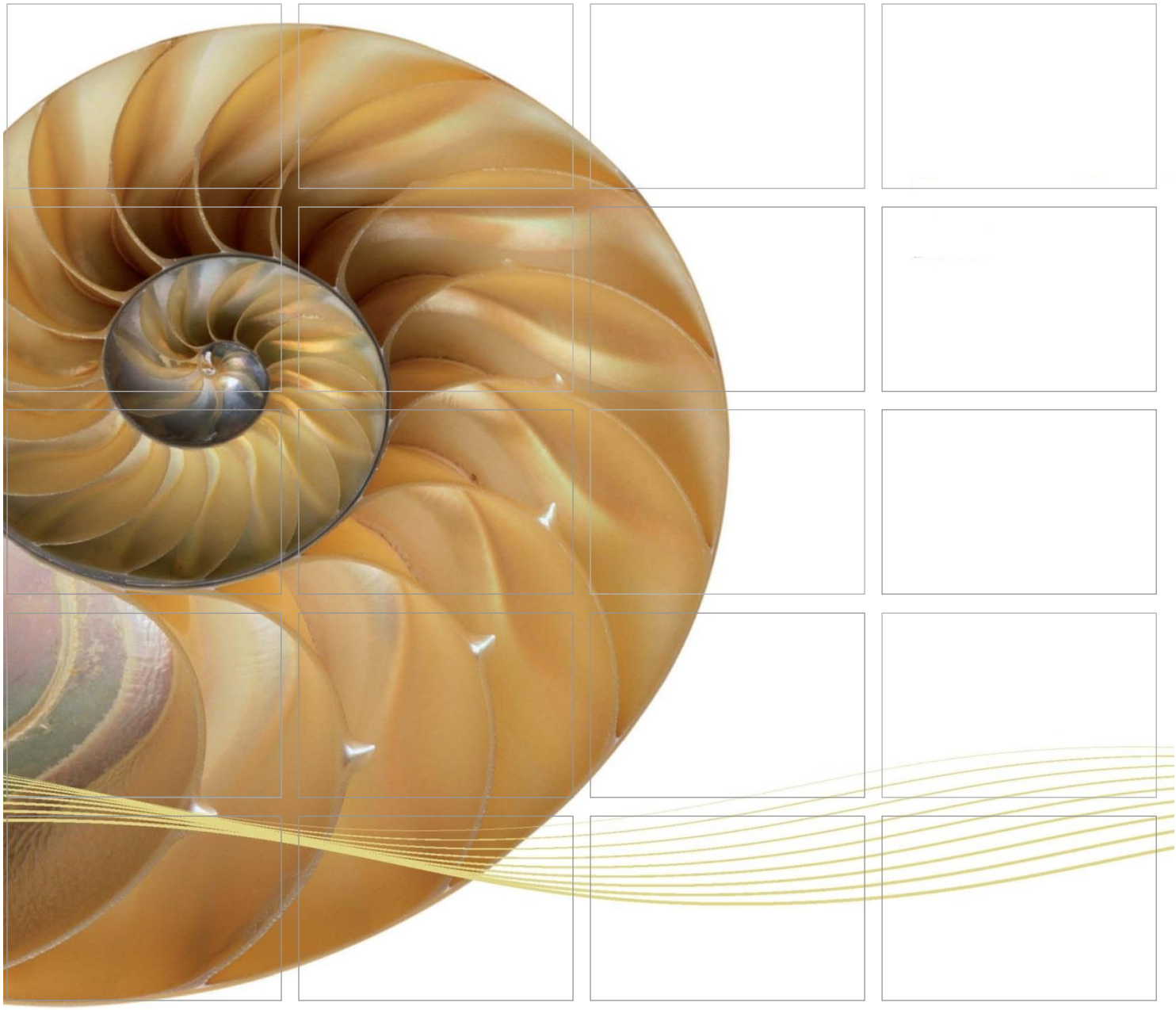
Report



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

Sixty-first Monthly Environmental Monitoring & Audit (EM&A) Report

14 December 2018

Environmental Resources Management
2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone 2271 3000
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The business of sustainability

RAMBOLL

Ref.: HYDHZMBEEM00_0_7064L.18 14 December 2018

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
61st Monthly EM&A Report for November 2018 (EP-354/2009/D)

Reference is made to the Monthly Environmental Monitoring and Audit (EM&A) Report (Nov. 2018) (ET's ref.: "*0212330_61st Monthly EM&A_20181121.doc*" dated 14 Dec. 2018) certified by the ET Leader and provided to us via e-mail on 14 Dec. 2018.

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. Tony Pang (By Fax: 3188 6614)
AECOM – Mr. Conrad Ng (By Fax: 3922 9797)
ERM – Dr. Jasmine Ng (By Fax: 2723 5660)
Dragages – Bouygues JV - Mr. Bryan Lee (By Fax: 2293 7499)

Internal: DY, YH, DF, ENPO Site

Q:\Projects\HYDHZMBEEM00\02_Proj_Mgt\02_Corr\2018\HYDHZMBEEM00_0_7064L.18.docx

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

Sixty-first Monthly Environmental Monitoring & Audit (EM&A) Report

Document Code: 0212330_61st Monthly EM&A_20181214.doc

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Client:	Project No:
DBJV	0212330

Summary:

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

Date: 14 December 2018

Approved by:

Mr Craig Reid
Partner

Certified by:

Dr Jasmine Ng
ET Leader

Revision	Description	By	Checked	Approved	Date
	61st Monthly EM&A Report	VAR	JN	CAR	14/12/18

Distribution

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☒ Public

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ISO 9001 : 2008
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TABLE OF CONTENTS

.EXECUTIVE SUMMARY

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 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 2019. 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 Sixty-first Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 30 November 2018 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

- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Cross Passage Construction by Pipe Jacking – TBM Tunnel;
- Corbel & OVHD Construction – TBM Tunnel;
- Parapet wall and fireboard Installation – TBM Tunnel;
- Bulk Excavation – Portion N-A; and
- D-wall Construction – 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

One (1) Action Level exceedance of 1-hour TSP was recorded at ASR1 on 6 November 2018. One (1) Action Level exceedance of 1-hour TSP, three (3) Action Level exceedances of 1-hour TSP and one (1) Action Level exceedance of 1-hour TSP were recorded at ASR1, ASR5 and ASR6 on 12 November 2018 respectively. Investigation reports are provided in Appendix K. Investigation report of exceedance recorded on 31 October 2018 is also provided in Appendix K.

Breaches of Action and Limit Levels for Dolphin Monitoring

Whilst one (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between September 2018 and November 2018, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations. Due to monthly variation in dolphin occurrence within the study area, it would be more appropriate to draw conclusion on whether any impacts on dolphins have been detected related to the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section 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.

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 between August and November 2018.

Environmental Complaints, Non-compliance & Summons

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

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

Reporting Change

There was no reporting change required in the reporting period.

Upcoming Works for the Next Reporting Month

Works to be undertaken in the next monitoring period of December 2018 include the following:

Land-based Works

- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Construction by Pipe Jacking – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;
- Parapet wall and fireboard Installation – TBM Tunnel
- Corbel & OVHD Construction – TBM Tunnel;
- Bulk Excavation – Portion S-A; and
- D-wall Construction – Portion S-A

Marine-based Works

- Sloping seawall construction – Portion S-B

Future Key Issue

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of December 2018 are mainly associated with dust, water quality, marine ecology and waste management issues.

1 INTRODUCTION

1.1 BACKGROUND

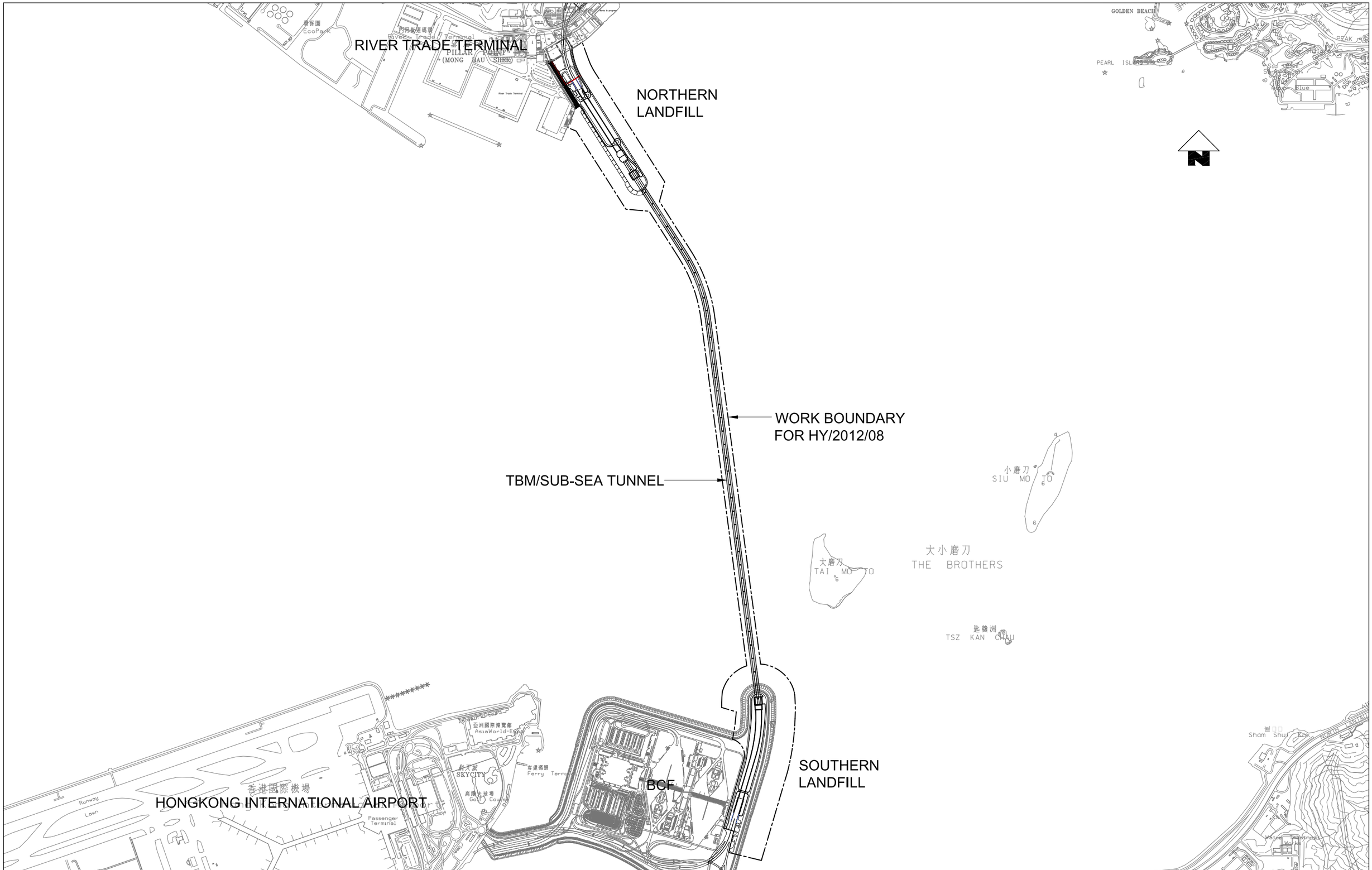
According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated 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 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 the end of 2019. 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.



Rev.	Description	Date	Checked
A	FIRST ISSUE	11SEP13	PKV

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

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

Client: 路政署 HIGHWAYS DEPARTMENT

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

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

Drawing Title: **Figure 1.1**

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

1.2 SCOPE OF REPORT

This is the Sixty-first 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 November 2018.

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 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)	Deputy Environmental Manager	Bryan Lee	2293 7323	2293 7499
	Senior Environmental Officer	Ashley Au	52950766	
	24-hour hotline		2293 7330	
ET (ERM-HK)	ET Leader	Jasmine Ng	2271 3311	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*.

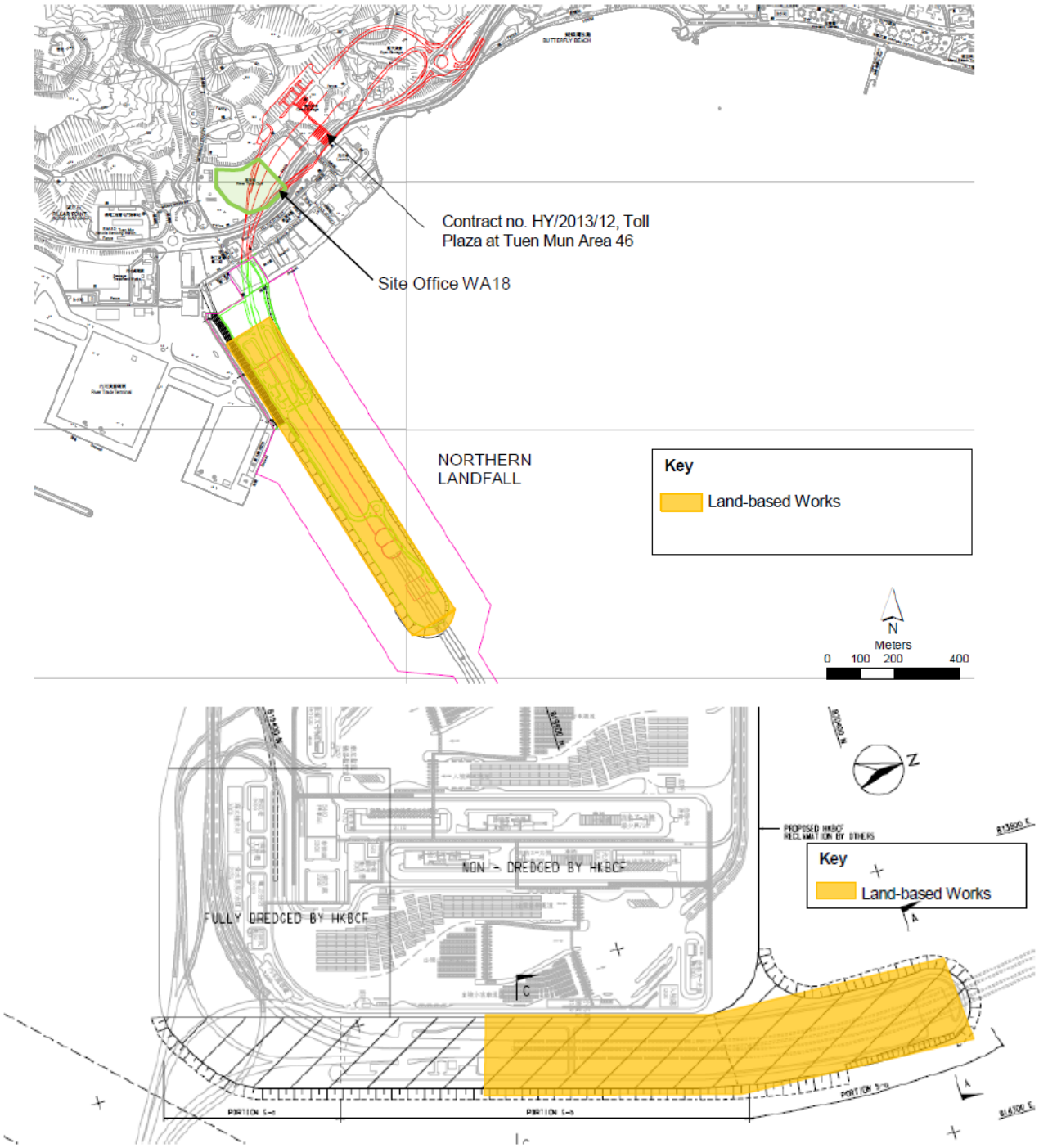
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.3*.

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
• Construction of Cross Passage Tympanum – TBM tunnel; • Cross Passage Lining Installation – TBM Tunnel; • Cross Passage Construction by Pipe Jacking – TBM Tunnel; • Corbel & OVHD Construction – TBM Tunnel; • Parapet wall and fireboard Installation – TBM Tunnel; • Bulk Excavation – Portion N-A; and • D-wall Construction – Portion S-A

Figure 1.2 Locations of Construction Activities – November 2018



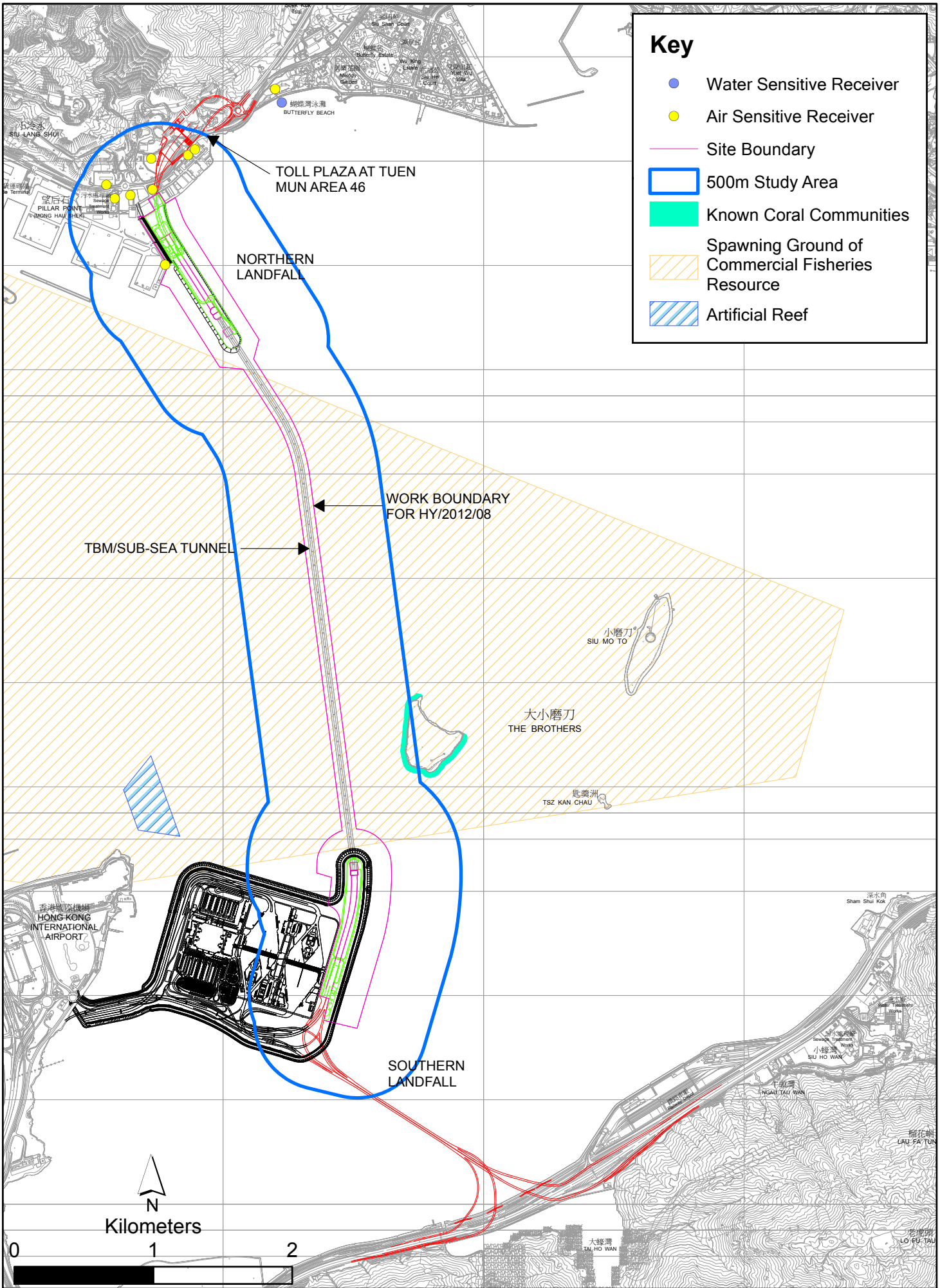


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

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Date: 15/4/2014

Environmental Resources Management

2 EM&A RESULTS

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

2.1 AIR QUALITY

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 November 2018 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 November 2018	Tuen Mun Fireboat Station	Office	TSP monitoring • 1-hour Total Suspended Particulates (1-hour TSP, µg/m³), 3 times in every 6 days • 24-hour Total Suspended Particulates (24-hour TSP, µg/m³), daily for 24-hour in every 6 days Enhanced TSP monitoring (commenced on 24 October 2014) • 1-hour Total Suspended Particulates (1-hour TSP, µg/m³), 3 times in every 3 days • 24-hour Total Suspended Particulates (24-hour TSP, µg/m³), daily for 24-hour in every 3 days
ASR5		Pillar Point Fire Station	Office	
AQMS1		Previous River Trade Golf	Bare ground	
ASR6		Butterfly Beach Laundry	Office	
ASR10		Butterfly Beach Park	Recreational uses	

