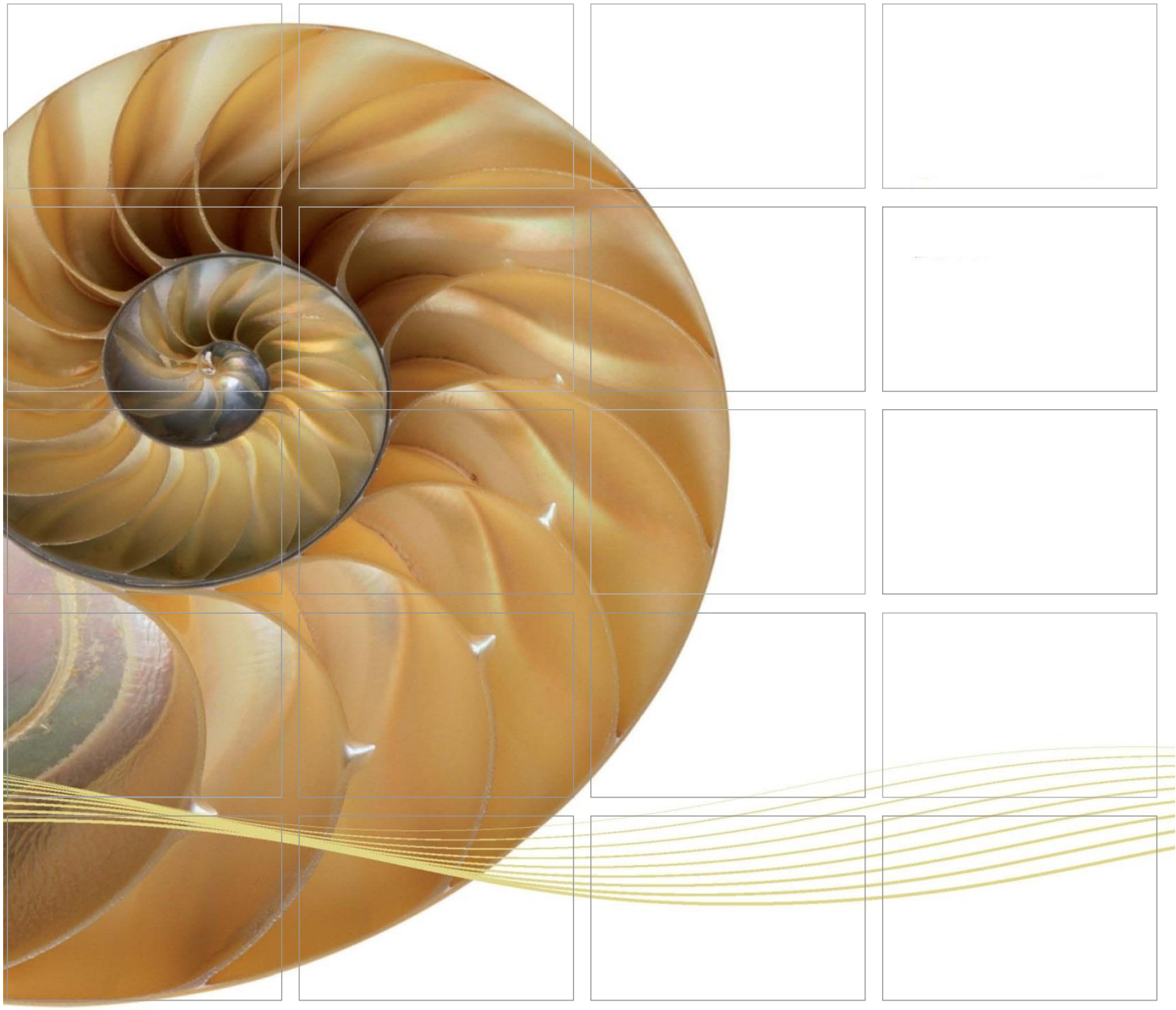
Report



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

Forty-seventh Monthly Environmental Monitoring & Audit (EM&A) Report

13 October 2017

Environmental Resources Management
16/F, Berkshire House
25 Westlands Road
Quarry Bay, Hong Kong
Telephone 2271 3000
Facsimile 2723 5660

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The business of sustainability

RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_5893L.17 16 October 2017

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. Andy Westmoreland / Roger Man

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
47th Monthly EM&A Report for September 2017 (EP-354/2009/D)

Reference is made to the Monthly Environmental Monitoring and Audit (EM&A) Report (Sep. 2017) (ET's ref.: "0212330_47th Monthly EM&A_20171013.doc" dated 13 Oct. 2017) certified by the ET Leader and provided to us via e-mail on 13 Oct. 2017.

Please be informed that we have no adverse comments on the captioned Report. We write to verify the captioned submission in accordance with Condition 4.4 of EP-354/2009/D.

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

Yours sincerely,

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

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

Internal: DY, YH, ENPO Site

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Ramboll Environ Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.Ramboll-Environ.com

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

Forty-seventh Monthly Environmental Monitoring & Audit (EM&A) Report

Document Code: 0212330_47th Monthly EM&A_20171013.doc

Environmental Resources Management

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

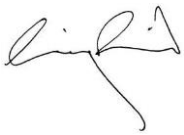
Client:	Project No:
DBJV	0212330

Summary:

This document presents the Forty-seventh Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.

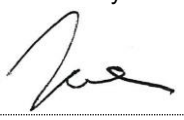
Date: 13 October 2017

Approved by:



Mr Craig Reid
Partner

Certified by:



Mr Jovy Tam
ET Leader

Revision	Description	By	Checked	Approved	Date
	47th Monthly EM&A Report	VAR	JT	CAR	13/10/17

Distribution

☐ Internal

☒ Public

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OHSAS 18001:2007 Certificate No. OHS 515956

ISO 9001 : 2008 Certificate No. FS 32515

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 Forty-seventh Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 30 September 2017 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, major activities in the reporting period included:

Land-based Works

- Box Culvert Extension at Works Area – Portion N-A;
- Construction of North Ventilation Building – Portion N-C;
- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Excavation of Sub-sea Tunnel – TBM tunnel;
- Corbel Construction – TBM Tunnel; and
- Bulk Excavation – Portion S-A.

There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period.

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

24-hour TSP Monitoring	10 sessions
1-hour TSP Monitoring	10 sessions
Impact Dolphin Monitoring	2 sessions
Joint Environmental Site Inspection	4 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

Six (6) Action Level exceedance and one (1) Limit Level exceedance of 1-hour TSP was recorded in the air quality monitoring of this reporting month. Investigation report will be provided in the next monthly EM&A report. Investigation report of action level exceedance on 22 August 2017 is provided in Appendix K.

Breaches of Action and Limit Levels for Dolphin Monitoring

Due to monthly variation in dolphin occurrence within the survey area, it would be more appropriate to draw conclusion on whether any unacceptable impacts on dolphins have been detected in relation to the construction activities of this Project in the quarterly EM&A reports, where comparison on distribution, group size and encounter rates of dolphins between the quarterly impact monitoring period and baseline monitoring period will be made.

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.

Summary of Marine Travel Route record

No non-compliance with EIA recommendations, EP conditions and other requirements associated with the marine travel route record of this Contract was recorded from September 2017.

Reporting Change

There was no reporting change required in the reporting period.

Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of October 2017 include the following:

Land-based Works

- Box Culvert Extension at Works Area – Portion N-A;
- Phase 2 Surcharge Removal – Portion N-A;
- Construction of North Ventilation Building – Portion N-C;
- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Excavation of Sub-sea Tunnel – TBM tunnel;
- Corbel Construction – TBM Tunnel; and
- Bulk Excavation – Portion S-A.
- CSM treatment, Jet Grouting works and D-wall Construction – Portion S-A
- Ground Freezing Works - Portion S-A

Marine-based Works

- Seawall Enhancement works – Portion N-C

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of October 2017 are mainly associated with dust, marine water quality, marine ecology and waste management issues.

1 INTRODUCTION

1.1 BACKGROUND

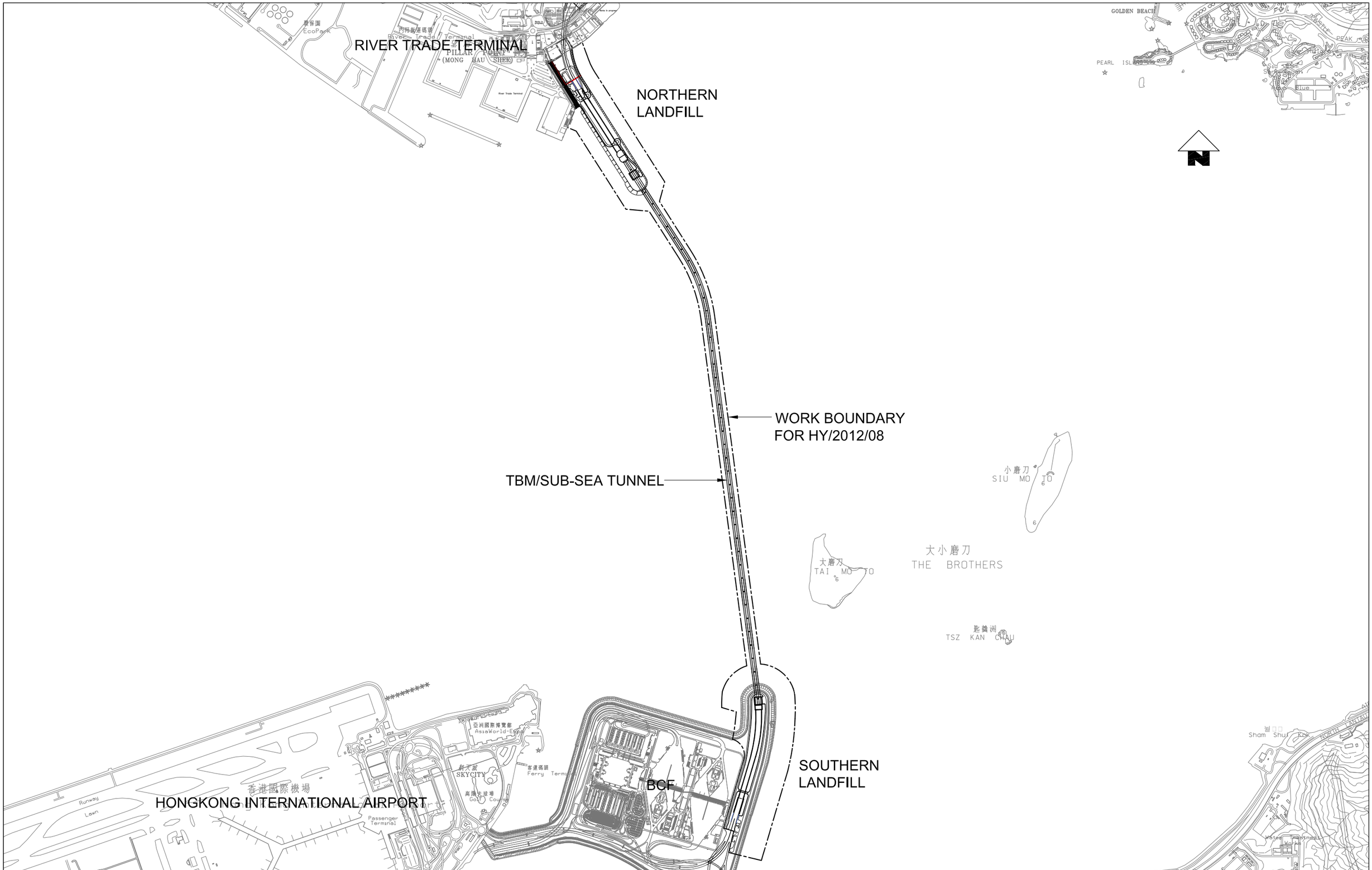
According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated 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-354/2009/A) was issued on 8 December 2010. Subsequent applications for variation of environmental permits (VEPs), *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). 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*.

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



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				Approved By	SPo PP
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Rev.	Description	Date	Checked		

Main Contractor

香寶嘉 Dragages HongKong

A member of the Bouygues Construction group

BOUYGUES TRAVAUX PUBLICS

Dragages - Bouygues Joint Venture 寶嘉 - 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

1.2 SCOPE OF REPORT

This is the Forty-seventh Monthly 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 in September 2017.

1.3 ORGANIZATION STRUCTURE

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

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Highways Department	Engr 22/HZMB	Chow Man Lung, Andrew	2762 4110	2762 4110
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Roger Man	2293 6388	2293 6300
		Andrew Westmoreland	2293 6360	2293 6300
ENPO / IEC (Ramboll Environ Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Dr. F.C. Tsang	3465 2851	3465 2899
Contractor (Dragages – Bouygues Joint Venture)	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 construction programme is shown in *Appendix B*.

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

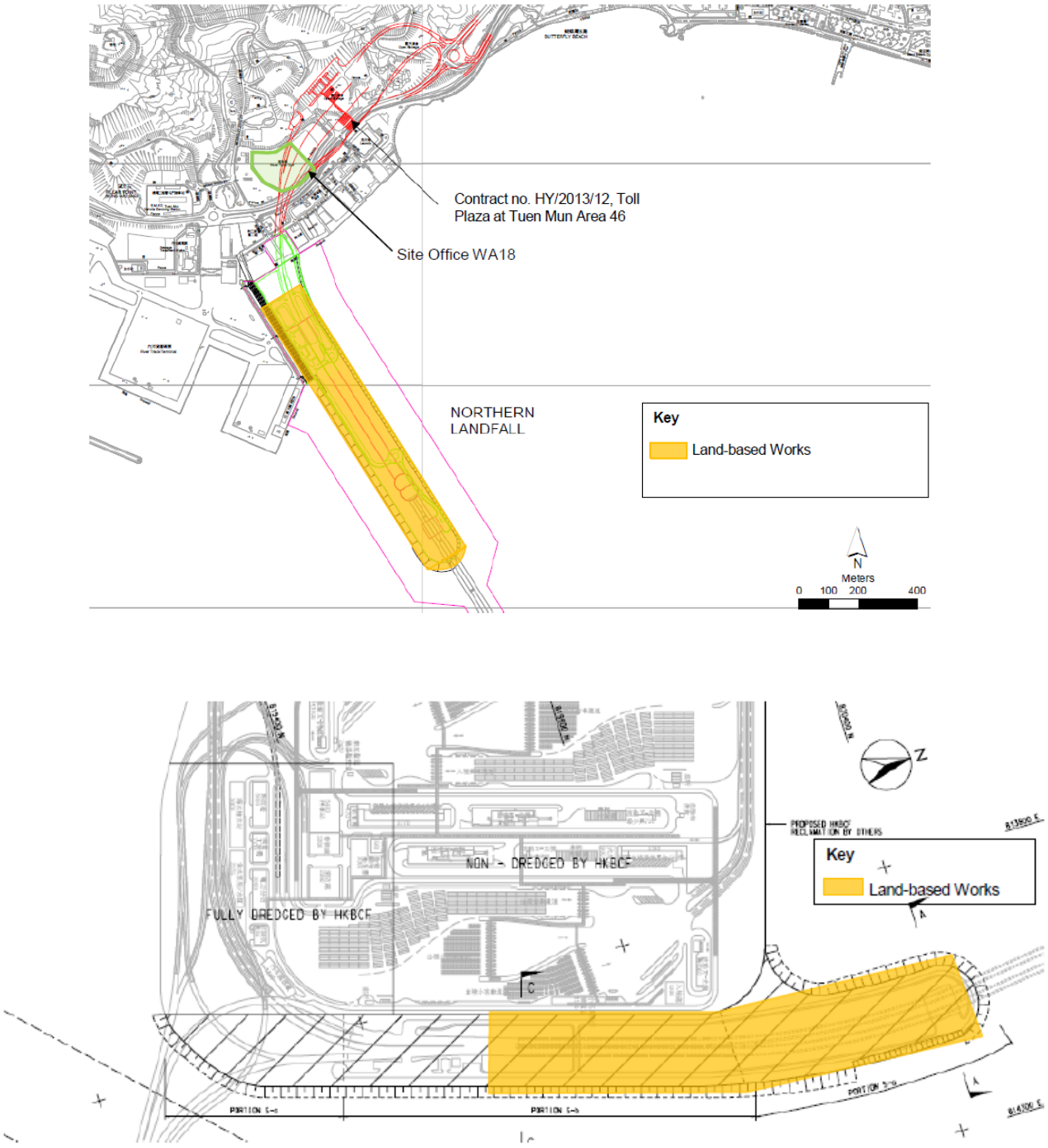
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.3*.

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
• Box Culvert Extension at Works Area – Portion N-A; • Construction of North Ventilation Building – Portion N-C; • Construction of Cross Passage Tympanum – TBM tunnel; • Cross Passage Lining Installation – TBM Tunnel; • Excavation of Sub-sea Tunnel – TBM tunnel; • Corbel Construction – TBM Tunnel; and • Bulk Excavation – Portion S-A. There was no dredging, reclamation or marine sheet piling works in open waters during this reporting period.

Figure 1.2 Locations of Construction Activities – September 2017



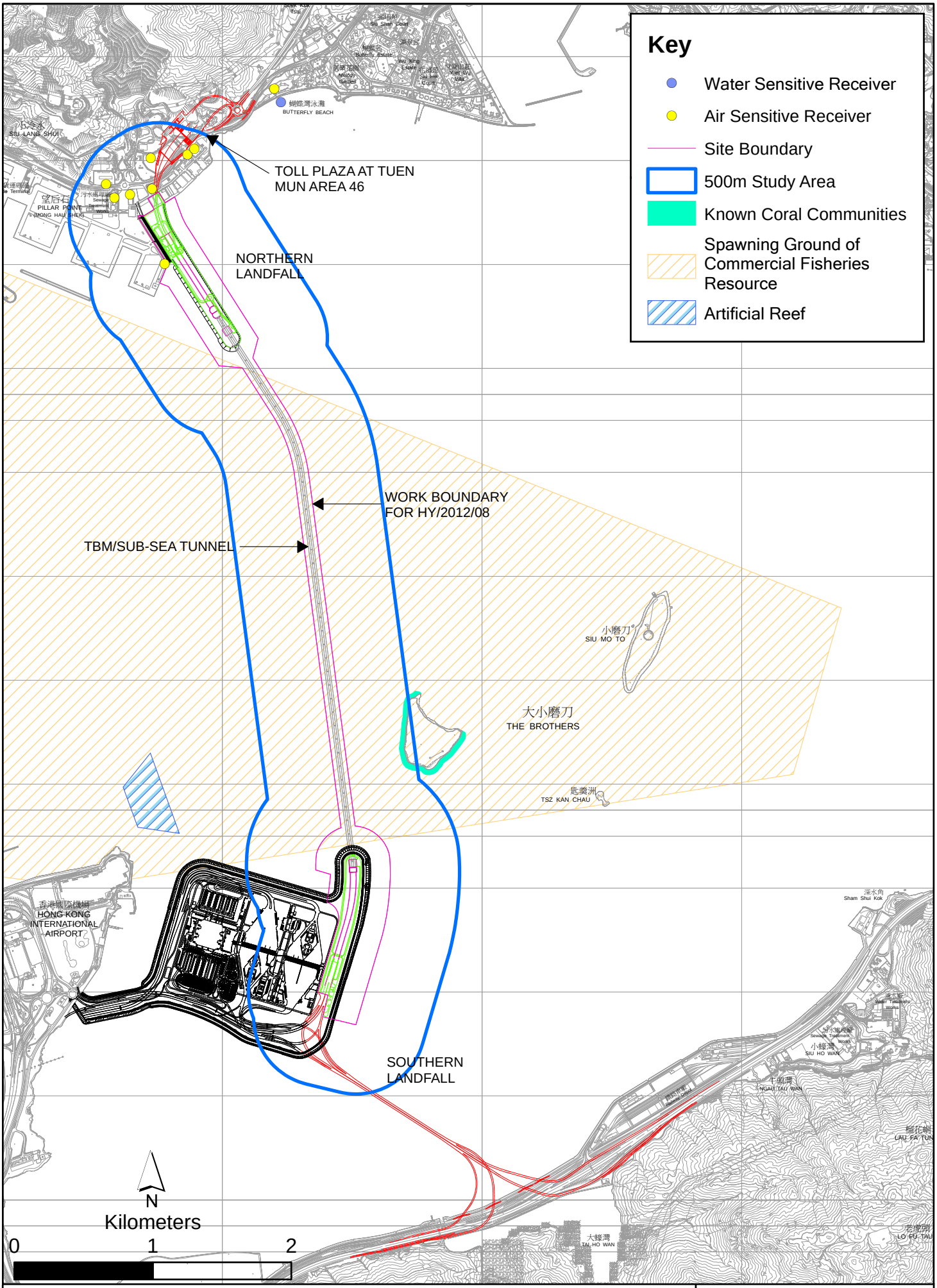


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

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Date: 15/4/2014

Environmental Resources Management

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

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 every six (6) days and impact 24-hour TSP monitoring was carried out once 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 on 3, 6, 9, 12, 15, 18, 21, 24, 27 and 30 September 2017 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 meter 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*. Copies of the calibration certificates for the equipment are presented in *Appendix E*.

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

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	3, 6, 9, 12, 15, 18, 21, 24, 27 and 30 September 2017	Tuen Mun Fireboat Station	Office	TSP monitoring • 1-hour Total Suspended Particulates (1-hour TSP, $\mu g/m^3$), 3 times in every 6 days • 24-hour Total Suspended Particulates (24-hour TSP, $\mu g/m^3$), daily for 24-hour in every 6 days Enhanced TSP monitoring (commenced on 24 October 2014) • 1-hour Total Suspended Particulates (1-hour TSP, $\mu g/m^3$), 3 times in every 3 days • 24-hour Total Suspended Particulates (24-hour TSP, $\mu g/m^3$), daily for 24-hour in every 3 days
ASR5		Pillar Point Fire Station	Office	
AQMS1		Previous River Trade Golf	Bare ground	
ASR6		Butterfly Beach Laundry	Office	
ASR10		Butterfly Beach Park	Recreational uses	

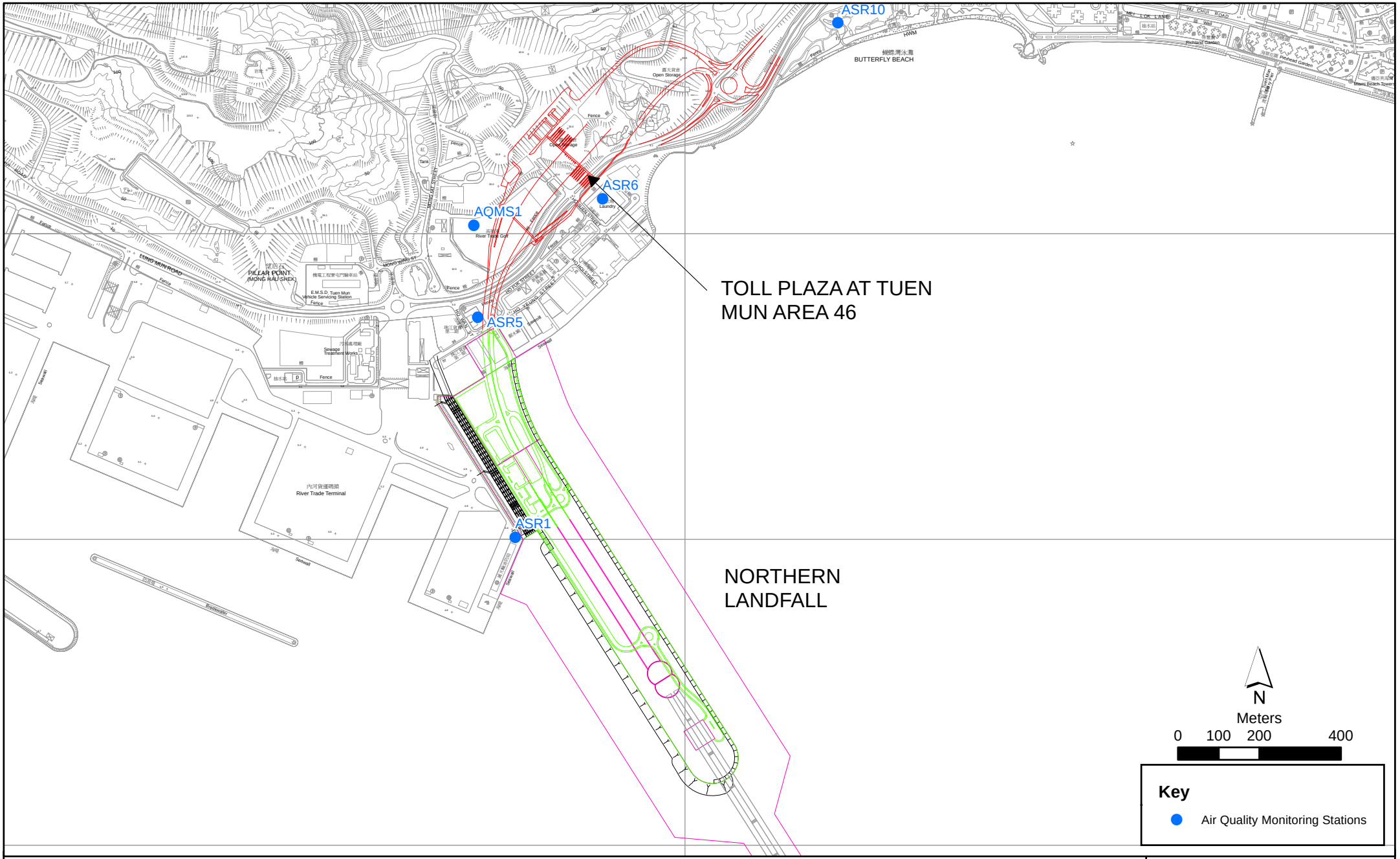

Figure 2.1

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 2.2 ***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: Vantage Pro 2 (S/N: AS160104014)
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 J.*

2.1.3 Monitoring Schedule for the Reporting Month

The schedule for air quality monitoring in September 2017 is provided in *Appendix F*.

2.1.4 Results and Observations

The monitoring results for 1-hour TSP and 24-hour TSP are summarized in *Tables 2.3* and *2.4,* respectively. Detailed impact air quality monitoring results and graphical presentations are presented in *Appendix G*.

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

Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
ASR1	157	52 - 545	331	500
ASR5	183	59 - 456	340	500
AQMS1	130	32 - 473	335	500
ASR6	148	50 - 310	338	500
ASR10	90	18 - 240	337	500

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

Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
ASR1	79	35 - 148	213	260
ASR5	69	30 - 138	238	260
AQMS1	47	28 - 92	213	260
ASR6	55	32 - 114	238	260
ASR10	46	26 - 95	214	260

The weather condition during the monitoring period varied from sunny to cloudy. The major dust sources in the reporting period included construction activities under the Contract as well as nearby traffic emissions.

A total of 10 1-hour TSP and 24-hour monitoring were undertaken in which six (6) Action Level exceedances and one (1) Limit Level exceedance of 1-hr TSP were recorded in this reporting month.

Meteorological information collected at the ASR5, including wind speed and wind direction, is provided in *Appendix H*.

2.2 WATER QUALITY MONITORING

Since marine works for Phase II reclamation of Northern Landfall were substantially completed in the end of May 2017 and will not resume tentatively until December 2017, no impact marine water quality monitoring is required for the reporting period. Impact marine water quality monitoring for Northern Landfall will resume during the seawall enhancement works at Northern Landfall in October 2017 in accordance with the requirement in the Contract Specific EM&A Manual.

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 summarises 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 Binocular	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.

