0 for ER(STG) and 0.0-3.9 for ER(ANI)) have been exceptionally low when compared to the baseline period (Table 4). Dolphins have almost vacated from NEL waters since January 2014, with only two groups of five dolphins sighted there since then despite consistent and intensive survey effort being conducted in this survey area

3.3.4. Moreover, the average dolphin encounter rates (STG and ANI) in NWL during the present impact phase monitoring period were also much lower (reductions of 60.0% and 52.9% respectively) than the ones recorded in the 3-month baseline period, indicating a dramatic decline in dolphin usage of this survey area as well during the present impact phase period (Table 5).

3.3.5. Even for the same autumn quarters, the dolphin encounter rates in NWL during autumn 2015 were much lower than the ones recorded in autumn 2013 and 2014 (Table 5).

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

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

3.3.6. It should be noted that the encounter rates in NWL in the present quarter have slightly rebounded from the exceptionally low level in the previous three quarters (Table 5). Such potential rebound in dolphin occurrence could be an encouraging sign, and should

be continuously monitored in the upcoming monitoring quarters.

3.3.7. As discussed recently in Hung (2015), the dramatic decline in dolphin usage of NEL waters in the past few years (including the declines in abundance, encounter rate and habitat use in NEL, as well as shifts of individual core areas and ranges away from NEL waters) was possibly related to the HZMB construction works that were commenced since 2012. It appeared that such noticeable decline has already extended to NWL waters progressively in 2013-2015.

3.3.8. 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).

3.3.9. For the comparison between the baseline period and the present quarter (twelfth quarter of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0079 and 0.071 respectively. If the alpha value is set at 0.05, significant differences were detected between the baseline and present quarters in the dolphin encounter rate of STG, but not in the dolphin encounter rate of ANI.

3.3.10. For the comparison between the baseline period and the cumulative quarters in impact phase (i.e. first twelve quarters of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.00009 and 0.00003 respectively. Even if the alpha value is set at 0.0001, significant differences were still detected in both the average dolphin encounter rates of STG and ANI (i.e. between the two periods and the locations).

3.3.11. As indicated in both dolphin distribution patterns and encounter rates, dolphin usage has been significantly reduced in both NEL and NWL survey areas during the present quarterly period, and such low occurrence of dolphins has also been consistently documented in previous quarters. This raises serious concern, as the timing of the decline in dolphin usage in North Lantau waters coincided well with the construction schedule of the HZMB-related projects (Hung 2015).

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

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from one to twelve individuals per group in North Lantau region during September to November 2015. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in Table 6.

Table 6. Comparison of average dolphin group sizes from impact monitoring period (September – November 2015) and baseline monitoring period (September – November 2011) (Note: ± denotes the standard deviation of the average group size)

	Average Dolphin Group Size	
	September – November 2015	**September – November 2011**
Overall	5.28 ± 3.54 (n = 18)	3.72 ± 3.13 (n = 66)
Northeast Lantau	N/A	3.18 ± 2.16 (n = 17)
Northwest Lantau	5.28 ± 3.54 (n = 18)	3.92 ± 3.40 (n = 49)

3.4.2. The average dolphin group size in NWL waters during September to November 2015 was higher than the ones recorded during the three-month baseline period (Table 6). Seven of the 18 groups were composed of 1-3 individuals only, while five other groups were moderate in size with 4-6 individuals per group. Moreover, six large dolphin groups were sighted during the present quarterly period, including three groups with 7-9 individuals each, and another three groups with 10-12 individuals each.

3.4.3. Distribution of dolphins with larger group sizes (five individuals or more per group and ten individuals per group) during the present quarter is shown in Figure 3, with comparison to the one in baseline period. During the autumn months of 2015, distribution of these large groups of dolphins were all located around Lung Kwu Chau and Sha Chau, with the three exceptionally large groups of dolphins (i.e. with 10 or more individuals) sighted adjacent to Lung Kwu Chau (Figure 3). This distribution pattern was very different from the baseline period, when the larger dolphin groups were distributed more evenly in NWL waters with a few more sighted in NEL waters (Figure 3).

3.4.4. None of the larger dolphin groups were sighted near the TMCLKL alignment during the present monitoring period (Figure 3).

3.5. Habitat use

3.5.1. From September to November 2015, the only area being heavily utilized by Chinese White Dolphins was around and to the north of Lung Kwu Chau, as well as both eastern and western sides of Sha Chau in North Lantau region (Figures 4a and 4b). All grids near TMCLKL alignment as well as HKLR03/HKBCF reclamation sites did not record any presence of dolphins during on-effort search in the present quarterly period, but one grid (F19) in the vicinity of HKLR09 alignment did record moderately high dolphin densities (Figure 4b).

3.5.2. It should be emphasized though that the amount of survey effort collected in each grid during the three-month period was fairly low (6-12 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern should be examined when more survey effort for each grid will be collected throughout the impact phase monitoring programme.

3.5.3. When compared with the habitat use patterns during the baseline period, dolphin usage in NEL and NWL has dramatically diminished in both areas during the present impact monitoring period (Figure 5). During the baseline period, many grids between Siu Mo To and Shum Shui Kok recorded moderately high to high dolphin densities, which was in stark contrast to the complete absence of dolphins there during the present impact phase period (Figure 5).

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

3.6. Mother-calf pairs

3.6.1. During the present quarterly period, two young calves (i.e. unspotted calf or unspotted juvenile) were spotted with their mothers near Lung Kwu Chau

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

3.7. Activities and associations with fishing boats

3.7.1. Four of the 18 dolphin groups were engaged in feeding activities, while two other dolphin groups were engaged in socializing activities. None of the dolphin groups were engaged in traveling or milling/resting activity during the three-month study period.

3.7.2. The percentages of sightings associated with feeding activities (22.2%) and socializing activities (11.1%) during the present impact phase period were both higher than the ones recorded during the baseline period (11.6% and 5.4% respectively). However, it should be noted the sample sizes on total numbers of dolphin sightings were very different between the two periods.

3.7.3. Distribution of dolphins engaged in various activities during the present three-month period and baseline period is shown in Figure 6. The four dolphin groups engaged in feeding activities were sighted near Lung Kwu Chau and Sha Chau as well as to the north of Lung Kwu Chau (Figure 6). The two groups engaged in socializing activities were both located to the west of Lung Kwu Chau.

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

3.7.5. As consistently recorded in the past monitoring quarters, none of the 18 dolphin groups was found to be associated with operating fishing vessels in North Lantau waters during the present impact phase period.

3.8. Summary of photo-identification works

3.8.1. From September to November 2015, over 2,500 digital photographs of Chinese White Dolphins were taken during the HKLR03 impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, 34 individuals sighted 65 times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). All of these re-sightings were made in NWL.

3.8.3. The majority of identified individuals were sighted only once or twice during the three-month period, with the exception of two individuals (NL46 and NL210) being 3-4 times and another three individuals (NL48, NL202 and NL286) being sighted 5-6 times.

3.8.4. Notably, eight of these 34 individuals (NL33, NL123, NL284, NL285, WL05, WL79, WL241 and WL243) were also sighted in West Lantau waters during the HKLR09 monitoring surveys from September to November 2015, implying that they have moved across the HKLR09 bridge alignment during the same three-month period.

3.9. Individual range use

3.9.1. Ranging patterns of the 34 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

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

3.9.3. Notably, several individuals (NL33, NL123, NL284, NL285 and WL05) consistently utilized both NWL and NEL waters in the past have extended their range use to WL waters (and even SWL waters in the case of NL33) during the present quarter. In the upcoming quarters, individual range use and movements should be continuously monitored to examine whether there has been any consistent shifts of individual home ranges from North Lantau to West or Southwest Lantau, as such shift could possibly be related to the HZMB-related construction works (see Hung 2015).

4. Conclusion

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

4.2. Although the dolphins infrequently occurred along the alignment of TMCLKL northern connection sub-sea tunnel section in the past and during the baseline monitoring period, it

is apparent that dolphin usage has been significantly reduced in NEL, and many individuals have shifted away from the important habitat around the Brothers Islands.

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

5. References

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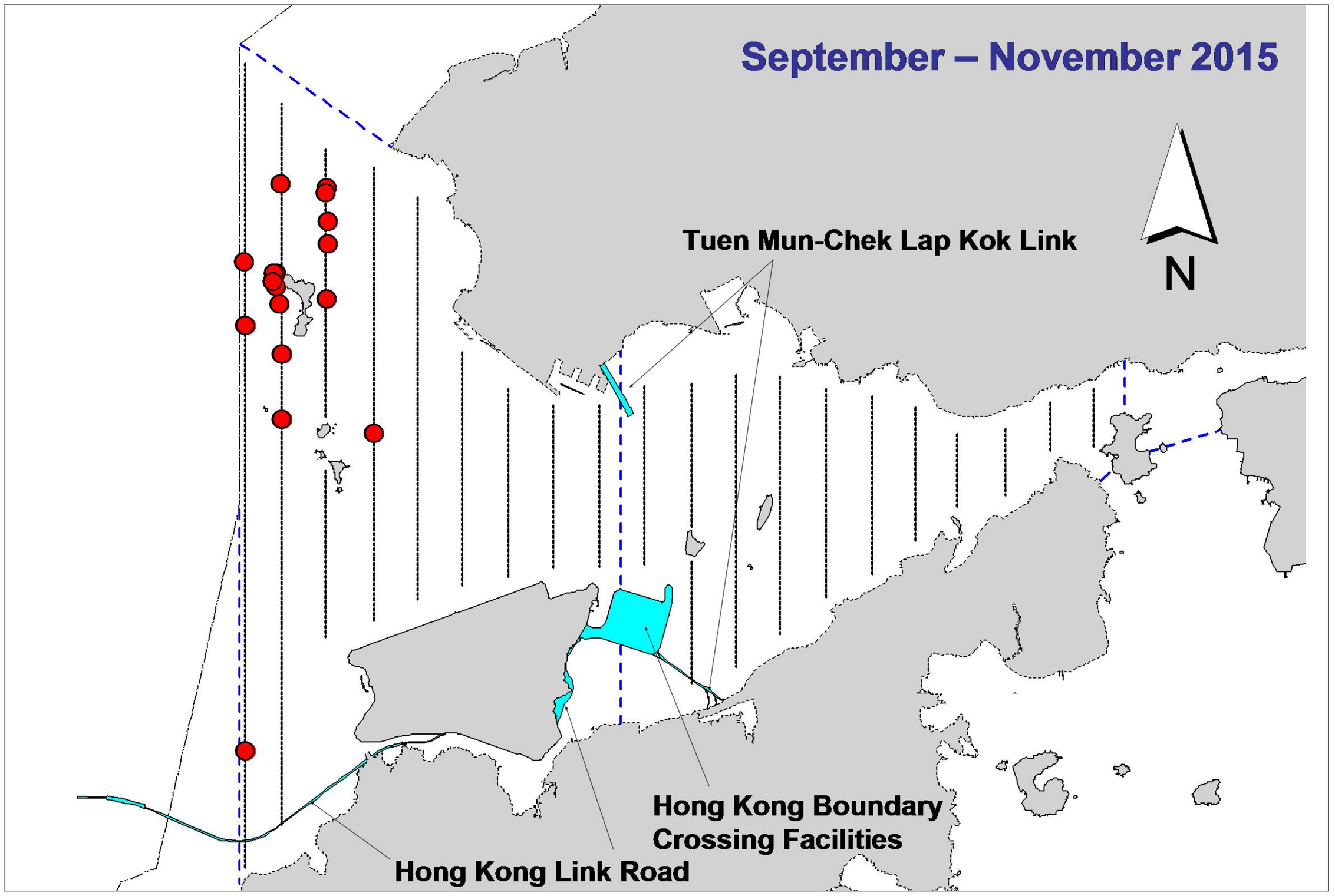