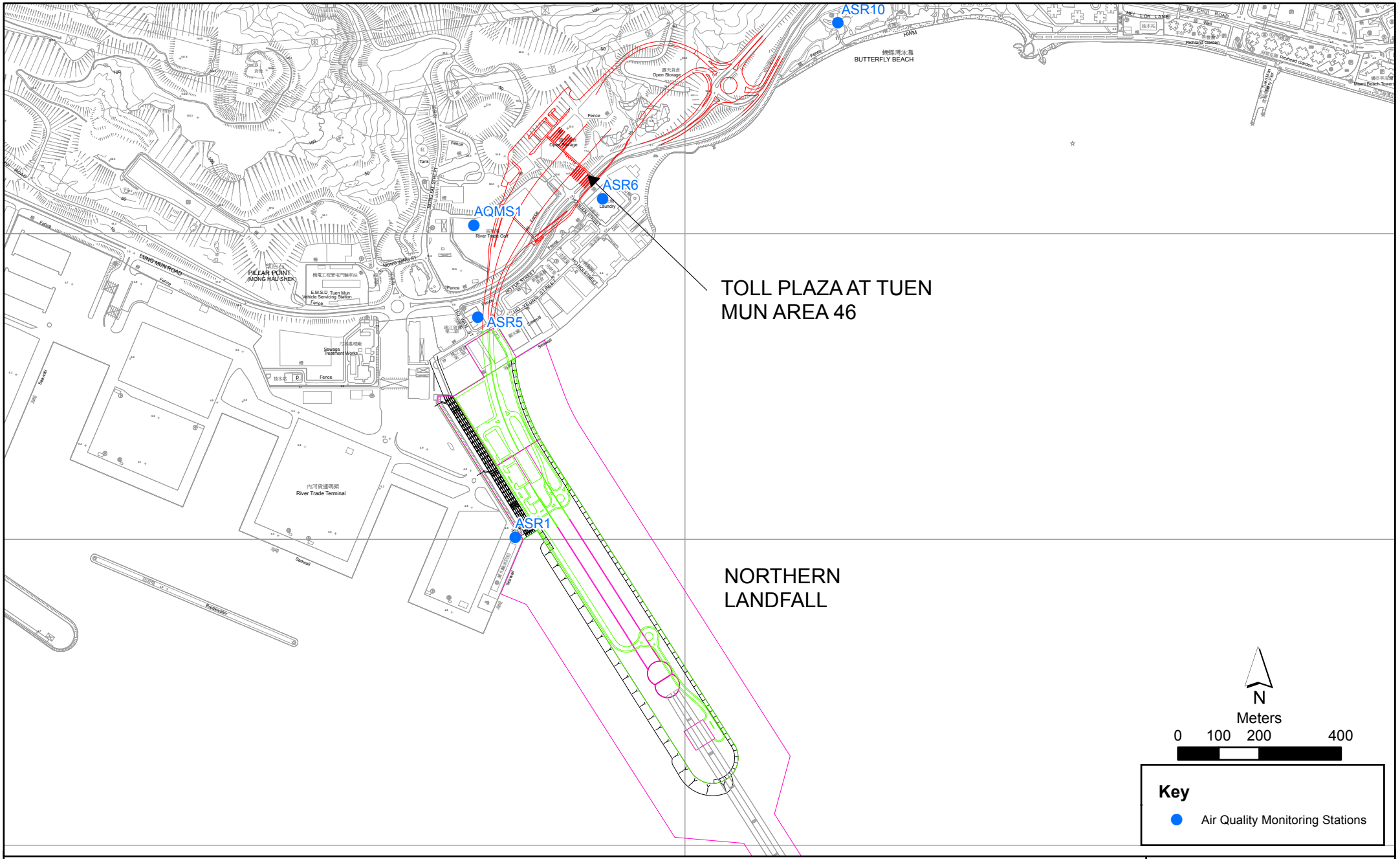

Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

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Date: 21/2/2014

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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 November 2018 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	136	44 – 395	331	500
ASR5	204	67 - 425	340	500
AQMS1	133	70 – 311	335	500
ASR6	141	52 – 343	338	500
ASR10	105	17 – 242	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	67	38 - 117	213	260
ASR5	114	86 - 148	238	260
AQMS1	69	39 – 99	213	260
ASR6	75	37 - 103	238	260
ASR10	62	32 - 146	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 TSP monitoring were undertaken in this reporting month. One (1) Action Level exceedance of 1-hour TSP was recorded at ASR1 on 6 November 2018. One (1) Action Level exceedance of

1-hour TSP, three (3) Action Level exceedances of 1-hour TSP and one (1) Action Level exceedance of 1-hour TSP were recorded at ASR1, ASR5 and ASR6 on 12 November 2018 respectively.

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

2.2 WATER QUALITY MONITORING

Seawall Enhancement Works at Northern Landfall has been completed on 31 December 2017. Notification of suspension of water quality monitoring has been approved by EPD on 2 March 2018. Water Quality Monitoring will be resumed prior to the start of sloping seawall construction in December 2018.

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.

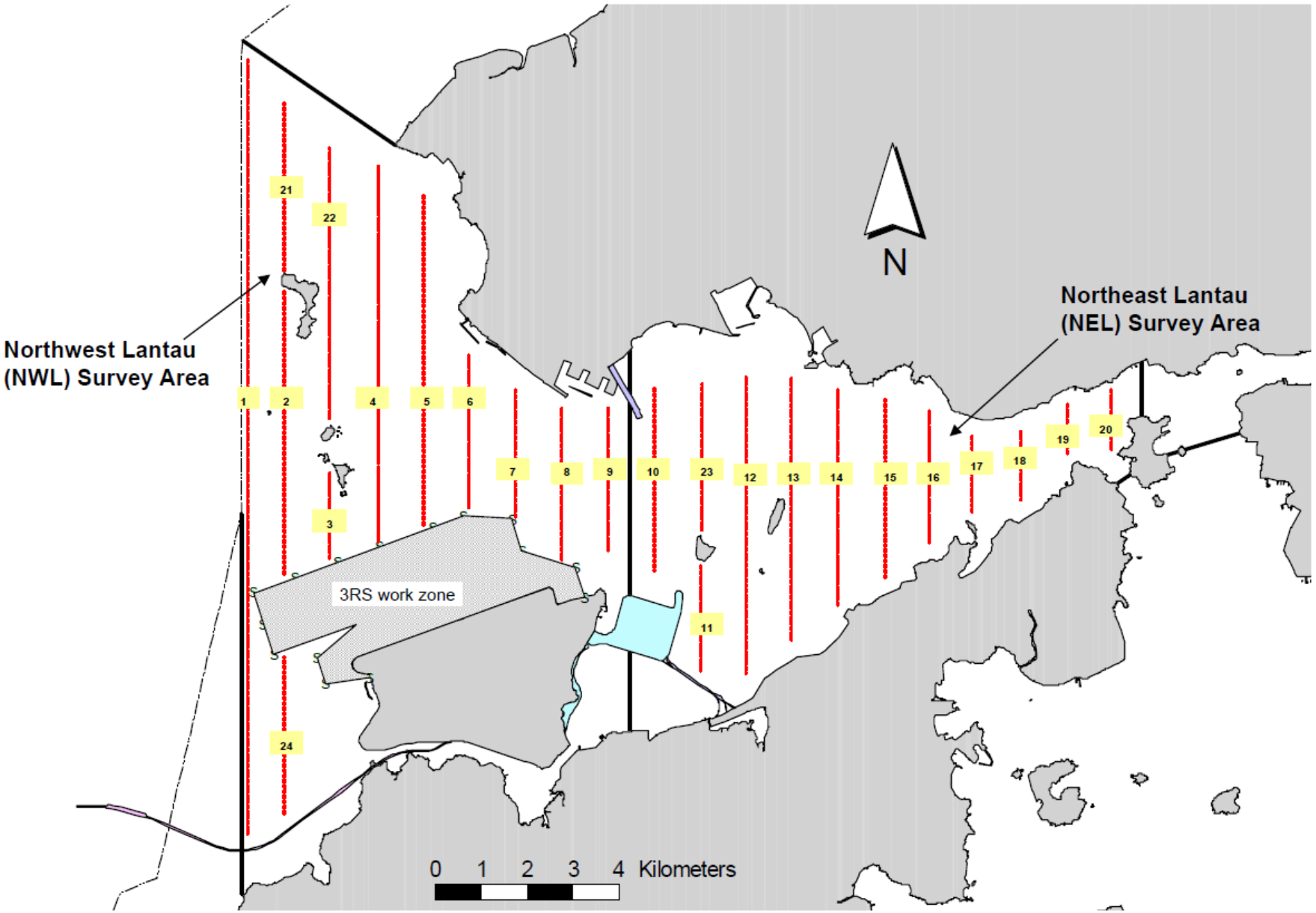

Figure 2.2

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

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Date: 29/11/2013

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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 1, 6, 8 and 13 of November 2018. The dolphin monitoring schedule for the reporting month is shown in *Appendix F*.

2.3.7 Results & Observations

A total of 267.99 km of survey effort was collected, with 83.8% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) in November 2018. Among the two areas, 100.30 km and 167.69 km of survey effort were collected from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 192.71 km and 75.28 km respectively. The survey efforts are summarized in *Appendix I.*

Three group of 5 Chinese White Dolphins sightings was recorded during the two sets of surveys in November 2018. All the dolphin sightings were made in NWL, while none was sighted in NEL. All dolphin sighting were made during on-effort search and on primary lines. The dolphin group was 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 November 2018 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: November 1st / 6th	0.0	0.0
	Set 2: November 8th / 13th	0.0	0.0
NWL	Set 1: November 1st / 6th	5.8	9.7
	Set 2: November 8th / 13th	0.0	0.0

Note: Dolphin Encounter Rates are deduced from the Two Sets of Surveys (Two Surveys in Each Set) in November 2018 in Northeast (NEL) and Northwest Lantau (NWL)

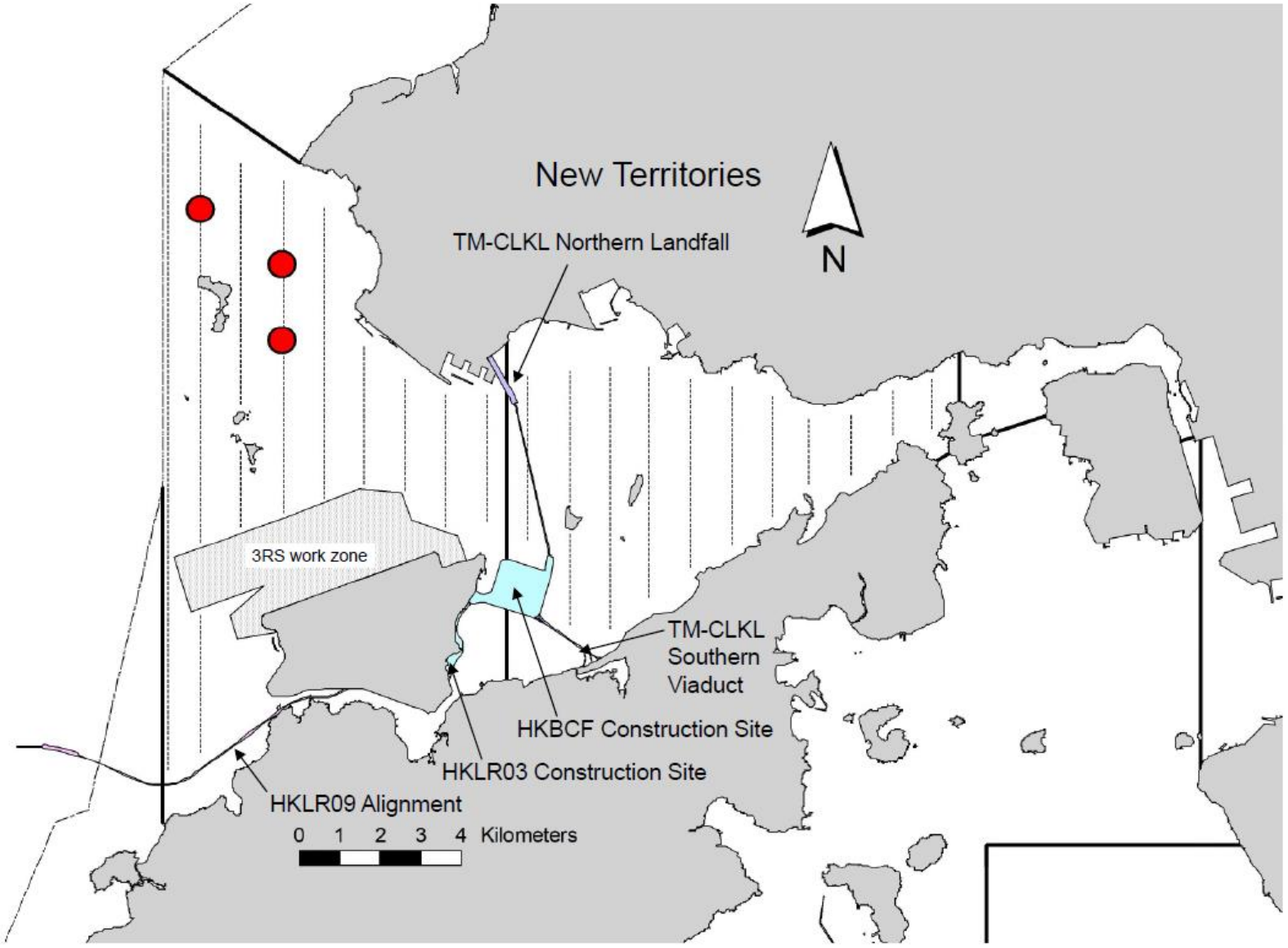

Figure 2.3

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 November 2018)

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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	3.2	2.3	5.3	3.8

Note: Overall dolphin encounter rates (sightings per 100 km of survey effort) from all four surveys are conducted in November 2018 on primary lines only as well as both primary lines and secondary lines in Northeast and Northwest Lantau.

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between September and November 2018, whilst no unacceptable impact from the construction activities of the TM-CLKL Southern Connection Viaduct Section on Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphin) was noticeable from general observations.

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 7, 14, 21 and 28 November 2018.

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
7 November 2018	Works Area – TBM tunnel • Cement bags should be covered with impervious sheet. Works Area – Portion N-A • General refuse should be removed. Works Area – Portion S-B • Drip tray should be provided for the oil drums.	Works Area – TBM tunnel • The Contractor was reminded to cover the cement bags with impervious sheet. Works Area – Portion N-A • The Contractor was reminded to remove the general refuse. Works Area – Portion S-B • The Contractor was reminded to provide drip tray for the oil drums.
14 November 2018	Works Area – Portion S-B • Faded NRMM label on the generator should be replaced. **Reminder from the SOR** Works Area - Portion N-A • The breaker tip should be wrapped with soundproof mat. • Stagnant water inside the water tank should be cleared.	Works Area – Portion S-B • The Contractor was reminded to replace the faded NRMM label on the generator. **Reminder from the SOR** Works Area - Portion N-A • The Contractor was reminded to wrap the breaker tip with soundproof mat. • The Contractor was reminded to clear the stagnant water inside the water tank.
21 November 2018	Works Area – TBM tunnel • Drip tray and chemical label should be provided for oil drums. Works Area – Portion S-B • The drainage should be cleaned up frequently to avoid blockage.	Works Area – TBM tunnel • The Contractor was reminded to provide drip tray and chemical label for the oil drums. Works Area – Portion S-B • The Contractor was reminded to clean up the drainage to avoid blockage.
28 November 2018	Works Area - TBM tunnel • Drip tray and chemical label should be provided for oil drums. Works Area - Portion S-B • Water spraying should be applied for dust control during rock breaking works.	Works Area - TBM tunnel • The Contractor was reminded to provide drip tray and chemical label for the oil drums. Works Area - Portion S-B • The Contractor was reminded to apply water spraying for dust control during rock breaking works.

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), chemical wastes and marine sediment. 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)	Mixed (L+M)
November 2018	155,310	141,730	448	380,780	1,400	8,027	12,324	1,799

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
Construction Waste Disposal Account	7021715	18 October 2018	17 January 2019	DBJV	Vessel Disposal
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	WT00031435-2018	2 August 2018	31 August 2023	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/19-063	19 November 2018	18 May 2019	DBJV	Type 1 (Open Sea Disposal)
Marine Dumping Permit	EP/MD/19-057	5 November 2018	4 December 2018	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-015	5 September 2018	4 March 2019	DBJV	Catepillar Area
Construction Noise Permit	GW-RW0344-18	20 August 2018	19 February 2019	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RS0598-18	15 July 2018	14 January 2019	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0406-18	16 October 2018	15 April 2019	DBJV	Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RS0966-18	26 October 2018	14 April 2019	DBJV	Southern Landfall

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

2.7 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

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

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

2.8 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

One (1) Action Level exceedance of 1-hour TSP was recorded at ASR1 on 6 November 2018. One (1) Action Level exceedance of 1-hour TSP, three (3) Action Level exceedances of 1-hour TSP and one (1) Action Level exceedance of 1-hour TSP were recorded at ASR1, ASR5 and ASR6 on 12 November 2018 respectively. Investigation reports are provided in Appendix K. Investigation report of exceedance recorded on 31 October 2018 is also provided in Appendix K.