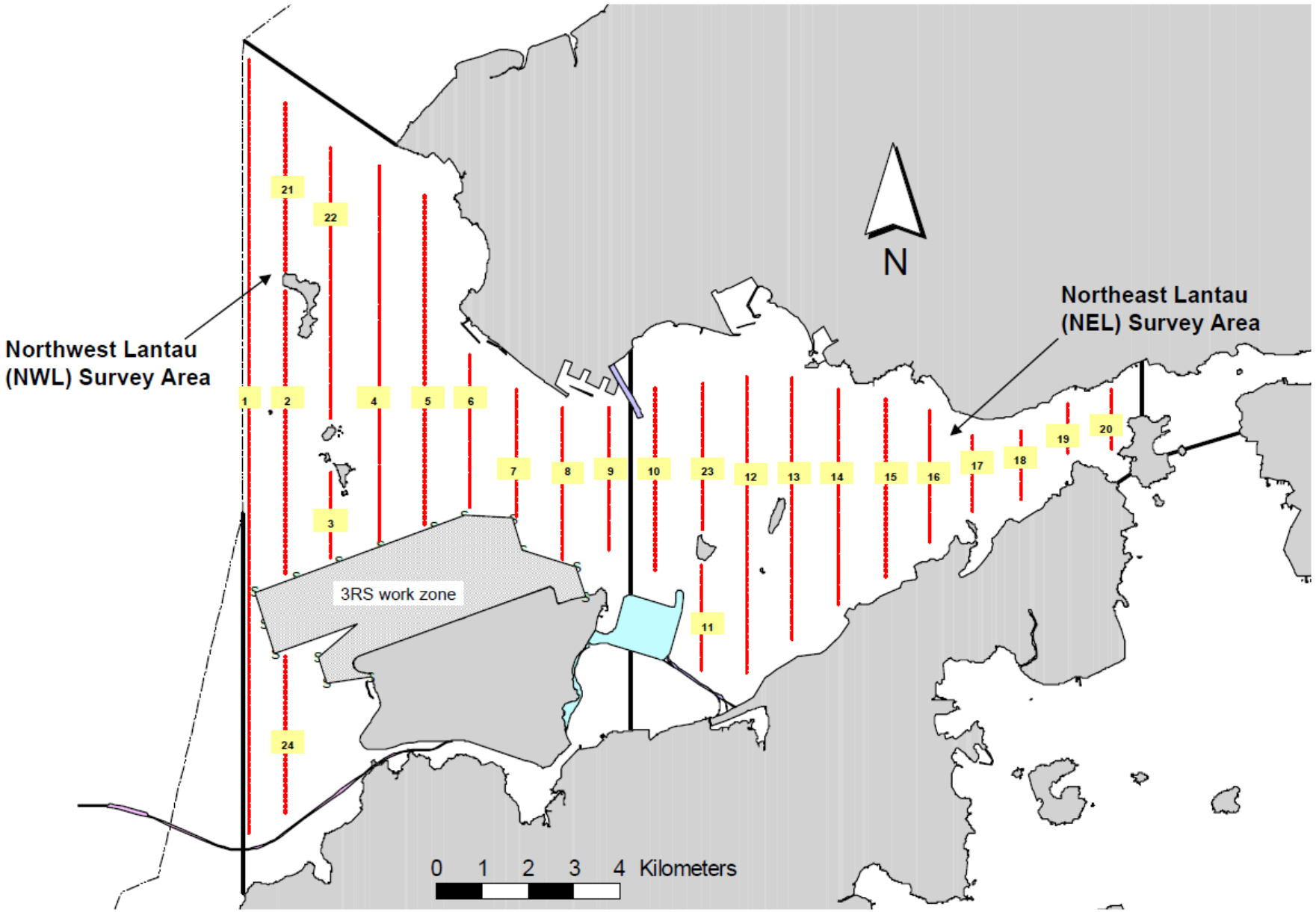

Figure 2.2

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

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Date: 29/11/2013

Environmental Resources Management

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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	805476	820800*	14	Start Point	817537	820220
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150*	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500*	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850*	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150*	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000*	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24*	Start Point	805476*	815900*
12	End Point	815542	824882	24*	End Point	805476*	819100*

Remarks: The coordinates of several starting and ending points have been revised due to the presence of a work zone to the north of the airport platform with intense construction activities in association with the construction of the third runway expansion for the Hong Kong International Airport. Co-ordinates in red and marked with asterisk are revised co-ordinates of transect line.

2.3.5 *Action & Limit Levels*

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

2.3.6 *Monitoring Schedule for the Reporting Month*

Dolphin monitoring was carried out on 15, 18, 22 and 29 of September 2017. The dolphin monitoring schedule for the reporting month is shown in *Appendix F*.

2.3.7 *Results & Observations*

A total of 266.33 km of survey effort was collected, with 97.9% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) in August 2017. Among the two areas, 96.80 km and 169.53 km of survey effort were collected from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 195.67 km and 70.66 km respectively. The survey efforts are summarized in *Appendix I*.

Three groups of 11 Chinese White Dolphins sightings were recorded during the two sets of surveys in September 2017. All dolphin sightings were made in NWL, while none was sighted in NEL. All dolphin sightings were made during on-effort search and was made on primary lines. These sightings were not associated with any operating fishing vessel.

No dolphin sighting was made in the proximity of the TM-CLKL alignment. The distribution of dolphin sightings during the reporting month is shown in *Figure 2.3*.

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) in September 2017 with the 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: September 15th / 18th	0.0	0.0
	Set 2: September 22nd / 29th	0.0	0.0
NWL	Set 1: September 15th / 18th	0.0	0.0
	Set 2: September 22nd / 29th	3.6	16.3

Note: Dolphin Encounter Rates are deduced from the Two Sets of Surveys (Two Surveys in Each Set) in September 2017 in Northeast (NEL) and Northwest Lantau (NWL)

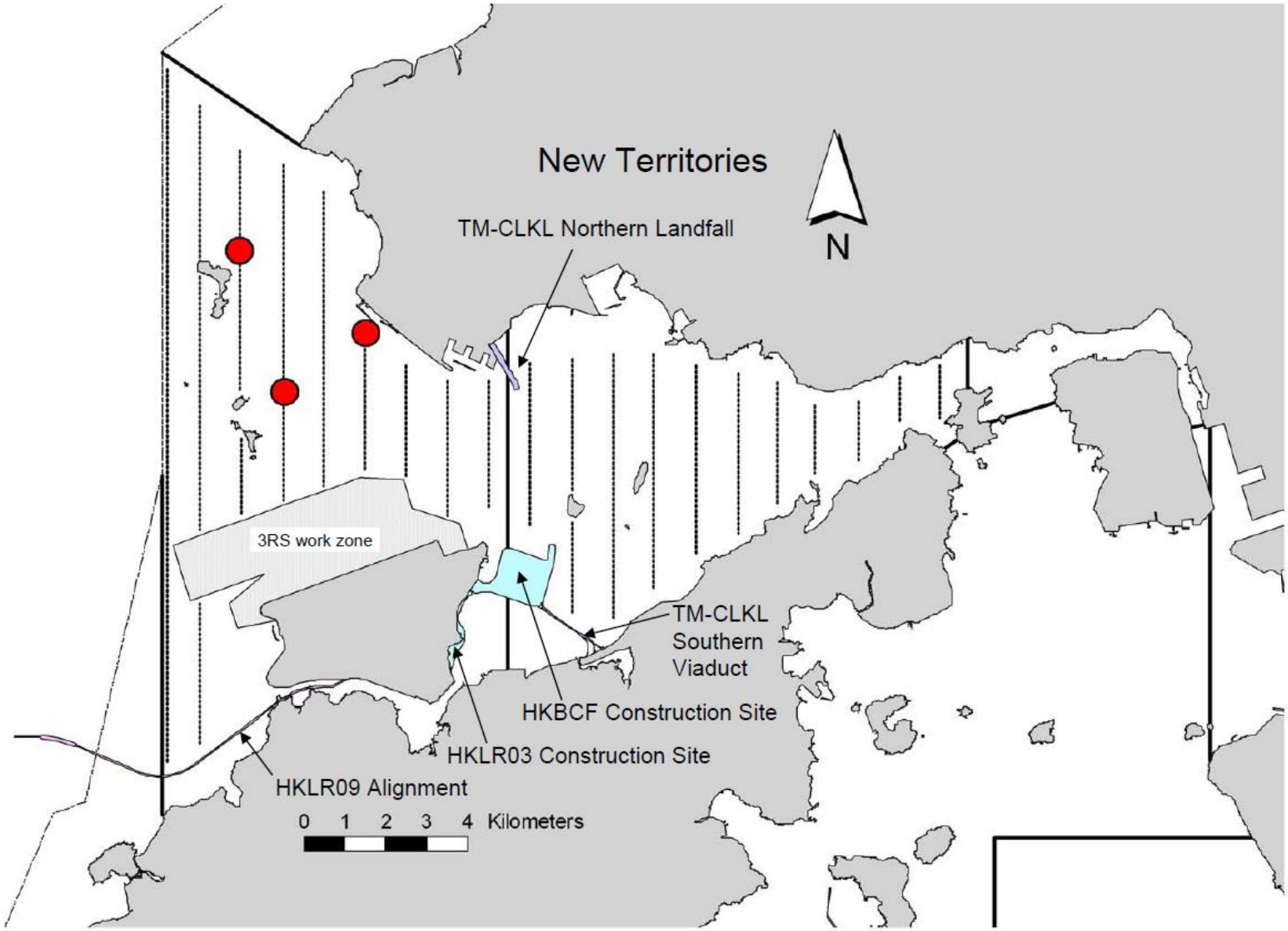

Figure 2.3

HY/2012/08 TM-CLKL Northern Connection Sub-sea Tunnel Section
The distribution of dolphin sightings during the reporting period
(Source: Adopted from HKLR03 Monitoring Survey in September 2017)

Environmental Resources Management

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Table 2.8 Monthly Average Encounter Rates

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	Primary Lines Only	**Both Primary and Secondary Lines**	**Primary Lines Only**	**Both Primary and Secondary Lines**
Northeast Lantau	0.0	0.0	0.0	0.0
Northwest Lantau	1.7	1.2	7.7	5.5

Note: Overall dolphin encounter rates (sightings per 100 km of survey effort) from all four surveys are conducted in September 2017 on primary lines only as well as both primary lines and secondary lines in Northeast and Northwest Lantau.

Due to monthly variation in dolphin occurrence within the survey area, it would be more appropriate to draw conclusion on whether any unacceptable impacts on dolphins have been detected in relation to the construction activities of this Project in the quarterly EM&A reports, where comparison on distribution, group size and encounter rates of dolphins between the quarterly impact monitoring period and baseline monitoring period will be made.

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. In the reporting month, four (4) site inspections were carried out on 6, 13, 20 and 27 September 2017.

Key observations and recommendations during the site inspections in this reporting period are summarized in *Table 2.9*.

Table 2.9 Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Month

Inspection Date	Observations	Recommendations/ Remarks
6 September 2017	Works Area - Portion N-C • Drip tray should be provided to the oil drum. Reminder from SOR Works Area - Portion N-B • Stagnant water should be removed. Works Area - Portion S-B • Stagnant water on the concrete block should be removed. • Label should be displayed on the discharge point and pipe.	Works Area - Portion N-C • The Contractor was reminded to provide drip tray to the oil drum. Reminder from SOR Works Area - Portion N-B • The Contractor was reminded to remove the stagnant water. Works Area - Portion S-B • The Contractor was reminded to remove the stagnant water on the concrete block. • The Contractor was reminded to display label on the discharge point and pipe.
13 September 2017	Works Area – TBM tunnel • Cements bags should be covered by impervious sheeting. • Drip tray should be provided for the chemical container. Works Area - Portion S-B • Adequate drip tray should be provided for chemical storage. • Repaired drip tray should be provided for the machine.	Works Area – TBM tunnel • The Contractor was reminded to cover the cement bags with impervious sheeting. • The Contractor was reminded to provide drip tray for the chemical container. Works Area - Portion S-B • The Contractor was reminded to provide adequate drip tray for chemical storage. • The Contractor was reminded to provide repaired drip tray for the machine.

Inspection Date	Observations	Recommendations/ Remarks
20 September 2017	Works Area – Portion N-C • Drip tray should be provided for the chemical container. Works Area - Portion N-B • Cement bags should be covered with tarpaulin sheeting. Works Area - Portion S-B • Drip tray should be provided for the chemical container. • Drip tray should be provided for the chemical container. Reminder from SOR: • Proper label should be displayed on the water pipe.	Works Area – Portion N-C • The Contractor was reminded to provide drip tray for the chemical container. Works Area - Portion N-B • The Contractor was reminded to cover the cement bags with tarpaulin sheeting. Works Area - Portion S-B • The Contractor was reminded to provide drip tray for the chemical container. • The Contractor was reminded to provide drip tray for the chemical container. Reminder from SOR: • The Contractor was reminded to put proper label on the water pipe.
27 September 2017	Works Area – Portion N-C • Accumulated rubbish should be removed from the waste container. Works Area – Portion N-A • Drip tray should be provided for the oil drum. • The surface of slope should be covered with tarpaulin sheeting. Works Area - Portion S-B • Cement bags should be covered with tarpaulin sheeting.	Works Area – Portion N-C • The Contractor was reminded to remove accumulated rubbish from the waste container. Works Area – Portion N-A • The Contractor was reminded to provide drip tray for the oil drum. • The Contractor was reminded to cover the surface of slope with tarpaulin sheeting. Works Area - Portion S-B • The Contractor was reminded to cover the cement bags with tarpaulin sheeting.

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

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 included mainly construction wastes (inert and non-inert). Reference has been made to the waste flow table prepared by the Contractor (*Appendix L*). The quantities of different types of wastes are summarized in *Table 2.10*.

Table 2.10 Quantities of Different Waste Generated in the Reporting Month

Month/Year	Inert Construction Waste [a] (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 (M_p & M_f)
September 2017	886	0	300	200	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 2.11* below.

Table 2.11 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	Northern Landfall
Construction Dust Notification	403620	10 June 2016	Throughout the Contract	DBJV	Southern Landfall
Chemical Waste Registration	5213-422-D2516-02	18 January 2017	Throughout the Contract	DBJV	Northern Landfall
Chemical Waste Registration	5213-951-D2591-01	25 May 2016	Throughout the Contract	DBJV	Southern Landfall
Construction Waste Disposal Account	7018108	28 August 2013	Throughout the Contract	DBJV	Waste disposal in Contract No. HY/2012/08
Waste Water Discharge License	WT00017707-2013	18 November 2013	30 November 2018	DBJV	For site WA18
Waste Water Discharge License	WT00018433-2014	6 March 2014	31 March 2019	DBJV	N6 Site
Waste Water Discharge License	WT00019248-2014	5 June 2014	30 June 2019	DBJV	For site Portion N6 and Reclamation Area E
Waste Water Discharge License	WT00025944-2016	15 December 2016	31 December 2021	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0247-17	19 May 2017	9 November 2017	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0279-17	13 June 2017	12 December 2017	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	PP-RS0019-17	31 August 2017	30 November 2017	DBJV	Southern Landfall (Percussive Piling)
Construction Noise Permit	GW-RS0713-17	1 September 2017	28 February 2018	DBJV	Southern Landfall

Notes:
HyD = Highways Department

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
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

Six (6) Action Level and one (1) Limit Level of air quality exceedances was recorded in the air quality monitoring of this reporting month. Investigation report will be provided in the next monthly EM&A report. Investigation report of action level exceedance on 22 August 2017 is provided in Appendix K.

Cumulative statistics are provided in *Appendix K*.

2.9 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

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

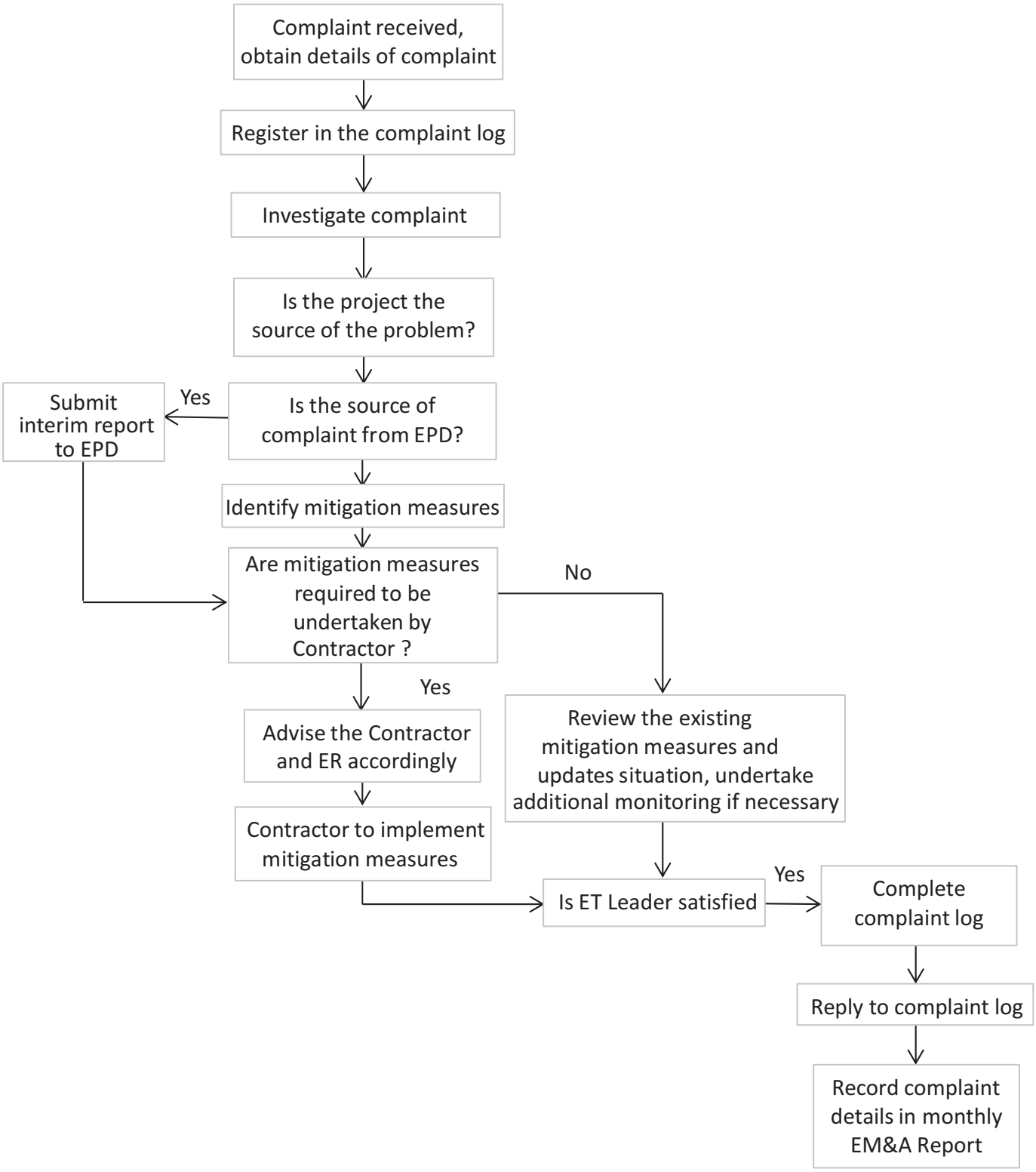

Figure 2.4 Environmental Complaint Handling Procedure

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3 FUTURE KEY ISSUES

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING MONTH

As informed by the Contractor, the major works for the Project in September 2017 are summarized in *Table 3.1*.

Table 3.1 Construction Works to Be Undertaken in the Coming Month

Works to be undertaken
Land-based Works • Box Culvert Extension at Works Area – Portion N-A; • Phase 2 Surcharge Removal – Portion N-A; • Construction of North Ventilation Building – Portion N-C; • Construction of Cross Passage Tympanum – TBM tunnel; • Cross Passage Lining Installation – TBM Tunnel; • Excavation of Sub-sea Tunnel – TBM tunnel; • Corbel Construction – TBM Tunnel; and • Bulk Excavation – Portion S-A; • CSM treatment, Jet Grouting works and D-wall Construction – Portion S-A • Ground Freezing Works - Portion S-A *Marine-based Works* • Seawall Enhancement works – Portion N-C

3.2 KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of October 2017 are mainly associated with dust, marine ecology and waste management issues.

3.3 MONITORING SCHEDULE FOR THE COMING MONTH

The tentative schedule for environmental monitoring in October 2017 is provided in *Appendix F*.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

This Forty-seventh Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 30 September 2017, 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 this reporting month. Six (6) Action Level exceedance and one (1) Limit Level exceedance of 1-hour TSP was recorded in the air quality monitoring of this reporting month. Investigation report will be provided in the next monthly EM&A report. Investigation report of action level exceedance on 22 August 2017 is provided in Appendix K.

Three groups of 11 Chinese White Dolphins sightings were recorded during the two sets of surveys in September 2017. All dolphin sightings were made in NWL, while none was sighted in NEL. All dolphin sightings were made during on-effort search and was made on primary lines. These sightings were not associated with any operating fishing vessel.

Environmental site inspection was carried out four (4) times in September 2017. Remedial actions recommended for the deficiencies identified during the site audits were properly implemented by the Contractor.

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

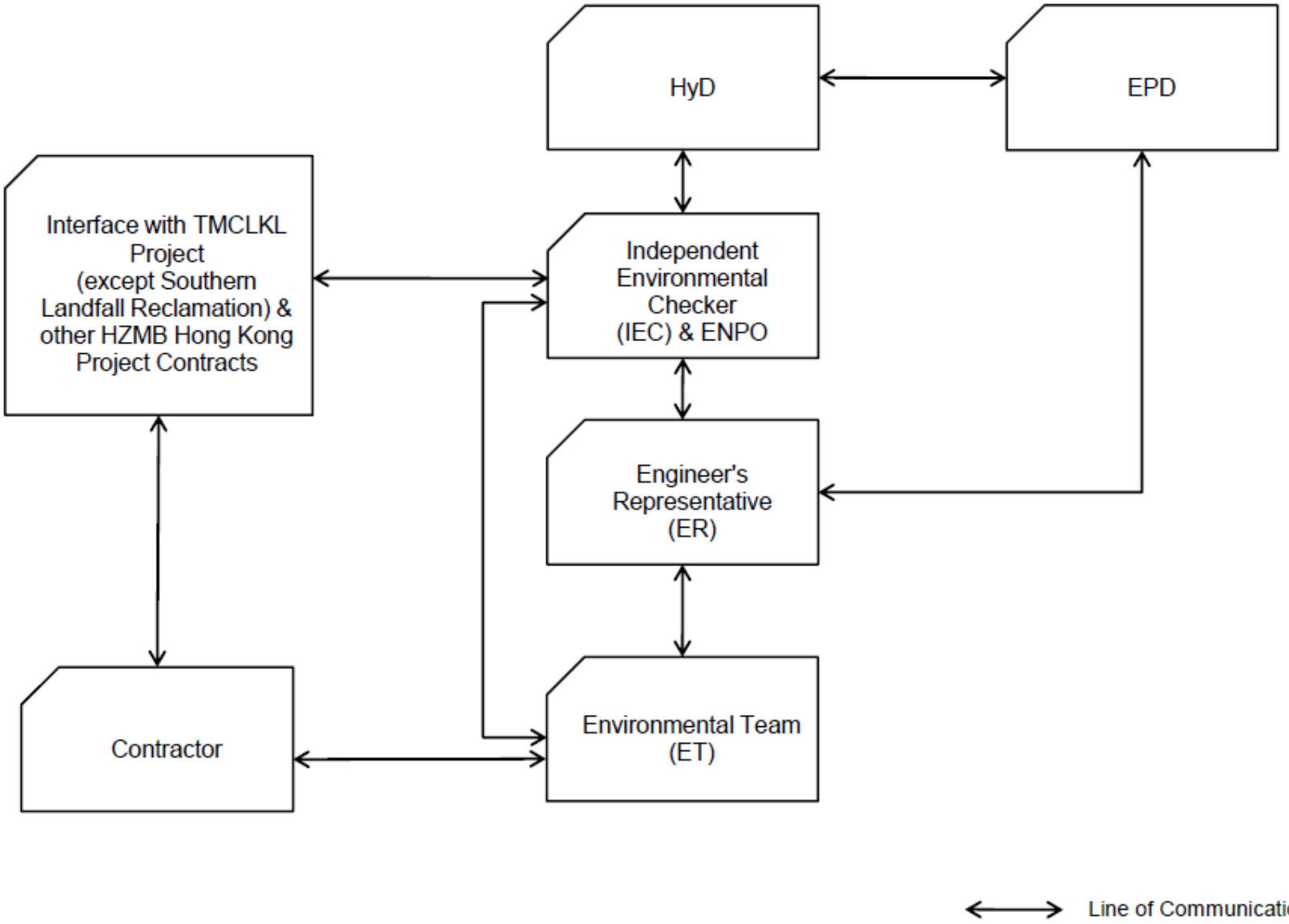
No environmental complaint was received in this reporting period.

No environmental summons was received in this 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

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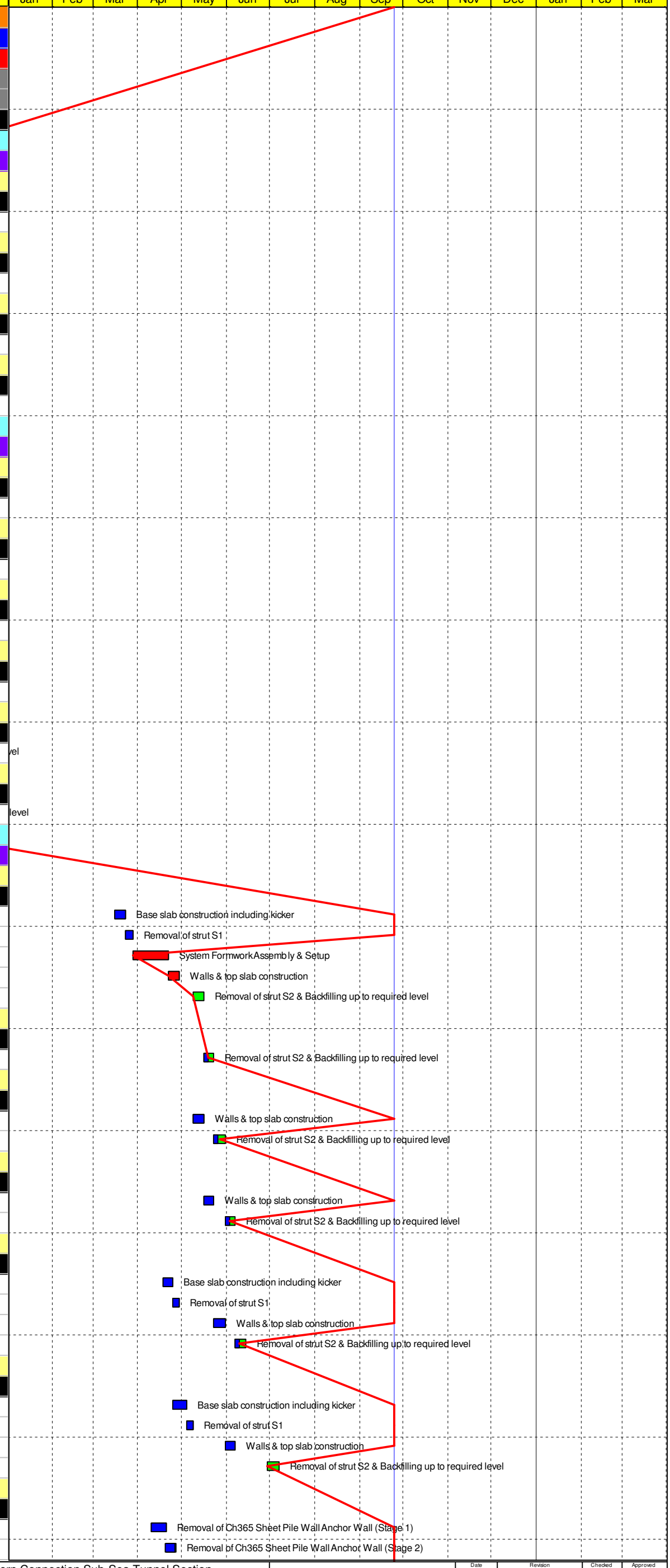
Appendix B