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

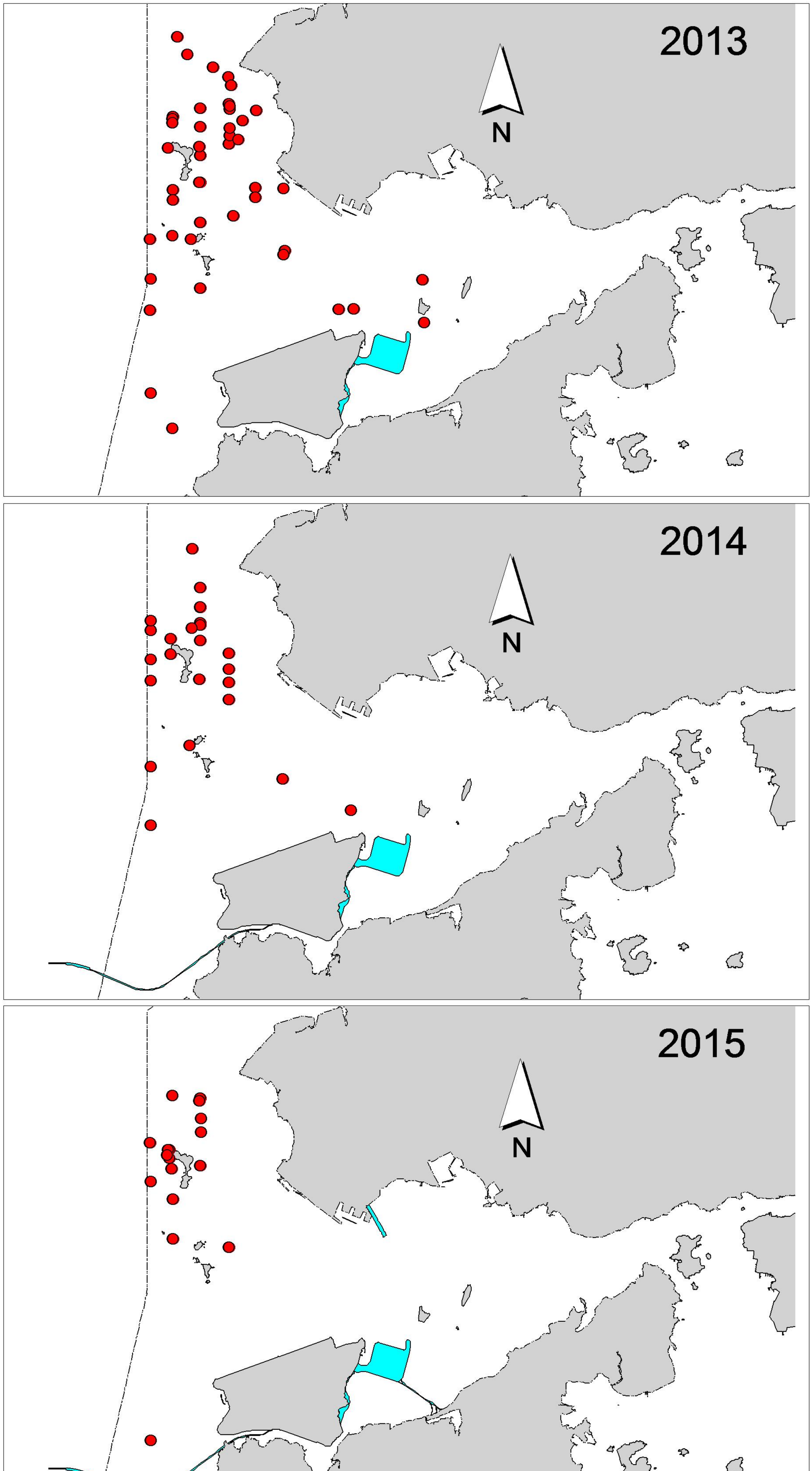


Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the same autumn quarters (June-August) of HKLR03 impact phase in 2013-15

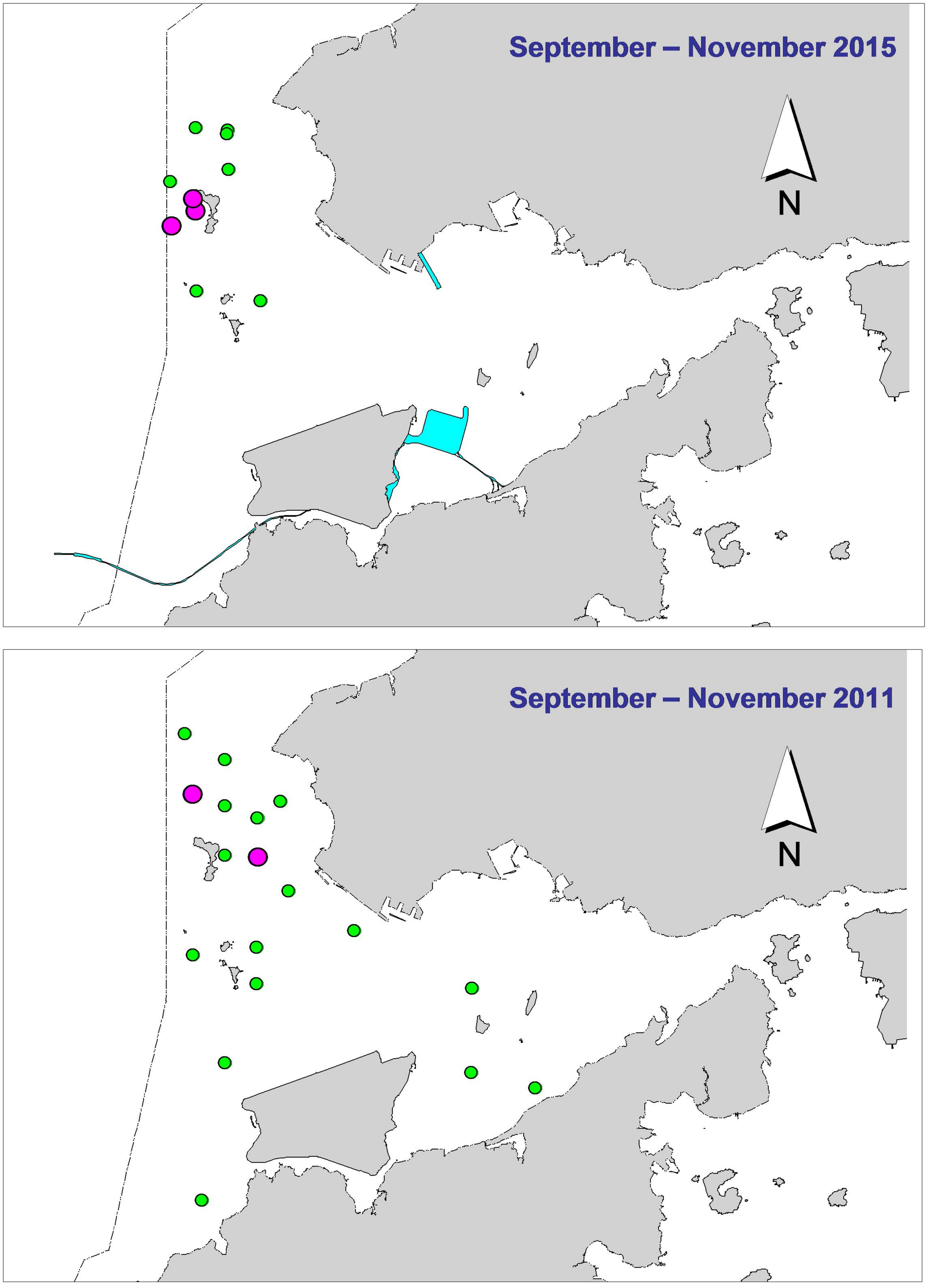


Figure 3. Distribution of Chinese white dolphins with larger group sizes during HKLR03 impact phase (top) and baseline monitoring surveys (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