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between September and November 2018, whilst no unacceptable impact from the construction activities of the TM-CLKL Southern Connection Viaduct Section on Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphin) was noticeable from general observations.

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*.

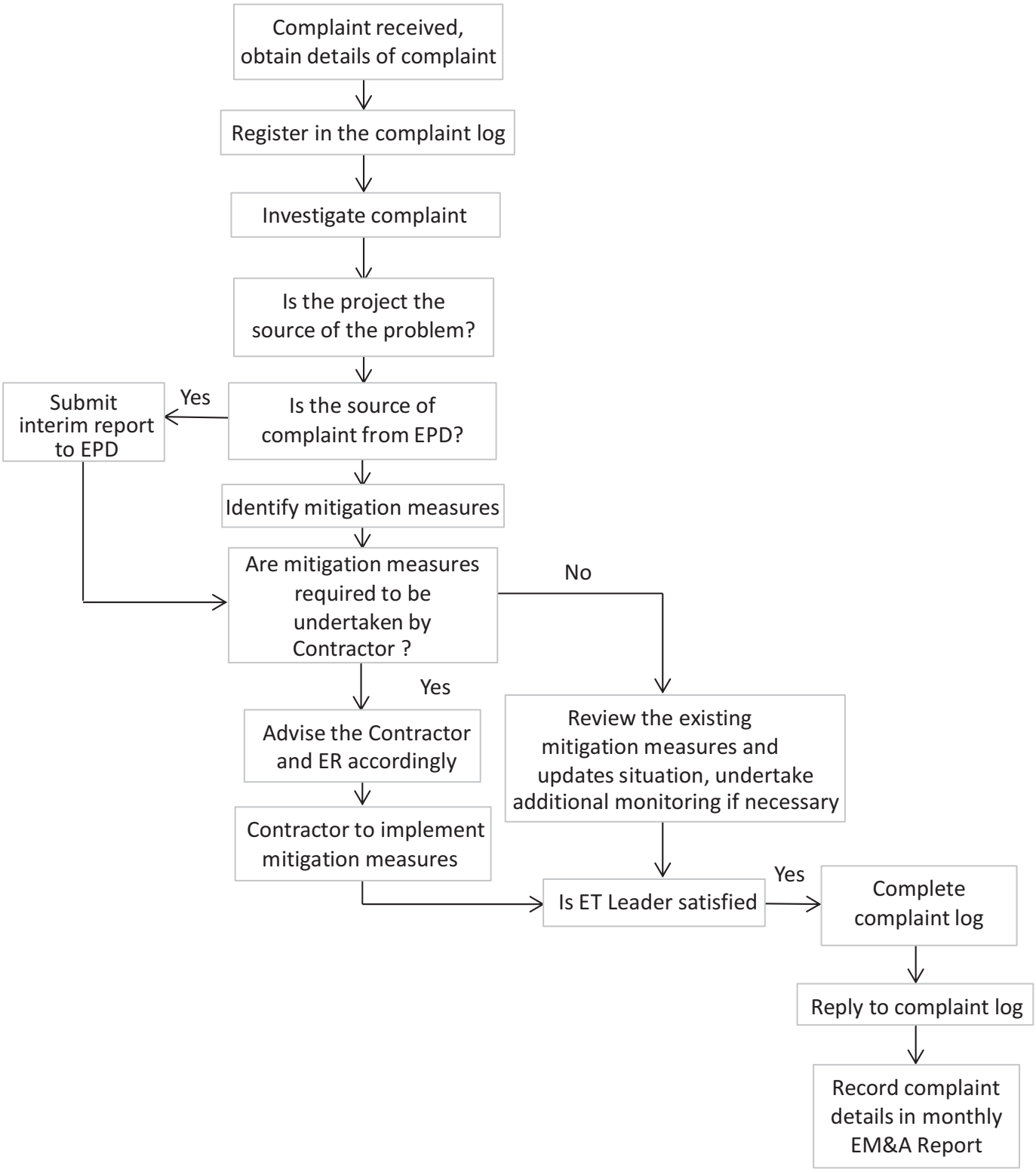

Figure 2.4 Environmental Complaint Handling Procedure

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DATE: 06/12/2013

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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 December 2018 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 • Construction of Cross Passage Tympanum – TBM tunnel; • Cross Passage Construction by Pipe Jacking – TBM tunnel; • Cross Passage Lining Installation – TBM Tunnel; • Parapet wall and fireboard Installation – TBM Tunnel • Corbel & OVHD Construction – TBM Tunnel; • Bulk Excavation – Portion S-A; and • D-wall Construction – Portion S-A *Marine-based Works* • Sloping seawall construction – Portion S-B

3.2 KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting month of December 2018 are mainly associated with dust, water quality, marine ecology and waste management issues.

3.3 MONITORING SCHEDULE FOR THE COMING MONTH

The tentative schedule for environmental monitoring in December 2018 is provided in *Appendix F*.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

This Sixty-first Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 30 November 2018, 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.

One (1) Action Level exceedance of 1-hour TSP was recorded at ASR1 on 6 November 2018. One (1) Action Level exceedance of 1-hour TSP, three (3) Action Level exceedances of 1-hour TSP and one (1) Action Level exceedance of 1-hour TSP were recorded at ASR1, ASR5 and ASR6 on 12 November 2018 respectively.

Three group of 5 Chinese White Dolphins sightings was recorded during the two sets of surveys in November 2018. All the dolphin sightings were made in NWL, while none was sighted in NEL. All dolphin sighting were made during on-effort search and on primary lines. The dolphin group was not associated with any operating fishing vessel.

Environmental site inspection was carried out four (4) times in November 2018. 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.

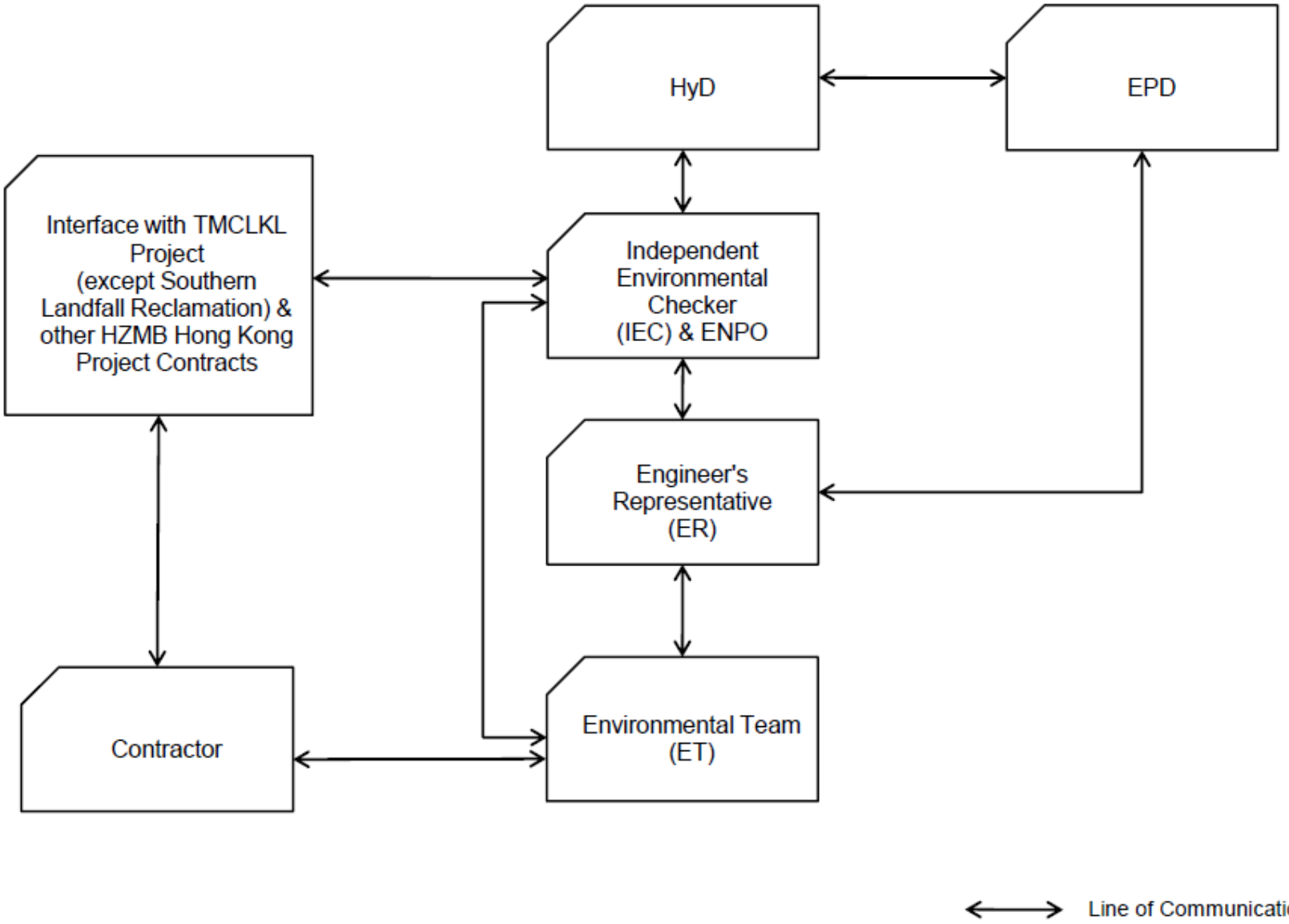
No environmental complaint was received in this reporting period.

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

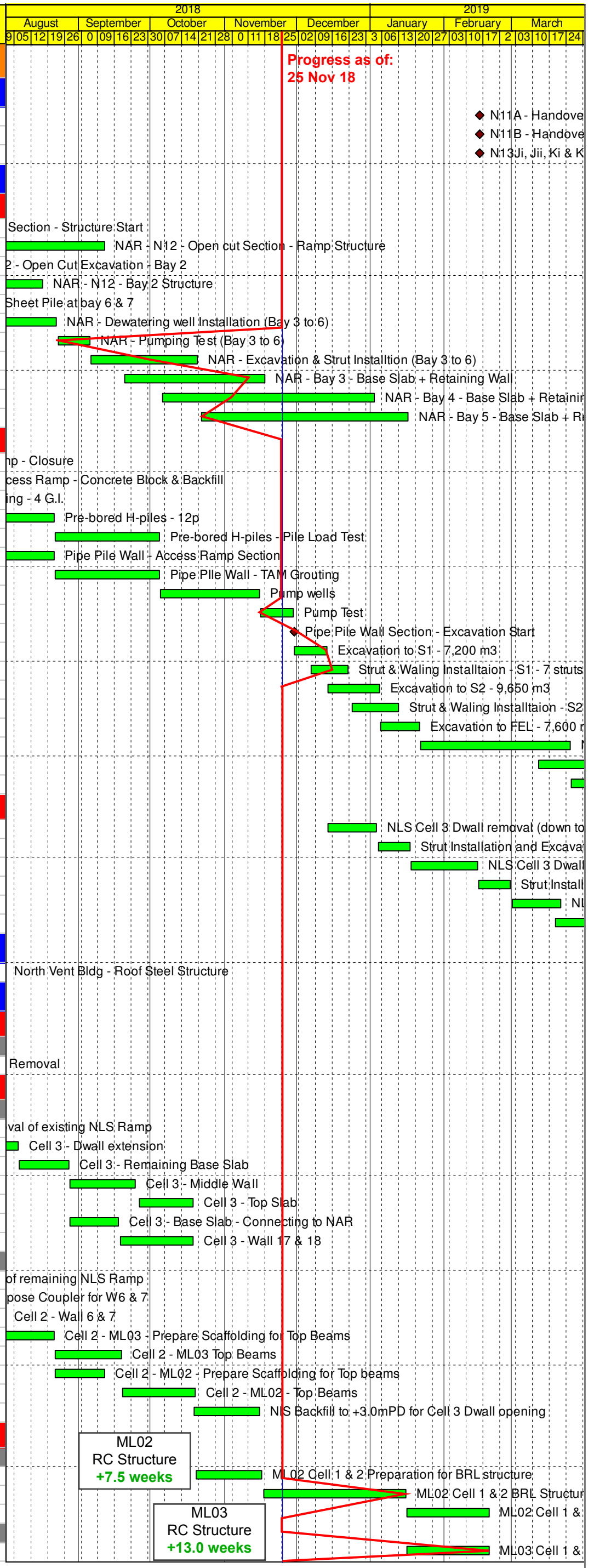
ERM

Appendix B

Construction Programme

TMCLKL Northern Connection Sub-sea Tunnel Sect

Activity Name	Orig Dur	Start	Finish
Portion Handover Dates			
N11A - Handover	0		15-Feb-19*
N11B - Handover	0		15-Feb-19*
N13Ji, Jii, Ki & Kii - Handover for E&M Contract scope	0		15-Feb-19*
North Approach Ramp			
Portion N12 Section			
NAR - N12 - Open Cut Section - Structure Start	0	04-Jun-18	
NAR - N12 - Open cut Section - Ramp Structure	84	04-Jun-18	11-Sep-18
NAR - N12 - Open Cut Excavation - Bay 2	12	20-Jun-18	04-Jul-18
NAR - N12 - Bay 2 Structure	36	06-Jul-18	16-Aug-18
NAR - Sheet Pile at bay 6 & 7	18	20-Jun-18	11-Jul-18
NAR - Dewatering well Installation (Bay 3 to 6)	36	12-Jul-18	22-Aug-18
NAR - Pumping Test (Bay 3 to 6)	12	23-Aug-18	05-Sep-18
NAR - Excavation & Strut Installtion (Bay 3 to 6)	36	06-Sep-18	20-Oct-18
NAR - Bay 3 - Base Slab + Retaining Wall	48	20-Sep-18	17-Nov-18
NAR - Bay 4 - Base Slab + Retaining Wall	72	06-Oct-18	02-Jan-19
NAR - Bay 5 - Base Slab + Retaining Wall	72	22-Oct-18	16-Jan-19
Access Ramp Section			
NLS Temp Access Ramp - Closure	0		04-Jun-18
NLS Temp Access Ramp - Concrete Block & Backfill	18	04-Jun-18	25-Jun-18
Predrilling - 4 G.I.	12	26-Jun-18	10-Jul-18
Pre-bored H-piles - 12p	36	11-Jul-18	21-Aug-18
Pre-bored H-piles - Pile Load Test	36	22-Aug-18	04-Oct-18
Pipe Pile Wall - Access Ramp Section	36	11-Jul-18	21-Aug-18
Pipe PIle Wall - TAM Grouting	36	22-Aug-18	04-Oct-18
Pump wells	35	05-Oct-18	15-Nov-18
Pump Test	12	16-Nov-18	29-Nov-18
Pipe Pile Wall Section - Excavation Start	0	30-Nov-18	
Excavation to S1 - 7,200 m3	12	30-Nov-18	13-Dec-18
Strut & Waling Installtaion - S1 - 7 struts	14	07-Dec-18	22-Dec-18
Excavation to S2 - 9,650 m3	16	14-Dec-18	04-Jan-19
Strut & Waling Installtaion - S2 - 7 struts	15	24-Dec-18	12-Jan-19
Excavation to FEL - 7,600 m3	14	05-Jan-19	21-Jan-19
NAR Pipe Pile Section - Base Slab	48	22-Jan-19	25-Mar-19
NAR Pipe Pile Section - Strut S2 Removal	24	12-Mar-19	09-Apr-19
NAR Pipe Pile Section - Wall up to S1	48	26-Mar-19	27-May-19
NLS Interface (OAP-NAR-DWG-10442-B)			
NLS Cell 3 Dwall removal (down to +2.5mPD) - 90m3	15	14-Dec-18	03-Jan-19
Strut Installation and Excavation down to S2	12	04-Jan-19	17-Jan-19
NLS Cell 3 Dwall removal (down to -3.0mPD) - 188m3	18	18-Jan-19	14-Feb-19
Strut Installation and Excavation down to FWL	12	15-Feb-19	28-Feb-19
NLS Cell 3 Dwall removal (down to -6.0mPD) - 134m3	18	01-Mar-19	21-Mar-19
NLS/NAR Stitch structure - Base Slab & S2 removed	36	19-Mar-19	04-May-19
North Ventilation Building			
North Vent Bldg - Roof Steel Structure	48	04-Jun-18	31-Jul-18
North Launching Shaft			
NLS Cell 1 False Tunnel			
ML03			
Cell 1 - Alimak Removal	15	06-Jun-18	23-Jun-18
NLS Cell 1-3 Structure for Cell 3 Dwall opening			
Cell 3			
Cell 3 - Removal of existing NLS Ramp	18	04-Jun-18	25-Jun-18
Cell 3 - Dwall extension	35	26-Jun-18	06-Aug-18
Cell 3 - Remaining Base Slab	18	07-Aug-18	27-Aug-18
Cell 3 - Middle Wall	24	28-Aug-18	24-Sep-18
Cell 3 - Top Slab	18	26-Sep-18	18-Oct-18
Cell 3 - Base Slab - Connecting to NAR	18	28-Aug-18	17-Sep-18
Cell 3 - Wall 17 & 18	24	18-Sep-18	18-Oct-18
Cell 2			
Cell 2 - Removal of remaining NLS Ramp	12	04-Jun-18	16-Jun-18
Cell 2 - Expose Coupler for W6 & 7	12	19-Jun-18	03-Jul-18
Cell 2 - Wall 6 & 7	24	04-Jul-18	31-Jul-18
Cell 2 - ML03 - Prepare Scaffolding for Top Beams	18	01-Aug-18	21-Aug-18
Cell 2 - ML03 Top Beams	24	22-Aug-18	18-Sep-18
Cell 2 - ML02 - Prepare Scaffolding for Top beams	18	22-Aug-18	11-Sep-18
Cell 2 - ML02 - Top Beams	24	19-Sep-18	19-Oct-18
NIS Backfill to +3.0mPD for Cell 3 Dwall opening	24	19-Oct-18	15-Nov-18
NLS Cell 1-3 Remaining Structure			
ML02			
ML02 Cell 1 & 2 Preparation for BRL structure	24	20-Oct-18	16-Nov-18
ML02 Cell 1 & 2 BRL Structure	48	17-Nov-18	15-Jan-19
ML02 Cell 1 & 2 OHVD Slab	24	16-Jan-19	19-Feb-19
ML03			
ML03 Cell 1 & 2 Preparation for BRL structure	24	16-Jan-19	19-Feb-19