Construction Programme

Activity Name	Orig Dur	DWPF Start	DWPF Finish
TMCLK - Northern Connection Sub-Sea Tunnel Section			
Construction			
Northern Landfall			
North Reclamation (Phase 1)			
Box Culvert Extension			
Construction			
CH100-150 Land Section			
ELS & Structure			
Pile A41/A39 CJ to Pile A39/A37 CJ (Bay 7)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	03-Jun-16	10-Jun-16
Pile A39/A37 CJ to Pile A37/A35 CJ (Bay 8)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	11-Jun-16	17-Jun-16
Pile A37/A35 CJ to Pile A35/A33 CJ (Bay 9)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	18-Jun-16	24-Jun-16
Pile A35/A33 CJ to Pile A33/P117 CJ (Bay 10)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	25-Jun-16	02-Jul-16
Ch150-250 Marine Section			
ELS & Structure			
Pile A33/P117 CJ to Pile P113/P109 CJ (Bay 11)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	04-Jul-16	09-Jul-16
Pile P113/P109 CJ to Pile P105/P101 CJ (Bay 12)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	11-Jul-16	16-Jul-16
Pile P105/P101 CJ to Pile P97/P93 CJ (Bay 13)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	18-Jul-16	23-Jul-16
Pile P97/P93 CJ to Pile P89/P85 CJ (Bay 14)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	25-Jul-16	30-Jul-16
Pile P89/P85 CJ to Pile P81/P77 CJ (Bay 15)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	01-Aug-16	06-Aug-16
Pile P81/P77 CJ to Pile P73/P69 CJ (Bay 16)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	08-Aug-16	13-Aug-16
Ch250-380 Marine Section			
ELS & Structure			
Pile P73/P69 CJ to Pile P65/P61 CJ (Bay17)			
Box Culvert Structure			
Base slab construction including kicker	6	16-Mar-17	23-Mar-17
Removal of strut S1	4	23-Mar-17	28-Mar-17
System Formwork Assembly & Setup	18	28-Mar-17	22-Apr-17
Walls & top slab construction	6	22-Apr-17	29-Apr-17
Removal of strut S2 & Backfilling up to required level	6	09-May-17	16-May-17
Pile P65/P61 CJ to Pile P57/P53 CJ (Bay 18)			
Box Culvert Structure			
Removal of strut S2 & Backfilling up to required level	6	16-May-17	23-May-17
Pile P57/P53 CJ to Pile P49/P45 CJ (Bay 19)			
Box Culvert Structure			
Walls & top slab construction	6	09-May-17	16-May-17
Removal of strut S2 & Backfilling up to required level	6	23-May-17	31-May-17
Pile P49/P45 CJ to Pile P41/P37 CJ (Bay 20)			
Box Culvert Structure			
Walls & top slab construction	6	16-May-17	23-May-17
Removal of strut S2 & Backfilling up to required level	6	31-May-17	07-Jun-17
Pile P41/P37 CJ to Pile P33/P29 CJ (Bay 21)			
Box Culvert Structure			
Base slab construction including kicker	6	18-Apr-17	25-Apr-17
Removal of strut S1	4	25-Apr-17	29-Apr-17
Walls & top slab construction	6	23-May-17	31-May-17
Removal of strut S2 & Backfilling up to required level	6	07-Jun-17	14-Jun-17
Pile P33/P29 CJ to Pile P25/P21 CJ (Bay 22)			
Box Culvert Structure			
Base slab construction including kicker	6	25-Apr-17	04-May-17
Removal of strut S1	4	04-May-17	09-May-17
Walls & top slab construction	6	31-May-17	07-Jun-17
Removal of strut S2 & Backfilling up to required level	6	29-Jun-17	07-Jul-17
Pile P25/P21 CJ to Pile P17/P13 CJ (Bay 23)			
ELS			
Removal of Ch365 Sheet Pile Wall Anchor Wall (Stage 1)	6	10-Apr-17	20-Apr-17
Removal of Ch365 Sheet Pile Wall Anchor Wall (Stage 2)	6	20-Apr-17	27-Apr-17



Data Date: 24-Sep-17

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

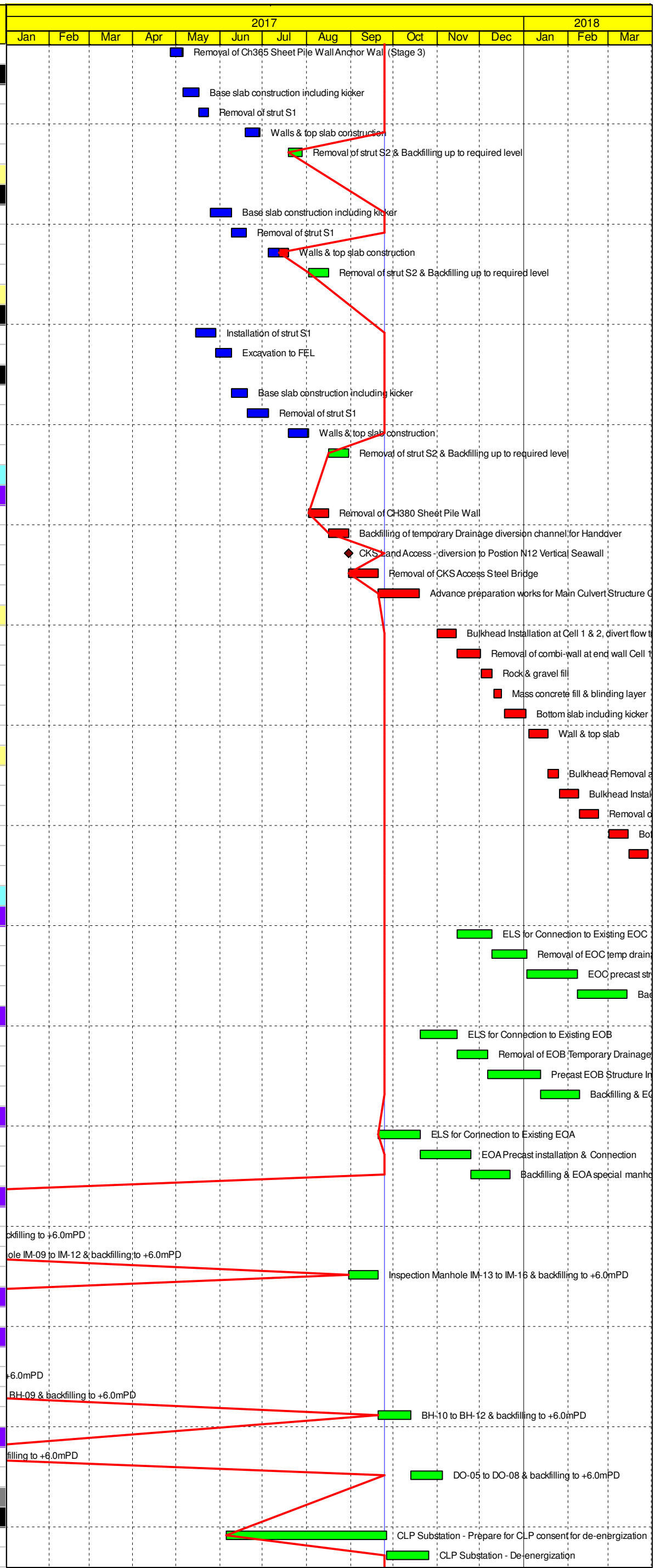
TMCLK - Northern Connection Sub-Sea Tunnel Section

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

Progress as of 24-Sep-17

Date	Revision	Checked	Approved
12-Feb-14	TMCLK/DBJ/GEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJ/GEN/PRG/98507 ...	SPa	WYu
28-Aug-14	TMCLK/DBJ/GEN/PRG/98507 ...	CLa	WYu
30-Oct-15	TMCLK/DBJ/GEN/PRG/98507 ...	WYu	

Activity Name	Orig Dur	DWPF Start	DWPF Finish
Removal of Ch365 Sheet Pile Wall Anchor Wall (Stage 3)	6	27-Apr-17	06-May-17
Box Culvert Structure			
Base slab construction including kicker	9	06-May-17	17-May-17
Removal of strut S1	6	17-May-17	24-May-17
Walls & top slab construction	9	19-Jun-17	29-Jun-17
Removal of strut S2 & Backfilling up to required level	9	19-Jul-17	29-Jul-17
Pile P17/P13 CJ to Pile P09/P05 CJ (Bay 24)			
Box Culvert Structure			
Base slab construction including kicker	12	25-May-17	09-Jun-17
Removal of strut S1	8	09-Jun-17	19-Jun-17
Walls & top slab construction	12	05-Jul-17	19-Jul-17
Removal of strut S2 & Backfilling up to required level	12	02-Aug-17	16-Aug-17
Pile P09/P05 CJ to End Wall CJ (Bay 25)			
ELS			
Installation of strut S1	12	15-May-17	29-May-17
Excavation to FEL	9	29-May-17	09-Jun-17
Box Culvert Structure			
Base slab construction including kicker	9	09-Jun-17	20-Jun-17
Removal of strut S1	12	20-Jun-17	05-Jul-17
Walls & top slab construction	12	19-Jul-17	02-Aug-17
Removal of strut S2 & Backfilling up to required level	12	16-Aug-17	30-Aug-17
Ch380-399 Connection Section			
Connection to Existing Culvert			
Removal of CH380 Sheet Pile Wall	12	02-Aug-17	16-Aug-17
Backfilling of temporary Drainage diversion channel for Handover	12	16-Aug-17	30-Aug-17
CKS Land Access - diversion to Postion N12 Vertical Seawall	0		30-Aug-17
Removal of CKS Access Steel Bridge	18	30-Aug-17	20-Sep-17
Advance preparation works for Main Culvert Structure Connection	23	20-Sep-17	19-Oct-17
Connection Stage 1 (Cell 1 & 2)			
Bulkhead Installation at Cell 1 & 2, divert flow to Cell 3 & 4	12	01-Nov-17	14-Nov-17
Removal of combi-wall at end wall Cell 1 & 2 for connection	15	15-Nov-17	01-Dec-17
Rock & gravel fill	7	02-Dec-17	09-Dec-17
Mass concrete fill & blinding layer	6	11-Dec-17	16-Dec-17
Bottom slab including kicker	12	18-Dec-17	02-Jan-18
Wall & top slab	12	04-Jan-18	17-Jan-18
Connection Stage 2 (Cell 3 & 4)			
Bulkhead Removal at Cell 1 & 2	7	18-Jan-18	25-Jan-18
Bulkhead Installation at Cell 3 & 4	12	26-Jan-18	08-Feb-18
Removal of combi-wall at end wall Cell 3 & 4 & row 2 for connection	12	09-Feb-18	22-Feb-18
Bottom slab including kicker	12	02-Mar-18	15-Mar-18
Wall & top slab	12	16-Mar-18	29-Mar-18
Backfilling	12	03-Apr-18	17-Apr-18
Miscellaneous works			
Connection to Existing EOC			
ELS for Connection to Existing EOC	21	15-Nov-17	09-Dec-17
Removal of EOC temp drainage diversion	18	09-Dec-17	03-Jan-18
EOC precast structure Installation & Connection	30	03-Jan-18	07-Feb-18
Backfilling & EOC special manhole Construction	24	07-Feb-18	14-Mar-18
Connection to Existing EOB			
ELS for Connection to Existing EOB	21	20-Oct-17	15-Nov-17
Removal of EOB Temporary Drainage Diversion	18	15-Nov-17	06-Dec-17
Precast EOB Structure Installation & Connection	29	06-Dec-17	12-Jan-18
Backfilling & EOB special manhole Construction	24	12-Jan-18	09-Feb-18
Connection to Existing EOA			
ELS for Connection to Existing EOA	24	20-Sep-17	20-Oct-17
EOA Precast installation & Connection	29	20-Oct-17	24-Nov-17
Backfilling & EOA special manhole Construction	24	24-Nov-17	22-Dec-17
Inspection Manhole (IM)			
Inspection Manhole IM-01 to IM-04 & backfilling to +6.0mPD	12	29-Sep-15	13-Oct-15
Inspection Manhole IM-05 to IM-08 & backfilling to +6.0mPD	18	15-Aug-16	03-Sep-16
Inspection Manhole IM-09 to IM-12 & backfilling to +6.0mPD	18	20-Oct-16	09-Nov-16
Inspection Manhole IM-13 to IM-16 & backfilling to +6.0mPD	18	30-Aug-17	20-Sep-17
Stop Log Opening (SLO)			
SLO-01 to SLO-05 & backfilling to +6.0mPD	24	14-Oct-15	11-Nov-15
Balance Hole (BH)			
BH-01 to BH-03 & backfilling to +6.0mPD	18	07-Sep-15	26-Sep-15
BH-04 to BH-06 & backfilling to +6.0mPD	18	05-Sep-16	26-Sep-16
BH-07 to BH-09 & backfilling to +6.0mPD	18	10-Nov-16	30-Nov-16
BH-10 to BH-12 & backfilling to +6.0mPD	18	20-Sep-17	13-Oct-17
Desilting Opening (DO)			
DO-01 to DO-04 & backfilling to +6.0mPD	18	27-Sep-16	19-Oct-16
DO-05 to DO-08 & backfilling to +6.0mPD	18	13-Oct-17	04-Nov-17
CLP Temporary Substation			
Construction			
CLP Substation - Prepare for CLP consent for de-energization	96	05-Jun-17	26-Sep-17
CLP Substation - De-energization	24	26-Sep-17	26-Oct-17



Planned Bar
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TMCLK - Northern Connection Sub-Sea Tunnel Section

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

Progress as of 24-Sep-17

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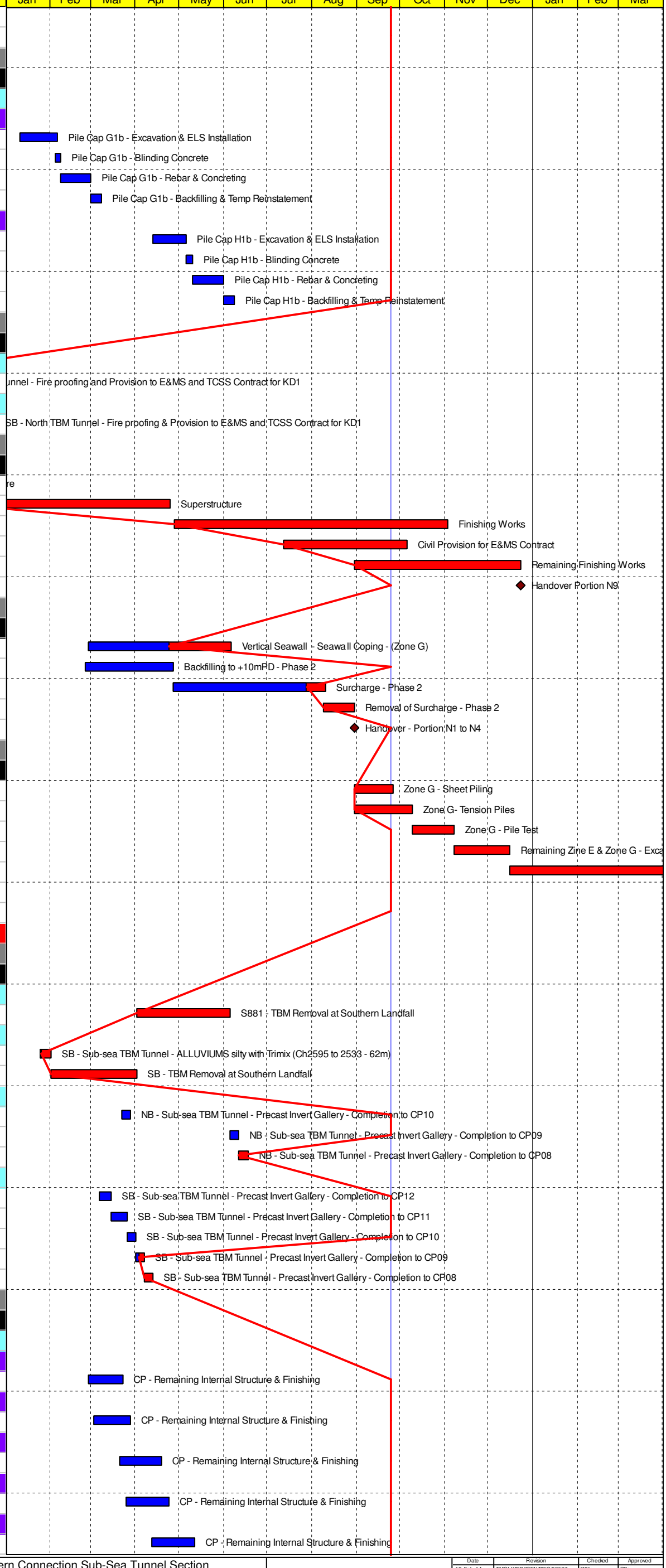
28-Aug-14	TMCLKDBJGEN/PRG.98507 ...	CLa	WYu
30-Oct-15	TMCLKDBJGEN/PRG.98507 ...	WYu	

Activity Name	Orig Dur	DWPF Start	DWPF Finish
CLP Substation - Dismantling & Removal	137	30-Jul-18	12-Jan-19
Handover of Portion N6B	0		12-Jan-19
TMCLK VO-008 - Construction of Viaduct Foundations at Portion N6A			
Viaduct Pile Cap			
Construction			
Pier G1b			
Pile Cap G1b - Excavation & ELS Installation	15	11-Jan-17	01-Feb-17
Pile Cap G1b - Blinding Concrete	3	04-Feb-17	08-Feb-17
Pile Cap G1b - Rebar & Concreting	18	08-Feb-17	01-Mar-17
Pile Cap G1b - Backfilling & Temp Reinstatement	6	01-Mar-17	08-Mar-17
Pier H1b			
Pile Cap H1b - Excavation & ELS Installation	15	13-Apr-17	06-May-17
Pile Cap H1b - Blinding Concrete	3	06-May-17	10-May-17
Pile Cap H1b - Rebar & Concreting	18	10-May-17	01-Jun-17
Pile Cap H1b - Backfilling & Temp Reinstatement	6	01-Jun-17	08-Jun-17
North Approach TBM Tunnelling & Cross Passage			
Construction			
North Approach Tunnel Internal Structure - NB			
NB - North TBM Tunnel - Fire proofing and Provision to E&MS and TCSS Contract for KD1	42	14-Sep-16	05-Nov-16
North Approach Tunnel Internal Structure - SB			
SB - North TBM Tunnel - Fire proofing & Provision to E&MS and TCSS Contract for KD1	42	05-Nov-16	24-Dec-16
North Ventilation Building			
Construction			
Substructure	120	04-Jul-16	24-Nov-16
Superstructure	120	24-Nov-16	25-Apr-17
Finishing Works	155	28-Apr-17	03-Nov-17
Civil Provision for E&MS Contract	72	12-Jul-17	06-Oct-17
Remaining Finishing Works	96	30-Aug-17	23-Dec-17
Handover Portion N9	0		23-Dec-17
North Reclamation (Phase 2)			
Construction			
Vertical Seawall - Seawall Coping - (Zone G)	78	27-Feb-17	06-Jun-17
Backfilling to +10mPD - Phase 2	48	25-Feb-17	27-Apr-17
Surcharge - Phase 2	105	27-Apr-17	10-Aug-17
Removal of Surcharge - Phase 2	18	09-Aug-17	30-Aug-17
Handover - Portion N1 to N4	0		30-Aug-17
North Approach Ramp			
Construction			
Zone G - Sheet Piling	23	30-Aug-17	26-Sep-17
Zone G- Tension Piles	32	30-Aug-17	09-Oct-17
Zone G - Pile Test	24	09-Oct-17	07-Nov-17
Remaining Zine E & Zone G - Excavation - Soft	34	07-Nov-17	16-Dec-17
Remaining Zone E & Zone G - Structure	94	16-Dec-17	20-Apr-18
Remaining Zone E & Zone G - Backfilling	48	20-Apr-18	19-Jun-18
Provision works for E&MS/TCSS (for Stage 3)	70	05-May-18	30-Jul-18
Sub-sea Tunnel			
Sub-sea TBM Tunnelling			
Construction			
Sub-sea TBM Tunnel - NB ID12.2m - S881			
S881 - TBM Removal at Southern Landfall	60	02-Apr-17	05-Jun-17
Sub-sea TBM Tunnel - SB ID12.2m - S882			
SB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2595 to 2533 - 62m)	4	25-Jan-17	01-Feb-17
SB - TBM Removal at Southern Landfall	60	01-Feb-17	02-Apr-17
Sub-sea TBM Tunnel - NB - Precast Invert Gallery			
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP10	6	22-Mar-17	28-Mar-17
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP09	6	05-Jun-17	11-Jun-17
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP08	6	11-Jun-17	18-Jun-17
Sub-sea TBM Tunnel - SB - Precast Invert Gallery			
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP12	8	07-Mar-17	15-Mar-17
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP11	11	15-Mar-17	26-Mar-17
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP10	6	26-Mar-17	01-Apr-17
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP09	6	01-Apr-17	07-Apr-17
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP08	6	07-Apr-17	13-Apr-17
Sub-sea Tunnel Cross Passage & Internal Structure			
Construction			
Sub-sea Tunnel Cross Passage			
CP30 - ML03 - Ch4724			
CP - Remaining Internal Structure & Finishing	21	27-Feb-17	23-Mar-17
CP29 - ML03 - Ch4626			
CP - Remaining Internal Structure & Finishing	21	03-Mar-17	28-Mar-17
CP28 - ML03 - Ch4527			
CP - Remaining Internal Structure & Finishing	21	21-Mar-17	19-Apr-17
CP27 - ML03 - Ch4429			
CP - Remaining Internal Structure & Finishing	21	25-Mar-17	24-Apr-17
CP26 - ML03 - Ch4330			
CP - Remaining Internal Structure & Finishing	21	12-Apr-17	12-May-17



Data Date: 24-Sep-17

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

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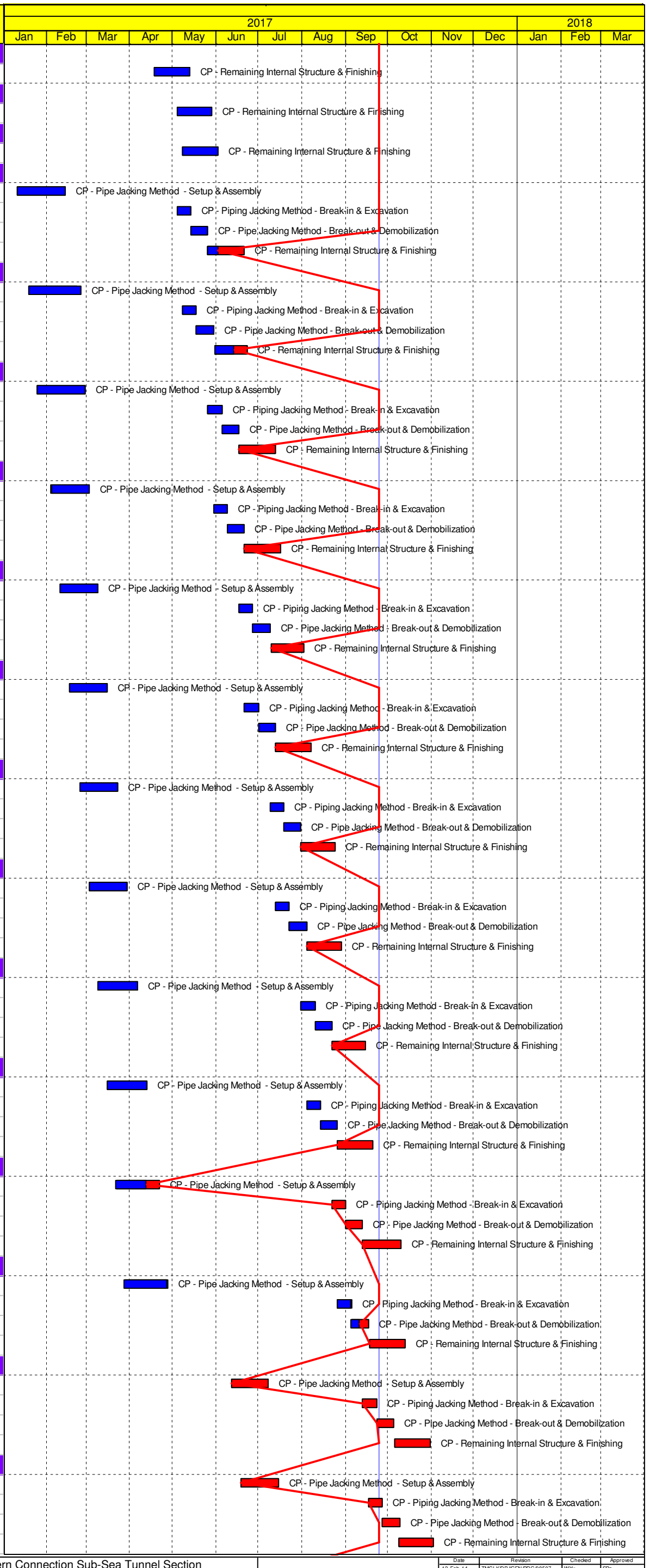
28-Aug-14	TMCLK/DBJGEN/PRG/98507 ...	CLa	WYu
30-Oct-15	TMCLK/DBJGEN/PRG/98507 ...	WYu	

Activity Name	Orig Dur	DWPF Start	DWPF Finish
CP25 - ML03 - Ch4232			
CP - Remaining Internal Structure & Finishing	21	18-Apr-17	13-May-17
CP24 - ML03 - Ch4133			
CP - Remaining Internal Structure & Finishing	21	04-May-17	29-May-17
CP23 - ML03 - Ch4035			
CP - Remaining Internal Structure & Finishing	21	08-May-17	02-Jun-17
CP22 - ML03 - Ch3936			
CP - Pipe Jacking Method - Setup & Assembly	26	11-Jan-17	14-Feb-17
CP - Piping Jacking Method - Break-in & Excavation	10	04-May-17	14-May-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	14-May-17	26-May-17
CP - Remaining Internal Structure & Finishing	21	26-May-17	21-Jun-17
CP21 - ML03 - Ch3838			
CP - Pipe Jacking Method - Setup & Assembly	26	19-Jan-17	22-Feb-17
CP - Piping Jacking Method - Break-in & Excavation	10	08-May-17	18-May-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	18-May-17	30-May-17
CP - Remaining Internal Structure & Finishing	21	31-May-17	23-Jun-17
CP20 - ML03 - Ch3739			
CP - Pipe Jacking Method - Setup & Assembly	26	25-Jan-17	28-Feb-17
CP - Piping Jacking Method - Break-in & Excavation	10	26-May-17	05-Jun-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	05-Jun-17	17-Jun-17
CP - Remaining Internal Structure & Finishing	21	17-Jun-17	13-Jul-17
CP19 - ML03 - Ch3641			
CP - Pipe Jacking Method - Setup & Assembly	23	04-Feb-17	02-Mar-17
CP - Piping Jacking Method - Break-in & Excavation	10	30-May-17	09-Jun-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	09-Jun-17	21-Jun-17
CP - Remaining Internal Structure & Finishing	21	21-Jun-17	17-Jul-17
CP18 - ML03 - Ch3542			
CP - Pipe Jacking Method - Setup & Assembly	23	10-Feb-17	09-Mar-17
CP - Piping Jacking Method - Break-in & Excavation	10	17-Jun-17	27-Jun-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	27-Jun-17	09-Jul-17
CP - Remaining Internal Structure & Finishing	21	10-Jul-17	02-Aug-17
CP17 - ML03 - Ch3444			
CP - Pipe Jacking Method - Setup & Assembly	23	17-Feb-17	16-Mar-17
CP - Piping Jacking Method - Break-in & Excavation	10	21-Jun-17	01-Jul-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	01-Jul-17	13-Jul-17
CP - Remaining Internal Structure & Finishing	21	13-Jul-17	07-Aug-17
CP16 - ML03 - Ch3345			
CP - Pipe Jacking Method - Setup & Assembly	23	24-Feb-17	23-Mar-17
CP - Piping Jacking Method - Break-in & Excavation	10	09-Jul-17	19-Jul-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	19-Jul-17	31-Jul-17
CP - Remaining Internal Structure & Finishing	21	31-Jul-17	24-Aug-17
CP15 - ML03 - Ch3247			
CP - Pipe Jacking Method - Setup & Assembly	23	03-Mar-17	30-Mar-17
CP - Piping Jacking Method - Break-in & Excavation	10	13-Jul-17	23-Jul-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	23-Jul-17	04-Aug-17
CP - Remaining Internal Structure & Finishing	21	04-Aug-17	29-Aug-17
CP14 - ML03 - Ch3148			
CP - Pipe Jacking Method - Setup & Assembly	23	09-Mar-17	06-Apr-17
CP - Piping Jacking Method - Break-in & Excavation	10	31-Jul-17	10-Aug-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	10-Aug-17	22-Aug-17
CP - Remaining Internal Structure & Finishing	21	22-Aug-17	15-Sep-17
CP13 - ML03 - Ch3050			
CP - Pipe Jacking Method - Setup & Assembly	23	16-Mar-17	13-Apr-17
CP - Piping Jacking Method - Break-in & Excavation	10	04-Aug-17	14-Aug-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	14-Aug-17	26-Aug-17
CP - Remaining Internal Structure & Finishing	21	26-Aug-17	20-Sep-17
CP12 - ML03 - Ch2951			
CP - Pipe Jacking Method - Setup & Assembly	23	22-Mar-17	22-Apr-17
CP - Piping Jacking Method - Break-in & Excavation	10	22-Aug-17	01-Sep-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	01-Sep-17	13-Sep-17
CP - Remaining Internal Structure & Finishing	21	13-Sep-17	10-Oct-17
CP11 - ML03 - Ch2853			
CP - Pipe Jacking Method - Setup & Assembly	23	28-Mar-17	28-Apr-17
CP - Piping Jacking Method - Break-in & Excavation	10	26-Aug-17	05-Sep-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	05-Sep-17	17-Sep-17
CP - Remaining Internal Structure & Finishing	21	18-Sep-17	13-Oct-17
CP10 - ML03 - Ch2754			
CP - Pipe Jacking Method - Setup & Assembly	23	12-Jun-17	08-Jul-17
CP - Piping Jacking Method - Break-in & Excavation	10	13-Sep-17	23-Sep-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	23-Sep-17	05-Oct-17
CP - Remaining Internal Structure & Finishing	21	06-Oct-17	31-Oct-17
CP09 - ML03 - Ch2656			
CP - Pipe Jacking Method - Setup & Assembly	23	19-Jun-17	15-Jul-17
CP - Piping Jacking Method - Break-in & Excavation	10	17-Sep-17	27-Sep-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	27-Sep-17	09-Oct-17
CP - Remaining Internal Structure & Finishing	21	09-Oct-17	02-Nov-17