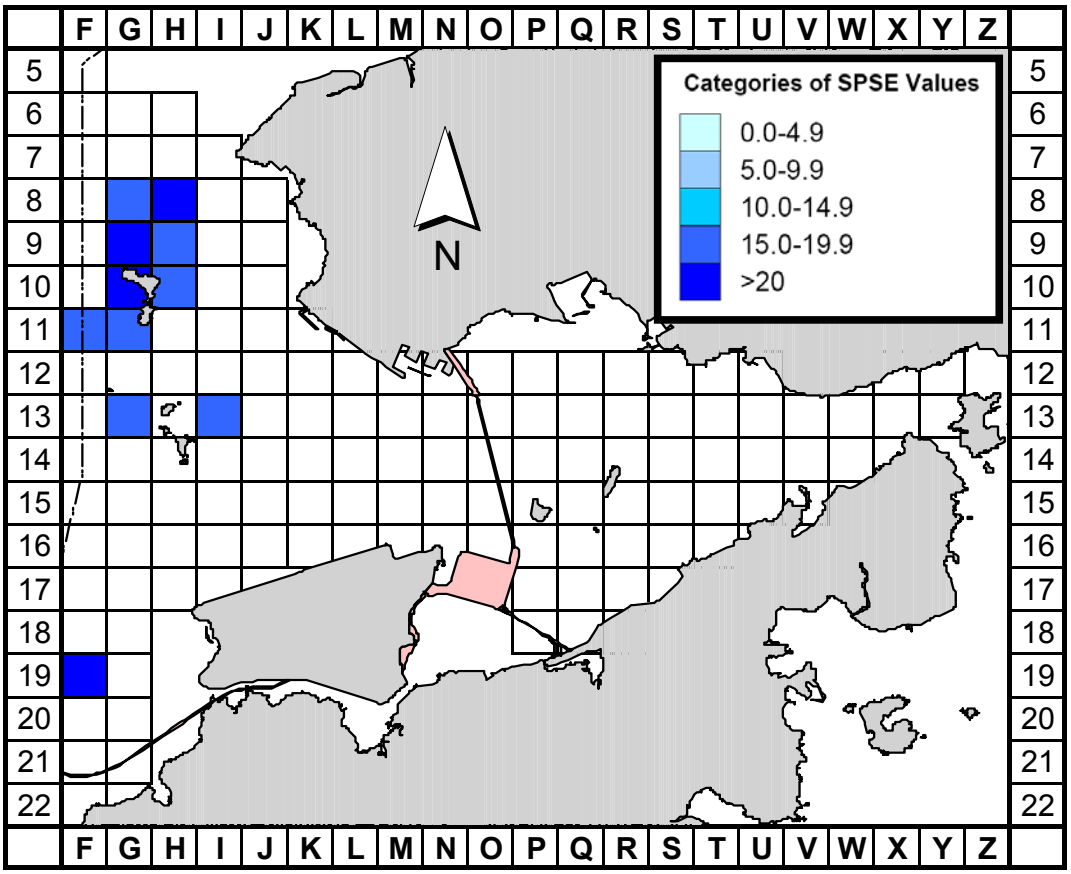


Figure 4a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (Sep-Nov 15) (SPSE = no. of on-effort sightings per 100 units of survey effort)

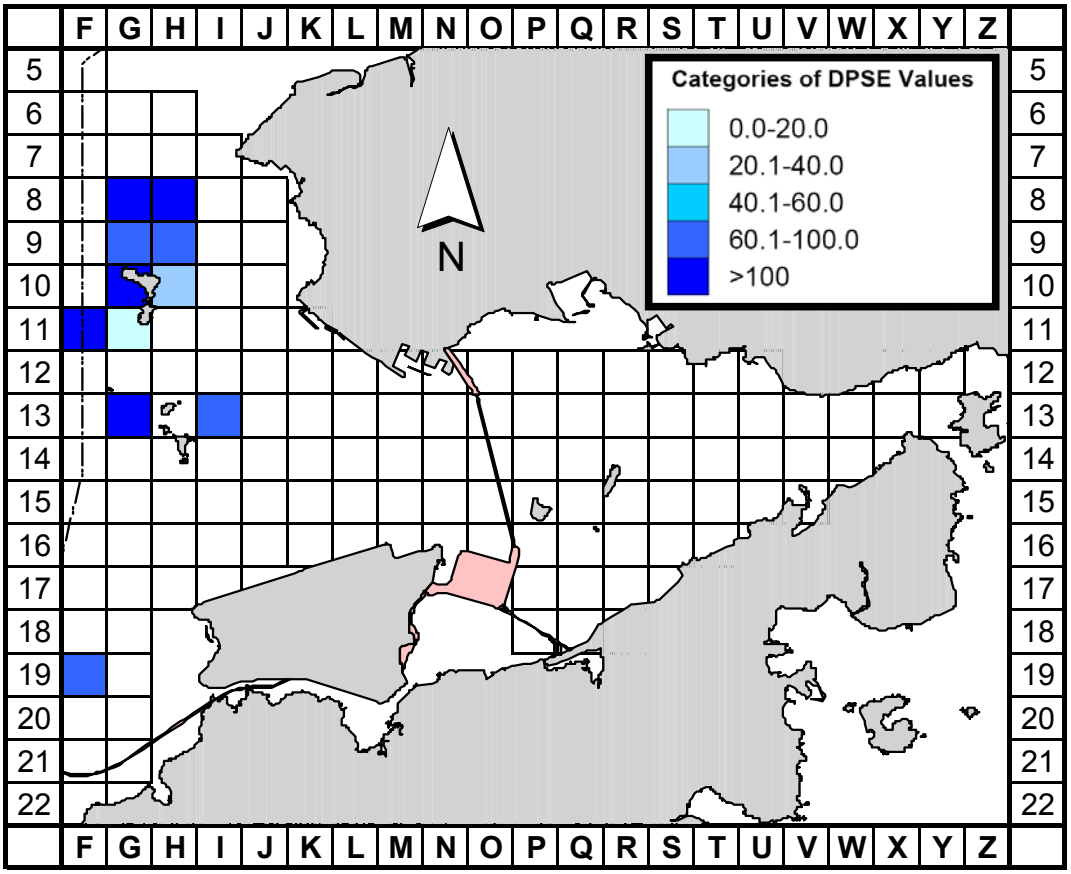


Figure 4b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (Sep-Nov 15) (DPSE = no. of dolphins per 100 units of survey effort)

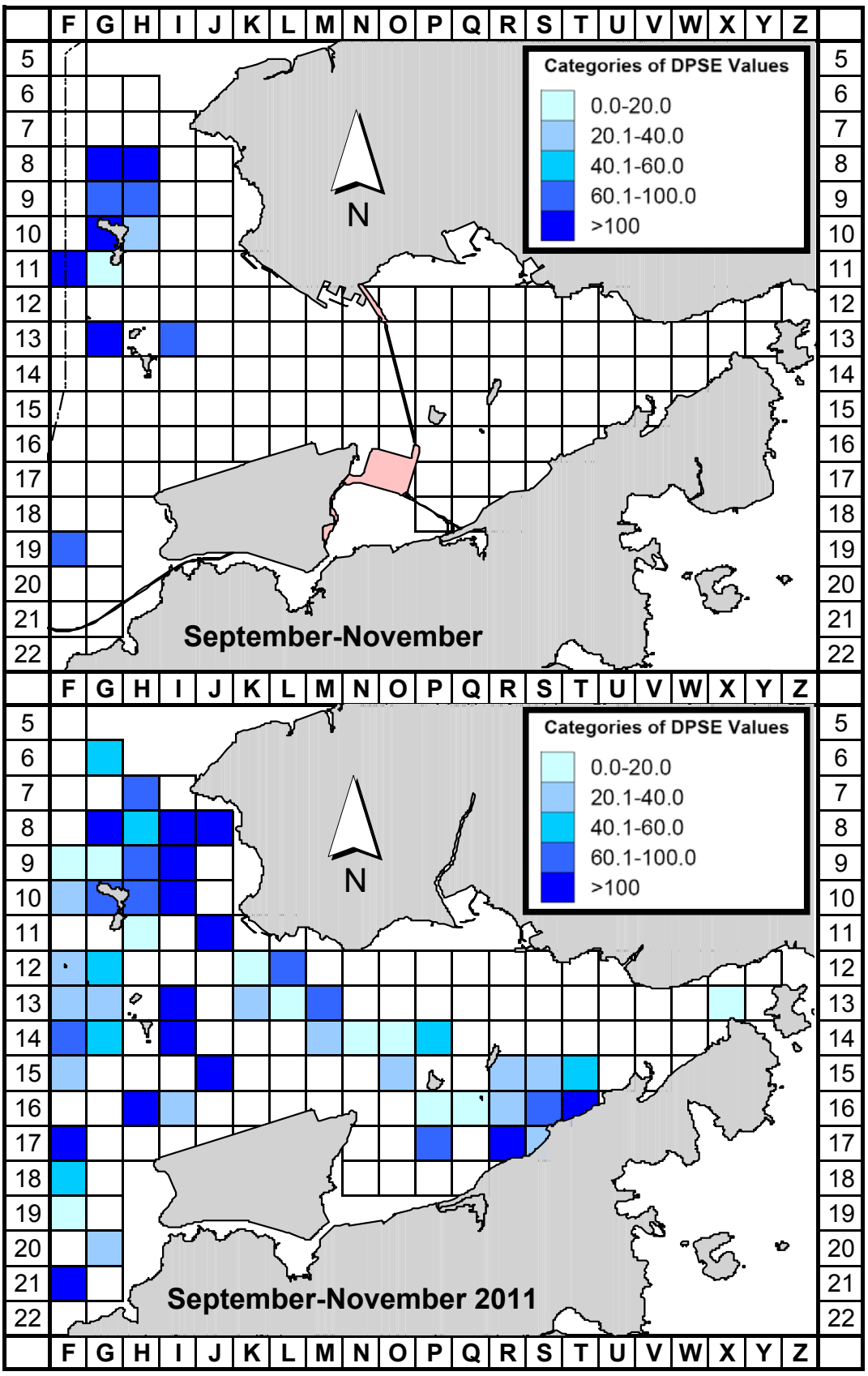


Figure 5. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between the impact monitoring period September-November 2015) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)