Planned Milestone

Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 25 Nov 2018

Dragages HongKong 香港寶嘉

A member of the Bouygues Construction group

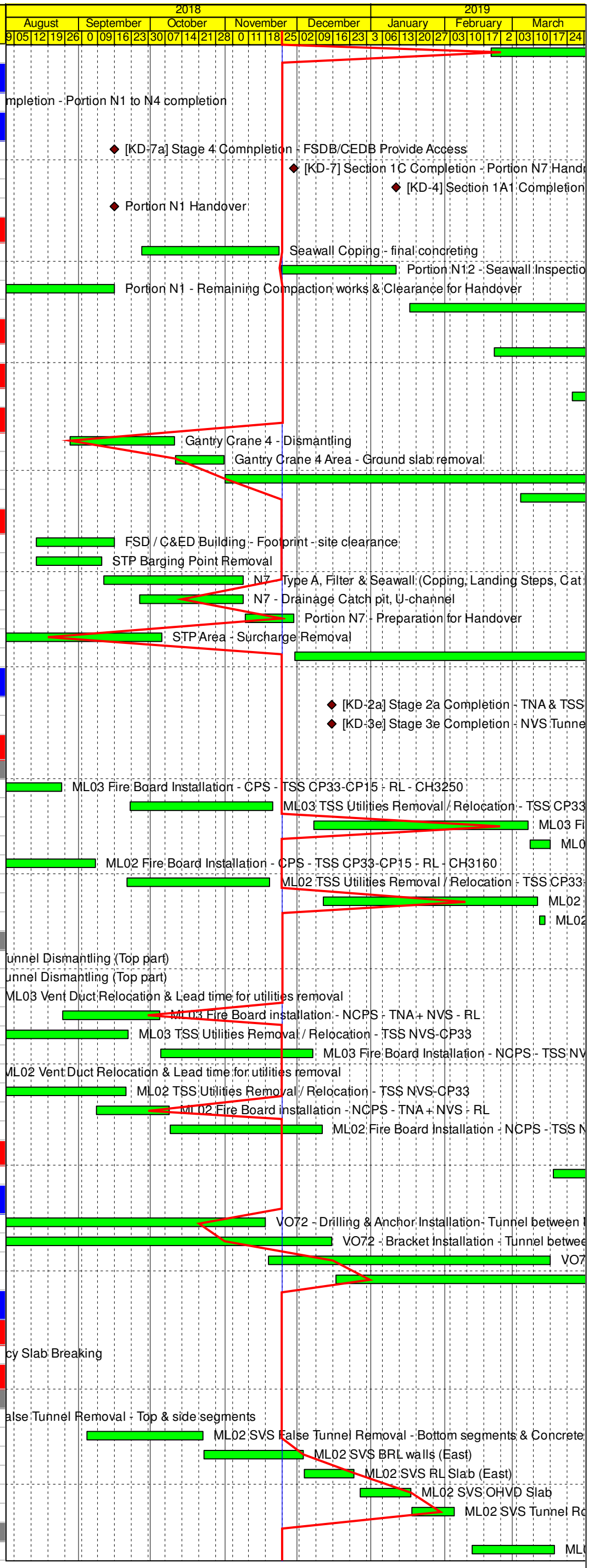
Dragages - Bouygues (TM-CLK) Joint Venture

寶嘉 - 布依格聯營

BOUYGUES TRAVAUX PUBLICS

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Activity Name	Orig Dur	Start	Finish
ML03 Cell 1 & 2 BRL Structure	48	20-Feb-19	17-Apr-19
North - Phase 2 Reclamation			
[KD-5] Section 1A2 Completion - Portion N1 to N4 completion	0		04-Jun-18*
NLF Demobilization & At-grade works			
[KD-7a] Stage 4 Comnpletion - FSDB/CEDB Provide Access	0		15-Sep-18*
[KD-7] Section 1C Completion - Portion N7 Handover	0		29-Nov-18*
[KD-4] Section 1A1 Completion - N12 Reclamation & Seawall	0		11-Jan-19*
Portion N1 Handover	0		15-Sep-18*
Portion N12 & Portion N6B			
Seawall Coping - final concreting	48	27-Sep-18	23-Nov-18
Portion N12 - Seawall Inspection & Remedial works (if any)	39	24-Nov-18	11-Jan-19
Portion N1 - Remaining Compaction works & Clearance for	88	04-Jun-18	15-Sep-18
Drainages & Watermain - Portion N12 & N6B	144	17-Jan-19	19-Jul-19
North Launching Shaft			
Drainages & Watermain - NLS	194	21-Feb-19	17-Oct-19
Sloping Seawall			
Workshop & Amenities - Removal	48	26-Mar-19	27-May-19
Precast Segment Yard			
Gantry Crane 4 - Dismantling	36	28-Aug-18	10-Oct-18
Gantry Crane 4 Area - Ground slab removal	17	11-Oct-18	31-Oct-18
Drainages & Watermain - Zone C Roundabout	144	01-Nov-18	03-May-19
Provision for Utilities - Zone C Roundabout	72	04-Mar-19	01-Jun-19
NVS & STP (Portion N7 Interface)			
FSD / C&ED Building - Footprint - site clearance	29	14-Aug-18	15-Sep-18
STP Barging Point Removal	24	14-Aug-18	10-Sep-18
N7 - Type A, Filter & Seawall (Coping, Landing Steps, Cat L	48	11-Sep-18	08-Nov-18
N7 - Drainage Catch pit, U-channel	36	26-Sep-18	08-Nov-18
Portion N7 - Preparation for Handover	18	09-Nov-18	29-Nov-18
STP Area - Surcharge Removal	72	12-Jul-18	05-Oct-18
Drainages & Watermain - NVS / STP	144	30-Nov-18	03-Jun-19
Tunnel - Thermal Barrier			
[KD-2a] Stage 2a Completion - TNA & TSS up to CP33	0		15-Dec-18*
[KD-3e] Stage 3e Completion - NVS Tunnel	0		15-Dec-18*
Fire board Installation below OHVD			
Fire Board between CP33 and CP13			
ML03 Fire Board Installation - CPS - TSS CP33-CP15 - RL	60	14-Jun-18	24-Aug-18
ML03 TSS Utilities Removal / Relocation - TSS CP33-CP15	48	22-Sep-18	20-Nov-18
ML03 Fire Board Installation - NPS - TSS CP33-CP13 - RL	68	08-Dec-18	07-Mar-19
ML03 Fire Board Installation - CPS - TSS CP15-CP13 - RL	8	08-Mar-19	16-Mar-19
ML02 Fire Board Installation - CPS - TSS CP33-CP15 - RL	65	23-Jun-18	07-Sep-18
ML02 TSS Utilities Removal / Relocation - TSS CP33-CP15	48	21-Sep-18	19-Nov-18
ML02 Fire Board Installation - NPS - TSS CP33-CP13 - RL	68	12-Dec-18	11-Mar-19
ML02 Fire Board Installation - CPS - TSS CP15-CP13 - RL	3	12-Mar-19	14-Mar-19
Fire board between NLS and CP33			
ML03 SVS False Tunnel Dismantling (Top part)	0	14-Jun-18	
ML02 SVS False Tunnel Dismantling (Top part)	0	13-Jun-18	
ML03 Vent Duct Relocation & Lead time for utilities removal	36	14-Jun-18	27-Jul-18
ML03 Fire Board installation - NCPS - TNA + NVS - RL	33	25-Aug-18	04-Oct-18
ML03 TSS Utilities Removal / Relocation - TSS NVS-CP33	48	28-Jul-18	21-Sep-18
ML03 Fire Board Installation - NCPS - TSS NVS-CP33 - RL	54	05-Oct-18	07-Dec-18
ML02 Vent Duct Relocation & Lead time for utilities removal	36	13-Jun-18	26-Jul-18
ML02 TSS Utilities Removal / Relocation - TSS NVS-CP33	48	27-Jul-18	20-Sep-18
ML02 Fire Board installation - NCPS - TNA + NVS - RL	24	08-Sep-18	08-Oct-18
ML02 Fire Board Installation - NCPS - TSS NVS-CP33 - RL	54	09-Oct-18	11-Dec-18
Fire board Installation above OHVD			
Fire Board installation - TNA+NVS - above OHVD Slab - ML	13	18-Mar-19	01-Apr-19
Tunnel - Anchor / E&M Bracket (VO72)			
VO72 - Drilling & Anchor Installation- Tunnel between NLS to	115	04-Jul-18	17-Nov-18
VO72 - Bracket Installation - Tunnel between NLS to CP33 (2	115	01-Aug-18	15-Dec-18
VO72 - Drilling & Anchor Installation - Tunnel between CP33	93	19-Nov-18	16-Mar-19
VO72 - Bracket Installation - Tunnel between CP33 to CP13	93	17-Dec-18	15-Apr-19
ML02 South Ventilation Shaft			
Concrete Bell Options			
ML02 SVS Bouyancy Slab Breaking	8	04-Jun-18	12-Jun-18
ML02 SVS Structure			
Tunnel Box			
ML02 SVS False Tunnel Removal - Top & side segments	12	13-Jun-18	27-Jun-18
ML02 SVS False Tunnel Removal - Bottom segments & Cc	39	04-Sep-18	22-Oct-18
ML02 SVS BRL walls (East)	36	23-Oct-18	03-Dec-18
ML02 SVS RL Slab (East)	18	04-Dec-18	24-Dec-18
ML02 SVS OHVD Slab	18	27-Dec-18	17-Jan-19
ML02 SVS Tunnel Roof Slab	15	18-Jan-19	04-Feb-19
Above Tunnel Vent Duct			
ML02 SVS Tunnel Roof Wall (-28.70 to -21.90)	30	12-Feb-19	18-Mar-19



Planned Milestone

Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

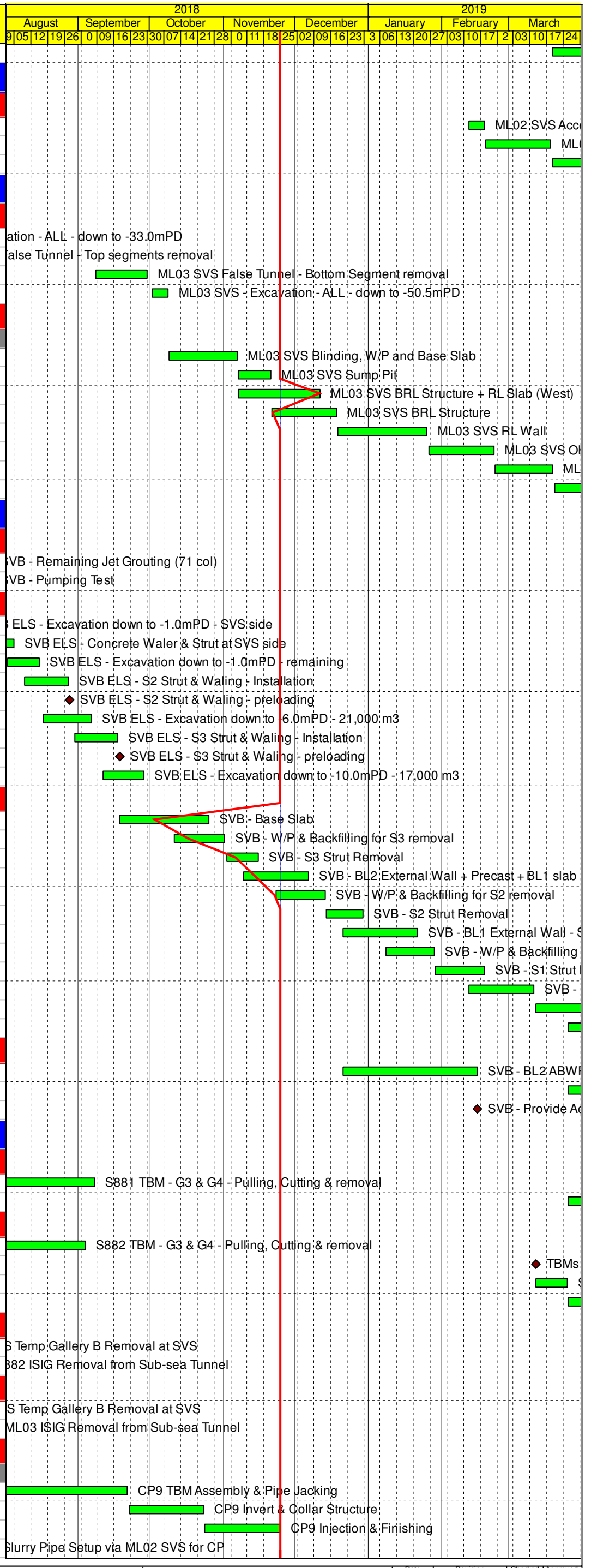
Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 25 Nov 2018

Dragages - Bouygues (TM-CLK) Joint Venture
寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Activity Name	Orig Dur	Start	Finish
ML02 SVS Above Tunnel Roof Wall & Slab (-21.90 to -18.7	36	19-Mar-19	04-May-19
CP7 South Ventilation Shaft			
ML02 SVS			
ML02 SVS Access Ramp for CP7	6	12-Feb-19	18-Feb-19
ML02 SVS CP7 Dwall opening + Excavation (Bottom)	24	19-Feb-19	18-Mar-19
ML02 SVS CP7 Invert Slab, Wall & Middle Slab	15	19-Mar-19	04-Apr-19
ML03 South Ventilation Shaft			
Shaft Excavation Stage 2			
ML03 SVS - Excavation - ALL - down to -33.0mPD	9	04-Jun-18 A	13-Jun-18
ML03 SVS False Tunnel - Top segments removal	12	14-Jun-18	28-Jun-18
ML03 SVS False Tunnel - Bottom Segment removal	18	08-Sep-18	29-Sep-18
ML03 SVS - Excavation - ALL - down to -50.5mPD	6	02-Oct-18	08-Oct-18
ML03 SVS Structure			
Tunnel Box			
ML03 SVS Blinding, W/P and Base Slab	24	09-Oct-18	06-Nov-18
ML03 SVS Sump Pit	12	07-Nov-18	20-Nov-18
ML03 SVS BRL Structure + RL Slab (West)	30	07-Nov-18	11-Dec-18
ML03 SVS BRL Structure	24	21-Nov-18	18-Dec-18
ML03 SVS RL Wall	30	19-Dec-18	25-Jan-19
ML03 SVS OHVD Slab	18	26-Jan-19	22-Feb-19
ML03 SVS ARL Wall	21	23-Feb-19	19-Mar-19
ML03 SVS Tunnel Roof Slab	15	20-Mar-19	06-Apr-19
South Ventilation Building			
ELS Foundation			
SVB - Remaining Jet Grouting (71 col)	30	20-Jun-18	25-Jul-18
SVB - Pumping Test	6	19-Jul-18	25-Jul-18
Cofferdam Excavation			
SVB ELS - Excavation down to -1.0mPD - SVS side	6	12-Jul-18	18-Jul-18
SVB ELS - Concrete Waler & Strut at SVS side	15	19-Jul-18	04-Aug-18
SVB ELS - Excavation down to -1.0mPD - remaining	12	02-Aug-18	15-Aug-18
SVB ELS - S2 Strut & Waling - Installation	16	09-Aug-18	27-Aug-18
SVB ELS - S2 Strut & Waling - preloading	0	28-Aug-18	28-Aug-18
SVB ELS - Excavation down to -6.0mPD - 21,000 m3	18	17-Aug-18	06-Sep-18
SVB ELS - S3 Strut & Waling - Installation	16	30-Aug-18	17-Sep-18
SVB ELS - S3 Strut & Waling - preloading	0	18-Sep-18	18-Sep-18
SVB ELS - Excavation down to -10.0mPD - 17,000 m3	15	11-Sep-18	28-Sep-18
Structure			
SVB - Base Slab	30	18-Sep-18	25-Oct-18
SVB - W/P & Backfilling for S3 removal	18	11-Oct-18	01-Nov-18
SVB - S3 Strut Removal	12	02-Nov-18	15-Nov-18
SVB - BL2 External Wall + Precast + BL1 slab	24	09-Nov-18	06-Dec-18
SVB - W/P & Backfilling for S2 removal	18	23-Nov-18	13-Dec-18
SVB - S2 Strut Removal	12	14-Dec-18	29-Dec-18
SVB - BL1 External Wall - Stage 1	24	21-Dec-18	21-Jan-19
SVB - W/P & Backfilling for S1 removal	18	08-Jan-19	28-Jan-19
SVB - S1 Strut Removal	12	29-Jan-19	18-Feb-19
SVB - BL1 External Wall - Stage 2 & Precast + GL Slab	24	12-Feb-19	11-Mar-19
SVB - GL Wall + 1F Slab	24	12-Mar-19	09-Apr-19
SVB - 1F Wall + 2F Slab	24	26-Mar-19	26-Apr-19
ABWF			
SVB - BL2 ABWF	40	21-Dec-18	15-Feb-19
SVB - BL1 ABWF	24	26-Mar-19	26-Apr-19
SVB - Provide Access for BL2 Lower Plenum Rooms	0		15-Feb-19
South Approach TBM Tunnel			
S881 TBM			
S881 TBM - G3 & G4 - Pulling, Cutting & removal	36	28-Jul-18	07-Sep-18
S881 TBM Final Break-out	14	26-Mar-19	08-Apr-19
S882 TBM			
S882 TBM - G3 & G4 - Pulling, Cutting & removal	36	24-Jul-18	03-Sep-18
TBMs Final Break out at Caterpillar Cell 1	0	12-Mar-19	
S882 TBM Final Break-out	14	12-Mar-19	25-Mar-19
S882 Cutterhead / Main Shield / Main Drive - Cut & remove	36	26-Mar-19	11-May-19
ML02 TSS Internal Structure			
ML02 TSS Temp Gallery B Removal at SVS	6	28-Jun-18	05-Jul-18
S882 ISIG Removal from Sub-sea Tunnel	15	06-Jul-18	23-Jul-18
ML03 TSS Internal Structure			
ML03 TSS Temp Gallery B Removal at SVS	6	29-Jun-18	06-Jul-18
ML03 ISIG Removal from Sub-sea Tunnel	18	07-Jul-18	27-Jul-18
TSS Cross Passage			
CP9			
CP9 TBM Assembly & Pipe Jacking	57	27-Jul-18	21-Sep-18
CP9 Invert & Collar Structure	24	22-Sep-18	23-Oct-18
CP9 Injection & Finishing	28	24-Oct-18	24-Nov-18
Slurry Pipe Setup via ML02 SVS for CP	24	28-Jun-18	26-Jul-18



◆ Planned Milestone

Planned Bar

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Dragages HongKong 香港寶嘉 — A member of the Bouygues Construction group