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

TMCLK - Northern Connection Sub-Sea Tunnel Section

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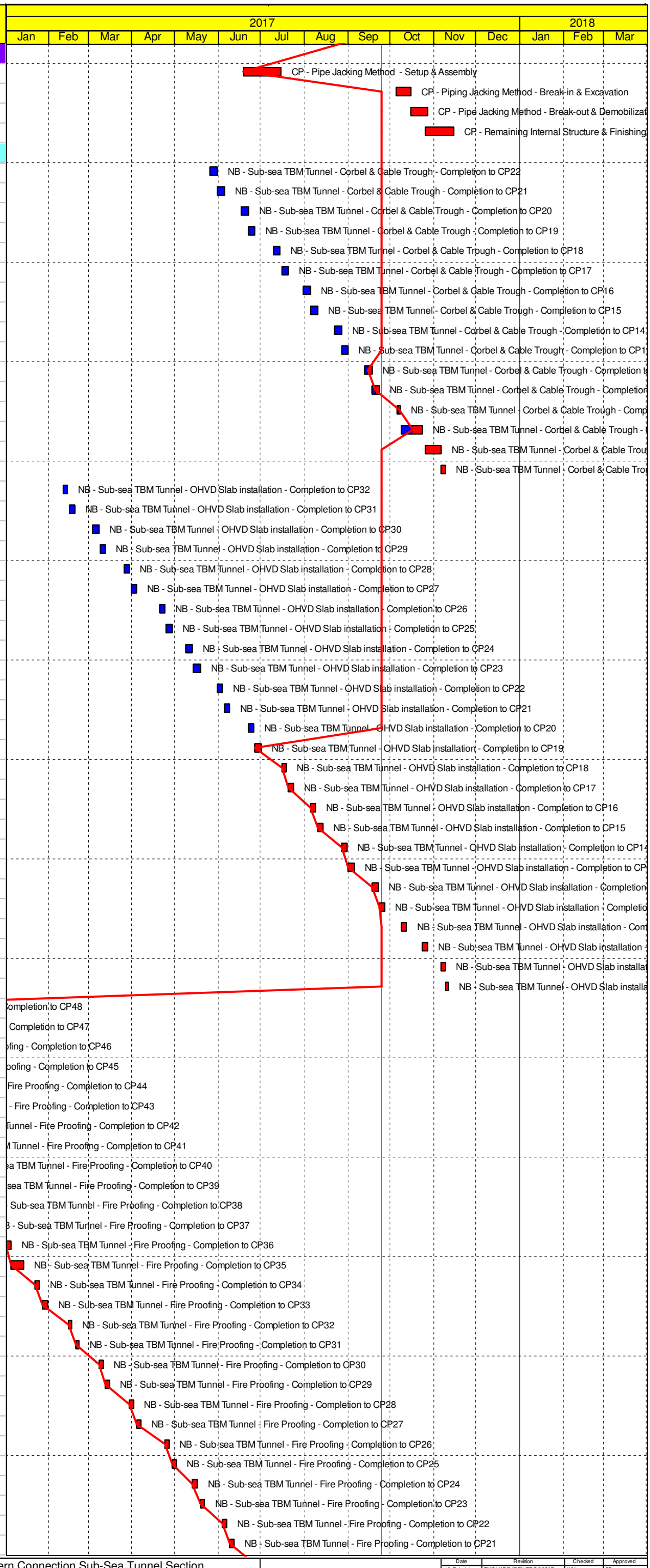
30-Oct-15	TMCLK/DBJ/GEN/PRG/98507 ...	WYu	

Activity Name	Orig Dur	DWPF Start	DWPF Finish
CP08 - ML03 - Ch2557			
CP - Pipe Jacking Method - Setup & Assembly	23	19-Jun-17	15-Jul-17
CP - Piping Jacking Method - Break-in & Excavation	10	05-Oct-17	15-Oct-17
CP - Pipe Jacking Method - Break-out & Demobilization	12	15-Oct-17	27-Oct-17
CP - Remaining Internal Structure & Finishing	16	26-Oct-17	15-Nov-17
Sub-sea TBM Tunnel - NB - Remaining Internal Structure			
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP22	5	26-May-17	31-May-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP21	5	31-May-17	05-Jun-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP20	5	17-Jun-17	22-Jun-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP19	5	22-Jun-17	27-Jun-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP18	5	10-Jul-17	14-Jul-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP17	5	16-Jul-17	20-Jul-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP16	5	31-Jul-17	05-Aug-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP15	5	05-Aug-17	10-Aug-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP14	5	22-Aug-17	27-Aug-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP13	5	27-Aug-17	01-Sep-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP12	5	13-Sep-17	18-Sep-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP11	5	18-Sep-17	23-Sep-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP10	3	06-Oct-17	08-Oct-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP09	15	09-Oct-17	23-Oct-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP08	11	26-Oct-17	06-Nov-17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to South Retrieval shaft	3	06-Nov-17	09-Nov-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP32	4	11-Feb-17	14-Feb-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP31	4	16-Feb-17	19-Feb-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP30	4	04-Mar-17	08-Mar-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP29	4	09-Mar-17	13-Mar-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP28	4	26-Mar-17	30-Mar-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP27	4	31-Mar-17	04-Apr-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP26	4	20-Apr-17	24-Apr-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP25	4	25-Apr-17	29-Apr-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP24	4	09-May-17	13-May-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP23	4	14-May-17	19-May-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP22	4	31-May-17	04-Jun-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP21	4	05-Jun-17	09-Jun-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP20	4	22-Jun-17	26-Jun-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP19	4	27-Jun-17	01-Jul-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP18	4	16-Jul-17	19-Jul-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP17	4	21-Jul-17	24-Jul-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP16	4	05-Aug-17	09-Aug-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP15	4	10-Aug-17	14-Aug-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP14	4	27-Aug-17	31-Aug-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP13	4	01-Sep-17	05-Sep-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP12	4	18-Sep-17	22-Sep-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP11	4	23-Sep-17	27-Sep-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP10	4	09-Oct-17	12-Oct-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP09	4	24-Oct-17	27-Oct-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP08	3	06-Nov-17	09-Nov-17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to South Retrieval shaft	2	09-Nov-17	11-Nov-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP48	4	18-Aug-16	22-Aug-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP47	4	23-Aug-16	27-Aug-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP46	4	08-Sep-16	12-Sep-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP45	4	14-Sep-16	17-Sep-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP44	4	03-Oct-16	07-Oct-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP43	4	08-Oct-16	12-Oct-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP42	4	26-Oct-16	30-Oct-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP41	4	31-Oct-16	04-Nov-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP40	4	18-Nov-16	22-Nov-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP39	4	23-Nov-16	27-Nov-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP38	4	10-Dec-16	14-Dec-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP37	4	15-Dec-16	19-Dec-16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP36	4	01-Jan-17	05-Jan-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP35	9	05-Jan-17	14-Jan-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP34	3	22-Jan-17	25-Jan-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP33	1	27-Jan-17	31-Jan-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP32	3	15-Feb-17	17-Feb-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP31	3	20-Feb-17	22-Feb-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP30	3	08-Mar-17	11-Mar-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP29	3	13-Mar-17	16-Mar-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP28	3	30-Mar-17	02-Apr-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP27	3	04-Apr-17	07-Apr-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP26	3	24-Apr-17	27-Apr-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP25	3	29-Apr-17	02-May-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP24	3	13-May-17	17-May-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP23	3	19-May-17	22-May-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP22	3	04-Jun-17	07-Jun-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP21	3	09-Jun-17	12-Jun-17



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Planned Bar
Planned Bar - Critical
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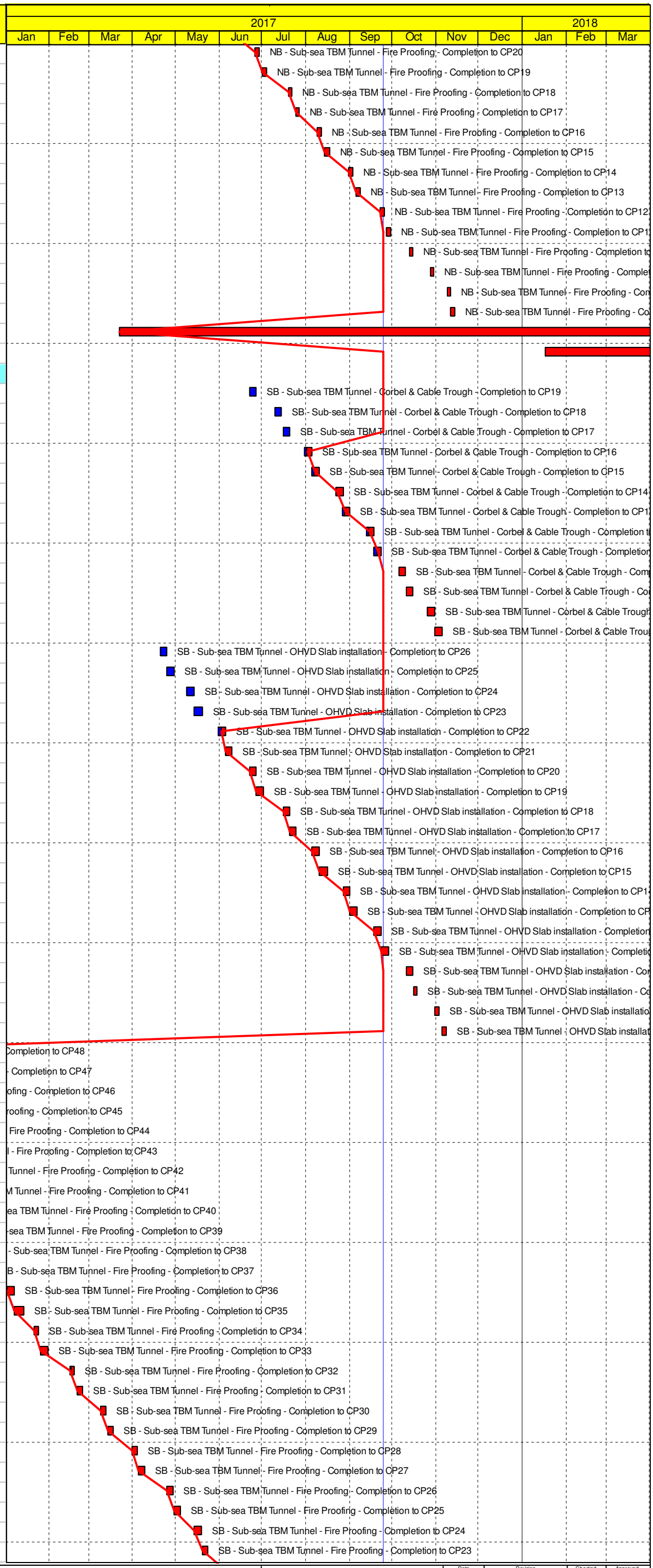
30-Oct-15	TMCLKDBJGEN/PRG/98507 ...	WYu	

Activity Name	Orig Dur	DWPF Start	DWPF Finish
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP20	3	26-Jun-17	29-Jun-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP19	3	01-Jul-17	04-Jul-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP18	3	20-Jul-17	22-Jul-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP17	3	25-Jul-17	27-Jul-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP16	3	09-Aug-17	12-Aug-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP15	3	14-Aug-17	18-Aug-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP14	3	31-Aug-17	03-Sep-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP13	3	05-Sep-17	08-Sep-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP12	3	22-Sep-17	25-Sep-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP11	3	27-Sep-17	30-Sep-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP10	3	13-Oct-17	15-Oct-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP09	3	28-Oct-17	30-Oct-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP08	2	09-Nov-17	11-Nov-17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to South Retrieval Shaft	3	11-Nov-17	14-Nov-17
NB - Sub-sea TBM Tunnel - Road Level Fire Proofing	334	22-Mar-17	15-May-18
NB Tunnel - Road works & Road marking	155	17-Jan-18	02-Aug-18
Sub-sea TBM Tunnel - SB - Remaining Internal Structure			
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP19	5	22-Jun-17	27-Jun-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP18	5	10-Jul-17	14-Jul-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP17	5	16-Jul-17	20-Jul-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP16	5	31-Jul-17	05-Aug-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP15	5	05-Aug-17	10-Aug-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP14	5	22-Aug-17	27-Aug-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP13	5	27-Aug-17	01-Sep-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP12	5	13-Sep-17	18-Sep-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP11	5	18-Sep-17	23-Sep-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP10	5	06-Oct-17	10-Oct-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP09	5	11-Oct-17	15-Oct-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP08	5	26-Oct-17	31-Oct-17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to South Retrieval shaft	5	31-Oct-17	05-Nov-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP26	5	20-Apr-17	25-Apr-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP25	5	25-Apr-17	30-Apr-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP24	5	09-May-17	14-May-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP23	5	14-May-17	20-May-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP22	5	31-May-17	05-Jun-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP21	5	05-Jun-17	10-Jun-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP20	5	22-Jun-17	27-Jun-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP19	5	27-Jun-17	02-Jul-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP18	5	16-Jul-17	20-Jul-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP17	5	21-Jul-17	25-Jul-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP16	5	05-Aug-17	10-Aug-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP15	5	10-Aug-17	16-Aug-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP14	5	27-Aug-17	01-Sep-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP13	5	01-Sep-17	06-Sep-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP12	5	18-Sep-17	23-Sep-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP11	5	23-Sep-17	28-Sep-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP10	5	11-Oct-17	15-Oct-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP09	3	16-Oct-17	18-Oct-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP08	3	31-Oct-17	03-Nov-17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to South Retrieval shaft	3	05-Nov-17	08-Nov-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP48	5	19-Aug-16	24-Aug-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP47	5	24-Aug-16	29-Aug-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP46	5	09-Sep-16	14-Sep-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP45	5	14-Sep-16	19-Sep-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP44	5	04-Oct-16	09-Oct-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP43	5	09-Oct-16	14-Oct-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP42	5	27-Oct-16	01-Nov-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP41	5	01-Nov-16	06-Nov-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP40	5	19-Nov-16	24-Nov-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP39	5	24-Nov-16	29-Nov-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP38	5	11-Dec-16	16-Dec-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP37	5	16-Dec-16	21-Dec-16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP36	5	02-Jan-17	07-Jan-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP35	7	07-Jan-17	14-Jan-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP34	3	21-Jan-17	24-Jan-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP33	2	26-Jan-17	31-Jan-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP32	3	16-Feb-17	18-Feb-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP31	4	21-Feb-17	24-Feb-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP30	4	09-Mar-17	13-Mar-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP29	4	14-Mar-17	18-Mar-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP28	4	31-Mar-17	04-Apr-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP27	4	05-Apr-17	09-Apr-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP26	4	25-Apr-17	29-Apr-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP25	4	30-Apr-17	04-May-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP24	4	14-May-17	19-May-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP23	4	20-May-17	24-May-17



Data Date: 24-Sep-17

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

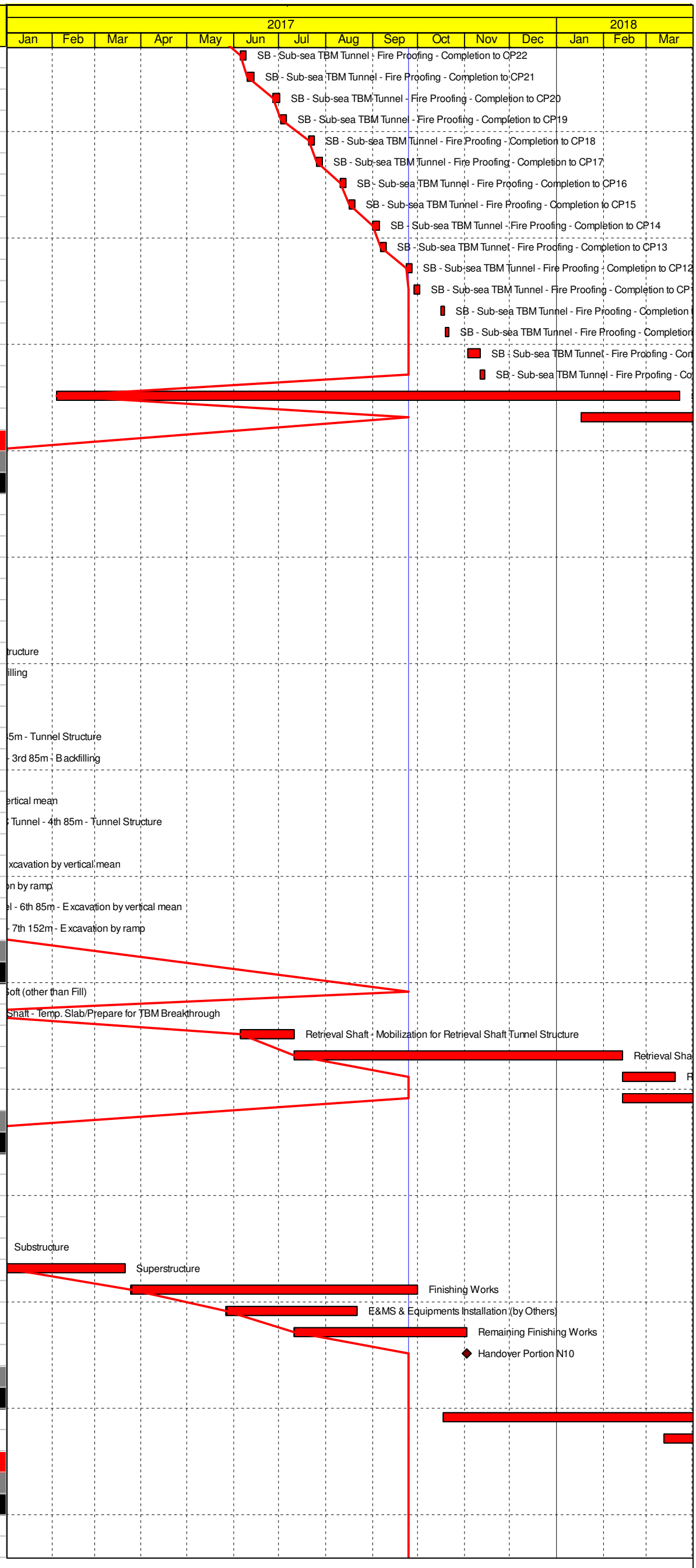
TMCLK - Northern Connection Sub-Sea Tunnel Section

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

Progress as of 24-Sep-17

Date	Revision	Checked	Approved
12-Feb-14	TMCLK/DBJGEN/PRG/98507	WYu	SPo
08-Apr-14	TMCLK/DBJGEN/PRG/98507 ...	SPa	WYu
28-Aug-14	TMCLK/DBJGEN/PRG/98507 ...	CLa	WYu
30-Oct-15	TMCLK/DBJGEN/PRG/98507 ...	WYu	

Activity Name	Orig Dur	DWPF Start	DWPF Finish
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP22	4	05-Jun-17	09-Jun-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP21	4	10-Jun-17	14-Jun-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP20	4	27-Jun-17	01-Jul-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP19	4	02-Jul-17	06-Jul-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP18	4	21-Jul-17	24-Jul-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP17	4	26-Jul-17	29-Jul-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP16	4	10-Aug-17	14-Aug-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP15	4	16-Aug-17	20-Aug-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP14	4	01-Sep-17	05-Sep-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP13	4	06-Sep-17	10-Sep-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP12	4	23-Sep-17	27-Sep-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP11	4	28-Sep-17	02-Oct-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP10	3	16-Oct-17	18-Oct-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP09	3	19-Oct-17	21-Oct-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP08	8	03-Nov-17	11-Nov-17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to South Retrieval Shaft	3	11-Nov-17	14-Nov-17
SB - Remaining Fire Proofing in Tunnel	334	04-Feb-17	23-Mar-18
SB Tunnel - Road works & Road Marking	155	17-Jan-18	02-Aug-18
Southern Landfall			
South Cut & Cover Tunnel			
Construction			
South C&C Tunnel - Diaphragm Wall	120	03-Oct-15	02-Mar-16
C&C Tunnel - 1st 85m - Excavation by ramp	23	03-Mar-16	01-Apr-16
C&C Tunnel - 1st 85m - Excavation by vertical mean	11	02-Apr-16	15-Apr-16
C&C Tunnel - 1st 85m - Tunnel Structure	95	16-Apr-16	09-Aug-16
C&C Tunnel - 1st 85m - Backfilling	4	10-Aug-16	13-Aug-16
C&C Tunnel - 2nd 85m - Excavation by ramp	17	30-Apr-16	21-May-16
C&C Tunnel - 2nd 85m - Excavation by vertical mean	18	23-May-16	13-Jun-16
C&C Tunnel - 2nd 85m - Tunnel Structure	83	14-Jun-16	20-Sep-16
C&C Tunnel - 2nd 85m - Backfilling	9	21-Sep-16	30-Sep-16
C&C Tunnel - 3rd 85m - Excavation by ramp	18	23-May-16	13-Jun-16
C&C Tunnel - 3rd 85m - Excavation by vertical mean	25	14-Jun-16	13-Jul-16
C&C Tunnel - 3rd 85m - Tunnel Structure	83	26-Jul-16	02-Nov-16
C&C Tunnel - 3rd 85m - Backfilling	15	03-Nov-16	19-Nov-16
C&C Tunnel - 4th 85m - Excavation by ramp	21	30-Jun-16	25-Jul-16
C&C Tunnel - 4th 85m - Excavation by vertical mean	35	26-Jul-16	03-Sep-16
C&C Tunnel - 4th 85m - Tunnel Structure	83	05-Sep-16	13-Dec-16
C&C Tunnel - 5th 85m - Excavation by ramp	23	26-Jul-16	20-Aug-16
C&C Tunnel - 5th 85m - Excavation by vertical mean	44	22-Aug-16	14-Oct-16
C&C Tunnel - 6th 85m - Excavation by ramp	27	22-Aug-16	22-Sep-16
C&C Tunnel - 6th 85m - Excavation by vertical mean	52	23-Sep-16	24-Nov-16
C&C Tunnel - 7th 152m - Excavation by ramp	15	03-Nov-16	19-Nov-16
South Retrieval Shaft			
Construction			
Retrieval Shaft - Excavation - Soft (other than Fill)	140	15-Apr-16	30-Sep-16
Retrieval Shaft - Temp. Slab/Prepare for TBM Breakthrough	48	03-Oct-16	28-Nov-16
Retrieval Shaft - Mobilization for Retrieval Shaft Tunnel Structure	30	05-Jun-17	11-Jul-17
Retrieval Shaft - Tunnel Structure	180	11-Jul-17	13-Feb-18
Retrieval Shaft - Tunnel Structure - Provision for TCSS/E&MS works for KD-3	24	13-Feb-18	20-Mar-18
Retrieval Shaft - Vent duct Structure & Backfilling	48	13-Feb-18	21-Apr-18
South Ventilation Building			
Construction			
S - Piling (Socket H-piles)	132	23-Oct-15	08-Apr-16
S - Pile Test	24	09-Apr-16	07-May-16
S -Sheet Piling	48	23-Oct-15	17-Dec-15
S- Excavation	100	09-May-16	05-Sep-16
Substructure	95	06-Sep-16	30-Dec-16
Superstructure	65	31-Dec-16	21-Mar-17
Finishing Works	155	25-Mar-17	30-Sep-17
E&MS & Equipments Installation (by Others)	72	27-May-17	21-Aug-17
Remaining Finishing Works	96	11-Jul-17	02-Nov-17
Handover Portion N10	0		02-Nov-17
South Surface Roadworks, Utility & Drainage works			
Construction			
South Landfall - Seawall Modification	144	18-Oct-17	19-Apr-18
South Landfall - Road Furniture	72	13-Mar-18	12-Jun-18
Testing & Commissioning/Inspection & Handover			
Final Inspection & Handover			
Construction			
Statutory Inspection	48	04-Aug-18	02-Oct-18
Final Inspection & Handover	63	02-Oct-18	15-Dec-18



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 24-Sep-17

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28-Aug-14	TMCLK/DBJGEN/PRG/98507 ...	CLa	WYu
30-Oct-15	TMCLK/DBJGEN/PRG/98507 ...	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 practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		<>
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit.	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		✓
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		✓

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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		✓

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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 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 - Reclamation dredging and filling for Portion 1 of HKLR;	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		✓
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		✓

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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	
General Marine Works									
6.1	-	Use of TBM 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 Guidelines. DASO permit conditions.		Y		✓
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		✓

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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	-	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 conditions.		Y		✓
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		✓

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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	
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		✓
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		✓

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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	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
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		✓

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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	-	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		✓

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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	-	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									
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		✓

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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, 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		✓
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

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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	
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		✓
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		✓

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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 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		✓
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		✓

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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	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		✓
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		✓

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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	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 w 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 entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and *f* Incompatible materials are adequately separated.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
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

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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	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		✓
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

Copies of Calibration Certificates for Air Quality Monitoring

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 5
Calibrated by	:	P.F.Yeung
Date	:	09/08/2017

Sampler

Model	:	TE-5170
Serial Number	:	S/N 0816

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	20 March 2017
Slope (m)	:	2.08464
Intercept (b)	:	-0.036840
Correlation Coefficient(r)	:	0.99994

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1005
Ta(K)	:	305

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	10.2	3.144	1.526	51	50.21
2	13 holes	8.8	2.921	1.419	45	44.30
3	10 holes	6.6	2.529	1.231	40	39.38
4	7 holes	4.4	2.065	1.008	34	33.47
5	5 holes	2.8	1.647	0.808	26	25.60

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b ,Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):32.235 Intercept(b):-0.0361 Correlation Coefficient(r): 0.9991

Checked by: Magnum Fan Date: 11/08/2017

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR10
Calibrated by	:	P.F.Yeung
Date	:	09/08/2017

Sampler

Model	:	TE-5170
Serial Number	:	S/N 8162

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	20 March 2017
Slope (m)	:	2.08464
Intercept (b)	:	-0.036840
Correlation Coefficient(r)	:	0.99994

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1005
Ta(K)	:	305

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.2	3.295	1.598	53	52.18
2	13 holes	9.2	2.986	1.450	48	47.26
3	10 holes	7.2	2.642	1.285	43	42.34
4	7 holes	4.7	2.134	1.042	35	34.46
5	5 holes	3.0	1.705	0.836	26	25.60

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b ,Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):34.219 Intercept(b): -2.138 Correlation Coefficient(r): 0.9976

Checked by: Magnum Fan Date: 11/08/17

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AQMS1
Calibrated by	:	P.F.Yeung
Date	:	09/08/2017

Sampler

Model	:	TE-5170
Serial Number	:	S/N 1253

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	20 March 2017
Slope (m)	:	2.08464
Intercept (b)	:	-0.036840
Correlation Coefficient(r)	:	0.99994

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1005
Ta(K)	:	305

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.1	3.425	1.661	52	51.20
2	13 holes	9.9	3.098	1.504	46	45.29
3	10 holes	7.5	2.696	1.311	40	39.38
4	7 holes	5.0	2.202	1.074	33	32.49
5	5 holes	3.1	1.733	0.849	27	26.58

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b ,Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):30.080 Intercept(b):0.496 Correlation Coefficient(r): 0.9980

Checked by: Magnum Fan Date: 11/08/2017

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 1
Calibrated by	:	P.F.Yeung
Date	:	09/08/2017

Sampler

Model	:	TE-5170
Serial Number	:	S/N 0146

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	20 March 2017
Slope (m)	:	2.08464
Intercept (b)	:	-0.036840
Correlation Coefficient(r)	:	0.99994

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1005
Ta(K)	:	305

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.6	3.353	1.626	53	52.18
2	13 holes	9.8	3.082	1.496	48	47.26
3	10 holes	7.6	2.714	1.320	42	41.35
4	7 holes	5.0	2.202	1.074	36	35.44
5	5 holes	3.2	1.761	0.863	28	27.57

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b ,Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):31.141 Intercept(b):1.034 correlation Coefficient(r): 0.9972

Checked by: Magnum Fan Date: 11/08/2017

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 6
Calibrated by	:	P.F.Yeung
Date	:	09/08/2017

Sampler

Model	:	TE-5170
Serial Number	:	S/N 3957

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	20 March 2017
Slope (m)	:	2.08464
Intercept (b)	:	-0.036840
Correlation Coefficient(r)	:	0.99994

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1005
Ta(K)	:	305

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.8	3.522	1.707	54	53.17
2	13 holes	9.3	3.002	1.458	47	46.27
3	10 holes	7.0	2.605	1.267	41	40.37
4	7 holes	4.6	2.112	1.031	33	32.49
5	5 holes	3.2	1.761	0.863	27	26.58

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b ,Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):31.557 Intercept(b): -0.148 Correlation Coefficient(r): 0.9988

Checked by: Magnum Fan Date: 11/08/2017

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 20, 2017 Rootsmeter S/N 0438320 Ta (K) - 293
Operator Tisch Orifice I.D. - 2454 Pa (mm) - 759.46

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4390	3.2	2.00
2	NA	NA	1.00	1.0240	6.4	4.00
3	NA	NA	1.00	0.9170	7.9	5.00
4	NA	NA	1.00	0.8730	8.8	5.50
5	NA	NA	1.00	0.7200	12.8	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
1.0120	0.7033	1.4257		0.9958	0.6920	0.8784
1.0078	0.9842	2.0163		0.9916	0.9683	1.2423
1.0057	1.0967	2.2543		0.9895	1.0791	1.3889
1.0045	1.1507	2.3643		0.9884	1.1322	1.4567
0.9992	1.3878	2.8514		0.9831	1.3654	1.7568
Qstd slope (m) =		2.08464		Qa slope (m) =		1.30537
intercept (b) =		-0.03684		intercept (b) =		-0.02270
coefficient (r) =		0.99994		coefficient (r) =		0.99994
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

ENVIROTECH SERVICES CO.