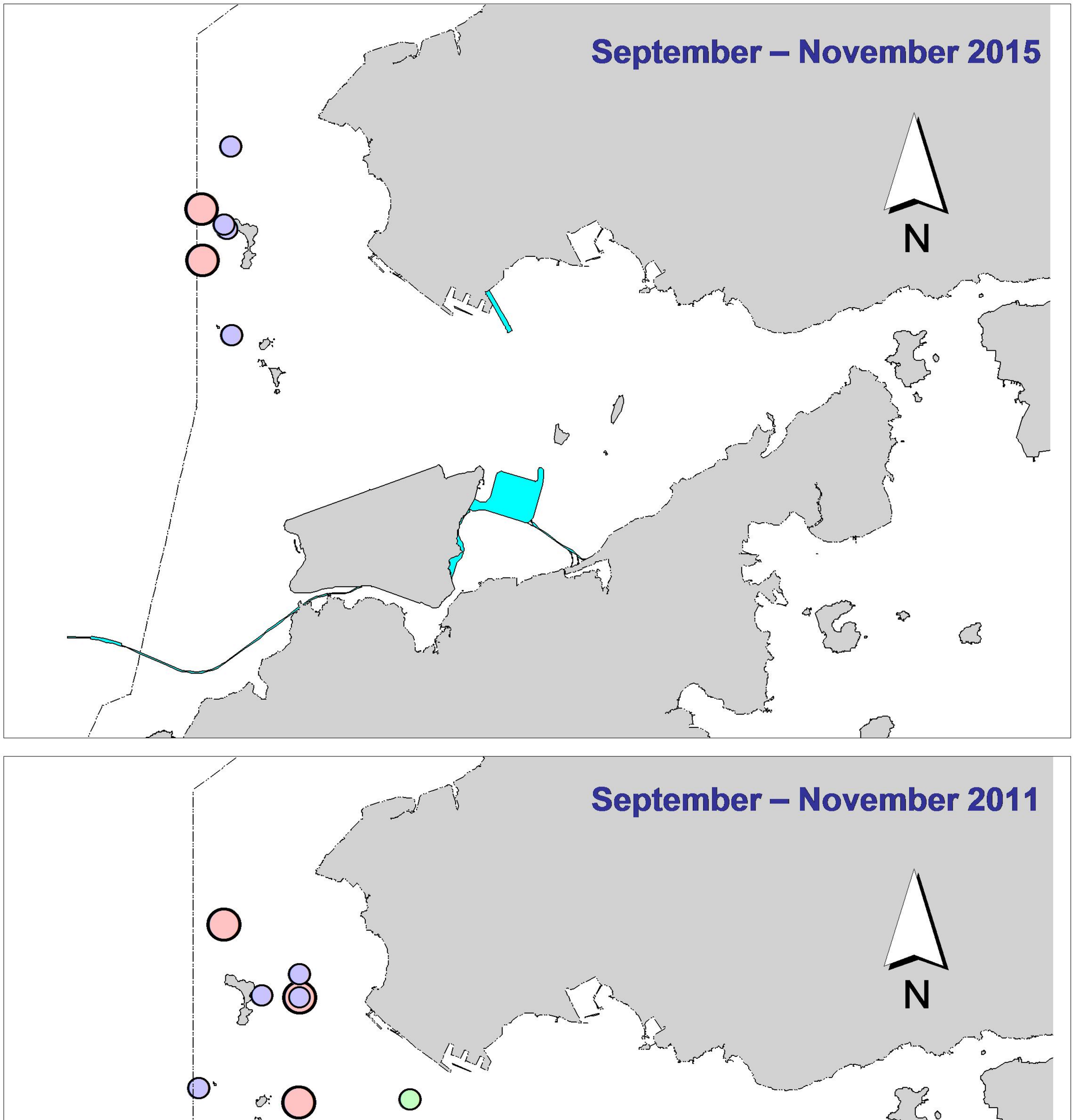


Figure 6. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

Appendix I. HKLR03 Survey Effort Database (September-November 2015)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
2-Sep-15	NW LANTAU	2	1.92	AUTUMN	STANDARD31516	HKLR	P
2-Sep-15	NW LANTAU	3	30.24	AUTUMN	STANDARD31516	HKLR	P
2-Sep-15	NW LANTAU	3	6.89	AUTUMN	STANDARD31516	HKLR	S
2-Sep-15	NE LANTAU	2	11.59	AUTUMN	STANDARD31516	HKLR	P
2-Sep-15	NE LANTAU	3	7.98	AUTUMN	STANDARD31516	HKLR	P
2-Sep-15	NE LANTAU	2	8.83	AUTUMN	STANDARD31516	HKLR	S
2-Sep-15	NE LANTAU	3	2.00	AUTUMN	STANDARD31516	HKLR	S
11-Sep-15	NW LANTAU	2	30.26	AUTUMN	STANDARD31516	HKLR	P
11-Sep-15	NW LANTAU	3	10.73	AUTUMN	STANDARD31516	HKLR	P
11-Sep-15	NW LANTAU	2	4.41	AUTUMN	STANDARD31516	HKLR	S
11-Sep-15	NW LANTAU	3	8.40	AUTUMN	STANDARD31516	HKLR	S
11-Sep-15	NE LANTAU	2	7.75	AUTUMN	STANDARD31516	HKLR	P
11-Sep-15	NE LANTAU	3	8.95	AUTUMN	STANDARD31516	HKLR	P
11-Sep-15	NE LANTAU	2	7.97	AUTUMN	STANDARD31516	HKLR	S
11-Sep-15	NE LANTAU	3	2.11	AUTUMN	STANDARD31516	HKLR	S
17-Sep-15	NE LANTAU	2	9.43	AUTUMN	STANDARD31516	HKLR	P
17-Sep-15	NE LANTAU	3	10.80	AUTUMN	STANDARD31516	HKLR	P
17-Sep-15	NE LANTAU	2	5.51	AUTUMN	STANDARD31516	HKLR	S
17-Sep-15	NE LANTAU	3	5.22	AUTUMN	STANDARD31516	HKLR	S
17-Sep-15	NW LANTAU	2	4.70	AUTUMN	STANDARD31516	HKLR	P
17-Sep-15	NW LANTAU	3	28.06	AUTUMN	STANDARD31516	HKLR	P
17-Sep-15	NW LANTAU	3	7.34	AUTUMN	STANDARD31516	HKLR	S
29-Sep-15	NE LANTAU	2	3.00	AUTUMN	STANDARD31516	HKLR	P
29-Sep-15	NE LANTAU	3	12.12	AUTUMN	STANDARD31516	HKLR	P
29-Sep-15	NE LANTAU	4	1.90	AUTUMN	STANDARD31516	HKLR	P
29-Sep-15	NE LANTAU	2	3.06	AUTUMN	STANDARD31516	HKLR	S
29-Sep-15	NE LANTAU	3	6.02	AUTUMN	STANDARD31516	HKLR	S
29-Sep-15	NE LANTAU	4	1.10	AUTUMN	STANDARD31516	HKLR	S
29-Sep-15	NW LANTAU	2	25.66	AUTUMN	STANDARD31516	HKLR	P
29-Sep-15	NW LANTAU	3	16.42	AUTUMN	STANDARD31516	HKLR	P
29-Sep-15	NW LANTAU	2	1.60	AUTUMN	STANDARD31516	HKLR	S
29-Sep-15	NW LANTAU	3	11.49	AUTUMN	STANDARD31516	HKLR	S
6-Oct-15	NW LANTAU	2	10.62	AUTUMN	STANDARD31516	HKLR	P
6-Oct-15	NW LANTAU	3	18.78	AUTUMN	STANDARD31516	HKLR	P
6-Oct-15	NW LANTAU	2	0.59	AUTUMN	STANDARD31516	HKLR	S
6-Oct-15	NW LANTAU	3	7.02	AUTUMN	STANDARD31516	HKLR	S
6-Oct-15	NE LANTAU	2	20.01	AUTUMN	STANDARD31516	HKLR	P
6-Oct-15	NE LANTAU	3	10.79	AUTUMN	STANDARD31516	HKLR	S
13-Oct-15	NW LANTAU	2	23.12	AUTUMN	STANDARD31516	HKLR	P
13-Oct-15	NW LANTAU	3	15.72	AUTUMN	STANDARD31516	HKLR	P
13-Oct-15	NW LANTAU	2	8.61	AUTUMN	STANDARD31516	HKLR	S
13-Oct-15	NW LANTAU	3	4.20	AUTUMN	STANDARD31516	HKLR	S
13-Oct-15	NE LANTAU	2	7.15	AUTUMN	STANDARD31516	HKLR	P
13-Oct-15	NE LANTAU	3	9.80	AUTUMN	STANDARD31516	HKLR	P
13-Oct-15	NE LANTAU	2	4.56	AUTUMN	STANDARD31516	HKLR	S
13-Oct-15	NE LANTAU	3	5.59	AUTUMN	STANDARD31516	HKLR	S
19-Oct-15	NE LANTAU	2	14.52	AUTUMN	STANDARD31516	HKLR	P
19-Oct-15	NE LANTAU	3	2.90	AUTUMN	STANDARD31516	HKLR	P
19-Oct-15	NE LANTAU	1	2.10	AUTUMN	STANDARD31516	HKLR	S
19-Oct-15	NE LANTAU	2	7.68	AUTUMN	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
19-Oct-15	NW LANTAU	2	14.07	AUTUMN	STANDARD31516	HKLR	P
19-Oct-15	NW LANTAU	3	27.17	AUTUMN	STANDARD31516	HKLR	P
19-Oct-15	NW LANTAU	2	6.61	AUTUMN	STANDARD31516	HKLR	S
19-Oct-15	NW LANTAU	3	6.25	AUTUMN	STANDARD31516	HKLR	S
26-Oct-15	NE LANTAU	2	10.41	AUTUMN	STANDARD31516	HKLR	P
26-Oct-15	NE LANTAU	3	10.00	AUTUMN	STANDARD31516	HKLR	P
26-Oct-15	NE LANTAU	2	8.99	AUTUMN	STANDARD31516	HKLR	S
26-Oct-15	NE LANTAU	3	1.60	AUTUMN	STANDARD31516	HKLR	S
26-Oct-15	NW LANTAU	2	1.22	AUTUMN	STANDARD31516	HKLR	P
26-Oct-15	NW LANTAU	3	30.67	AUTUMN	STANDARD31516	HKLR	P
26-Oct-15	NW LANTAU	2	0.10	AUTUMN	STANDARD31516	HKLR	S
26-Oct-15	NW LANTAU	3	7.51	AUTUMN	STANDARD31516	HKLR	S
2-Nov-15	NW LANTAU	2	6.50	AUTUMN	STANDARD31516	HKLR	P
2-Nov-15	NW LANTAU	3	27.18	AUTUMN	STANDARD31516	HKLR	P
2-Nov-15	NW LANTAU	4	7.13	AUTUMN	STANDARD31516	HKLR	P
2-Nov-15	NW LANTAU	2	2.30	AUTUMN	STANDARD31516	HKLR	S
2-Nov-15	NW LANTAU	3	7.55	AUTUMN	STANDARD31516	HKLR	S
2-Nov-15	NW LANTAU	4	2.74	AUTUMN	STANDARD31516	HKLR	S
2-Nov-15	NE LANTAU	2	14.92	AUTUMN	STANDARD31516	HKLR	P
2-Nov-15	NE LANTAU	3	1.70	AUTUMN	STANDARD31516	HKLR	P
2-Nov-15	NE LANTAU	2	7.98	AUTUMN	STANDARD31516	HKLR	S
2-Nov-15	NE LANTAU	3	2.40	AUTUMN	STANDARD31516	HKLR	S
6-Nov-15	NW LANTAU	3	18.35	AUTUMN	STANDARD31516	HKLR	P
6-Nov-15	NW LANTAU	4	13.86	AUTUMN	STANDARD31516	HKLR	P
6-Nov-15	NW LANTAU	3	6.79	AUTUMN	STANDARD31516	HKLR	S
6-Nov-15	NE LANTAU	2	5.90	AUTUMN	STANDARD31516	HKLR	P
6-Nov-15	NE LANTAU	3	14.15	AUTUMN	STANDARD31516	HKLR	P
6-Nov-15	NE LANTAU	2	6.70	AUTUMN	STANDARD31516	HKLR	S
6-Nov-15	NE LANTAU	3	3.95	AUTUMN	STANDARD31516	HKLR	S
10-Nov-15	NW LANTAU	2	2.44	AUTUMN	STANDARD31516	HKLR	P
10-Nov-15	NW LANTAU	3	27.80	AUTUMN	STANDARD31516	HKLR	P
10-Nov-15	NW LANTAU	4	0.98	AUTUMN	STANDARD31516	HKLR	P
10-Nov-15	NW LANTAU	2	0.28	AUTUMN	STANDARD31516	HKLR	S
10-Nov-15	NW LANTAU	3	6.23	AUTUMN	STANDARD31516	HKLR	S
10-Nov-15	NW LANTAU	4	1.30	AUTUMN	STANDARD31516	HKLR	S
10-Nov-15	NE LANTAU	2	9.09	AUTUMN	STANDARD31516	HKLR	P
10-Nov-15	NE LANTAU	3	10.38	AUTUMN	STANDARD31516	HKLR	P
10-Nov-15	NE LANTAU	2	8.03	AUTUMN	STANDARD31516	HKLR	S
10-Nov-15	NE LANTAU	3	2.70	AUTUMN	STANDARD31516	HKLR	S
16-Nov-15	NE LANTAU	2	5.26	AUTUMN	STANDARD31516	HKLR	P
16-Nov-15	NE LANTAU	3	12.22	AUTUMN	STANDARD31516	HKLR	P
16-Nov-15	NE LANTAU	2	7.72	AUTUMN	STANDARD31516	HKLR	S
16-Nov-15	NE LANTAU	3	2.10	AUTUMN	STANDARD31516	HKLR	S
16-Nov-15	NW LANTAU	2	6.48	AUTUMN	STANDARD31516	HKLR	P
16-Nov-15	NW LANTAU	3	21.03	AUTUMN	STANDARD31516	HKLR	P
16-Nov-15	NW LANTAU	4	9.27	AUTUMN	STANDARD31516	HKLR	P
16-Nov-15	NW LANTAU	5	4.10	AUTUMN	STANDARD31516	HKLR	P
16-Nov-15	NW LANTAU	2	2.53	AUTUMN	STANDARD31516	HKLR	S
16-Nov-15	NW LANTAU	3	7.79	AUTUMN	STANDARD31516	HKLR	S
16-Nov-15	NW LANTAU	4	2.60	AUTUMN	STANDARD31516	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (September-November 2015)