Dragages - Bouygues (TM-CLK) Joint Venture

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22-Dec-17	Rev. H	WYu	
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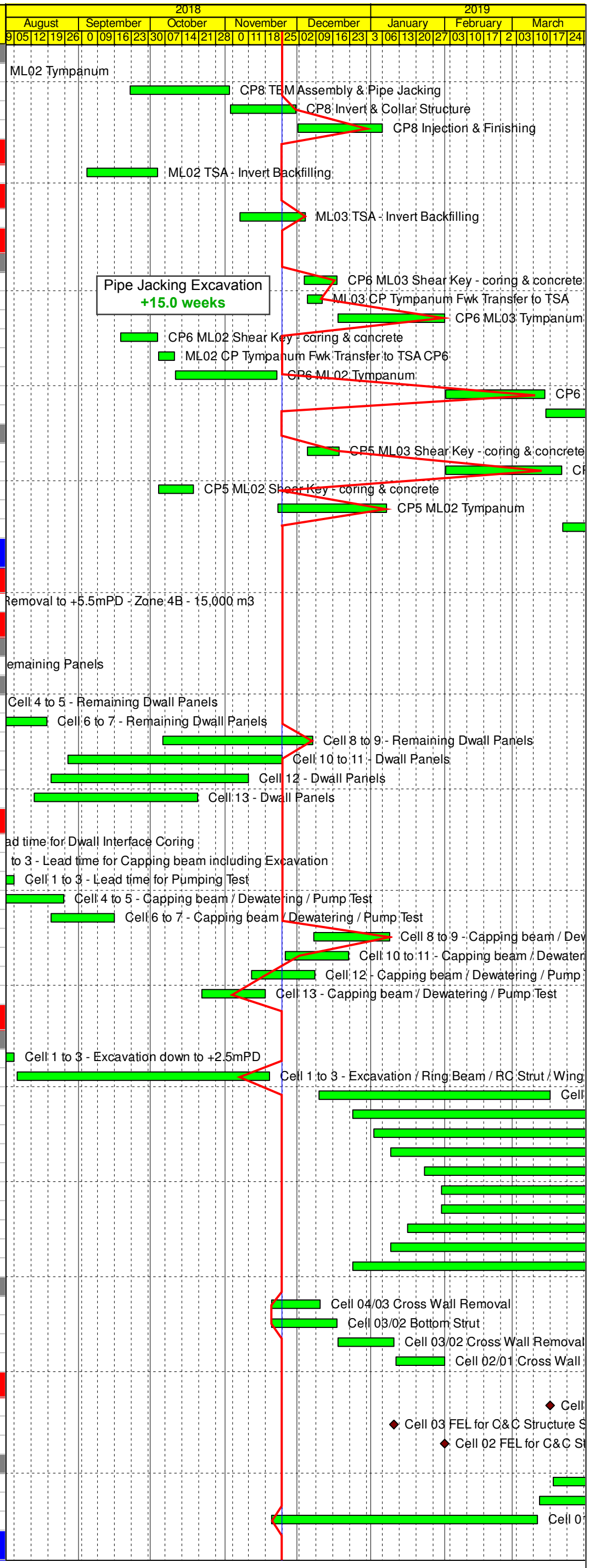
Activity Name	Orig Dur	Start	Finish
CP8			
CP8 ML02 Tympanum	36	04-Jun-18	17-Jul-18
CP8 TBM Assembly & Pipe Jacking	42	22-Sep-18	02-Nov-18
CP8 Invert & Collar Structure	24	03-Nov-18	30-Nov-18
CP8 Injection & Finishing	28	01-Dec-18	05-Jan-19
ML02 TSA Internal Structure			
ML02 TSA - Invert Backfilling	24	04-Sep-18	03-Oct-18
ML03 TSA Internal Structure			
ML03 TSA - Invert Backfilling	24	07-Nov-18	04-Dec-18
TSA Cross Passage			
CP6			
CP6 ML03 Shear Key - coring & concrete	12	04-Dec-18	17-Dec-18
ML03 CP Tympanum Fwk Transfer to TSA	6	05-Dec-18	11-Dec-18
CP6 ML03 Tympanum	36	18-Dec-18	31-Jan-19
CP6 ML02 Shear Key - coring & concrete	12	18-Sep-18	03-Oct-18
ML02 CP Tympanum Fwk Transfer to TSA CP6	6	04-Oct-18	10-Oct-18
CP6 ML02 Tympanum	36	11-Oct-18	22-Nov-18
CP6 TBM Assembly & Pipe Jacking	42	01-Feb-19	14-Mar-19
CP6 Invert & Collar Structure	24	15-Mar-19	12-Apr-19
CP5			
CP5 ML03 Shear Key - coring & concrete	12	05-Dec-18	18-Dec-18
CP5 ML03 Tympanum	36	01-Feb-19	21-Mar-19
CP5 ML02 Shear Key - coring & concrete	12	04-Oct-18	18-Oct-18
CP5 ML02 Tympanum	36	23-Nov-18	07-Jan-19
CP5 TBM Assembly & Pipe Jacking	42	22-Mar-19	02-May-19
MHS Cut-and-cover Tunnel			
MHS C&C Band Drain, Surcharge & Dwall			
Surcharge Removal to +5.5mPD - Zone 4B - 15,000 m3	3	27-Jun-18	29-Jun-18
N MHS C&C Caterpillar Dwall			
Cell 1 to 3 - Remaining Panels			
Cell 1 to 3 - Remaining Panels	12	11-Jun-18	25-Jun-18
Cell 4 to 8			
Cell 4 to 5 - Remaining Dwall Panels	40	11-Jun-18	28-Jul-18
Cell 6 to 7 - Remaining Dwall Panels	58	11-Jun-18	18-Aug-18
Cell 8 to 9 - Remaining Dwall Panels	53	06-Oct-18	07-Dec-18
Cell 10 to 11 - Dwall Panels	75	27-Aug-18	24-Nov-18
Cell 12 - Dwall Panels	69	20-Aug-18	10-Nov-18
Cell 13 - Dwall Panels	57	13-Aug-18	20-Oct-18
N MHS C&C Preparation for Excavation			
Cell 1 to 3 - Lead time for Dwall Interface Coring	12	08-Jun-18	22-Jun-18
Cell 1 to 3 - Lead time for Capping beam including Excavatio	18	23-Jun-18	14-Jul-18
Cell 1 to 3 - Lead time for Pumping Test	18	16-Jul-18	04-Aug-18
Cell 4 to 5 - Capping beam / Dewatering / Pump Test	24	30-Jul-18	25-Aug-18
Cell 6 to 7 - Capping beam / Dewatering / Pump Test	24	20-Aug-18	15-Sep-18
Cell 8 to 9 - Capping beam / Dewatering / Pump Test	24	08-Dec-18	08-Jan-19
Cell 10 to 11 - Capping beam / Dewatering / Pump Test	24	26-Nov-18	22-Dec-18
Cell 12 - Capping beam / Dewatering / Pump Test	24	12-Nov-18	08-Dec-18
Cell 13 - Capping beam / Dewatering / Pump Test	24	22-Oct-18	17-Nov-18
N MHS C&C Caterpillar Excavation			
MHS C&C Cell 12 to 04			
Cell 1 to 3 - Excavation down to +2.5mPD	18	16-Jul-18	04-Aug-18
Cell 1 to 3 - Excavation / Ring Beam / RC Strut / Wing Cort	88	06-Aug-18	19-Nov-18
Cell 13 Excavation from +2.5mPD to FEL	75	10-Dec-18	16-Mar-19
Cell 12 Excavation from +2.5mPD to FEL	80	24-Dec-18	06-Apr-19
Cell 11 Excavation from +2.5mPD to FEL	89	02-Jan-19	26-Apr-19
Cell 10 Excavation from +2.5mPD to FEL	105	09-Jan-19	24-May-19
Cell 09 Excavation from +2.5mPD to FEL	105	23-Jan-19	08-Jun-19
Cell 08 Excavation from +2.5mPD to FEL	105	30-Jan-19	15-Jun-19
Cell 07 Excavation from +2.5mPD to FEL	111	30-Jan-19	22-Jun-19
Cell 06 Excavation from +2.5mPD to FEL	123	16-Jan-19	22-Jun-19
Cell 05 Excavation from +2.5mPD to FEL	129	09-Jan-19	22-Jun-19
Cell 04 Excavation from +2.5mPD to FEL	140	24-Dec-18	22-Jun-19
Cross Wall Removal			
Cell 04/03 Cross Wall Removal	18	20-Nov-18	10-Dec-18
Cell 03/02 Bottom Strut	24	20-Nov-18	17-Dec-18
Cell 03/02 Cross Wall Removal	18	18-Dec-18	10-Jan-19
Cell 02/01 Cross Wall Removal	18	11-Jan-19	31-Jan-19
N MHS C&C Caterpillar Structure			
Cell 13 FEL for C&C Structure Start	0		16-Mar-19
Cell 03 FEL for C&C Structure Start	0		10-Jan-19
Cell 02 FEL for C&C Structure Start	0		31-Jan-19
Main Box Structure			
Cell 13 C&C Sturcture (In-situ) & system fwk assembly	163	18-Mar-19	04-Oct-19
Cell 02 C&C Structure - Base Slab, Wall & Top Slab & OH\	78	12-Mar-19	18-Jun-19
Cell 01 - Base Slab & Tympanum for TBM B/O	87	20-Nov-18	11-Mar-19
MHS Approach Ramp			



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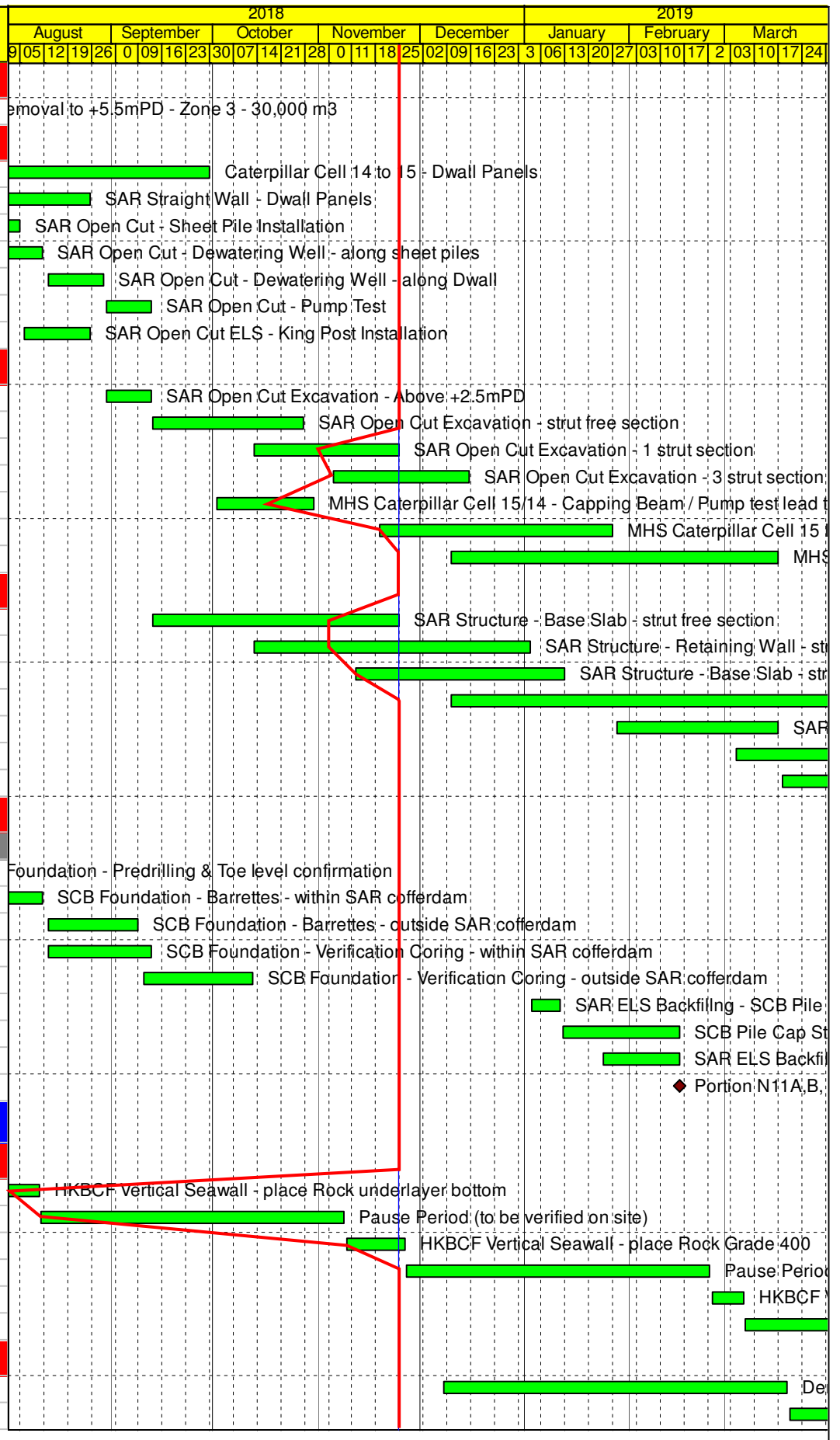
Activity Name	Orig Dur	Start	Finish
Band Drain & Surcharge			
Surcharge Removal to +5.5mPD - Zone 3 - 30,000 m3	15	08-Jun-18	26-Jun-18
MHS Ramp Dwall, Treatment & King Post			
Caterpillar Cell 14 to 15 - Dwall Panels	75	04-Jul-18	29-Sep-18
SAR Straight Wall - Dwall Panels	66	08-Jun-18	25-Aug-18
SAR Open Cut - Sheet Pile Installation	48	08-Jun-18	04-Aug-18
SAR Open Cut - Dewatering Well - along sheet piles	36	30-Jun-18	11-Aug-18
SAR Open Cut - Dewatering Well - along Dwall	15	13-Aug-18	29-Aug-18
SAR Open Cut - Pump Test	12	30-Aug-18	12-Sep-18
SAR Open Cut ELS - King Post Installation	18	06-Aug-18	25-Aug-18
MHS Approach Ramp Excavation			
SAR Open Cut Excavation - Above +2.5mPD	12	30-Aug-18	12-Sep-18
SAR Open Cut Excavation - strut free section	36	13-Sep-18	27-Oct-18
SAR Open Cut Excavation - 1 strut section	36	13-Oct-18	24-Nov-18
SAR Open Cut Excavation - 3 strut section	36	05-Nov-18	15-Dec-18
MHS Caterpillar Cell 15/14 - Capping Beam / Pump test lea	24	02-Oct-18	30-Oct-18
MHS Caterpillar Cell 15 Excavation	57	19-Nov-18	26-Jan-19
MHS Caterpillar Cell 14 Excavation	75	10-Dec-18	16-Mar-19
MHS Approach Ramp Structure			
SAR Structure - Base Slab - strut free section	60	13-Sep-18	24-Nov-18
SAR Structure - Retaining Wall - strut free section	66	13-Oct-18	02-Jan-19
SAR Structure - Base Slab - strut section	51	12-Nov-18	12-Jan-19
SAR Strucutre - Retaining Wall - strut section	92	10-Dec-18	06-Apr-19
SAR Structure - Base Slab - Cell 15	36	28-Jan-19	16-Mar-19
SAR Strucutre - Retaining Wall - Cell 15	66	04-Mar-19	25-May-19
SAR Structure - Base Slab - Cell 14	24	18-Mar-19	15-Apr-19
VO73 SCB Foundation & Substructure			
Foundation			
SCB Foundation - Predrilling & Toe level confirmation	30	08-Jun-18	14-Jul-18
SCB Foundation - Barrettes - within SAR cofferdam	24	16-Jul-18	11-Aug-18
SCB Foundation - Barrettes - outside SAR cofferdam	24	13-Aug-18	08-Sep-18
SCB Foundation - Verification Coring - within SAR cofferdam	27	13-Aug-18	12-Sep-18
SCB Foundation - Verification Coring - outside SAR cofferd	27	10-Sep-18	12-Oct-18
SAR ELS Backfillng - SCB Pile Cap Location	8	03-Jan-19	11-Jan-19
SCB Pile Cap Structure	24	12-Jan-19	15-Feb-19
SAR ELS Backfilling - Portion N13K,J	14	24-Jan-19	15-Feb-19
Portion N11A,B, N13K,J - Handover	0		15-Feb-19
Southern Landfall - Surface			
HKBCF Seawall Modification (schedule TBC)			
HKBCF Vertical Seawall - place Rock underlayer bottom	9	01-Aug-18*	10-Aug-18
Pause Period (to be verified on site)	90	11-Aug-18	08-Nov-18
HKBCF Vertical Seawall - place Rock Grade 400	15	09-Nov-18	26-Nov-18
Pause Period (to be verified on site)	90	27-Nov-18	24-Feb-19
HKBCF Vertical Seawall - place Rock underlayer upper	9	25-Feb-19	06-Mar-19
HKBCF Vertical Seawall - place Armour Rock	31	07-Mar-19	12-Apr-19
UU / At-grade works			
Demobilization of Dwall site setup	78	08-Dec-18	19-Mar-19
Drainage & Watermain - SLF	216	20-Mar-19	09-Dec-19



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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		✓

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

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

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

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
		- Reclamation dredging and filling for Portion 1 of HKLR;							
6.1	-	The filling material for the other parts of the works are the same as Sequence A;	All other areas/backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	5.7	Cage type silt curtain (with steel enclosure) shall be used for grab dredgers working in the site of HKBCF and TM- CLKL southern reclamation. Cage type silt curtains will be applied round all grab dredgers at other works area.	HKBCF, HKLR and TM-CLKL grab dredging	Contractor	TM-EIAO		Y		✓
6.1	Annex A	A layer of floating type silt curtain will be applied around all works as defined in Appendix D6b.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	TM-CLKL northern landfall: - Reclamation filling shall not proceed until at least 200m section of leading seawall at both the east and west sides of the reclamation are formed above +2.5 mPD, except for 100m gaps for marine access;	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
General Marine Works									
6.1	-	Use of 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		Y		✓

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

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
					Guidelines. DASO permit conditions.				
6.1	-	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
					conditions.				
6.1	5.2	Silt curtain shall have proved effectiveness from the producer and shall be fully maintained throughout the works by the contractor.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The daily maximum production rates shall not exceed those assumed in the water quality assessment.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The dredging and filling works shall be scheduled to spread the works evenly over a working day.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
Land Works									
6.1	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Sewage effluent and discharges from on- site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.1	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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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	
6.1	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	5.8	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
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		✓

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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	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal Ordinance		Y		✓
6.1	-	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	✓
6.1	Section 5	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✓
Water Quality Monitoring									
6.1	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period. One year operation phase water quality monitoring at designated stations.	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	✓
ECOLOGY									
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		✓