Calibration Report of Wind Meter

Date of Calibration : 18 April 2017

Brand of Test Meter: Davis

Model: Vantage Pro 2 (s/n: AS160104014)

Location : Roof of Tuen Mun Firestation

Procedures :

1. Wind Still Test: The wind speed sensor was hold by hand until it keep still

2.Wind Speed Test: The wind meter was on-site calibrated against the Anemometer

3.Wind Direction Test : The wind meter was on-site calibrated against the marine compass at four directions

Results:

Wind Still Test

Wind Speed (m/s)
0.00

Wind Speed Test

Davis (m/s)	Anemometer (m/s)
0.5	0.6
1.0	1.1
2.1	2.3

Wind Direction Test

Davis (o)	Marine Compass (o)
269	270
359	0
91	90
180	180

Calibrated by: Ho

Yeung Ping Fai
(Technical Officer)

Checked by : Fat

Ho Kam Fat
(Senior Technical Officer)

Appendix F

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 2017

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

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Air Quality Impact Monitoring Schedule - October 2017

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

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

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - September 2017

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Impact Dolphin Monitoring Survey Monitoring Schedule - October 2017

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

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

Appendix G

Impact Air Quality Monitoring Results

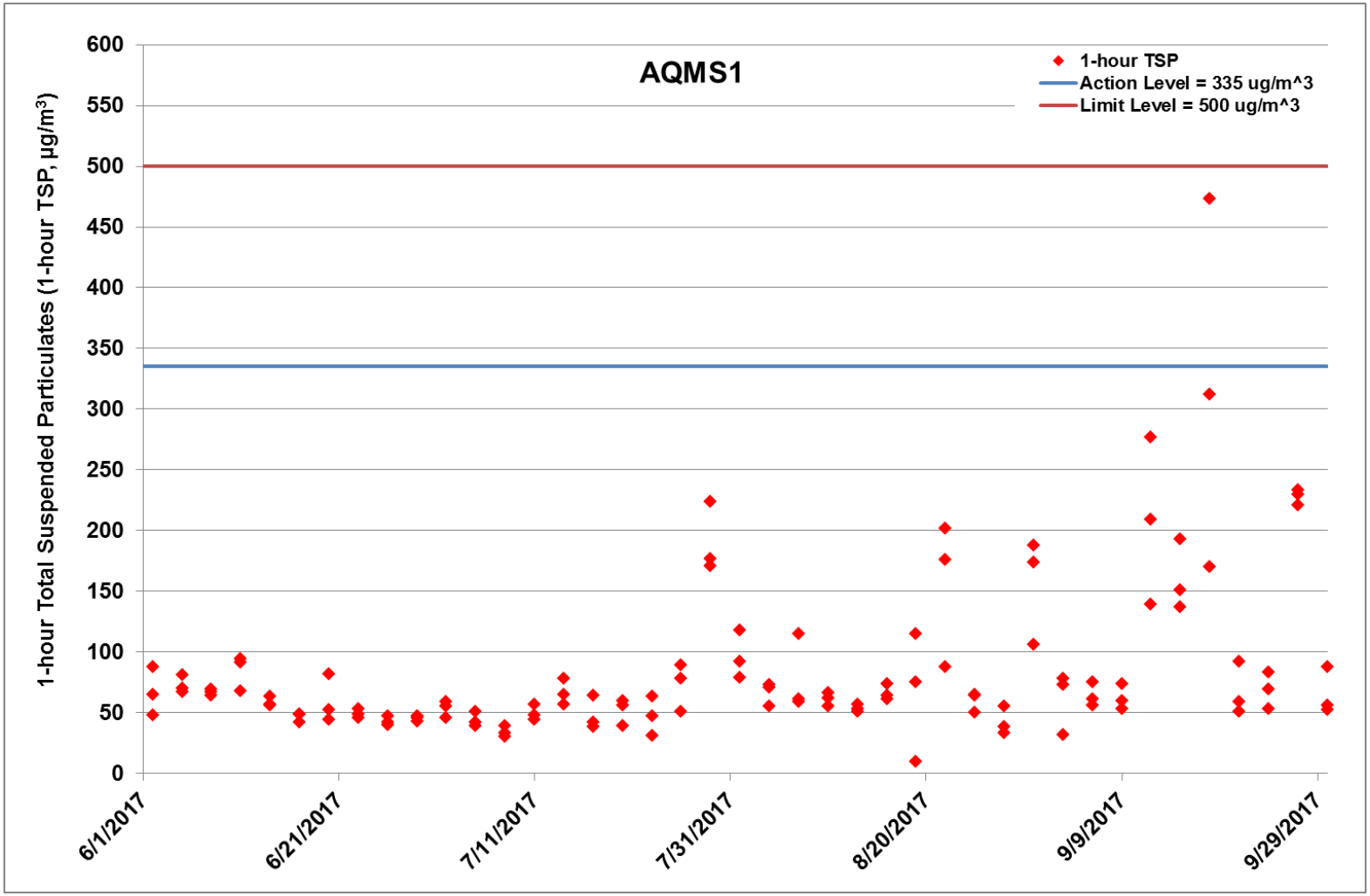

Figure G.1 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

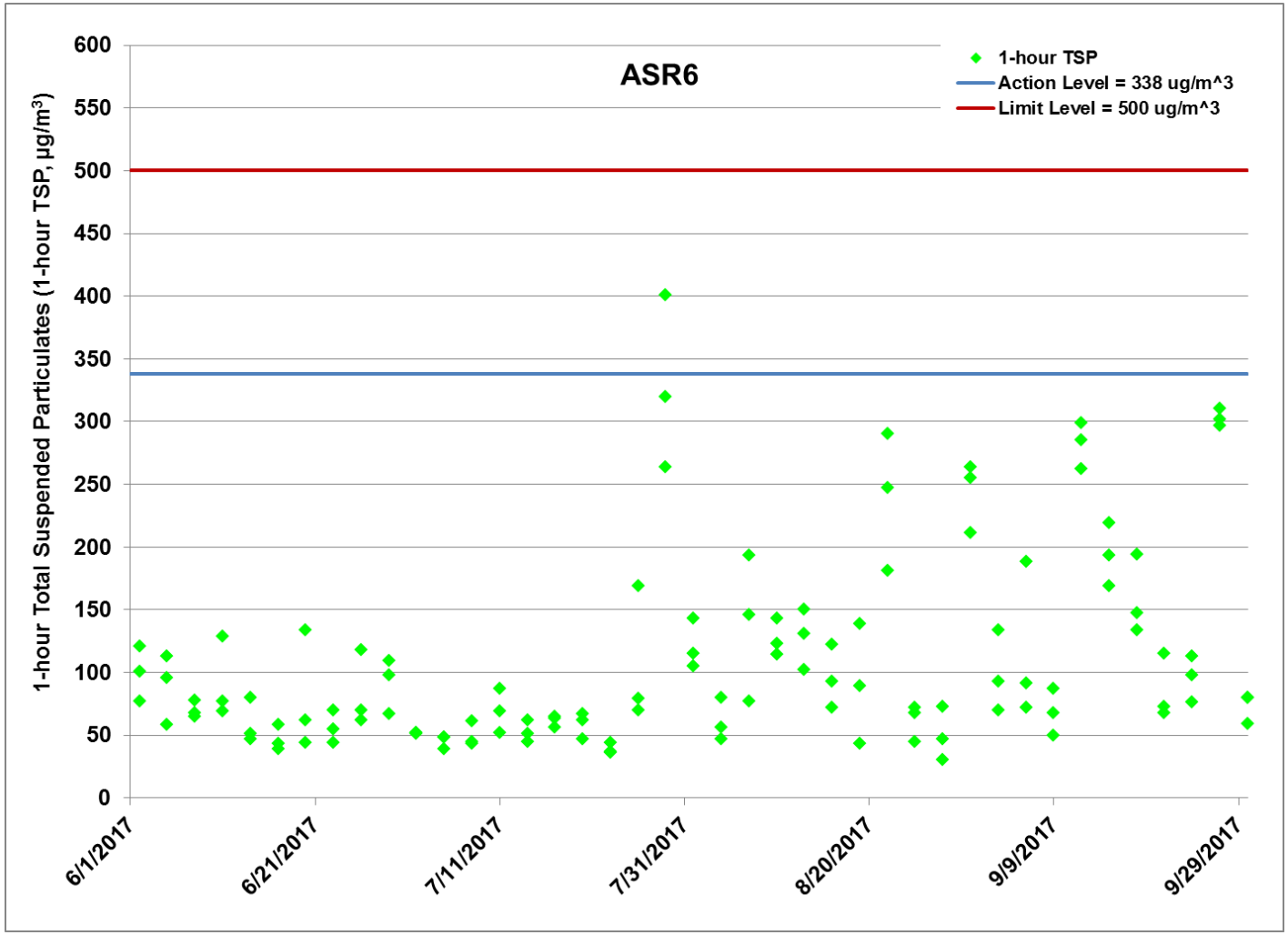

Figure G.2 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

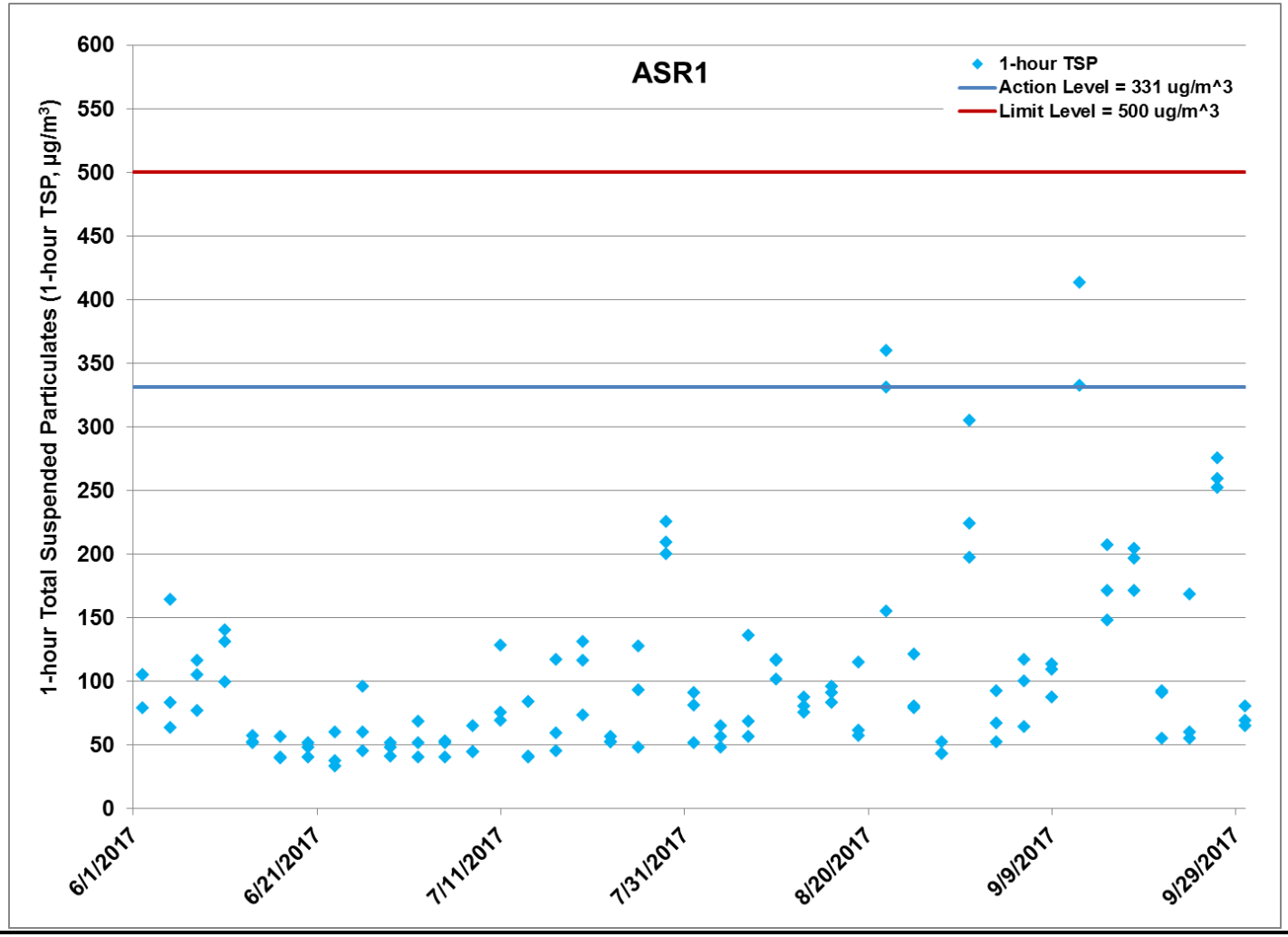

Figure G.3 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

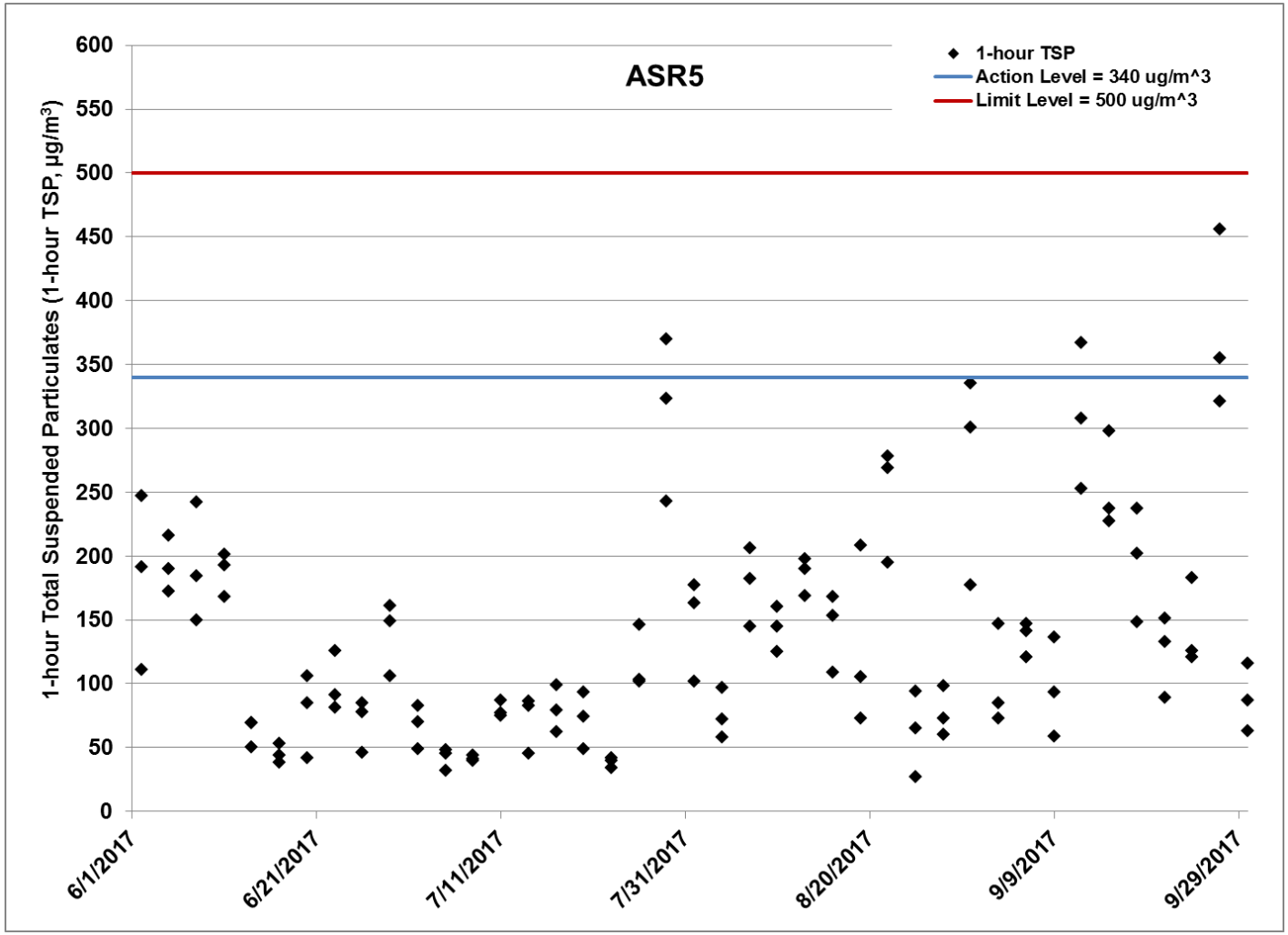

Figure G.4 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

ERM

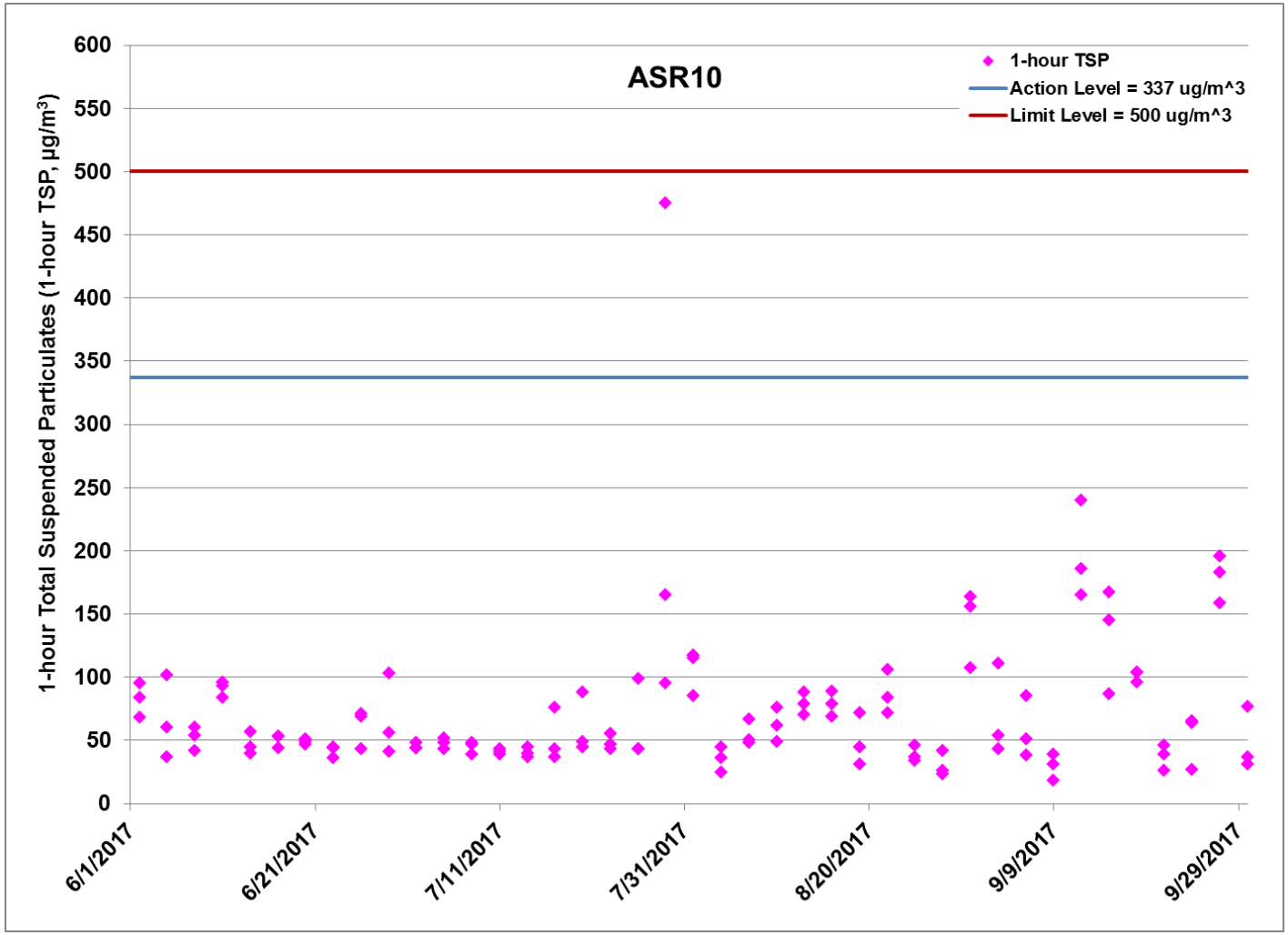

Figure G.5 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

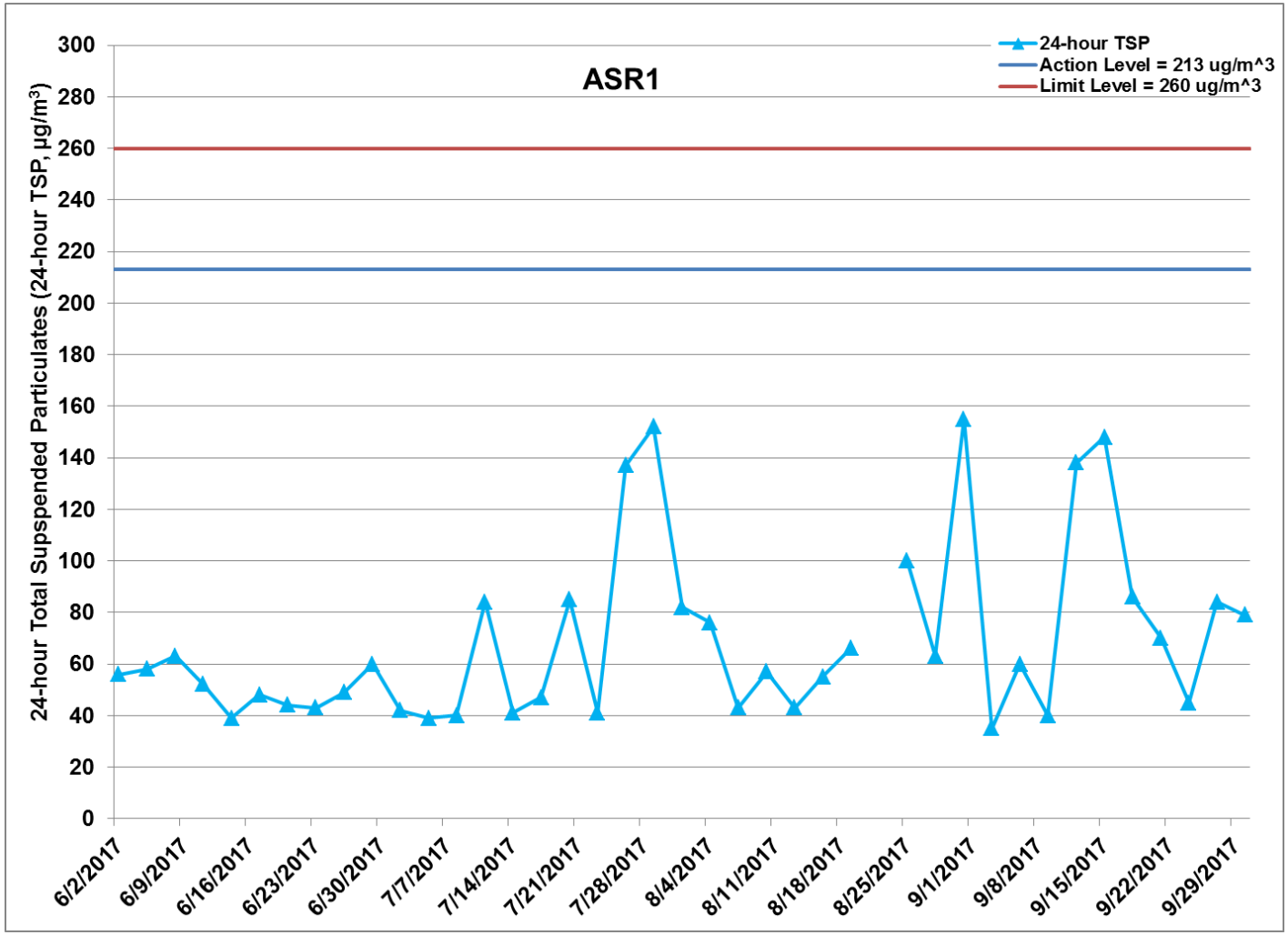

Figure G.6 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

Remarks: 24-hour TSP monitoring was cancelled on 22 August 2017 due to adverse weather.

ERM

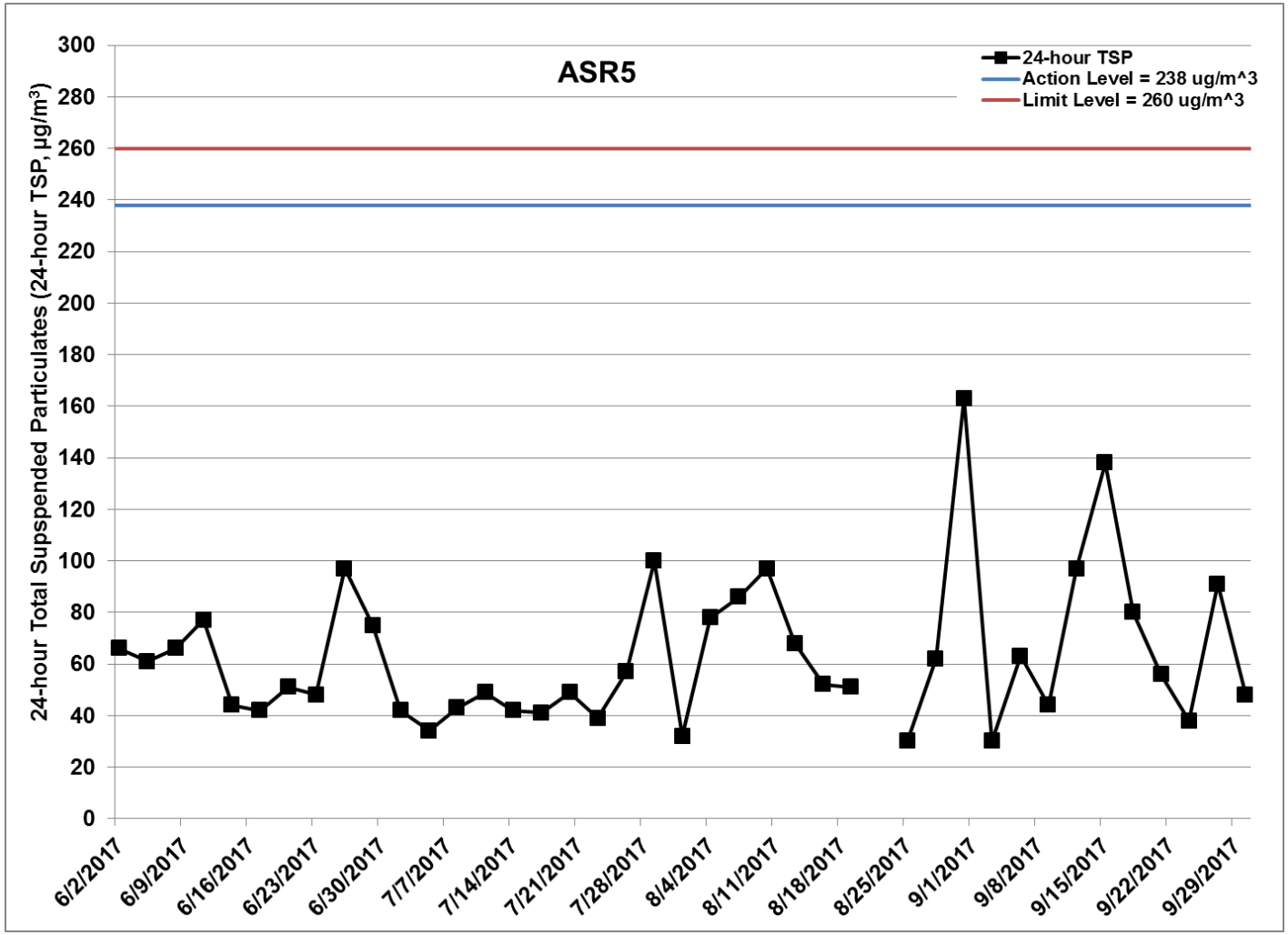

Figure G.7 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

Remarks: 24-hour TSP monitoring was cancelled on 22 August 2017 due to adverse weather.