(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
02-Sep-15	1	1045	8	NW LANTAU	3	629	ON	HKLR	823950	805482	AUTUMN	NONE	P
02-Sep-15	2	1122	12	NW LANTAU	2	240	ON	HKLR	826365	805436	AUTUMN	NONE	P
02-Sep-15	3	1143	12	NW LANTAU	2	75	ON	HKLR	826741	805344	AUTUMN	NONE	P
11-Sep-15	1	1155	6	NW LANTAU	2	349	ON	HKLR	828788	806460	AUTUMN	NONE	P
17-Sep-15	1	1411	7	NW LANTAU	3	134	ON	HKLR	828867	805462	AUTUMN	PURSE-SEINE	P
29-Sep-15	1	1445	5	NW LANTAU	2	430	ON	HKLR	827625	806489	AUTUMN	NONE	P
29-Sep-15	2	1512	4	NW LANTAU	2	281	ON	HKLR	828090	806500	AUTUMN	NONE	P
06-Oct-15	1	1113	2	NW LANTAU	2	72	ON	HKLR	827029	805334	AUTUMN	NONE	P
13-Oct-15	1	1025	2	NW LANTAU	3	195	ON	HKLR	817031	804665	AUTUMN	NONE	P
13-Oct-15	2	1036	3	NW LANTAU	3	102	ON	HKLR	817020	804675	AUTUMN	NONE	P
13-Oct-15	3	1123	10	NW LANTAU	2	745	ON	HKLR	825923	804673	AUTUMN	NONE	P
19-Oct-15	1	1407	2	NW LANTAU	3	14	ON	HKLR	826473	806476	AUTUMN	NONE	P
26-Oct-15	1	1326	6	NW LANTAU	3	73	ON	HKLR	823681	807511	AUTUMN	NONE	P
26-Oct-15	2	1444	2	NW LANTAU	2	107	ON	HKLR	827007	805303	AUTUMN	NONE	S
02-Nov-15	1	1143	7	NW LANTAU	2	181	ON	HKLR	828699	806450	AUTUMN	NONE	P
06-Nov-15	1	1106	1	NW LANTAU	3	77	ON	HKLR	826830	805262	AUTUMN	NONE	P
10-Nov-15	1	1042	1	NW LANTAU	3	465	ON	HKLR	825312	805475	AUTUMN	NONE	P
16-Nov-15	1	1455	5	NW LANTAU	5	662	ON	HKLR	827241	804645	AUTUMN	NONE	P

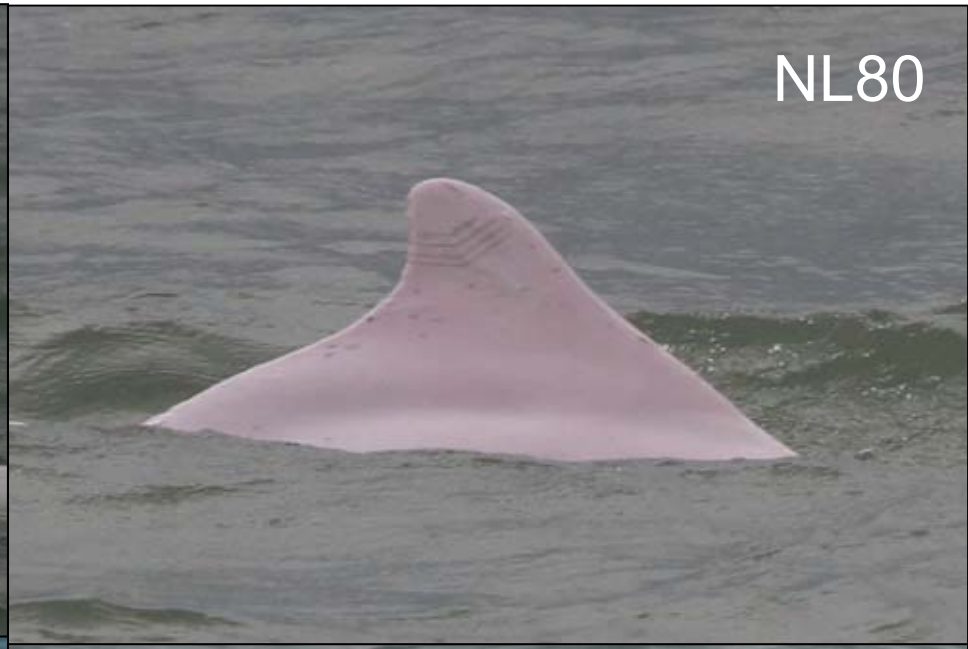
Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in September-November 2015

ID#	DATE	STG#	AREA
CH34	29/09/15	1	NW LANTAU
	19/10/15	1	NW LANTAU
CH84	02/09/15	3	NW LANTAU
NL33	13/10/15	1	NW LANTAU
	26/10/15	1	NW LANTAU
NL46	02/09/15	2	NW LANTAU
	17/09/15	1	NW LANTAU
	10/11/15	1	NW LANTAU
NL48	02/09/15	1	NW LANTAU
	11/09/15	1	NW LANTAU
	17/09/15	1	NW LANTAU
	02/11/15	1	NW LANTAU
	16/11/15	1	NW LANTAU
NL80	02/09/15	2	NW LANTAU
NL98	02/11/15	1	NW LANTAU
NL104	13/10/15	3	NW LANTAU
NL123	17/09/15	1	NW LANTAU
	02/11/15	1	NW LANTAU
NL136	29/09/15	1	NW LANTAU
	02/11/15	1	NW LANTAU
NL150	02/09/15	2	NW LANTAU
NL165	02/09/15	1	NW LANTAU
NL182	17/09/15	1	NW LANTAU
	02/11/15	1	NW LANTAU
NL202	02/09/15	2	NW LANTAU
	17/09/15	1	NW LANTAU
	29/09/15	2	NW LANTAU
	13/10/15	3	NW LANTAU
	26/10/15	2	NW LANTAU
	16/11/15	1	NW LANTAU
NL203	02/09/15	3	NW LANTAU
NL210	02/09/15	2	NW LANTAU
	13/10/15	3	NW LANTAU
	02/11/15	1	NW LANTAU
	16/11/15	1	NW LANTAU
NL214	13/10/15	3	NW LANTAU
NL220	19/10/15	1	NW LANTAU
	26/10/15	1	NW LANTAU
NL233	02/09/15	2	NW LANTAU