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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	
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600m2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	N/A. To be implemented by AFCD.
8.14	6.3, 6.5	Specification and implementation of marine vessel control specifications	All areas/Detailed Design/during construction works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.14	6.3, 6.5	Design and implementation of acoustic decoupling methods for dredging and reclamation works	All areas/ Detailed Design/during dredging and reclamation works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.5	Audit coral translocation success	Post translocation	Contractor	TMEIA		Y		✓
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		N/A
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
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

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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	Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5)	All areas/detailed design	Design Consultant	TMEIA	Y			N/A
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous		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	
					Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.				
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		✓
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		✓

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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	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		✓
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,	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	
		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.						
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	:	09/10/2018

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	19 Mar 2018
Slope (m)	:	2.05242
Intercept (b)	:	-0.01383
Correlation Coefficient(r)	:	0.99994

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1015
Ta(K)	:	298

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	10.8	3.290	1.610	54	54.05
2	13 holes	9.0	3.003	1.470	50	50.05
3	10 holes	6.8	2.610	1.279	45	45.04
4	7 holes	4.4	2.100	1.030	37	37.04
5	5 holes	2.4	1.551	0.762	27	27.03

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):31.657 Intercept(b):3.704 Correlation Coefficient(r): 0.9975

Checked by: Magnum Fan Date: 12/10/2018

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR10
Calibrated by	:	P.F.Yeung
Date	:	09/10/2018

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	19 Mar 2018
Slope (m)	:	2.05242
Intercept (b)	:	-0.01383
Correlation Coefficient(r)	:	0.99994

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1015
Ta(K)	:	298

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	10.2	3.197	1.564	52	52.05
2	13 holes	8.6	2.935	1.437	48	48.05
3	10 holes	6.2	2.492	1.221	44	44.04
4	7 holes	4.2	2.051	1.006	38	38.04
5	5 holes	2.6	1.614	0.793	30	30.03

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):27.443 Intercept(b): 9.391 Correlation Coefficient(r): 0.9928

Checked by: Magnum Fan Date: 12/10/2018

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AQMS1
Calibrated by	:	P.F.Yeung
Date	:	09/10/2018

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	19 Mar 2018
Slope (m)	:	2.05242
Intercept (b)	:	-0.01383
Correlation Coefficient(r)	:	0.99994

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1015
Ta(K)	:	298

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.6	3.409	1.668	54	54.05
2	13 holes	9.0	3.003	1.470	49	49.05
3	10 holes	6.7	2.591	1.269	43	43.04
4	7 holes	4.6	2.147	1.053	35	35.03
5	5 holes	2.5	1.583	0.778	27	27.03

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):31.016 Intercept(b):2.949 Correlation Coefficient(r): 0.9984

Checked by: Magnum Fan Date: 12/10/2018

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 1
Calibrated by	:	P.F.Yeung
Date	:	09/10/2018

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	19 Mar 2018
Slope (m)	:	2.05242
Intercept (b)	:	-0.01383
Correlation Coefficient(r)	:	0.99994

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1015
Ta(K)	:	298

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.5	3.395	1.661	54	54.05
2	13 holes	9.0	3.003	1.470	49	49.05
3	10 holes	6.8	2.610	1.279	43	43.04
4	7 holes	4.5	2.123	1.041	38	38.04
5	5 holes	2.7	1.645	0.808	30	30.03

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):27.681 Intercept(b):8.194 Correlation Coefficient(r): 0.9977

Checked by: Magnum Fan Date: 12/10/2018

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 6
Calibrated by	:	P.F.Yeung
Date	:	09/10/2018

Sampler

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

Calibration Orifice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	19 Mar 2018
Slope (m)	:	2.05242
Intercept (b)	:	-0.01383
Correlation Coefficient(r)	:	0.99994

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1015
Ta(K)	:	298

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.0	3.468	1.696	52	52.05
2	13 holes	10.2	3.197	1.564	47	47.04
3	10 holes	7.6	2.760	1.351	42	42.04
4	7 holes	4.6	2.147	1.053	36	36.04
5	5 holes	2.5	1.583	0.778	25	25.02

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):27.670 Intercept(b): 4.787 Correlation Coefficient(r): 0.9916

Checked by: Magnum Fan Date: 12/10/2018

TISCH Environmental

RECALIBRATION DUE DATE:
March 19, 2019

Certificate of Calibration

Calibration Certification Information					
Cal. Date:	March 19, 2018	**Rootsmeter S/N:** 438320	**Ta:** 294	°K
Operator:	Jim Tisch		**Pa:** 746.8	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **2454**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4300	3.2	2.00
2	3	4	1	1.0040	6.4	4.00
3	5	6	1	0.9030	7.9	5.00
4	7	8	1	0.8590	8.7	5.50
5	9	10	1	0.7080	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9917	0.6935	1.4113	0.9957	0.6963	0.8874
0.9874	0.9835	1.9959	0.9914	0.9875	1.2549
0.9854	1.0913	2.2315	0.9894	1.0957	1.4030
0.9843	1.1459	2.3405	0.9883	1.1506	1.4715
0.9789	1.3826	2.8227	0.9829	1.3882	1.7747
QSTD	**m=**	**2.05242**	**QA**	**m=**	**1.28519**
	b=	**-0.01383**		**b=**	**-0.00869**
	r=	**0.99994**		**r=**	**0.99994**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C184960
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-1761) Date of Receipt / 收件日期 : 23 August 2018

Description / 儀器名稱 : Anemometer
Manufacturer / 製造商 : Lutron
Model No. / 型號 : AM-4201
Serial No. / 編號 : AF.27513
Supplied By / 委託者 : Envirotech Services Co.
Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 5 September 2018

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- Testo Industrial Services GmbH, Germany

Tested By / 測試 : T L Shek, Assistant Engineer

Certified By / 核證 : H C Chan, Engineer

Date of Issue / 簽發日期 : 6 September 2018

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C184960
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 10 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL386	Multi-function Measuring Instrument	S16493

4. Test procedure : MA130N.

5. Results :

Air Velocity

Applied Value (m/s)	UUT Reading (m/s)	Measured Correction		
		Value (m/s)	Measurement Uncertainty	
			Expanded Uncertainty (m/s)	Coverage Factor
2.0	1.7	+0.3	0.2	2.0
4.0	3.8	+0.2	0.3	2.0
6.0	5.8	+0.2	0.3	2.0
8.0	7.9	+0.1	0.3	2.0
10.0	10.0	0.0	0.4	2.0

Remarks : - The Measured Corrections are defined as :
Value = Applied Value - UUT Reading

- The expanded uncertainties are for a level of confidence of 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

ENVIROTECH SERVICES CO.

Calibration Report of Wind Meter

Date of Calibration : 30 September 2018

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)
1.6	1.4
3.2	2.7
4.8	4.1

Wind Direction Test

Davis (o)	Marine Compass (o)
270	270
359	0
89	90
181	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 - November 2018

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

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Air Quality Impact Monitoring Schedule - December 2018

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Dec
2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec
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
16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec	22-Dec
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
23-Dec	24-Dec	Public Holiday 25-Dec	Public Holiday 26-Dec	27-Dec	28-Dec	29-Dec
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
30-Dec	31-Dec					
	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 Landfall
Impact Marine Water Quality Monitoring (WQM) Schedule (December 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1/Dec
2/Dec	3/Dec	4/Dec	5/Dec	6/Dec	7/Dec	8/Dec
	ebb tide 8:14 - 11:44 flood tide 2:13 - 5:43		ebb tide 10:02 - 13:32 flood tide 4:20 - 7:50		ebb tide 11:27 - 14:57 flood tide 5:59 - 9:29	
9/Dec	10/Dec	11/Dec	12/Dec	13/Dec	14/Dec	15/Dec
	ebb tide 13:15 - 16:45 flood tide 8:03 - 11:33		ebb tide 14:43 - 16:43 flood tide 9:27 - 12:57		ebb tide 4:43 - 6:35 flood tide 11:32 - 15:02	
16/Dec	17/Dec	18/Dec	19/Dec	20/Dec	21/Dec	22/Dec
	ebb tide 5:57 - 9:27 flood tide 13:24 - 16:54		ebb tide 8:12 - 11:42 flood tide 14:23 - 17:53		ebb tide 10:00 - 13:30 flood tide 15:33 - 19:03	
23/Dec	24/Dec	25/Dec	26/Dec	27/Dec	28/Dec	29/Dec
	ebb tide 12:28 - 15:58 flood tide 7:10 - 10:40		ebb tide 14:06 - 16:21 flood tide 8:49 - 12:19		ebb tide 4:21 - 6:36 flood tide 10:34 - 14:04	
30/Dec	31/Dec					
	ebb tide 6:37 - 10:07 flood tide 13:13 - 16:43					

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - November 2018

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

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Tentative Impact Dolphin Monitoring Survey Monitoring Schedule - December 2018