ERM

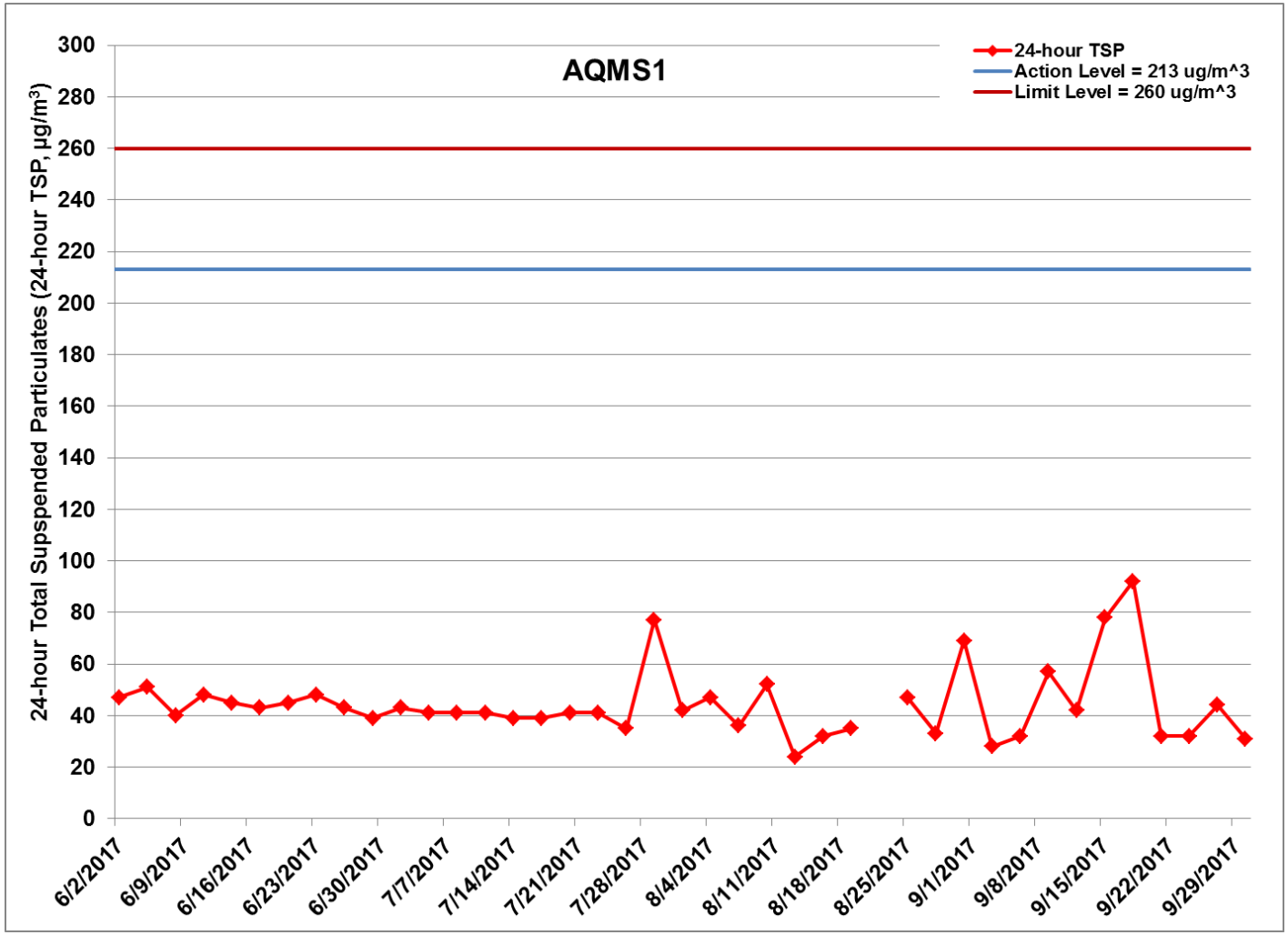

Figure G.8 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

Remarks: 24-hour TSP monitoring was cancelled on 22 August 2017 due to adverse weather.

ERM

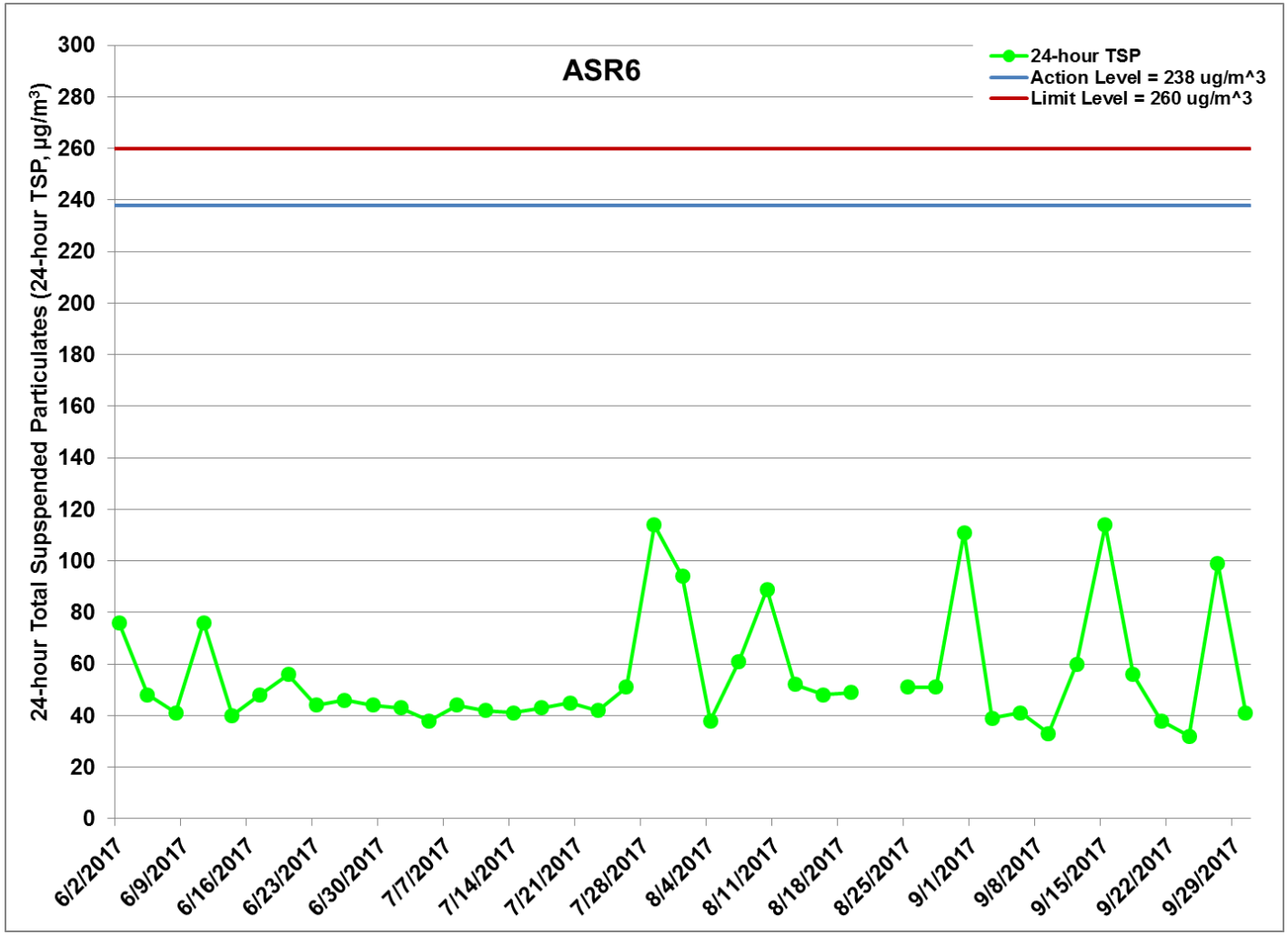

Figure G.9 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

Remarks: 24-hour TSP monitoring was cancelled on 22 August 2017 due to adverse weather.

ERM

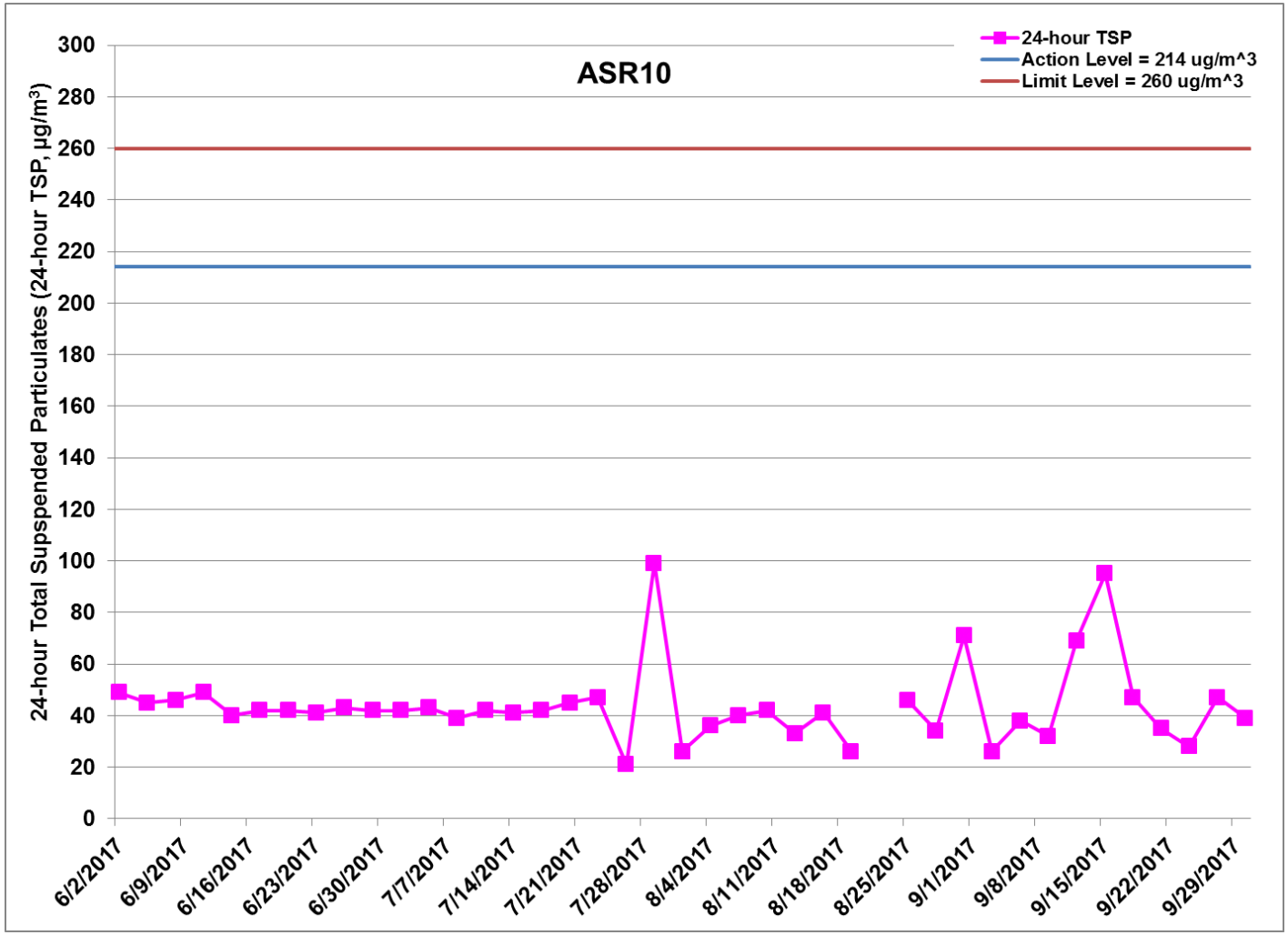

Figure G.10 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 June 2017 and 30 September 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/6/2017 – 30/9/2017) *Ref: 0212330_Impact AQM graphs_September 2017_REV a.xlsx*

Remarks: 24-hour TSP monitoring was cancelled on 22 August 2017 due to adverse weather.

ERM

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-03	AQMS1	Cloudy	13:56	1-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2017-09-03	AQMS1	Cloudy	14:58	1-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-09-03	AQMS1	Cloudy	16:00	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR1	Cloudy	13:45	1-hour TSP	92	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR1	Cloudy	14:47	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR1	Cloudy	15:49	1-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR10	Cloudy	13:12	1-hour TSP	111	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR10	Cloudy	14:14	1-hour TSP	54	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR10	Cloudy	15:16	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR5	Cloudy	13:33	1-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR5	Cloudy	14:35	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR5	Cloudy	15:37	1-hour TSP	147	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR6	Cloudy	13:23	1-hour TSP	134	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR6	Cloudy	14:25	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR6	Cloudy	15:27	1-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2017-09-06	AQMS1	Sunny	13:49	1-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2017-09-06	AQMS1	Sunny	14:51	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-09-06	AQMS1	Sunny	15:53	1-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR1	Sunny	13:38	1-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR1	Sunny	14:40	1-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR1	Sunny	15:42	1-hour TSP	100	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR10	Sunny	13:07	1-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR10	Sunny	14:09	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR10	Sunny	15:11	1-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR5	Sunny	13:28	1-hour TSP	141	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR5	Sunny	14:30	1-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR5	Sunny	15:32	1-hour TSP	147	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR6	Sunny	13:18	1-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR6	Sunny	14:20	1-hour TSP	188	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR6	Sunny	15:22	1-hour TSP	72	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-09	AQMS1	Sunny	09:47	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2017-09-09	AQMS1	Sunny	10:49	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2017-09-09	AQMS1	Sunny	11:51	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR1	Sunny	09:35	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR1	Sunny	10:37	1-hour TSP	109	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR1	Sunny	11:39	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR10	Sunny	09:00	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR10	Sunny	10:02	1-hour TSP	31	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR10	Sunny	11:04	1-hour TSP	18	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR5	Sunny	09:23	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR5	Sunny	10:25	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR5	Sunny	11:27	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR6	Sunny	09:12	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR6	Sunny	10:14	1-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR6	Sunny	11:16	1-hour TSP	50	ug/m3
TMCLKL	HY/2012/08	2017-09-12	AQMS1	Sunny	13:49	1-hour TSP	277	ug/m3
TMCLKL	HY/2012/08	2017-09-12	AQMS1	Sunny	14:51	1-hour TSP	209	ug/m3
TMCLKL	HY/2012/08	2017-09-12	AQMS1	Sunny	15:53	1-hour TSP	139	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR1	Sunny	13:38	1-hour TSP	332	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR1	Sunny	14:40	1-hour TSP	545	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR1	Sunny	15:42	1-hour TSP	413	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR10	Sunny	13:02	1-hour TSP	165	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR10	Sunny	14:04	1-hour TSP	240	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR10	Sunny	15:06	1-hour TSP	186	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR5	Sunny	13:27	1-hour TSP	367	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR5	Sunny	14:29	1-hour TSP	308	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR5	Sunny	15:31	1-hour TSP	253	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR6	Sunny	13:15	1-hour TSP	285	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR6	Sunny	14:17	1-hour TSP	299	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR6	Sunny	15:19	1-hour TSP	262	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-15	AQMS1	Sunny	13:08	1-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2017-09-15	AQMS1	Sunny	14:10	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2017-09-15	AQMS1	Sunny	15:12	1-hour TSP	151	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR1	Sunny	12:56	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR1	Sunny	13:58	1-hour TSP	207	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR1	Sunny	15:00	1-hour TSP	171	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR10	Sunny	12:22	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR10	Sunny	13:24	1-hour TSP	145	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR10	Sunny	14:26	1-hour TSP	167	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR5	Sunny	12:45	1-hour TSP	227	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR5	Sunny	13:47	1-hour TSP	298	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR5	Sunny	14:49	1-hour TSP	237	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR6	Sunny	12:33	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR6	Sunny	13:35	1-hour TSP	219	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR6	Sunny	14:37	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2017-09-18	AQMS1	Sunny	13:52	1-hour TSP	473	ug/m3
TMCLKL	HY/2012/08	2017-09-18	AQMS1	Sunny	14:54	1-hour TSP	312	ug/m3
TMCLKL	HY/2012/08	2017-09-18	AQMS1	Sunny	15:56	1-hour TSP	170	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR1	Sunny	13:40	1-hour TSP	204	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR1	Sunny	14:42	1-hour TSP	196	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR1	Sunny	15:44	1-hour TSP	171	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR10	Sunny	13:06	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR10	Sunny	14:08	1-hour TSP	96	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR10	Sunny	15:10	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR5	Sunny	13:29	1-hour TSP	237	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR5	Sunny	14:31	1-hour TSP	202	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR5	Sunny	15:33	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR6	Sunny	13:17	1-hour TSP	194	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR6	Sunny	14:19	1-hour TSP	147	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR6	Sunny	15:21	1-hour TSP	134	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-21	AQMS1	Sunny	13:54	1-hour TSP	92	ug/m3
TMCLKL	HY/2012/08	2017-09-21	AQMS1	Sunny	14:56	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-09-21	AQMS1	Sunny	15:58	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR1	Sunny	13:42	1-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR1	Sunny	14:44	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR1	Sunny	15:46	1-hour TSP	92	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR10	Sunny	13:08	1-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR10	Sunny	14:10	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR10	Sunny	15:12	1-hour TSP	26	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR5	Sunny	13:31	1-hour TSP	151	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR5	Sunny	14:33	1-hour TSP	133	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR5	Sunny	15:35	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR6	Sunny	13:19	1-hour TSP	115	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR6	Sunny	14:21	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR6	Sunny	15:23	1-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2017-09-24	AQMS1	Sunny	10:08	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2017-09-24	AQMS1	Sunny	11:10	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2017-09-24	AQMS1	Rainy	12:12	1-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR1	Sunny	09:57	1-hour TSP	168	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR1	Sunny	10:59	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR1	Rainy	12:01	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR10	Sunny	09:22	1-hour TSP	27	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR10	Sunny	10:24	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR10	Rainy	11:26	1-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR5	Sunny	09:45	1-hour TSP	183	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR5	Sunny	10:47	1-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR5	Rainy	11:47	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR6	Sunny	09:33	1-hour TSP	98	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR6	Sunny	10:35	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR6	Rainy	11:37	1-hour TSP	76	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-27	AQMS1	Sunny	13:50	1-hour TSP	230	ug/m3
TMCLKL	HY/2012/08	2017-09-27	AQMS1	Sunny	14:52	1-hour TSP	233	ug/m3
TMCLKL	HY/2012/08	2017-09-27	AQMS1	Sunny	15:54	1-hour TSP	221	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR1	Sunny	13:40	1-hour TSP	275	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR1	Sunny	14:42	1-hour TSP	252	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR1	Sunny	15:44	1-hour TSP	259	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR10	Sunny	13:15	1-hour TSP	159	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR10	Sunny	14:17	1-hour TSP	183	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR10	Sunny	15:19	1-hour TSP	196	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR5	Sunny	13:28	1-hour TSP	321	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR5	Sunny	14:30	1-hour TSP	355	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR5	Sunny	15:32	1-hour TSP	456	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR6	Sunny	13:27	1-hour TSP	297	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR6	Sunny	14:29	1-hour TSP	302	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR6	Sunny	15:31	1-hour TSP	310	ug/m3
TMCLKL	HY/2012/08	2017-09-30	AQMS1	Sunny	14:09	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-09-30	AQMS1	Sunny	15:11	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-09-30	AQMS1	Sunny	16:13	1-hour TSP	88	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR1	Sunny	13:58	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR1	Sunny	15:00	1-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR1	Sunny	16:02	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR10	Sunny	13:24	1-hour TSP	31	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR10	Sunny	14:26	1-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR10	Sunny	15:28	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR5	Sunny	13:46	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR5	Sunny	14:48	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR5	Sunny	15:50	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR6	Sunny	13:35	1-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR6	Sunny	14:37	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR6	Sunny	15:39	1-hour TSP	80	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-03	AQMS1	Cloudy	17:02	24-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR1	Cloudy	16:51	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR10	Cloudy	16:18	24-hour TSP	26	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR5	Cloudy	16:39	24-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2017-09-03	ASR6	Cloudy	16:29	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-09-06	AQMS1	Cloudy	16:55	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR1	Cloudy	16:44	24-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR10	Cloudy	16:13	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR5	Cloudy	16:34	24-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2017-09-06	ASR6	Cloudy	16:25	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-09-09	AQMS1	Sunny	12:53	24-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR1	Sunny	12:41	24-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR10	Sunny	12:06	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR5	Sunny	12:29	24-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-09-09	ASR6	Sunny	12:18	24-hour TSP	33	ug/m3
TMCLKL	HY/2012/08	2017-09-12	AQMS1	Sunny	16:55	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR1	Sunny	16:44	24-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR10	Sunny	16:08	24-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR5	Sunny	16:33	24-hour TSP	97	ug/m3
TMCLKL	HY/2012/08	2017-09-12	ASR6	Sunny	16:21	24-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2017-09-15	AQMS1	Sunny	16:14	24-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR1	Sunny	16:02	24-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR10	Sunny	15:28	24-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR5	Sunny	15:51	24-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	2017-09-15	ASR6	Sunny	15:39	24-hour TSP	114	ug/m3
TMCLKL	HY/2012/08	2017-09-18	AQMS1	Sunny	16:58	24-hour TSP	92	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR1	Sunny	16:46	24-hour TSP	86	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR10	Sunny	16:12	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR5	Sunny	16:35	24-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2017-09-18	ASR6	Sunny	16:23	24-hour TSP	56	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-09-21	AQMS1	Sunny	17:00	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR1	Sunny	16:48	24-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR10	Sunny	16:14	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR5	Sunny	16:37	24-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-09-21	ASR6	Sunny	16:25	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2017-09-24	AQMS1	Sunny	13:14	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR1	Sunny	13:03	24-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR10	Sunny	12:28	24-hour TSP	28	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR5	Sunny	12:51	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2017-09-24	ASR6	Sunny	12:39	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-09-27	AQMS1	Sunny	16:56	24-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR1	Sunny	16:46	24-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR10	Sunny	16:21	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR5	Sunny	16:34	24-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2017-09-27	ASR6	Sunny	16:33	24-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2017-09-30	AQMS1	Sunny	17:15	24-hour TSP	31	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR1	Sunny	17:04	24-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR10	Sunny	16:30	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR5	Sunny	16:52	24-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-09-30	ASR6	Sunny	16:41	24-hour TSP	41	ug/m3

Appendix H

Meteorological Data

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/03	0:00	1.8	95
17/09/03	1:00	0.4	78
17/09/03	2:00	0	-
17/09/03	3:00	0	-
17/09/03	4:00	0.4	96
17/09/03	5:00	0	-
17/09/03	6:00	0	-
17/09/03	7:00	0.9	309
17/09/03	8:00	0.4	312
17/09/03	9:00	1.3	294
17/09/03	10:00	1.3	282
17/09/03	11:00	1.8	286
17/09/03	12:00	2.2	276
17/09/03	13:00	1.8	267
17/09/03	14:00	1.8	281
17/09/03	15:00	1.3	284
17/09/03	16:00	0.9	252
17/09/03	17:00	0.9	273
17/09/03	18:00	0.9	313
17/09/03	19:00	2.2	306
17/09/03	20:00	1.3	317
17/09/03	21:00	0.4	321
17/09/03	22:00	2.2	311
17/09/03	23:00	1.3	275
17/09/04	0:00	0.4	269
17/09/04	1:00	0.4	284
17/09/04	2:00	0.4	277
17/09/04	3:00	0.4	185
17/09/04	4:00	0	-
17/09/04	5:00	0.9	259
17/09/04	6:00	3.1	229
17/09/04	7:00	3.6	231
17/09/04	8:00	3.1	226
17/09/04	9:00	4	237
17/09/04	10:00	4	174
17/09/04	11:00	3.6	205
17/09/04	12:00	2.2	251
17/09/04	13:00	1.8	253
17/09/04	14:00	2.2	230
17/09/04	15:00	0.9	276
17/09/04	16:00	0.4	294
17/09/04	17:00	0.9	230
17/09/04	18:00	0.9	130
17/09/04	19:00	0.9	231
17/09/04	20:00	0	-
17/09/04	21:00	0.4	94
17/09/04	22:00	0.4	86
17/09/04	23:00	0.9	65
17/09/06	0:00	0.4	71
17/09/06	1:00	0	-
17/09/06	2:00	0	-
17/09/06	3:00	0.4	65
17/09/06	4:00	0	-
17/09/06	5:00	0	-
17/09/06	6:00	0	-

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/06	7:00	0	-
17/09/06	8:00	0.9	286
17/09/06	9:00	1.3	284
17/09/06	10:00	0.4	223
17/09/06	11:00	0.4	248
17/09/06	12:00	1.3	235
17/09/06	13:00	1.8	226
17/09/06	14:00	1.8	231
17/09/06	15:00	0.9	236
17/09/06	16:00	0.9	170
17/09/06	17:00	1.3	95
17/09/06	18:00	2.2	98
17/09/06	19:00	1.8	88
17/09/06	20:00	0.9	74
17/09/06	21:00	1.8	93
17/09/06	22:00	1.8	89
17/09/06	23:00	0.4	82
17/09/07	0:00	0.4	85
17/09/07	1:00	0.4	5
17/09/07	2:00	0.4	4
17/09/07	3:00	0.4	76
17/09/07	4:00	0	-
17/09/07	5:00	0	-
17/09/07	6:00	0	-
17/09/07	7:00	0	-
17/09/07	8:00	0.4	93
17/09/07	9:00	1.3	95
17/09/07	10:00	1.3	115
17/09/07	11:00	1.3	132
17/09/07	12:00	1.8	96
17/09/07	13:00	1.3	229
17/09/07	14:00	1.3	191
17/09/07	15:00	0.9	316
17/09/07	16:00	0.9	111
17/09/07	17:00	1.8	94
17/09/07	18:00	1.3	93
17/09/07	19:00	0.9	86
17/09/07	20:00	0	-
17/09/07	21:00	0	-
17/09/07	22:00	0	-
17/09/07	23:00	0.4	94
17/09/09	0:00	1.3	92
17/09/09	1:00	1.3	130
17/09/09	2:00	0.4	105
17/09/09	3:00	0	-
17/09/09	4:00	0	-
17/09/09	5:00	0.4	351
17/09/09	6:00	0	-
17/09/09	7:00	0	-
17/09/09	8:00	0.4	77
17/09/09	9:00	0.9	93
17/09/09	10:00	2.7	105
17/09/09	11:00	2.7	94
17/09/09	12:00	2.7	100
17/09/09	13:00	2.2	101

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/09	14:00	1.3	285
17/09/09	15:00	1.3	347
17/09/09	16:00	1.3	93
17/09/09	17:00	1.8	88
17/09/09	18:00	1.8	96
17/09/09	19:00	2.2	91
17/09/09	20:00	1.3	97
17/09/09	21:00	0.9	73
17/09/09	22:00	0.9	76
17/09/09	23:00	0.9	80
17/09/10	0:00	0.4	46
17/09/10	1:00	0.4	43
17/09/10	2:00	0.9	51
17/09/10	3:00	0	-
17/09/10	4:00	0.4	102
17/09/10	5:00	0	-
17/09/10	6:00	0	-
17/09/10	7:00	0	-
17/09/10	8:00	0	-
17/09/10	9:00	0.9	93
17/09/10	10:00	1.3	91
17/09/10	11:00	1.3	88
17/09/10	12:00	0.9	86
17/09/10	13:00	1.3	133
17/09/10	14:00	1.3	261
17/09/10	15:00	1.8	173
17/09/10	16:00	1.8	133
17/09/10	17:00	0.9	141
17/09/10	18:00	1.3	226
17/09/10	19:00	0.9	231
17/09/10	20:00	0.4	184
17/09/10	21:00	1.3	93
17/09/10	22:00	2.7	95
17/09/10	23:00	1.8	87
17/09/12	0:00	0	-
17/09/12	1:00	0.4	322
17/09/12	2:00	0.9	319
17/09/12	3:00	0.9	328
17/09/12	4:00	0.4	334
17/09/12	5:00	0	-
17/09/12	6:00	0.4	317
17/09/12	7:00	1.3	286
17/09/12	8:00	1.8	281
17/09/12	9:00	0.4	274
17/09/12	10:00	1.3	319
17/09/12	11:00	1.3	294
17/09/12	12:00	1.3	265
17/09/12	13:00	1.8	302
17/09/12	14:00	1.8	280
17/09/12	15:00	1.8	299
17/09/12	16:00	2.2	85
17/09/12	17:00	3.1	344
17/09/12	18:00	0.9	94
17/09/12	19:00	0.9	86
17/09/12	20:00	0.4	78