ID#	DATE	STG#	AREA
NL261	02/09/15	1	NW LANTAU
	26/10/15	1	NW LANTAU
NL272	26/10/15	1	NW LANTAU
NL284	13/10/15	3	NW LANTAU
	26/10/15	1	NW LANTAU
NL285	02/09/15	1	NW LANTAU
	11/09/15	1	NW LANTAU
NL286	02/09/15	2	NW LANTAU
	17/09/15	1	NW LANTAU
	06/10/15	1	NW LANTAU
	13/10/15	3	NW LANTAU
	26/10/15	2	NW LANTAU
	16/11/15	1	NW LANTAU
NL297	02/09/15	3	NW LANTAU
NL302	02/09/15	3	NW LANTAU
	11/09/15	1	NW LANTAU
NL308	02/09/15	2	NW LANTAU
NL319	29/09/15	2	NW LANTAU
SL47	13/10/15	2	NW LANTAU
WL05	02/09/15	1	NW LANTAU
	29/09/15	2	NW LANTAU
WL17	02/09/15	2	NW LANTAU
	17/09/15	1	NW LANTAU
WL79	13/10/15	3	NW LANTAU
WL241	13/10/15	2	NW LANTAU
WL243	13/10/15	2	NW LANTAU

Appendix IV. Thirty-four individual dolphins that were identified during September-November 2015 under HKLR03 impact phase monitoring surveys

Appendix IV. (cont'd)



Appendix IV. (cont'd)

Appendix IV. (cont'd)

Appendix IV. (cont'd)

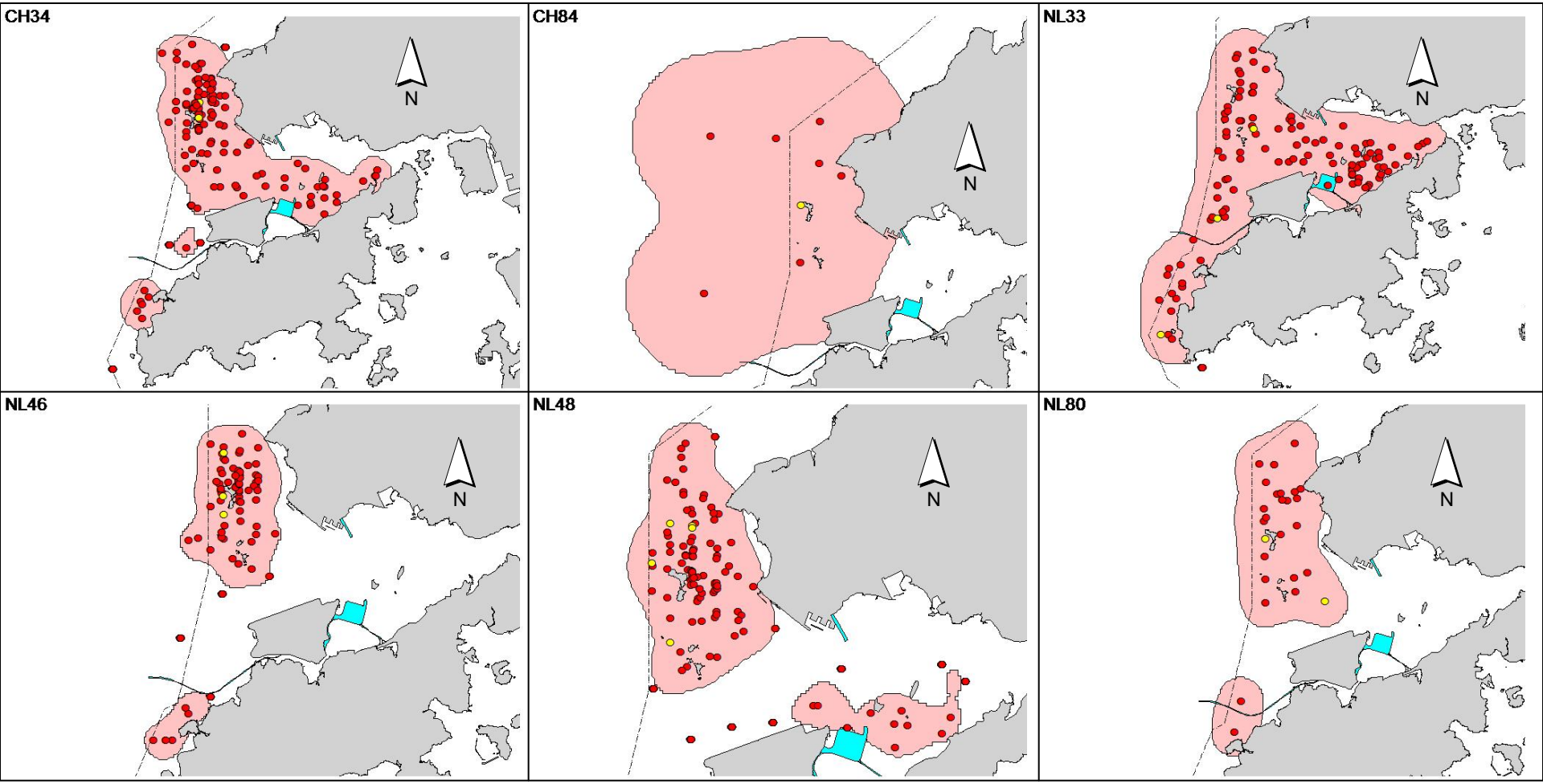
Appendix IV. (cont'd)

Appendix IV. (cont'd)

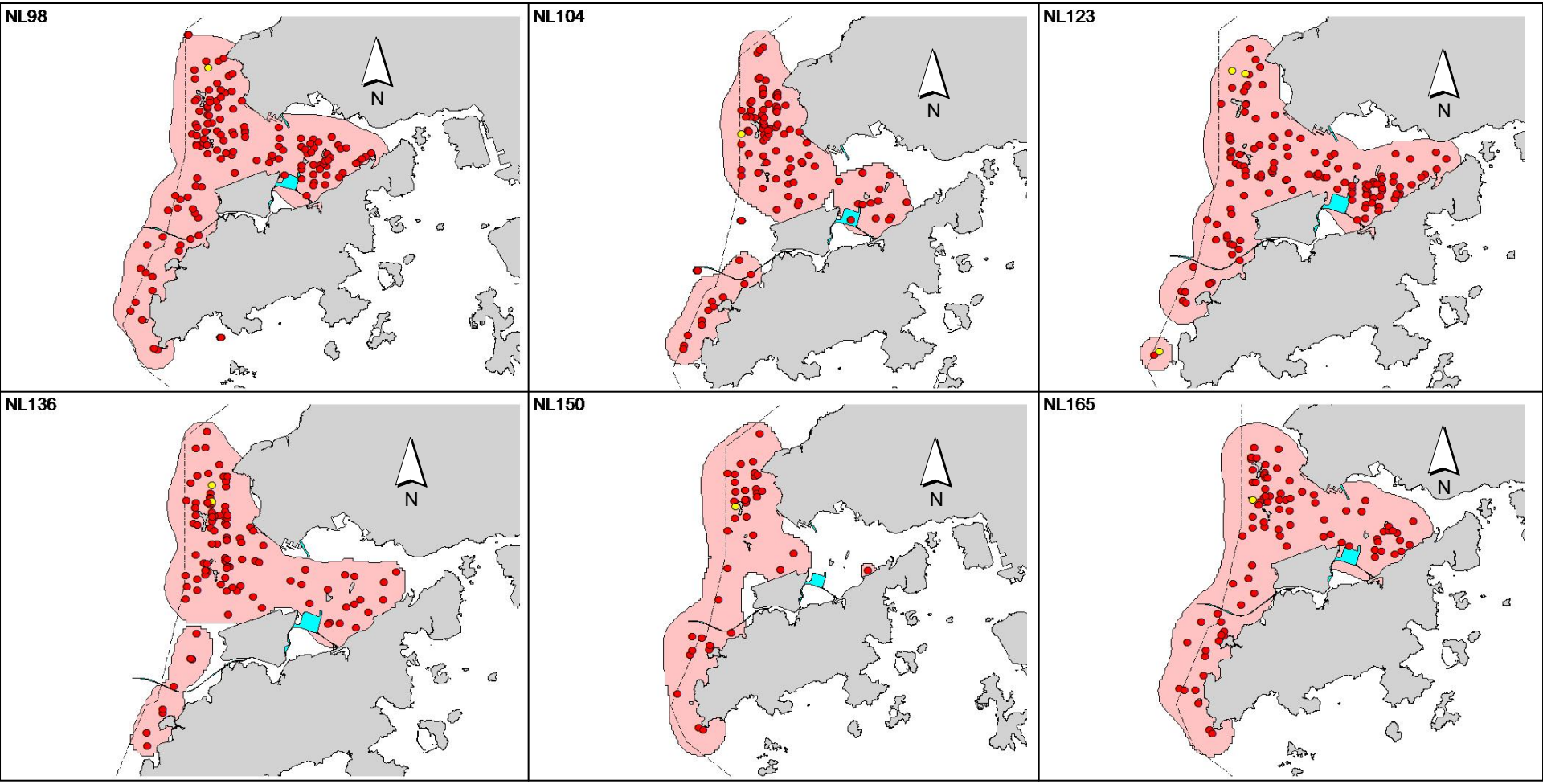
Appendix IV. (cont'd)

Appendix IV. (cont'd)