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

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

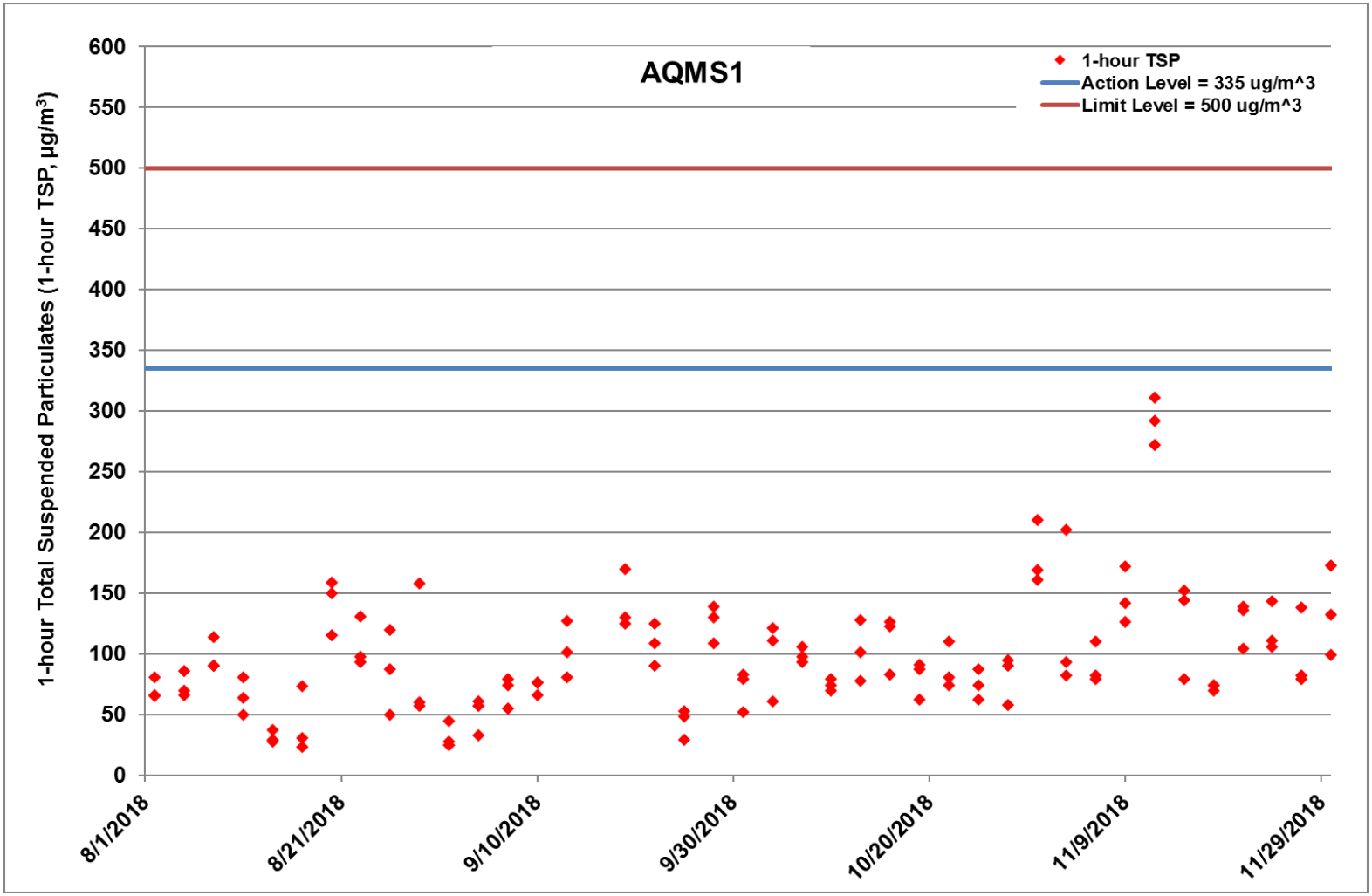


Figure G.1 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

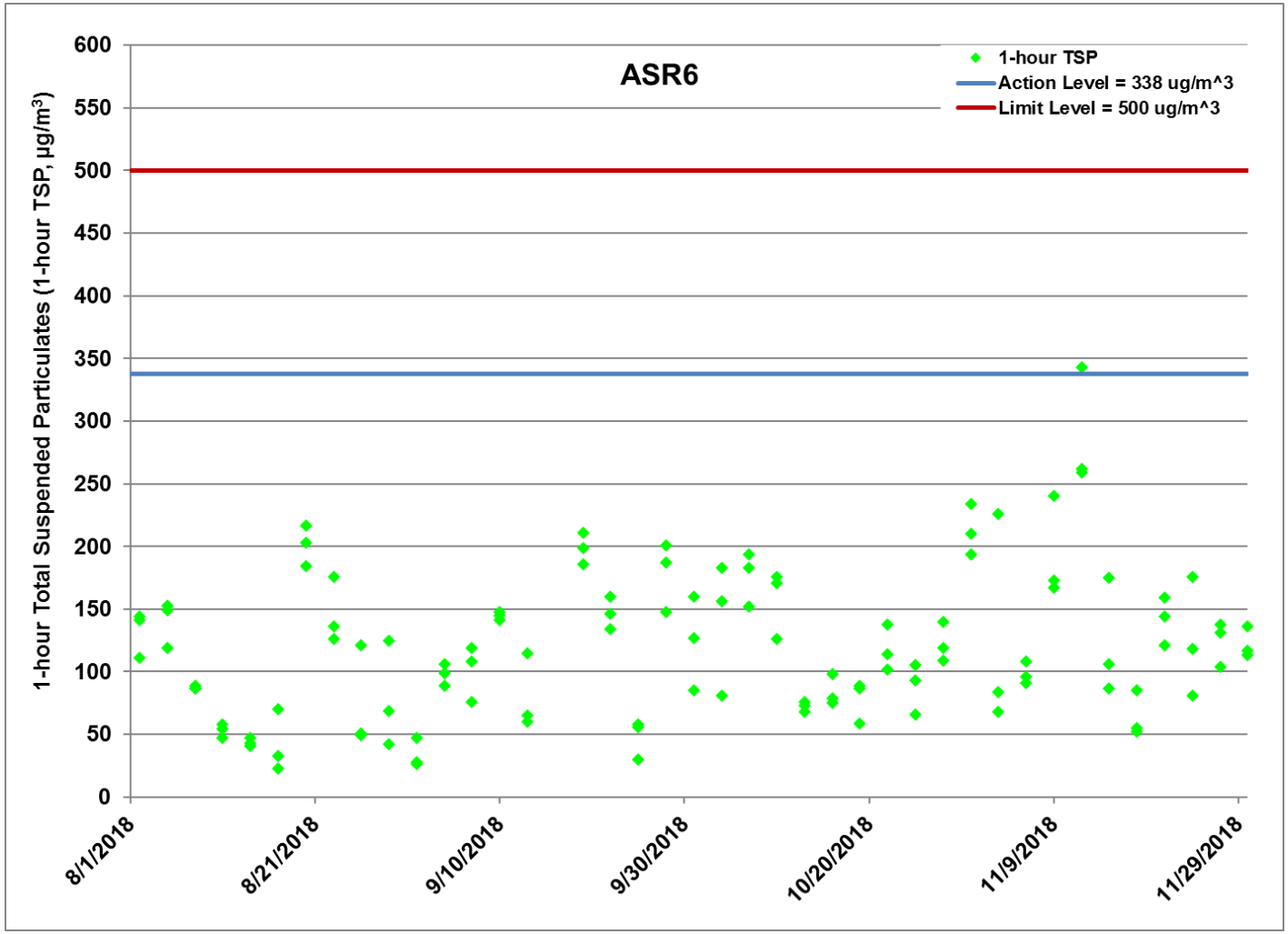


Figure G.2 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

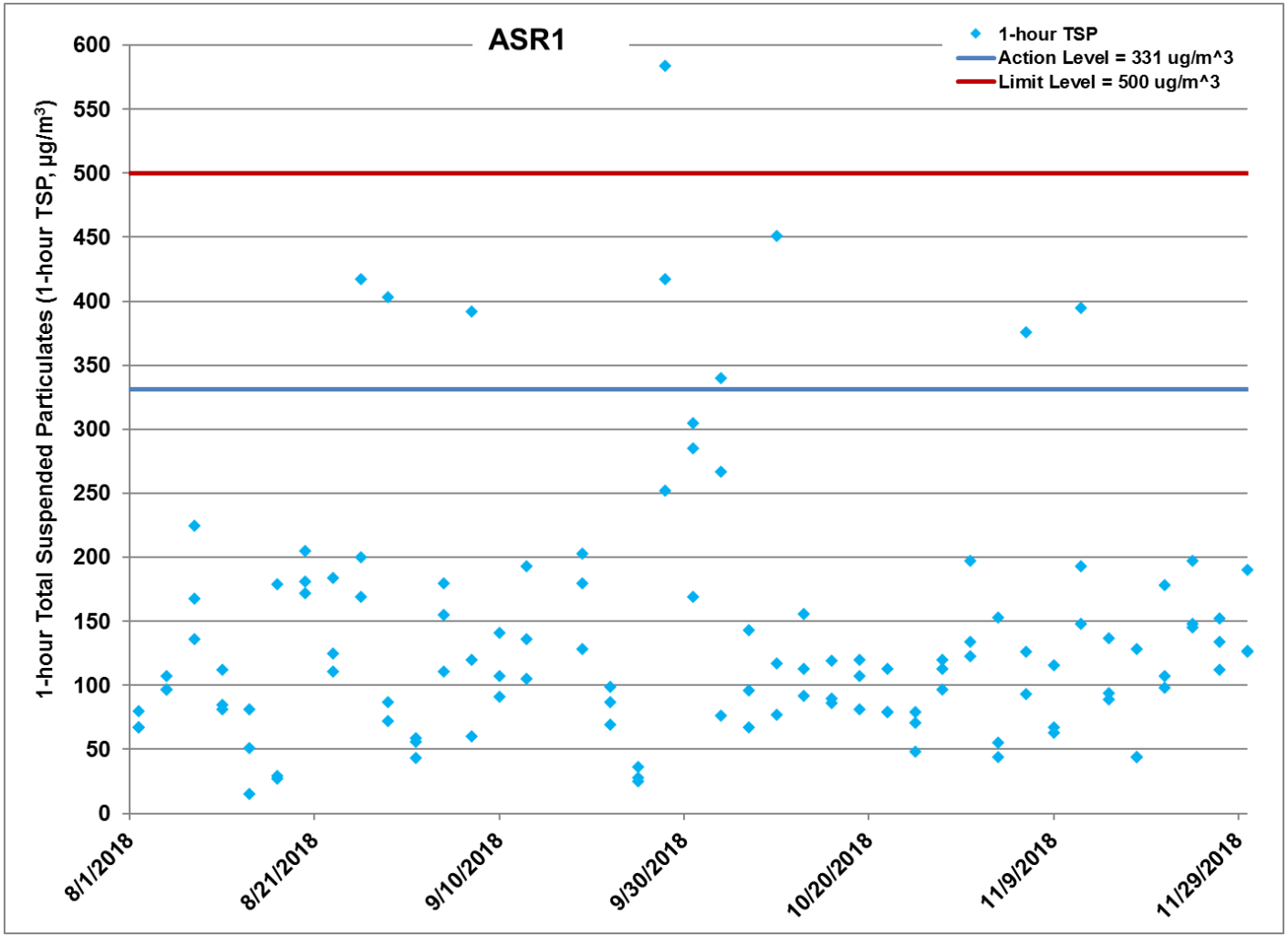


Figure G.3 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

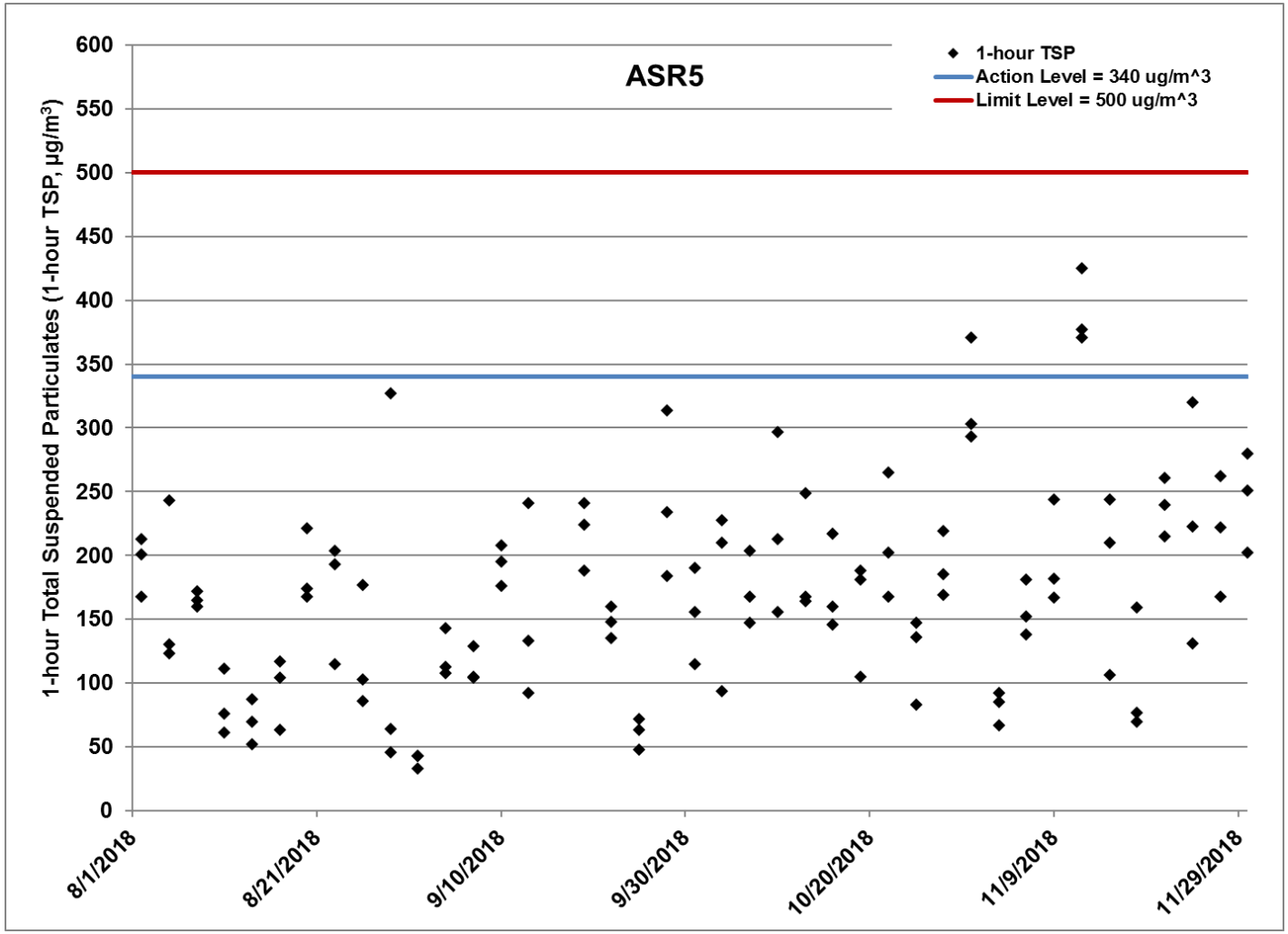


Figure G.4 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

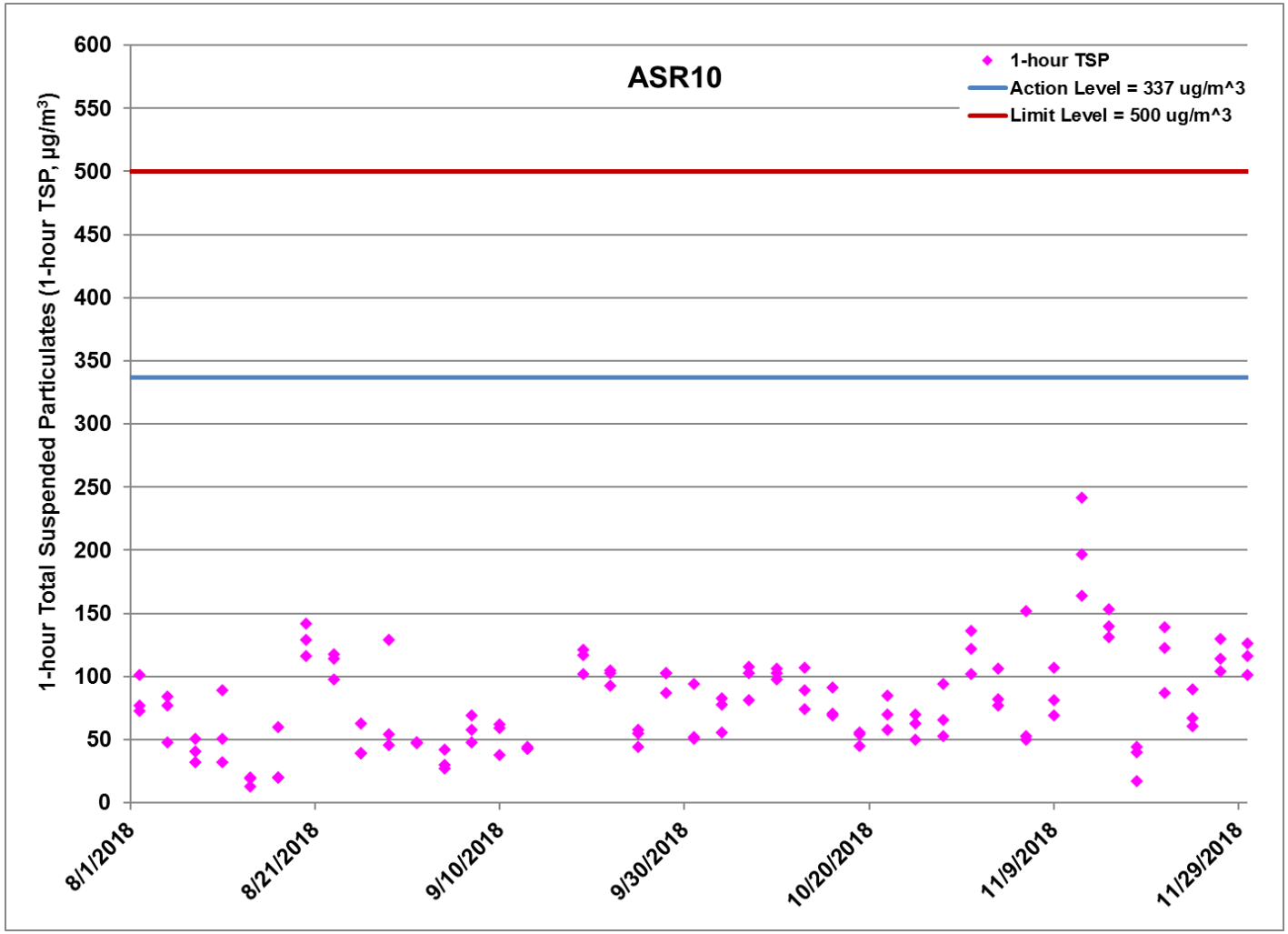


Figure G.5 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

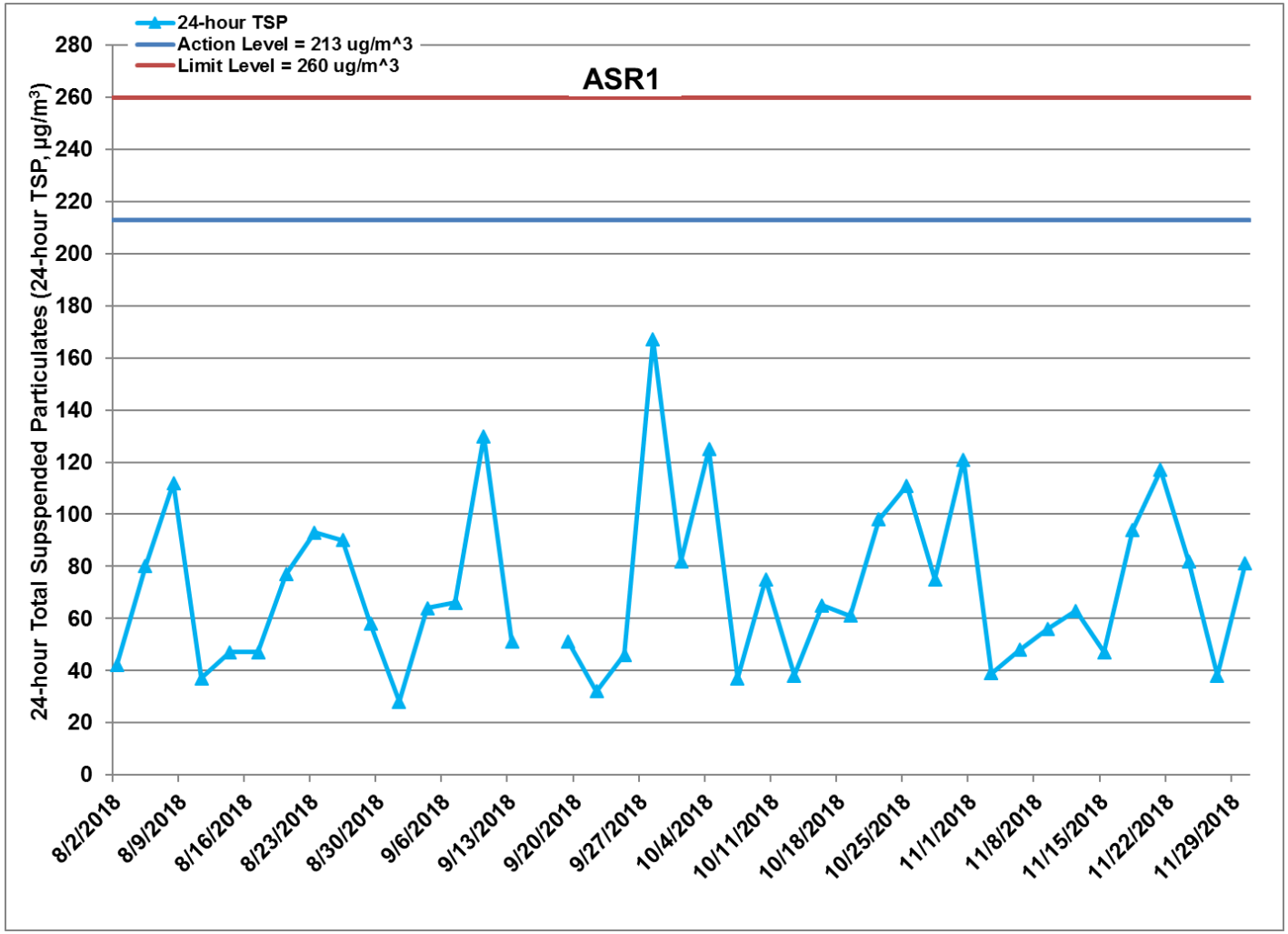


Figure G.6 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

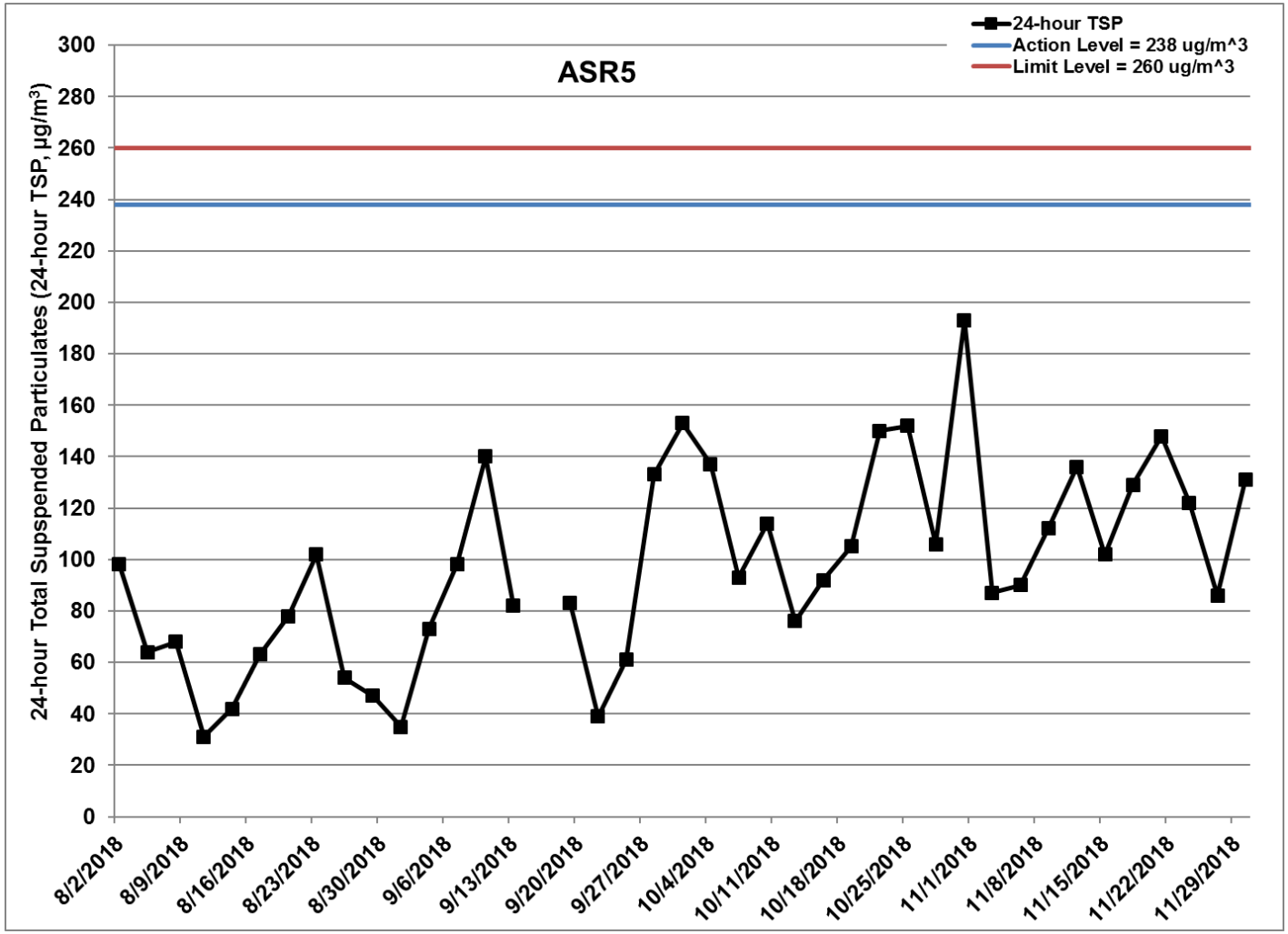


Figure G.7 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

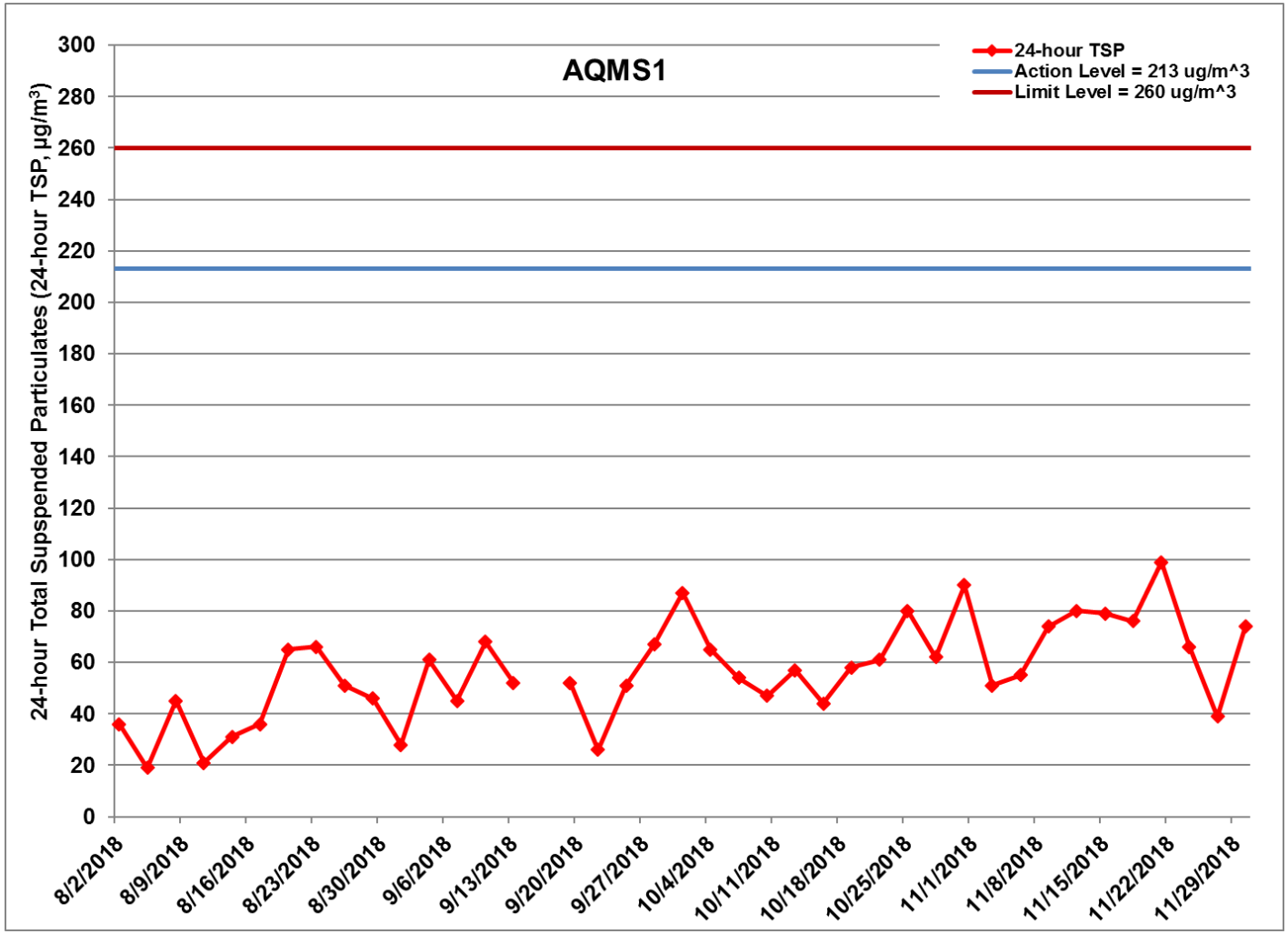


Figure G.8 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

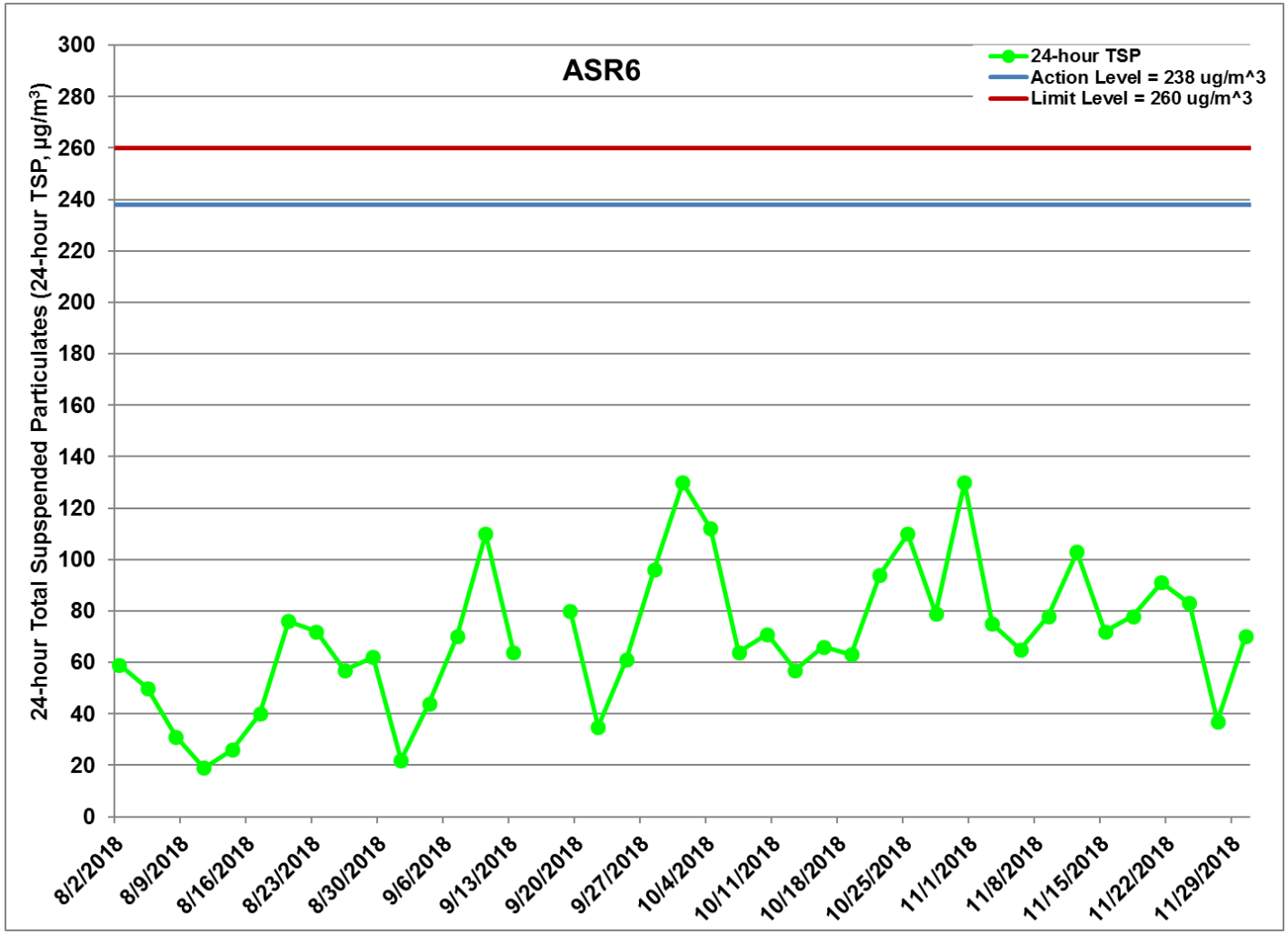


Figure G.9 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

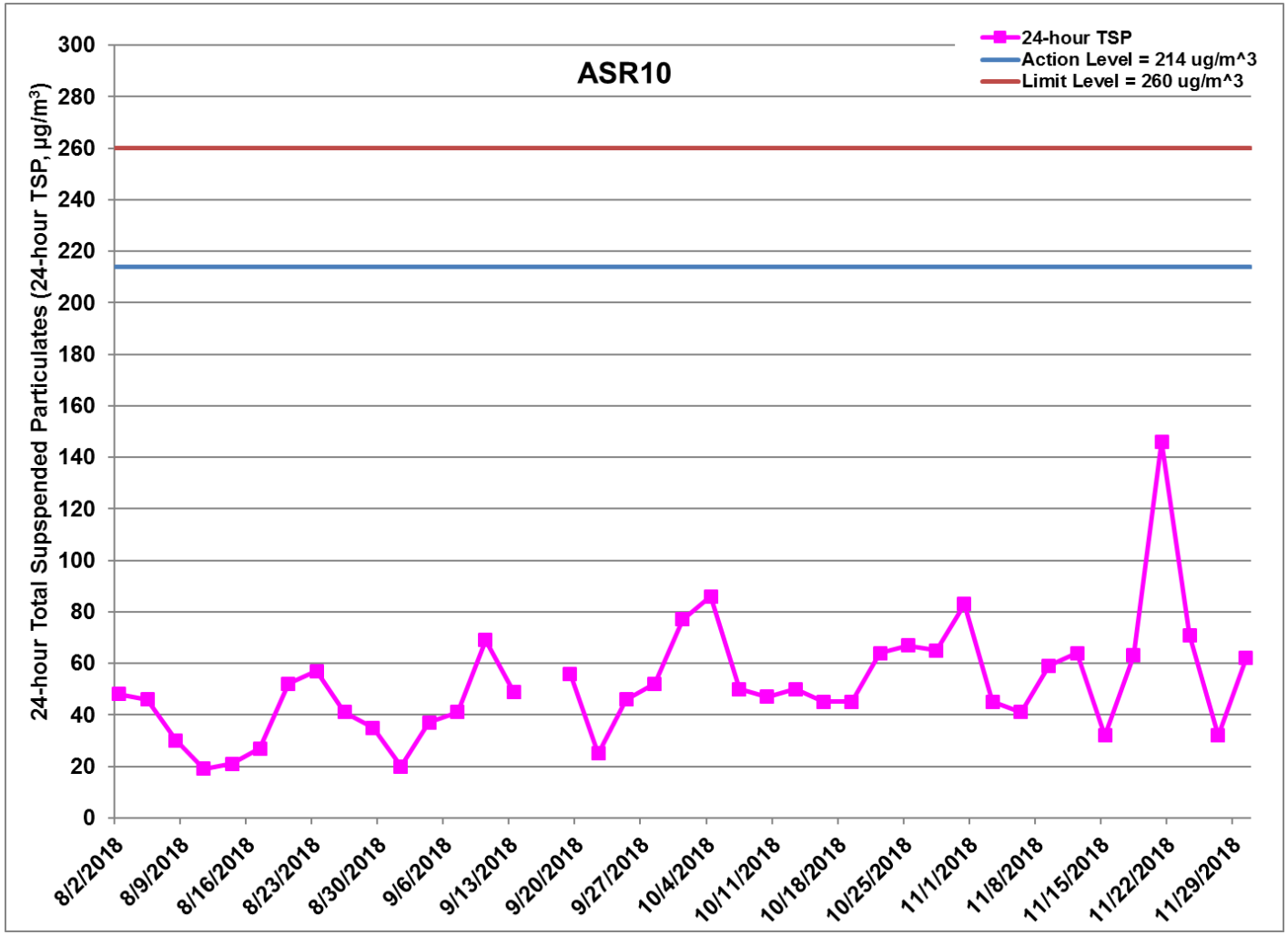


Figure G.10 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 August 2018 and 30 November 2018 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Bulk Excavation, TBM Tunnel Works (1/8/2018 – 30/11/2018)

Ref: 0212330_Impact AQM graphs_November 2018_REV a.xlsx

ERM

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-03	AQMS1	Sunny	08:50	1-hour TSP	202	ug/m3
TMCLKL	HY/2012/08	2018-11-03	AQMS1	Sunny	09:52	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018-11-03	AQMS1	Sunny	10:54	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR1	Sunny	08:38	1-hour TSP	153	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR1	Sunny	09:40	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR1	Sunny	10:42	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR10	Sunny	08:04	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR10	Sunny	09:06	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR10	Sunny	10:08	1-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR5	Sunny	08:26	1-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR5	Sunny	09:28	1-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR5	Sunny	10:30	1-hour TSP	92	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR6	Sunny	08:15	1-hour TSP	226	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR6	Sunny	09:17	1-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR6	Sunny	10:19	1-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	2018-11-06	AQMS1	Sunny	13:59	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018-11-06	AQMS1	Sunny	15:01	1-hour TSP	110	ug/m3
TMCLKL	HY/2012/08	2018-11-06	AQMS1	Sunny	16:03	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR1	Sunny	13:48	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR1	Sunny	14:50	1-hour TSP	376	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR1	Sunny	15:52	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR10	Sunny	13:13	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR10	Sunny	14:15	1-hour TSP	50	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR10	Sunny	15:17	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR5	Sunny	13:37	1-hour TSP	181	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR5	Sunny	14:39	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR5	Sunny	15:41	1-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR6	Sunny	13:25	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR6	Sunny	14:27	1-hour TSP	96	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR6	Sunny	15:29	1-hour TSP	91	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-09	AQMS1	Sunny	08:50	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2018-11-09	AQMS1	Sunny	09:52	1-hour TSP	142	ug/m3
TMCLKL	HY/2012/08	2018-11-09	AQMS1	Sunny	10:54	1-hour TSP	172	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR1	Sunny	08:39	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR1	Sunny	09:41	1-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR1	Sunny	10:43	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR10	Sunny	08:06	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR10	Sunny	09:08	1-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR10	Sunny	10:10	1-hour TSP	107	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR5	Sunny	08:28	1-hour TSP	244	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR5	Sunny	09:30	1-hour TSP	182	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR5	Sunny	10:32	1-hour TSP	167	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR6	Sunny	08:17	1-hour TSP	167	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR6	Sunny	09:19	1-hour TSP	173	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR6	Sunny	10:21	1-hour TSP	240	ug/m3
TMCLKL	HY/2012/08	2018-11-12	AQMS1	Sunny	14:12	1-hour TSP	311	ug/m3
TMCLKL	HY/2012/08	2018-11-12	AQMS1	Sunny	15:14	1-hour TSP	272	ug/m3
TMCLKL	HY/2012/08	2018-11-12	AQMS1	Sunny	16:16	1-hour TSP	292	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR1	Sunny	14:00	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR1	Sunny	15:02	1-hour TSP	395	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR1	Sunny	16:04	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR10	Sunny	13:26	1-hour TSP	242	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR10	Sunny	14:28	1-hour TSP	164	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR10	Sunny	15:30	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR5	Sunny	13:49	1-hour TSP	371	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR5	Sunny	14:51	1-hour TSP	425	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR5	Sunny	15:53	1-hour TSP	377	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR6	Sunny	13:38	1-hour TSP	262	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR6	Sunny	14:40	1-hour TSP	343	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR6	Sunny	15:42	1-hour TSP	259	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-15	AQMS1	Sunny	13:59	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2018-11-15	AQMS1	Sunny	15:01	1-hour TSP	144	ug/m3