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/12	21:00	0.4	2
17/09/12	22:00	0.4	6
17/09/12	23:00	0.9	94
17/09/15	0:00	2.2	85
17/09/15	1:00	2.2	99
17/09/15	2:00	1.3	90
17/09/15	3:00	0.9	76
17/09/15	4:00	0.9	72
17/09/15	5:00	0.9	70
17/09/15	6:00	0.9	94
17/09/15	7:00	1.3	87
17/09/15	8:00	0.9	88
17/09/15	9:00	1.3	86
17/09/15	10:00	1.3	91
17/09/15	11:00	1.3	87
17/09/15	12:00	1.3	169
17/09/15	13:00	1.8	184
17/09/15	14:00	1.8	224
17/09/15	15:00	2.2	174
17/09/15	16:00	2.7	203
17/09/15	17:00	1.8	212
17/09/15	18:00	0.4	261
17/09/15	19:00	0.4	263
17/09/15	20:00	0.9	311
17/09/15	21:00	0	-
17/09/15	22:00	0	-
17/09/15	23:00	0.4	21
17/09/16	0:00	0.4	17
17/09/16	1:00	0	-
17/09/16	2:00	0	-
17/09/16	3:00	0	-
17/09/16	4:00	0.4	320
17/09/16	5:00	0	-
17/09/16	6:00	0.9	319
17/09/16	7:00	1.3	322
17/09/16	8:00	0.4	317
17/09/16	9:00	1.3	285
17/09/16	10:00	0.9	268
17/09/16	11:00	1.8	220
17/09/16	12:00	1.3	319
17/09/16	13:00	2.2	305
17/09/16	14:00	1.8	274
17/09/16	15:00	1.3	265
17/09/16	16:00	1.3	309
17/09/16	17:00	1.8	314
17/09/16	18:00	1.3	326
17/09/16	19:00	0.9	327
17/09/16	20:00	0.9	284
17/09/16	21:00	0.4	317
17/09/16	22:00	0.9	331
17/09/16	23:00	0.4	326
17/09/18	0:00	0.4	64
17/09/18	1:00	0.4	51
17/09/18	2:00	0	-
17/09/18	3:00	0	-

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/18	4:00	0	-
17/09/18	5:00	0	-
17/09/18	6:00	0	-
17/09/18	7:00	0	-
17/09/18	8:00	0.9	98
17/09/18	9:00	1.3	115
17/09/18	10:00	1.8	91
17/09/18	11:00	2.2	121
17/09/18	12:00	3.1	136
17/09/18	13:00	3.1	141
17/09/18	14:00	3.6	128
17/09/18	15:00	3.6	111
17/09/18	16:00	3.6	137
17/09/18	17:00	4	142
17/09/18	18:00	3.1	15
17/09/18	19:00	3.6	124
17/09/18	20:00	3.1	117
17/09/18	21:00	3.6	113
17/09/18	22:00	4	125
17/09/18	23:00	3.6	110
17/09/21	0:00	2.2	94
17/09/21	1:00	1.8	96
17/09/21	2:00	0.4	88
17/09/21	3:00	0.4	87
17/09/21	4:00	0.9	83
17/09/21	5:00	0	-
17/09/21	6:00	0	-
17/09/21	7:00	0	-
17/09/21	8:00	0.4	94
17/09/21	9:00	0.9	92
17/09/21	10:00	0.9	119
17/09/21	11:00	2.2	163
17/09/21	12:00	1.3	170
17/09/21	13:00	1.8	126
17/09/21	14:00	1.3	136
17/09/21	15:00	1.3	141
17/09/21	16:00	2.2	115
17/09/21	17:00	3.1	120
17/09/21	18:00	4	138
17/09/21	19:00	2.7	117
17/09/21	20:00	2.2	131
17/09/21	21:00	0.9	110
17/09/21	22:00	0.4	346
17/09/21	23:00	1.3	93
17/09/22	0:00	0.9	91
17/09/22	1:00	2.2	92
17/09/22	2:00	1.8	84
17/09/22	3:00	1.3	88
17/09/22	4:00	0	-
17/09/22	5:00	0.4	91
17/09/22	6:00	0	-
17/09/22	7:00	0.4	74
17/09/22	8:00	2.2	92
17/09/22	9:00	0.9	98
17/09/22	10:00	0.4	345
17/09/22	11:00	0.9	351

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/22	12:00	1.8	126
17/09/22	13:00	1.8	167
17/09/22	14:00	3.1	92
17/09/22	15:00	3.6	105
17/09/22	16:00	3.6	103
17/09/22	17:00	4	104
17/09/22	18:00	4	116
17/09/22	19:00	4	109
17/09/22	20:00	3.1	94
17/09/22	21:00	1.8	95
17/09/22	22:00	1.8	88
17/09/22	23:00	1.8	92
17/09/24	0:00	0.9	12
17/09/24	1:00	0.9	50
17/09/24	2:00	1.3	73
17/09/24	3:00	1.8	68
17/09/24	4:00	0.9	74
17/09/24	5:00	1.3	55
17/09/24	6:00	2.2	67
17/09/24	7:00	2.2	95
17/09/24	8:00	1.3	78
17/09/24	9:00	3.1	96
17/09/24	10:00	4.9	87
17/09/24	11:00	5.4	91
17/09/24	12:00	4	93
17/09/24	13:00	4.9	84
17/09/24	14:00	5.8	87
17/09/24	15:00	6.3	86
17/09/24	16:00	6.7	92
17/09/24	17:00	5.4	91
17/09/24	18:00	5.4	87
17/09/24	19:00	5.8	99
17/09/24	20:00	5.4	94
17/09/24	21:00	5.4	86
17/09/24	22:00	4.9	100
17/09/24	23:00	4.9	84
17/09/25	0:00	4.9	92
17/09/25	1:00	5.4	75
17/09/25	2:00	4.9	90
17/09/25	3:00	4.5	69
17/09/25	4:00	3.1	97
17/09/25	5:00	4.5	68
17/09/25	6:00	2.2	123
17/09/25	7:00	2.7	75
17/09/25	8:00	2.2	135
17/09/25	9:00	2.7	134
17/09/25	10:00	3.1	140
17/09/25	11:00	3.6	72
17/09/25	12:00	3.6	75
17/09/25	13:00	4	139
17/09/25	14:00	4	71
17/09/25	15:00	4.5	138
17/09/25	16:00	4.5	129
17/09/25	17:00	3.6	142
17/09/25	18:00	3.1	133
17/09/25	19:00	3.1	137
17/09/25	20:00	3.6	72

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/25	21:00	3.1	63
17/09/25	22:00	3.6	65
17/09/25	23:00	3.6	75
17/09/27	0:00	0.4	93
17/09/27	1:00	0	-
17/09/27	2:00	0	-
17/09/27	3:00	0.4	19
17/09/27	4:00	0.9	4
17/09/27	5:00	1.3	325
17/09/27	6:00	1.3	319
17/09/27	7:00	0.9	322
17/09/27	8:00	0.9	324
17/09/27	9:00	0.9	114
17/09/27	10:00	1.3	103
17/09/27	11:00	1.3	289
17/09/27	12:00	1.3	275
17/09/27	13:00	1.3	259
17/09/27	14:00	1.3	231
17/09/27	15:00	1.8	201
17/09/27	16:00	1.8	226
17/09/27	17:00	1.3	235
17/09/27	18:00	1.8	95
17/09/27	19:00	2.2	98
17/09/27	20:00	2.2	88
17/09/27	21:00	2.2	86
17/09/27	22:00	1.8	65
17/09/27	23:00	1.3	84
17/09/28	0:00	1.3	92
17/09/28	1:00	0.4	46
17/09/28	2:00	0.4	74
17/09/28	3:00	0.4	94
17/09/28	4:00	0	-
17/09/28	5:00	0.4	12
17/09/28	6:00	0.9	8
17/09/28	7:00	0.4	350
17/09/28	8:00	0	-
17/09/28	9:00	0.9	205
17/09/28	10:00	1.3	230
17/09/28	11:00	2.2	232
17/09/28	12:00	1.8	226
17/09/28	13:00	1.3	237
17/09/28	14:00	1.3	226
17/09/28	15:00	1.3	239
17/09/28	16:00	2.2	105
17/09/28	17:00	3.1	135
17/09/28	18:00	2.7	140
17/09/28	19:00	2.2	95
17/09/28	20:00	1.8	87
17/09/28	21:00	2.2	92
17/09/28	22:00	2.7	88
17/09/28	23:00	2.2	87
17/09/30	0:00	4.5	96
17/09/30	1:00	2.2	48
17/09/30	2:00	2.7	93
17/09/30	3:00	4	87
17/09/30	4:00	4	82
17/09/30	5:00	2.2	88

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/09/30	6:00	1.8	48
17/09/30	9:00	0.2	49
17/09/30	10:00	0.2	50
17/09/30	11:00	0.2	52
17/09/30	12:00	0.2	60
17/09/30	13:00	0.2	65
17/09/30	14:00	0.2	63
17/09/30	15:00	0.2	66
17/09/30	16:00	0.2	61
17/09/30	17:00	0.2	65
17/09/30	18:00	0.2	70
17/09/30	19:00	0.2	82
17/09/30	20:00	0.2	88
17/09/30	21:00	0.2	89
17/09/30	22:00	0.2	84
17/09/30	23:00	0.2	92
17/10/01	0:00	0.2	105
17/10/01	1:00	0.5	111
17/10/01	2:00	0.2	106
17/10/01	3:00	0.3	121
17/10/01	4:00	0.2	115
17/10/01	5:00	0.2	113
17/10/01	6:00	0.3	104
17/10/01	7:00	0.2	131
17/10/01	8:00	0.4	125
17/10/01	9:00	0.2	156
17/10/01	10:00	0.2	184
17/10/01	11:00	0.2	192
17/10/01	12:00	0.2	187
17/10/01	13:00	0.3	165
17/10/01	14:00	0.2	192
17/10/01	15:00	0.2	177
17/10/01	16:00	0.2	185
17/10/01	17:00	0.1	232
17/10/01	18:00	0.2	232
17/10/01	19:00	0.2	340
17/10/01	20:00	0.2	351
17/10/01	21:00	0.2	268
17/10/01	22:00	0.2	227
17/10/01	23:00	0.2	248

Appendix I

Impact Dolphin Monitoring Survey

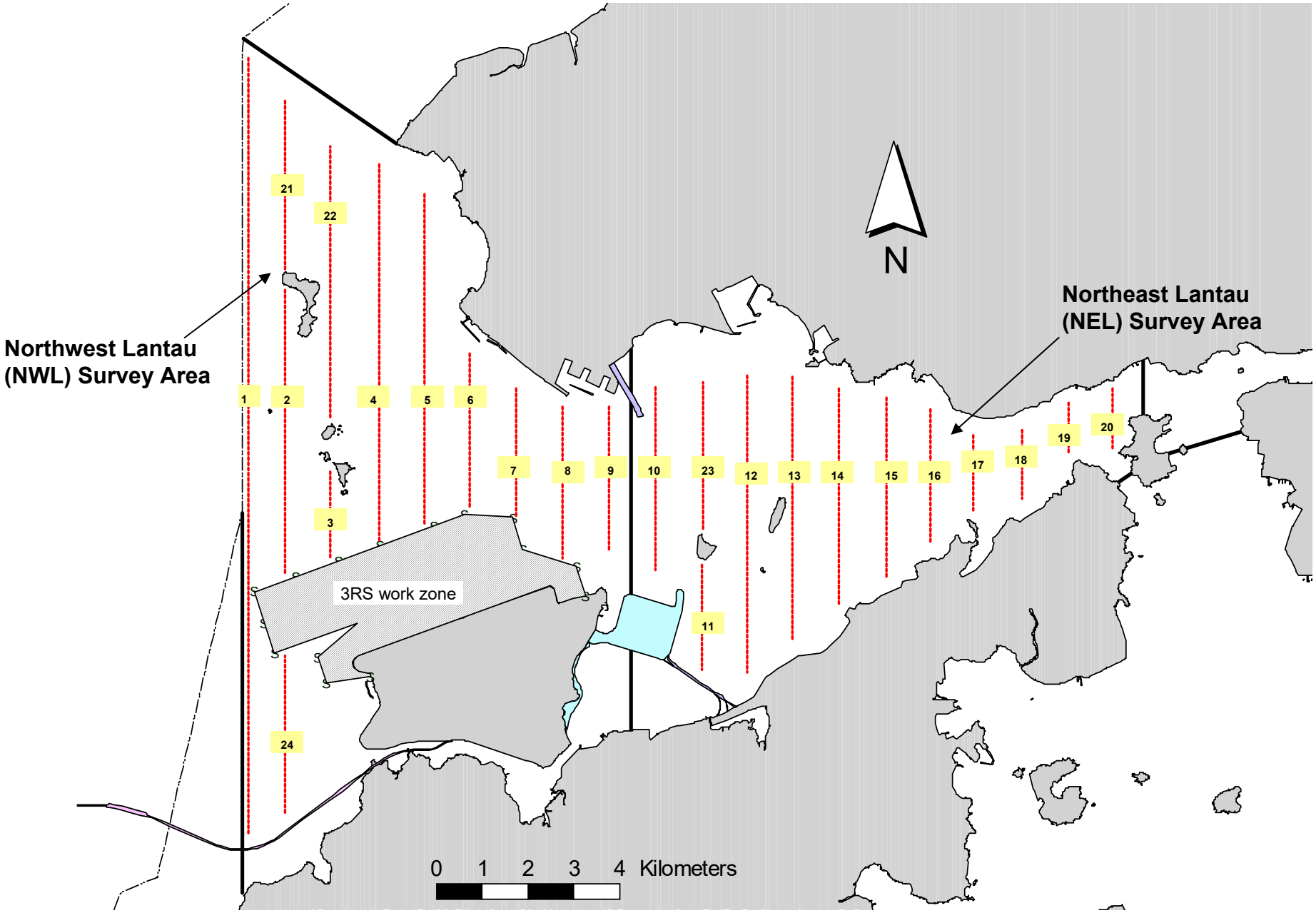

Figure 1. Transect Line Layout in Northwest and Northeast Lantau Survey Areas

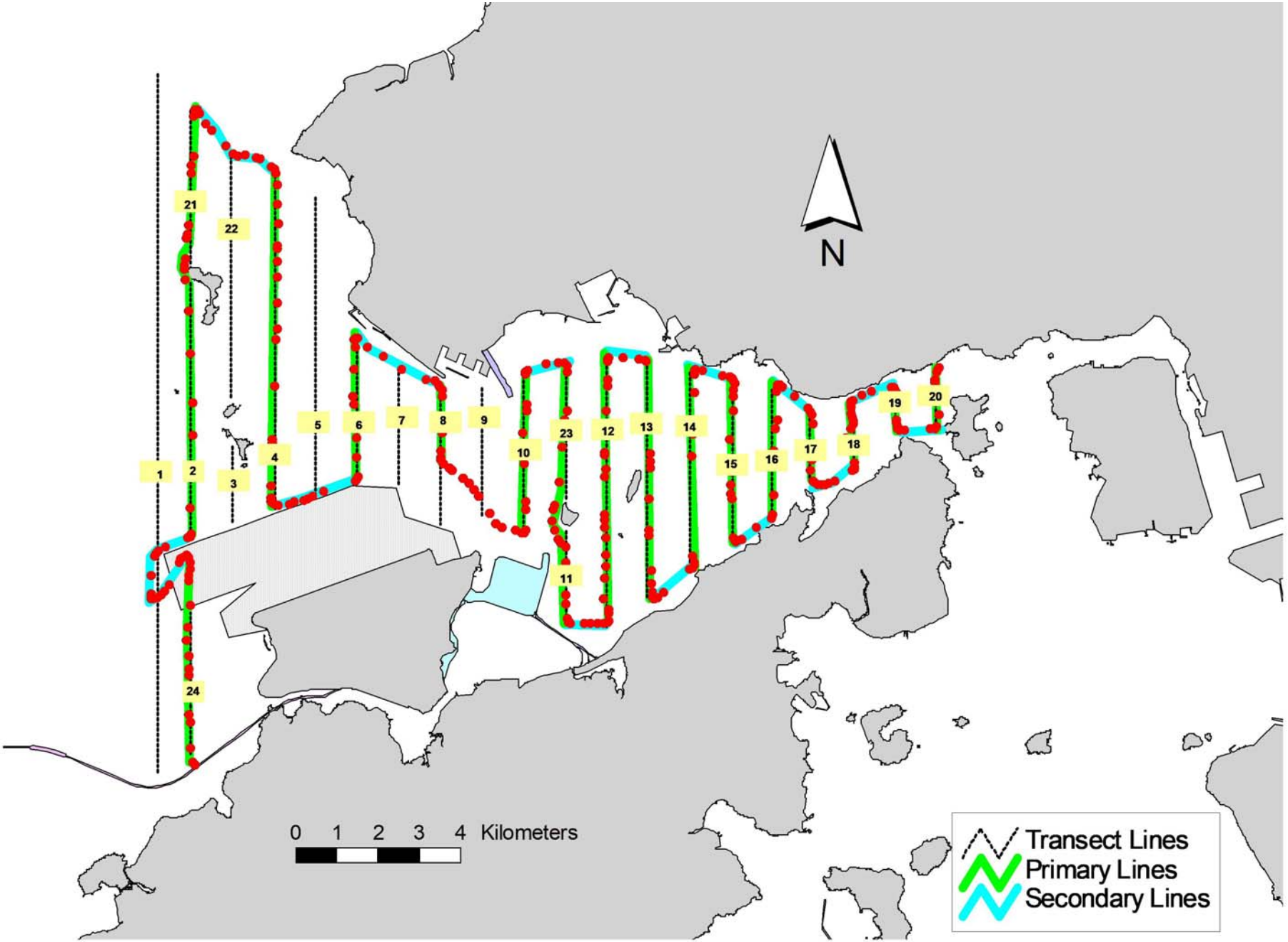

Figure 2. Survey Route on September 15th, 2017 (from HKLR03 project)

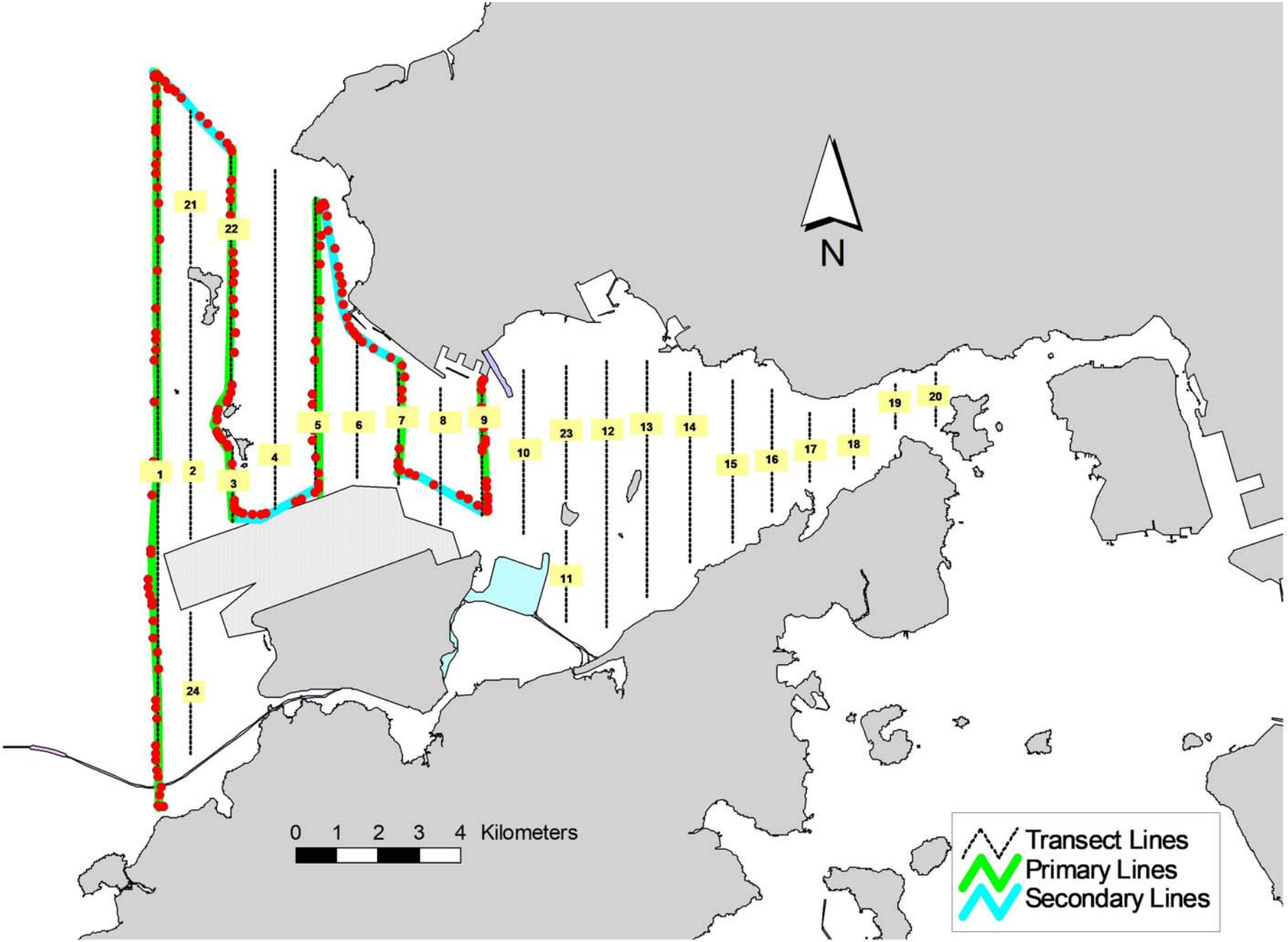

Figure 3. Survey Route on September 18th, 2017 (from HKLR03 project)

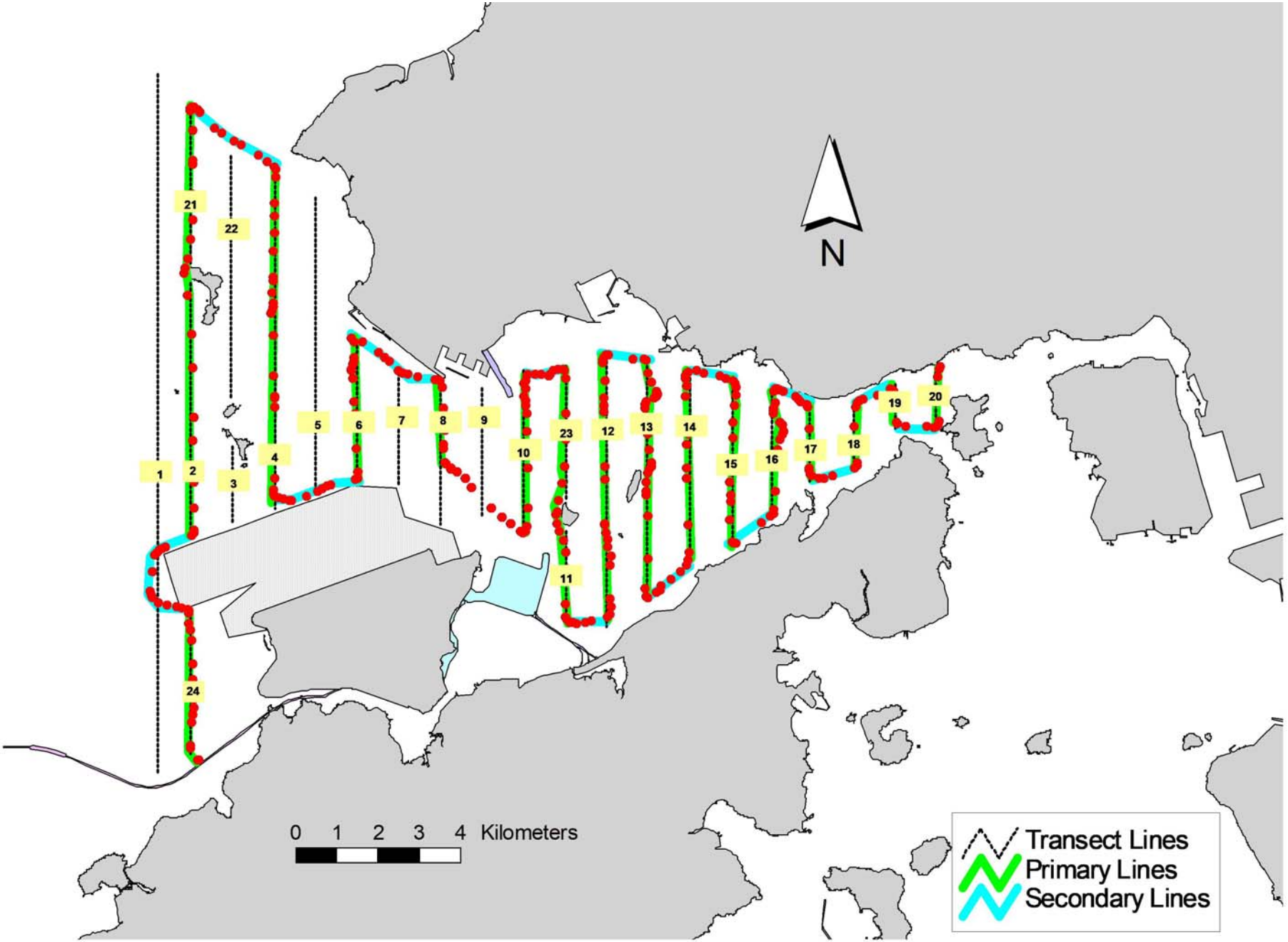

Figure 4. Survey Route on September 22nd, 2017 (from HKLR03 project)

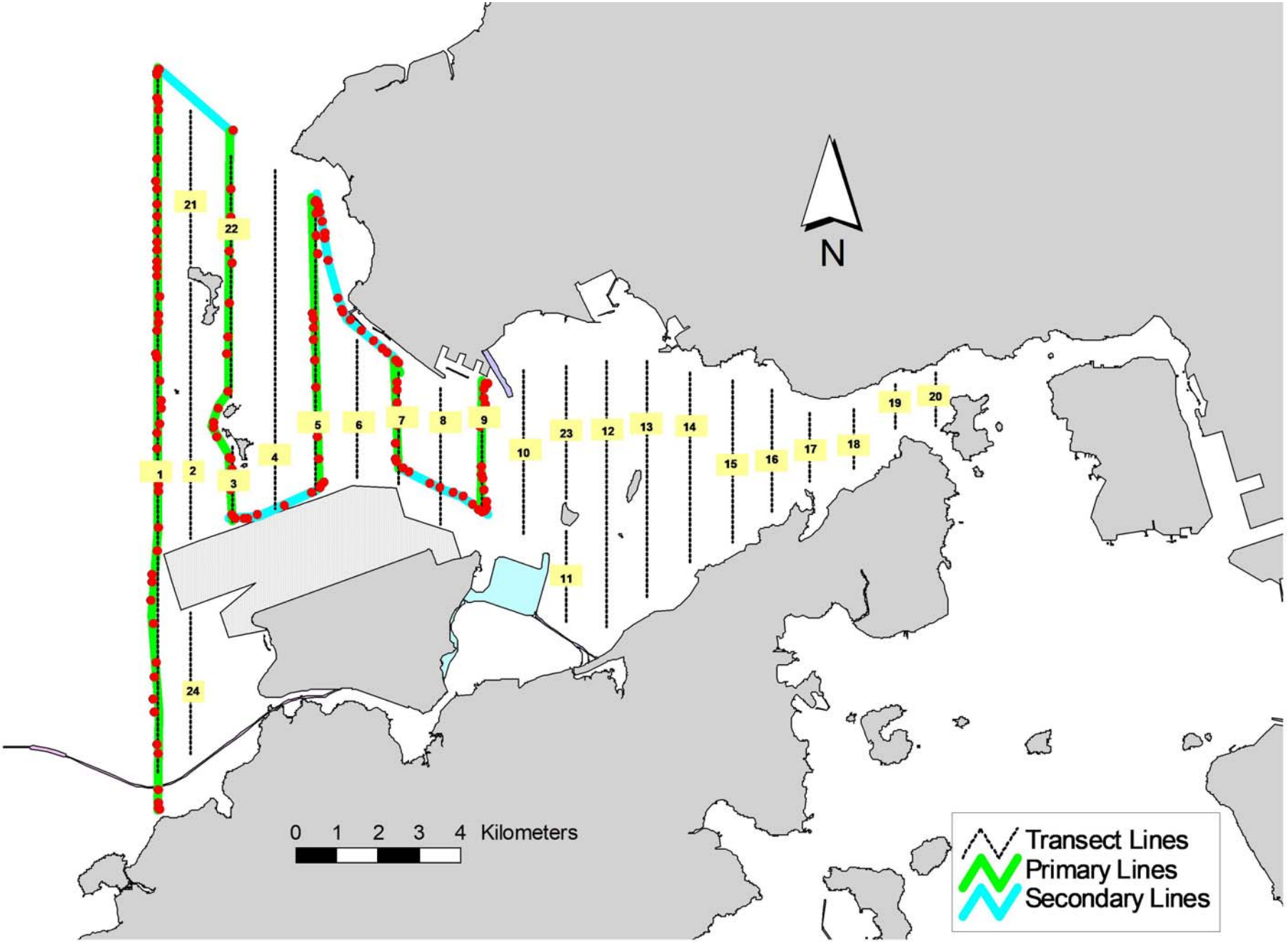

Figure 5. Survey Route on September 29th, 2017 (from HKLR03 project)