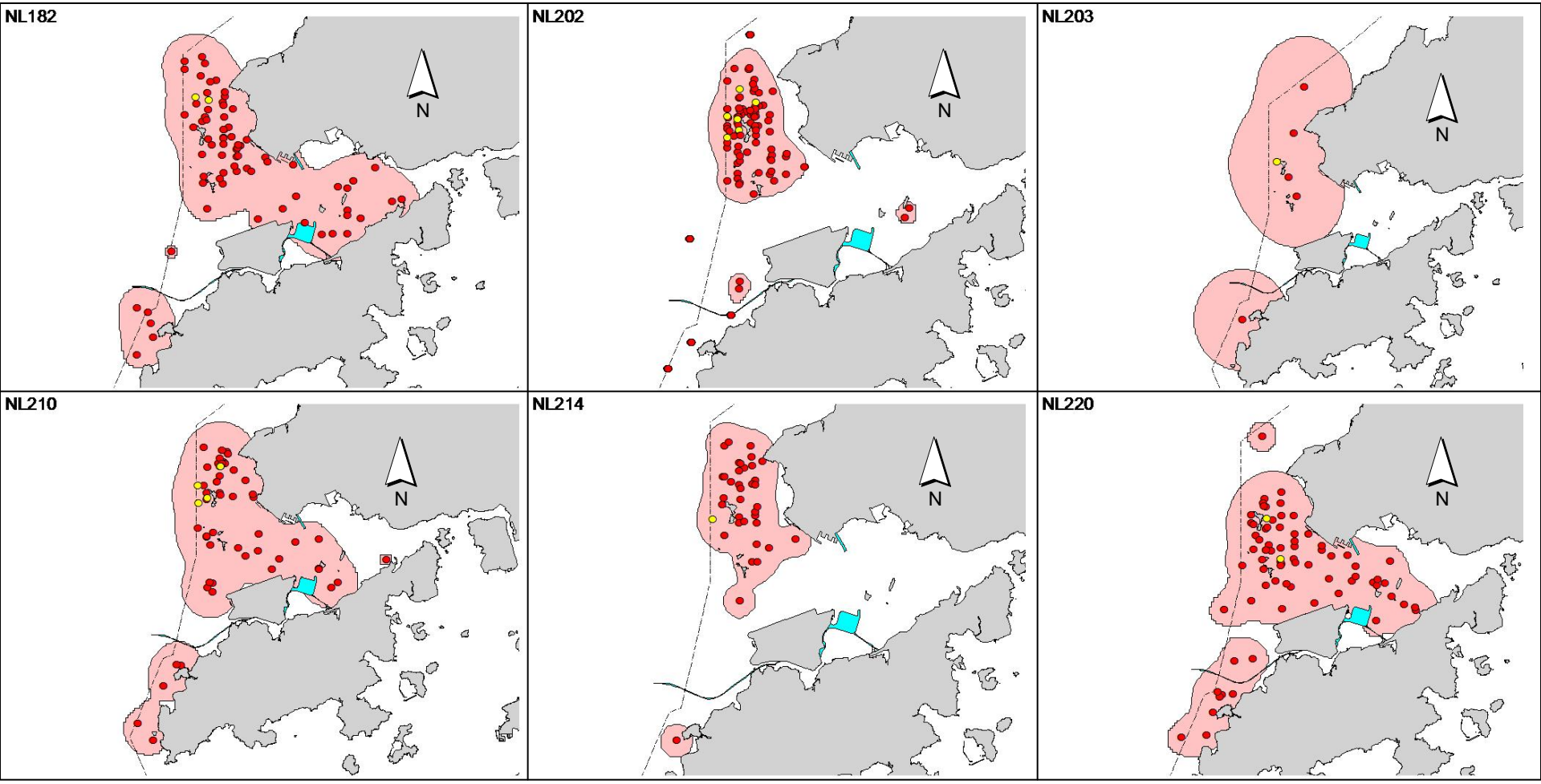
Appendix V. Ranging patterns (95% kernel ranges) of 34 individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicates sightings made in September-November 2015)



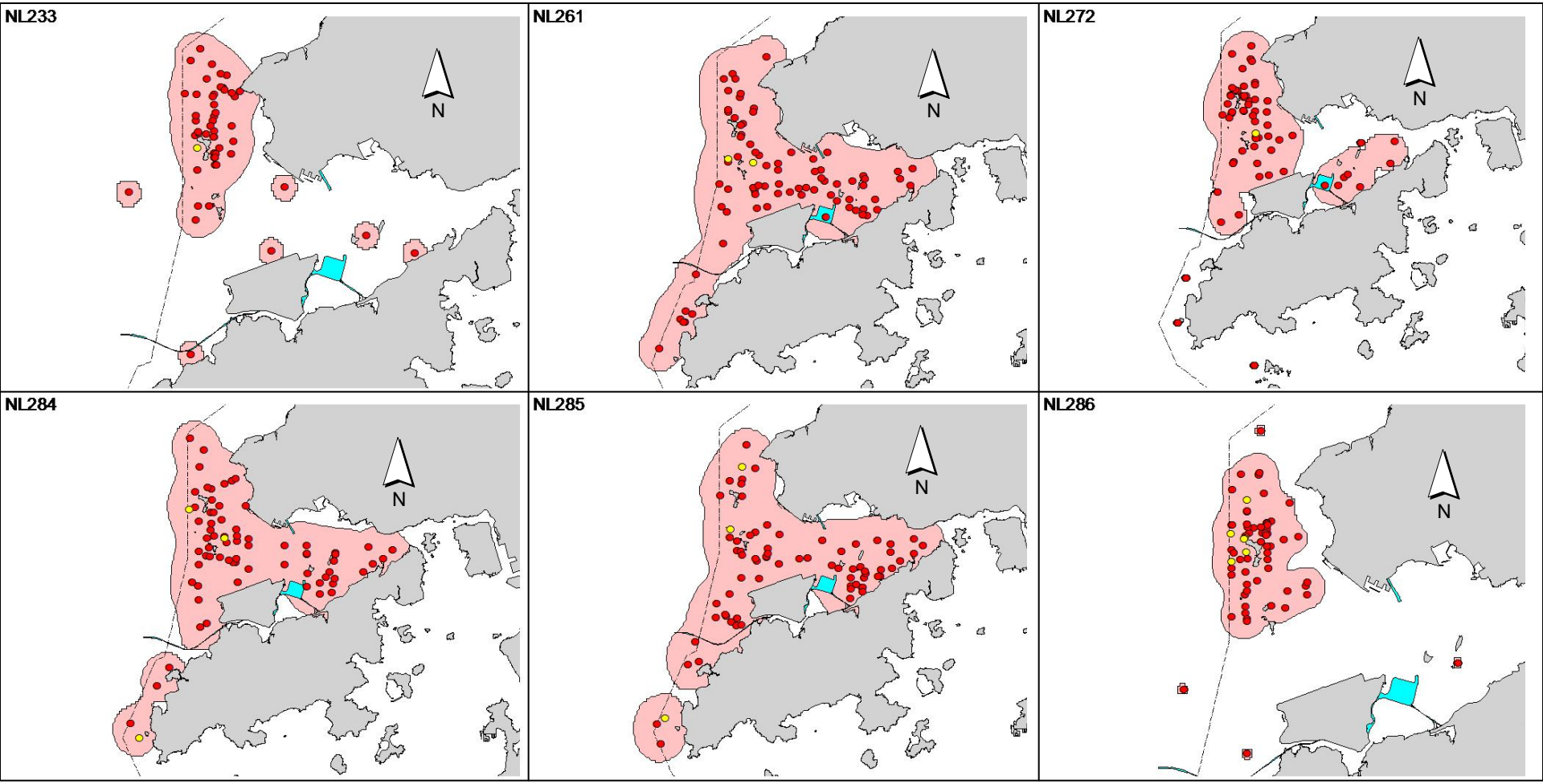
Appendix V. (cont'd)



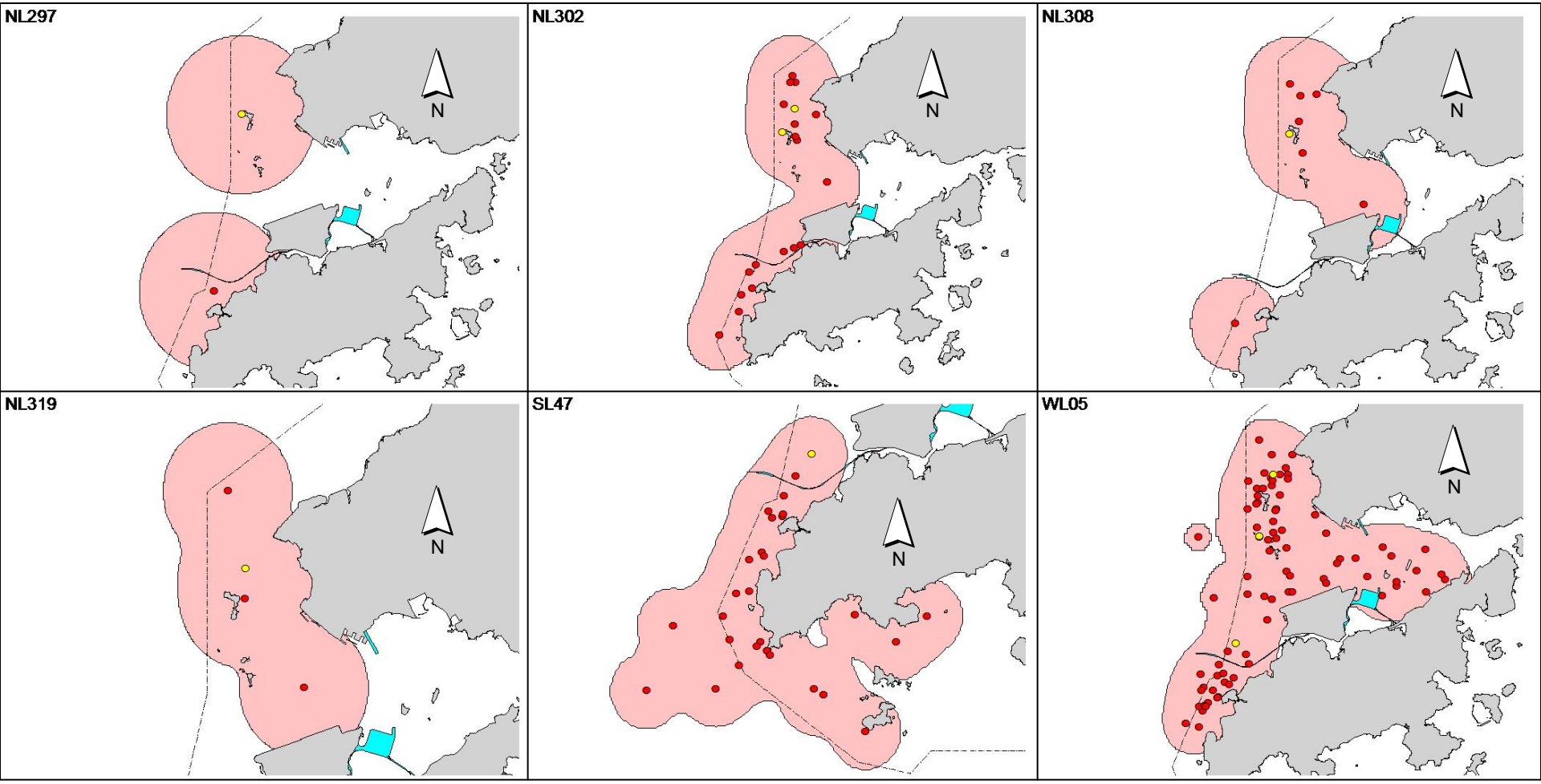
Appendix V. (cont'd)