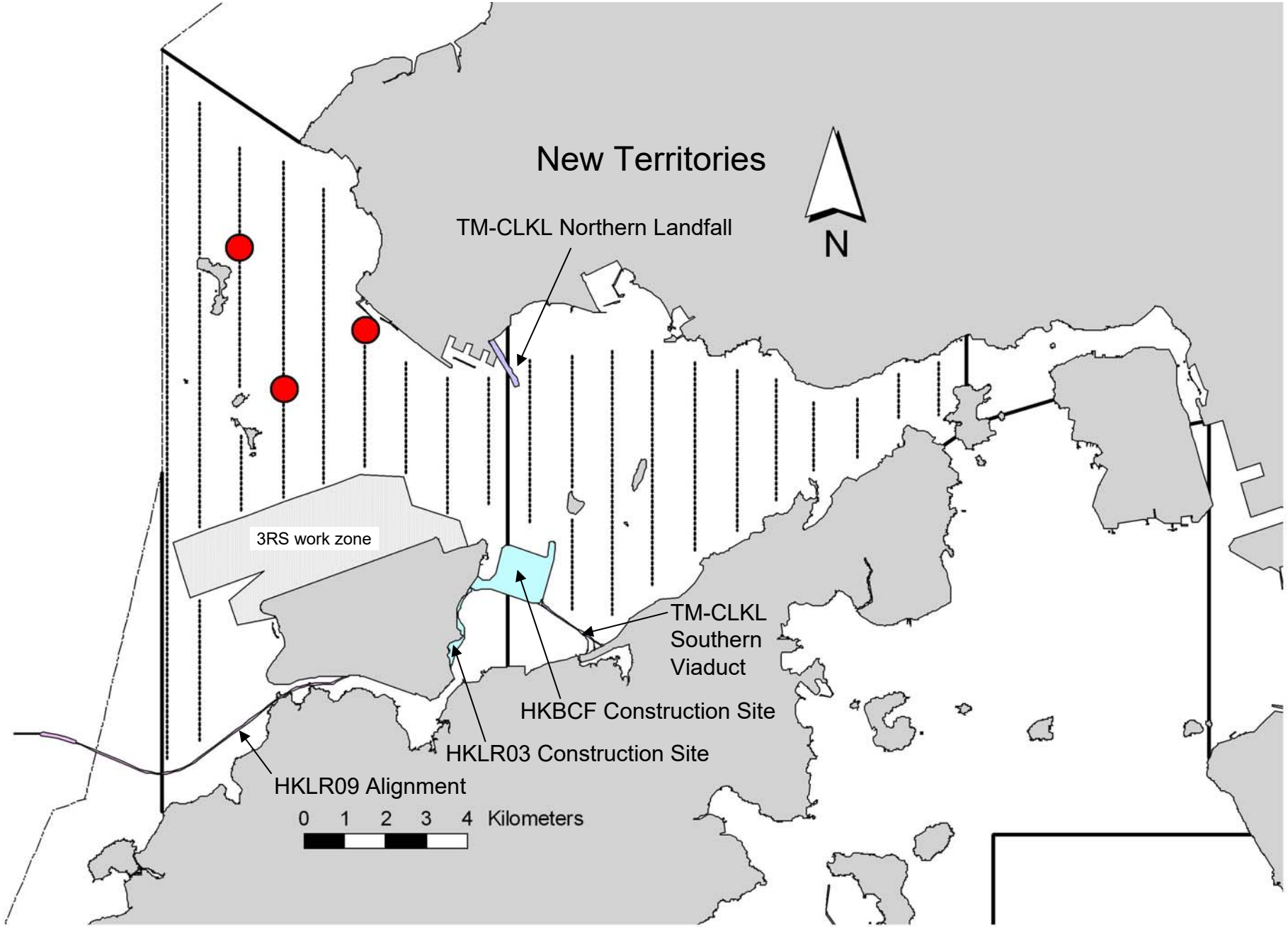

Figure 6. Distribution of Chinese White Dolphin Sightings during September 2017 HKLR03 Monitoring Surveys

Appendix I. HKLR03 Survey Effort Database (September 2017)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
15-Sep-17	NW LANTAU	2	26.51	AUTUMN	STANDARD36826	HKLR	P
15-Sep-17	NW LANTAU	2	10.09	AUTUMN	STANDARD36826	HKLR	S
15-Sep-17	NW LANTAU	3	1.20	AUTUMN	STANDARD36826	HKLR	S
15-Sep-17	NE LANTAU	2	34.49	AUTUMN	STANDARD36826	HKLR	P
15-Sep-17	NE LANTAU	3	2.20	AUTUMN	STANDARD36826	HKLR	P
15-Sep-17	NE LANTAU	2	12.01	AUTUMN	STANDARD36826	HKLR	S
18-Sep-17	NW LANTAU	2	28.84	AUTUMN	STANDARD36826	HKLR	P
18-Sep-17	NW LANTAU	3	7.20	AUTUMN	STANDARD36826	HKLR	P
18-Sep-17	NW LANTAU	2	12.96	AUTUMN	STANDARD36826	HKLR	S
22-Sep-17	NW LANTAU	1	6.05	AUTUMN	STANDARD36826	HKLR	P
22-Sep-17	NW LANTAU	2	18.48	AUTUMN	STANDARD36826	HKLR	P
22-Sep-17	NW LANTAU	3	0.56	AUTUMN	STANDARD36826	HKLR	P
22-Sep-17	NW LANTAU	1	1.58	AUTUMN	STANDARD36826	HKLR	S
22-Sep-17	NW LANTAU	2	9.25	AUTUMN	STANDARD36826	HKLR	S
22-Sep-17	NE LANTAU	2	4.68	AUTUMN	STANDARD36826	HKLR	P
22-Sep-17	NE LANTAU	3	31.06	AUTUMN	STANDARD36826	HKLR	P
22-Sep-17	NE LANTAU	2	3.30	AUTUMN	STANDARD36826	HKLR	S
22-Sep-17	NE LANTAU	3	9.06	AUTUMN	STANDARD36826	HKLR	S
29-Sep-17	NW LANTAU	1	3.40	AUTUMN	STANDARD36826	HKLR	P
29-Sep-17	NW LANTAU	2	13.70	AUTUMN	STANDARD36826	HKLR	P
29-Sep-17	NW LANTAU	3	12.90	AUTUMN	STANDARD36826	HKLR	P
29-Sep-17	NW LANTAU	4	5.60	AUTUMN	STANDARD36826	HKLR	P
29-Sep-17	NW LANTAU	2	1.15	AUTUMN	STANDARD36826	HKLR	S
29-Sep-17	NW LANTAU	3	10.06	AUTUMN	STANDARD36826	HKLR	S

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

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

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
22-Sep-17	1	1152	6	NW LANTAU	2	320	ON	HKLR	823991	807501	AUTUMN	NONE	P
22-Sep-17	2	1244	3	NW LANTAU	1	250	ON	HKLR	825349	809502	AUTUMN	NONE	P
29-Sep-17	1	1309	2	NW LANTAU	4	140	ON	HKLR	827215	806416	AUTUMN	NONE	P

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

ID#	DATE	STG#	AREA
NL46	22/09/17	1	NW LANTAU
NL49	22/09/17	1	NW LANTAU
NL123	22/09/17	1	NW LANTAU
NL202	22/09/17	2	NW LANTAU
	29/09/17	1	NW LANTAU
NL242	22/09/17	1	NW LANTAU
NL286	22/09/17	2	NW LANTAU
	29/09/17	1	NW LANTAU
NL296	22/09/17	1	NW LANTAU
WL05	22/09/17	1	NW LANTAU

Appendix IV. Photographs of Identified Individual Dolphins in September 2017 (HKLR03)

Appendix IV. (cont'd)

Appendix J

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 K

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

Table K1 *Cumulative Statistics on Exceedances*

Parameters	Level of Exceedance	Total No. recorded in this reporting month	Total No. recorded since project commencement
1-hr TSP	Action	6	40
	Limit	1	3
24-hr TSP	Action	0	5
	Limit	0	1
Water Quality	Action	0	6
	Limit	0	1
Impact Dolphin Monitoring	Action	0	9
	Limit	0	9

Table K2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Month (September 2017)	0	0	0
Total No. received since project commencement	14	1	0

Email message

Environmental Resources Management

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

To	Ramboll Environ - Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Air Quality Impact Monitoring
Date	22 August 2017

ERM

Dear Sir or Madam,

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

0212330_22August2017_1hrTSP_Station ASR1

One Action Level Exceedance was recorded on 22 August 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_22August2017_1hrTSP_Station ASR1** **[Total No. of Exceedances = 1]**	
Date	22 August 2017 (Measured) 1 September 2017 (Laboratory results received by ERM)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10 and AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	24-hr TSP (µg/m³)	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214
	1-hr TSP (µg/m³)	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337
Limit Levels	1-hr TSP (µg/m³)	500
	24-hr TSP (µg/m³)	260
Measured Levels	Action Level Exceedance for 1-hr TSP is observed at ASR1 (360 µg/m³) during 1505 - 1605 hrs.	
Works Undertaken (at the time of monitoring event)	On 22 August 2017, no construction works was carried out as Typhoon Hato was approaching and The Hong Kong Observatory expected to issue T8 signal soon.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance is unlikely to be due to the Project, in view of the following: • According to the construction information provided by the Contractor, all construction works has been stopped by the time of recorded exceedance. Typhoon Hato was approaching and T8 signal was expected to be issued later.	
Actions Taken / To Be Taken	Based on the record of weekly site inspection on 24 August 2017 and contractor's photo record on 22 August 2017, no dust nuisance was recorded at the Northern Landfall and activities conducted in this Contract's work have strictly followed the requirements stated in the EP (EP-354/2009/D). In addition, the Contractor has implemented the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual including watering to maintain all exposed road surfaces and dust sources wet, use of wheel washing facilities, use of sprinklers for water spraying, materials having the potential to create dust covered by a clean tarpaulin, use of water truck and watering on all exposed soil within the Project site) throughout the construction period, no additional mitigation is deemed necessary. Photo record is provided in *Annex A*. Weekly water spraying record is also provided. The Enhanced TSP Monitoring has commenced on 24 October 2014, the ET will monitor for future trends in exceedances.	

Remarks	The monitoring results and the locations of air quality monitoring stations are attached. The exceedance is considered not related to this Contract as there was no construction works during the time of recorded exceedance. Materials having the potential to create dust were also covered by tarpaulin sheets. However, the Contractor has also been reminded to adhere strictly to implement all relevant dust mitigation measures recommended or specified in the EP (EP-354/2009/D), the approved EIA and the Updated EM&A Manual of this Project to avoid causing dust nuisance.

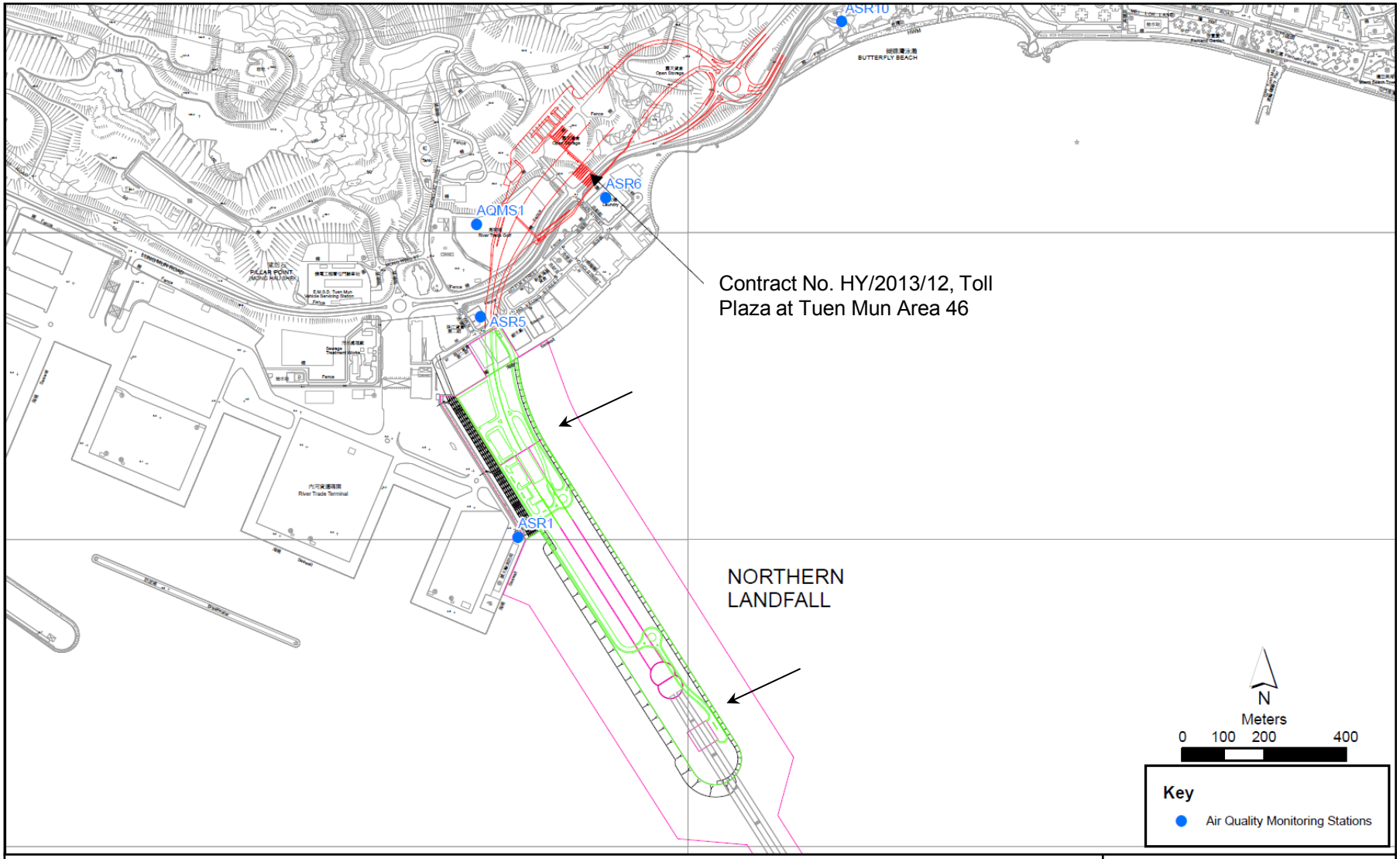

Figure 1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

DATE: 06/03/2013

Environmental Resources Management

ERM

ERM

Annex A Photo Records provided by the Contractor

*Note: Photos taken on 22/8/2017

Water spraying was applied frequently during dry conditions.(Works Area Portion N-A)

No dust nuisance was observed. (Works Area Portion N-A)

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Annex A Photo Records provided by the Contractor

*Note: Photos taken on 22/8/2017

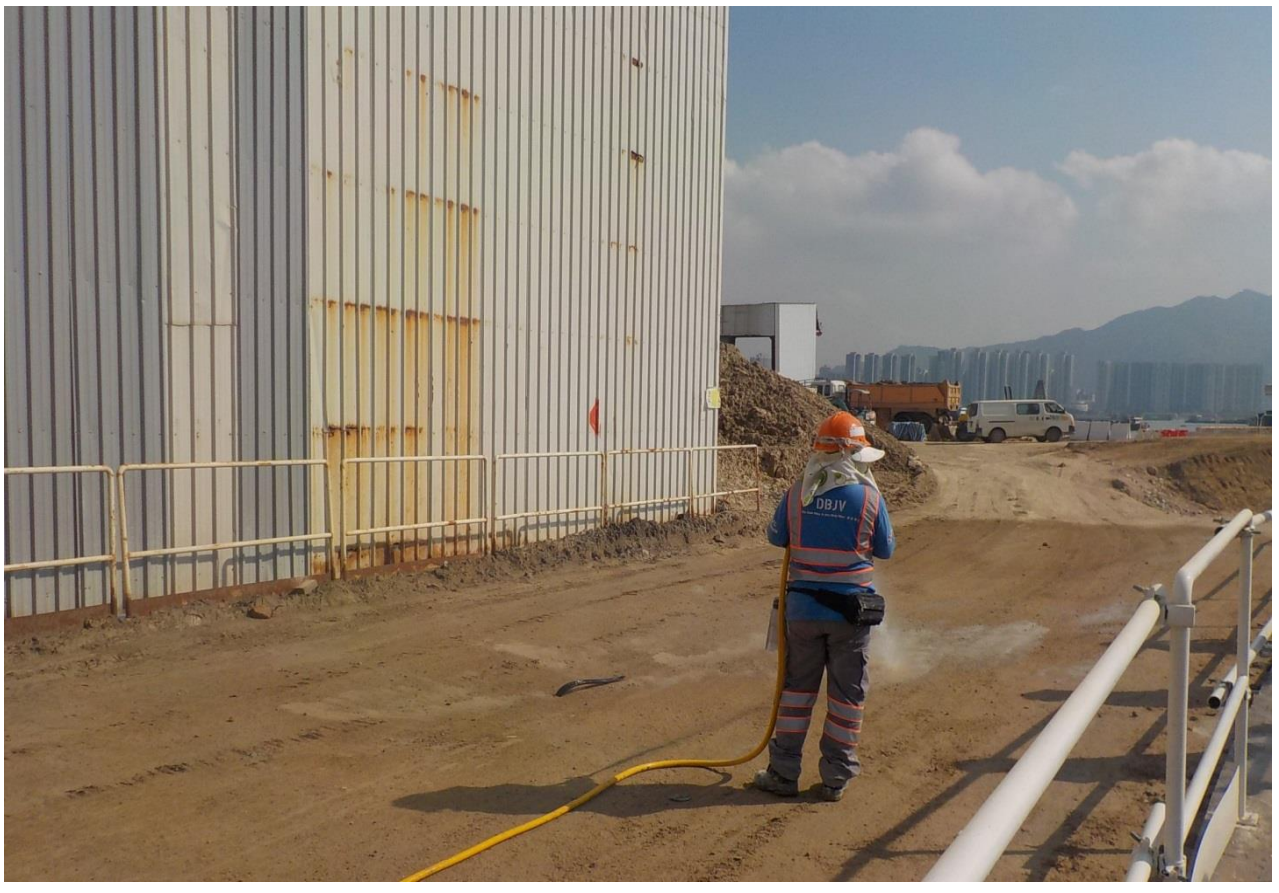
Cement bags are covered by tarpaulin sheets. (Works Area Portion N-A)

Use of water truck for water spraying. (Works Area Portion N-A)

ERM

Annex A Photo Records provided by the Contractor

*Note: Photos taken on 22/8/2017



Watering on all exposed soil within the site. (Works Area Portion N-B)

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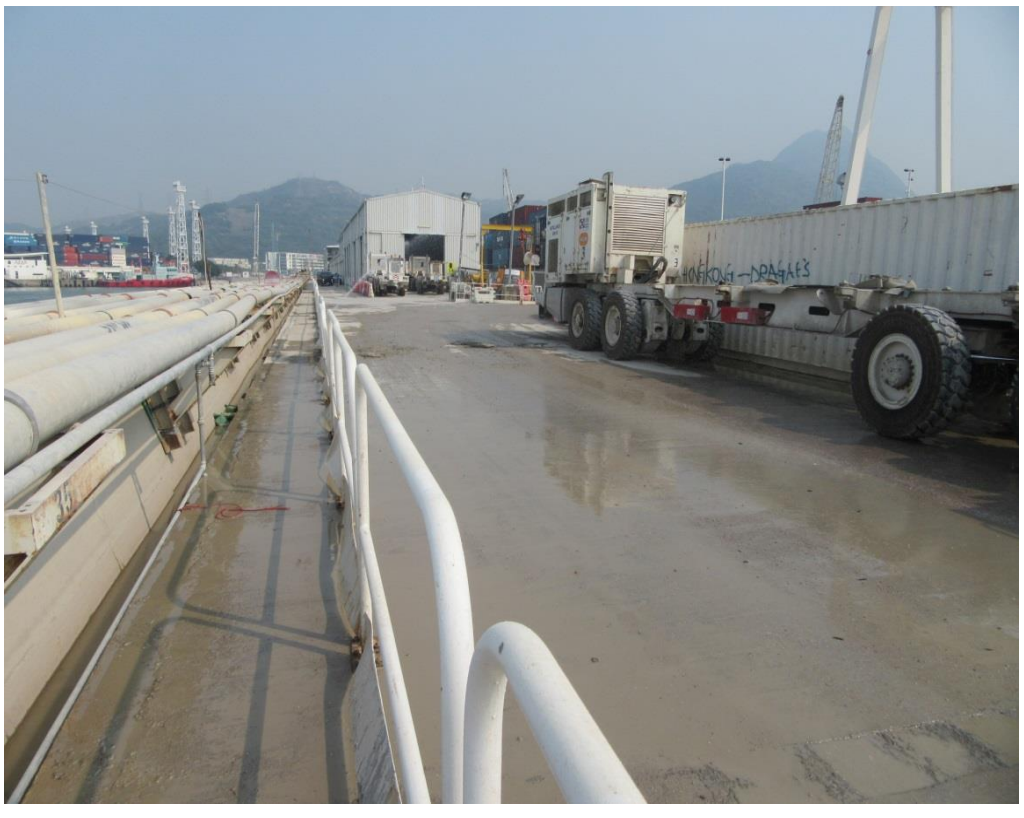
Annex A Photo Records taken during Weekly Site Inspection

*Note: Photos taken on 24/8/2017

Water spraying was applied frequently during dry conditions.(Works Area Portion N-B)



Sprinklers are installed for water spraying. (Works Area Portion N-C)

Dragages Hong Kong 香港寶嘉 Dragages · Bouygues Joint Venture	Contract No. HY/2012/08 Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section	**Weekly Water Spraying Record** **每週灑水檢查記錄**

Site Location 地盤位置: Northern Landfall

Date 日期: 21-Aug-2017 to 至 27-Aug-2017

	Time 時間	Monday 星期一	Tuesday 星期二	Wednesday 星期三	Thursday 星期四	Friday 星期五	Saturday 星期六	Sunday 星期日
1	8:00 – 8:45	✓	✓	typhoon	✓	✓	✓	✓
2	8:45 – 9:30	✓	✓		✓	✓	✓	✓
3	9:30 – 10:15	✓	✓		✓	✓	✓	✓
4	10:15 – 11:00	✓	✓		✓	✓	✓	✓
5	11:00 – 11:45	✓	✓		✓	✓	✓	✓
6	11:45 – 12:30	✓	✓	heavy rain	✓	✓	✓	✓
7	12:30 – 13:15	✓	✓		✓	✓	✓	✓
8	13:15 – 14:00	✓	✓		✓	✓	✓	✓
9	14:00 – 14:45	✓	✓		✓	✓	✓	✓
10	14:45 – 15:30	✓	✓		✓	✓	✓	✓
11	15:30 – 16:45	✓	✓		✓	✓	✓	✓
12	16:45 – 17:30	✓	✓		✓	✓	✓	✓
	Verified by Site Foreman 地盤科文簽署確認	✓	✓	✓	✓	✓	✓	✓

Night shift 夜間工作 (if necessary 如需要)								
	17:30 – 19:00							
	19:00 – 20:30							
	20:30 – 22:00							
	22:00 – 23:00							

*Please - tick (√) in the box if complete the spraying of water.
circle (O) in the box if it is raining.

*如果 - 已經完成灑水, 請於方格內加上剔號(√)。
是下雨天, 請於方格內加上圓圈(O)。

Remarks:

(1) Pursuant to EP Clause 3.15, the Permit Holder shall undertake watering at least 12 times per day on all exposed soil within the Project site and associated work areas in Tuen Mun area throughout the construction phase.
(2) Spraying position includes the main haul road, open area, slopes, stockpiles and any other dusty materials.
(3) If it is raining, no water spraying is needed.
(4) The no of spraying will be increased due to site condition.

備註:

(1) 根據環境許可證 3.15 條例，在整個施工階段內，許可證持有人須每天至少 12 次在屯門區項目工地和相關的工作區域內的所有暴露土壤灑水。
(2) 灑水位置包括主要運輸道路，空曠地帶，斜坡，存料堆，以及任何其他產生塵埃物料。
(3) 當下雨時，地盤將不需要灑水。
(4) 如果地盤情況更改或有需要時，灑水次數會相應增加。

TMCLKL	HY/2012/08	2017-08-22	AQMS1	Sunny	14:14	1-hour TSP	176	ug/m3
TMCLKL	HY/2012/08	2017-08-22	AQMS1	Sunny	15:16	1-hour TSP	202	ug/m3
TMCLKL	HY/2012/08	2017-08-22	AQMS1	Rainy	16:18	1-hour TSP	88	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR1	Sunny	14:03	1-hour TSP	155	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR1	Sunny	15:05	1-hour TSP	360	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR1	Rainy	16:07	1-hour TSP	331	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR10	Sunny	13:29	1-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR10	Sunny	14:31	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR10	Rainy	15:33	1-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR5	Sunny	13:52	1-hour TSP	195	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR5	Sunny	14:54	1-hour TSP	269	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR5	Rainy	15:56	1-hour TSP	278	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR6	Sunny	13:40	1-hour TSP	181	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR6	Sunny	14:42	1-hour TSP	247	ug/m3
TMCLKL	HY/2012/08	2017-08-22	ASR6	Rainy	15:44	1-hour TSP	290	ug/m3

Appendix L

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 September 2017 [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	1097.465	0.000	0.000	0.000	1097.465
Jan-2017	60.781	0.000	0.000	0.000	60.781
Feb-2017	17.367	0.000	0.000	0.000	17.367
Mar-2017	7.508	0.000	0.000	0.000	7.508
Apr-2017	15.603	0.000	0.000	0.000	15.603
May-2017	12.358	0.000	0.000	0.000	12.358
Jun-2017	0.194	0.000	0.000	0.000	0.194
Half Year Sub-total	113.811	0.000	0.000	0.000	113.811
Jul-2017	0.652	0.000	0.000	0.000	0.652
Aug-2017	1.624	0.000	0.000	0.000	1.624
Sep-2017	0.886	0.000	0.000	0.000	0.886
Oct-2017					
Nov-2017					
Dec-2017					
Project Total Quantities	1214.438	0.000	0.000	0.000	1214.438

Month	**Actual Quantities of Non-inert Construction Waste Generated Monthly**								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	1.850	1.850	3.150	3.150	6.870	6.870	9.450	9.450	4.935
Jan-2017	0.000	0.000	0.000	0.000	0.000	0.000	3.400	3.400	0.257
Feb-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.340
Mar-2017	0.000	0.000	0.000	0.000	0.000	0.000	6.100	6.100	0.286
Apr-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.237
May-2017	0.000	0.000	0.000	0.000	0.000	0.000	10.400	10.400	0.300
Jun-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317
Half Year Sub-total	0.000	0.000	0.200	0.200	0.000	0.000	19.900	19.900	1.737
Jul-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.272
Aug-2017	141.990	141.990	0.200	0.200	0.000	0.000	0.000	0.000	0.305
Sep-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.300
Oct-2017									
Nov-2017									
Dec-2017									
Project Total Quantities	143.840	143.840	3.950	3.950	6.870	6.870	29.350	29.350	7.549

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)
20.000	0.000	0.000	0.000	20.000

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 '000 ton)
0.000	0.000	0.000	0.000	0.100

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