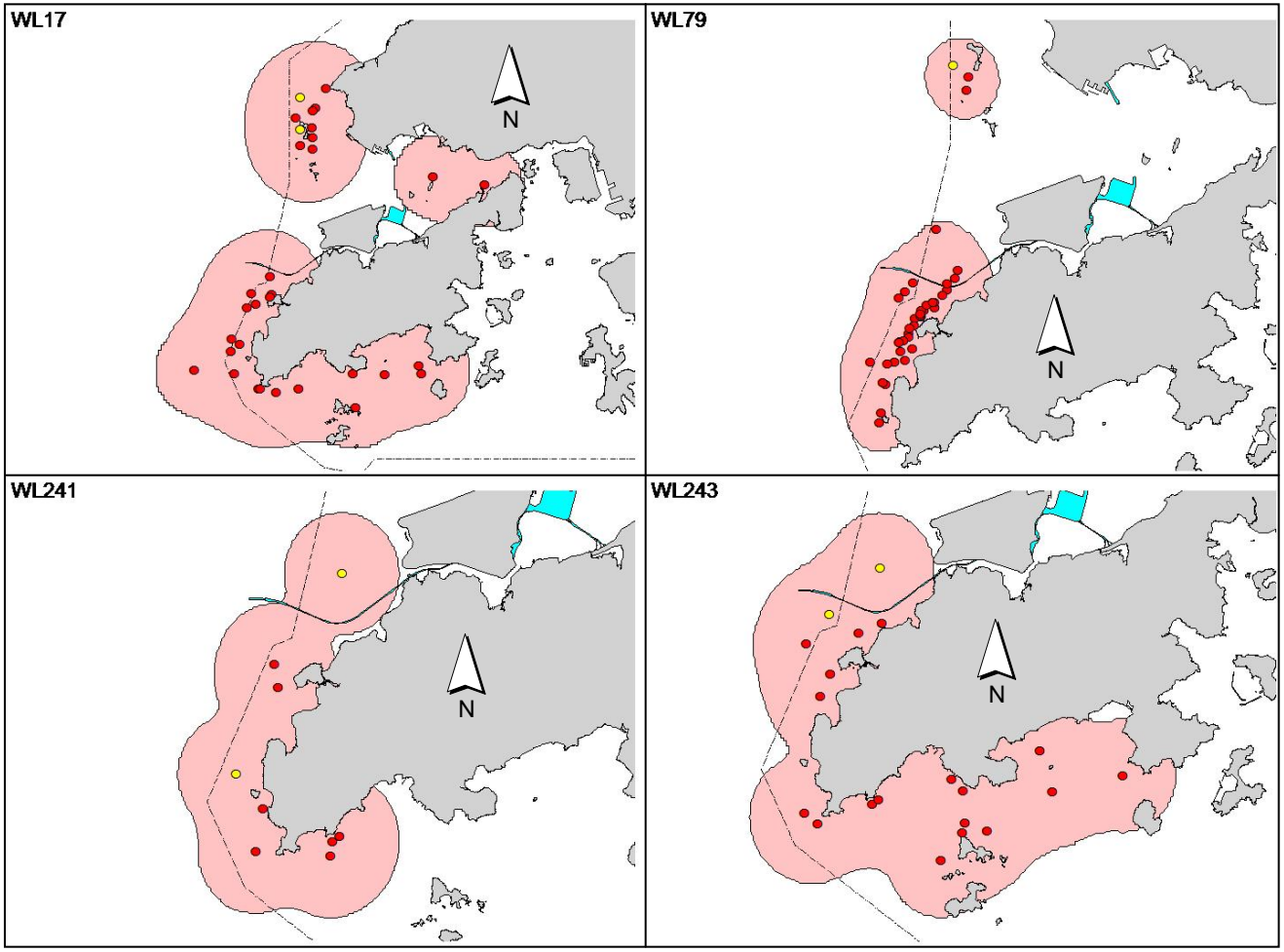
Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix H

Event and Action Plan

Event and Action Plan for Impact Air Monitoring

	Action			
	ET [(a)]	**IEC [(a)]**	**SOR [(a)]**	**Contractor(s)**
Action Level Exceedance				
	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. Supervise 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				
	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. Supervise 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 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.

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

Appendix I

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

Table I1 ***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	0	30
	Limit	0	2
24-Hr TSP	Action	0	5
	Limit	0	1
Water Quality	Action	0	6
	Limit	0	1
Impact Dolphin Monitoring	Action	2	9
	Limit	0	3

Table I2 ***Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions***

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Period (September 2015 to November 2015)	0	0	0
Total No. received since project commencement	4	0	0

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_Sep2015/Nov2015_dolphin_STG&ANI_NEL&NWL** **[Total No. of Exceedances = 2 Action Level Exceedances]**	
Date	September 2015 to November 2015 (monitored) 7 January 2016 (results received by ERM)	
Monitoring Area	Northeast Lantau (NEL) and Northwest Lantau (NWL)	
Parameter(s) with Exceedance(s)	Quarterly encounter rate of dolphin sightings (STG) Quarterly encounter rate of total number of dolphins (ANI)	
Action Levels	North Lantau Social cluster	NEL: STG < 4.2 & ANI < 15.5 or NWL: STG < 6.9 & ANI < 31.3
Limit Levels		NEL: STG < 2.4 & ANI < 8.9 and NWL: STG < 3.9 & ANI < 17.9
Recorded Levels	NEL	STG = 0.0 & ANI = 0.0
	NWL	STG = 3.94 & ANI = 21.05
	Two Action Level Exceedances were recorded in the quarterly impact dolphin monitoring at NEL and NWL between September 2015 and November 2015. The exceedance was reported in the approved *Twenty-fifth Monthly EM&A Report* dated 10 December 2015.	
Statistical Analyses	Further to the review of the available and relevant dolphin monitoring data in the EM&A programme by 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, September 2015 to November 2015) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and present impact monitoring quarter. By setting $\alpha = 0.05$ as the significance level in the statistical tests, significant difference in STG ($p = 0.0079$) was detected between Periods but not in ANI ($p = 0.071$). • A two-way ANOVA with repeated measures and unequal sample size was conducted using Cumulative Period (2 levels: baseline vs impact – cumulative quarters*, December 2012 to November 2015) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and cumulative impact monitoring quarters. By setting $\alpha = 0.0001$ as the significance level in the statistical tests, significant difference in STG ($p = 0.00009$) and in ANI ($p = 0.00003$) 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 September 2015 and November 2015, no marine works was carried out in this Contract.	

Possible Reason for Action or Limit Level Exceedance(s)	The exceedance is considered not caused by the Project, in view of the following: • The *Monitoring of Marine Mammals in Hong Kong Waters (2014 – 15)* (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 Chinese White Dolphin (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/D and the updated EM&A Manual. No marine works were carried out during the monitoring quarter. During this quarter of dolphin monitoring, no unacceptable impact on CWD due to the activities under this Contract was observed.
Actions Taken / To Be Taken	With reference to the site inspection records in this quarter, the respective marine ecological mitigation measures (including 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). A joint team meeting was held on 15 January 2016 for discussion on CWD trend, with attendance of ENPO, HyD, Representatives of Resident Site Staff (RSS), Environmental Team (ET) for Contract No. HY/2010/02, HY2011/03, HY/2012/07 and HY/2012/08, and Representatives of Main Contractor for Contract No. HY/2012/08. The discussion/recommendation as recorded in the minutes of the meeting, which might be relevant to this Contract are summarized below. It was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified nor separate from the other stress factors. It was reminded that the ETs shall keep reviewing the implementation status of the dolphin related mitigation measures and remind the contractor to ensure the relevant measures are fully implemented. The participants were requested by ENPO to collect and report the marine traffic statistics. It was recommended that the marine works of HZMB projects should be completed as soon as possible so as to reduce the overall duration of impacts and allow the dolphins population to recover as early as possible. Further protection measures (e.g. speed limit control) should be carried out as soon as possible to minimize the disturbance to the proposed Brothers Marine Park (BMP). The Marine Travel Route Plan for this Project should be updated once the boundary of BMP is gazetted.
Remarks	The results of impact water quality and impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved *Twenty-third* to *Twenty-fifth EM&A Monthly Reports*.

(1) Hung SKY (2015). 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

Appendix J

Waste Flow Table

Monthly Summary Waste Flow Table

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

Monthly Summary Waste Flow Table for November 2015 [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	Monthly Break-down of Inert Construction & Demolition Materials (i.e. Public Fill Materials)				
	(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)
Sub-total	64.216	0.000	0.000	0.000	64.216
Jan-2015	30.877	0.000	0.000	0.000	30.877
Feb-2015	4.152	0.000	0.000	0.000	4.152
Mar-2015	36.718	0.000	0.000	0.000	36.718
Apr-2015	62.847	0.000	0.000	0.000	62.847
May-2015	121.436	0.000	0.000	0.000	121.436
Jun-2015	247.282	0.000	0.000	0.000	247.282
Half Year Sub-total	503.312	0.000	0.000	0.000	503.312
Jul-2015	233.422	0.000	0.000	0.000	233.422
Aug-2015	62.367	0.000	0.000	0.000	62.367
Sep-2015	9.555	0.000	0.000	0.000	9.555
Oct-2015	7.218	0.000	0.000	0.000	7.218
Nov-2015	11.578	0.000	0.000	0.000	11.578
Dec-2015					
Project Total Quantities	891.668	0.000	0.000	0.000	891.668

Month	**Actual Quantities of <u>Non-inert</u> 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	Disposed	generated
Sub-total	0.000	0.000	1.050	1.050	0.000	0.000	0.110	0.110	0.605
Jan-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080
Feb-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074
Mar-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115
Apr-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091
May-2015	0.000	0.000	0.000	0.000	0.000	0.000	1.600	1.600	0.108
Jun-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120
Half Year Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	1.600	1.600	0.588
Jul-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.172
Aug-2015	0.000	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.246
Sep-2015	0.000	0.000	0.000	0.300	0.220	0.220	0.000	0.000	0.195
Oct-2015	0.000	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.177
Nov-2015	0.000	0.000	0.000	0.200	5.950	5.950	0.000	0.000	0.093
Dec-2015									
Project Total Quantities	0.000	0.000	2.150	2.150	6.170	6.170	1.710	1.710	2.076

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
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
50.000	0.000	0.000	0.000	50.000

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	0.000	0.000	0.000	0.200

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).