TMCLKL	HY/2012/08	2018-11-15	AQMS1	Sunny	16:03	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR1	Sunny	13:48	1-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR1	Sunny	14:50	1-hour TSP	94	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR1	Sunny	15:52	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR10	Sunny	13:13	1-hour TSP	153	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR10	Sunny	14:15	1-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR10	Sunny	15:17	1-hour TSP	140	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR5	Sunny	13:36	1-hour TSP	210	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR5	Sunny	14:38	1-hour TSP	244	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR5	Sunny	15:40	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR6	Sunny	13:24	1-hour TSP	175	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR6	Sunny	14:26	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR6	Sunny	15:28	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-11-18	AQMS1	Sunny	08:50	1-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2018-11-18	AQMS1	Sunny	09:52	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2018-11-18	AQMS1	Sunny	10:54	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR1	Sunny	08:38	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR1	Sunny	09:40	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR1	Sunny	10:42	1-hour TSP	128	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR10	Sunny	08:04	1-hour TSP	17	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR10	Sunny	09:06	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR10	Sunny	10:08	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR5	Sunny	08:27	1-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR5	Sunny	09:29	1-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR5	Sunny	10:31	1-hour TSP	159	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR6	Sunny	08:15	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR6	Sunny	09:17	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR6	Sunny	10:19	1-hour TSP	85	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-21	AQMS1	Sunny	13:52	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2018-11-21	AQMS1	Sunny	14:54	1-hour TSP	139	ug/m3
TMCLKL	HY/2012/08	2018-11-21	AQMS1	Sunny	15:56	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR1	Sunny	13:40	1-hour TSP	98	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR1	Sunny	14:42	1-hour TSP	178	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR1	Sunny	15:44	1-hour TSP	107	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR10	Sunny	13:07	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR10	Sunny	14:09	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR10	Sunny	15:11	1-hour TSP	139	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR5	Sunny	13:28	1-hour TSP	215	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR5	Sunny	14:30	1-hour TSP	240	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR5	Sunny	15:32	1-hour TSP	261	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR6	Sunny	13:18	1-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR6	Sunny	14:20	1-hour TSP	144	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR6	Sunny	15:22	1-hour TSP	159	ug/m3
TMCLKL	HY/2012/08	2018-11-24	AQMS1	Sunny	09:14	1-hour TSP	143	ug/m3
TMCLKL	HY/2012/08	2018-11-24	AQMS1	Sunny	10:16	1-hour TSP	106	ug/m3
TMCLKL	HY/2012/08	2018-11-24	AQMS1	Sunny	11:18	1-hour TSP	111	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR1	Sunny	09:02	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR1	Sunny	10:04	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR1	Sunny	11:06	1-hour TSP	145	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR10	Sunny	08:30	1-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR10	Sunny	09:32	1-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR10	Sunny	10:34	1-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR5	Sunny	08:51	1-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR5	Sunny	09:53	1-hour TSP	223	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR5	Sunny	10:55	1-hour TSP	320	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR6	Sunny	08:40	1-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR6	Sunny	09:42	1-hour TSP	118	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR6	Sunny	10:44	1-hour TSP	176	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-27	AQMS1	Cloudy	13:47	1-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	2018-11-27	AQMS1	Cloudy	14:49	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2018-11-27	AQMS1	Cloudy	15:51	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR1	Cloudy	13:35	1-hour TSP	134	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR1	Cloudy	14:37	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR1	Cloudy	15:39	1-hour TSP	112	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR10	Cloudy	13:00	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR10	Cloudy	14:02	1-hour TSP	130	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR10	Cloudy	15:04	1-hour TSP	114	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR5	Cloudy	13:23	1-hour TSP	222	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR5	Cloudy	14:25	1-hour TSP	262	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR5	Cloudy	15:27	1-hour TSP	168	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR6	Cloudy	13:11	1-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR6	Cloudy	14:13	1-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR6	Cloudy	15:15	1-hour TSP	104	ug/m3
TMCLKL	HY/2012/08	2018-11-30	AQMS1	Sunny	09:11	1-hour TSP	173	ug/m3
TMCLKL	HY/2012/08	2018-11-30	AQMS1	Sunny	10:13	1-hour TSP	132	ug/m3
TMCLKL	HY/2012/08	2018-11-30	AQMS1	Sunny	11:15	1-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR1	Sunny	08:58	1-hour TSP	190	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR1	Sunny	10:00	1-hour TSP	127	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR1	Sunny	11:02	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR10	Sunny	08:24	1-hour TSP	101	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR10	Sunny	09:26	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR10	Sunny	10:28	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR5	Sunny	08:47	1-hour TSP	280	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR5	Sunny	09:49	1-hour TSP	251	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR5	Sunny	10:51	1-hour TSP	202	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR6	Sunny	08:35	1-hour TSP	113	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR6	Sunny	09:37	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR6	Sunny	10:39	1-hour TSP	117	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-03	AQMS1	Sunny	11:56	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR1	Sunny	11:44	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR10	Sunny	11:10	24-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR5	Sunny	11:32	24-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2018-11-03	ASR6	Sunny	11:21	24-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2018-11-06	AQMS1	Sunny	17:05	24-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR1	Sunny	16:54	24-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR10	Sunny	16:19	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR5	Sunny	16:43	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	2018-11-06	ASR6	Sunny	16:31	24-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2018-11-09	AQMS1	Sunny	11:56	24-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR1	Sunny	11:45	24-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR10	Sunny	11:12	24-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR5	Sunny	11:34	24-hour TSP	112	ug/m3
TMCLKL	HY/2012/08	2018-11-09	ASR6	Sunny	11:23	24-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2018-11-12	AQMS1	Sunny	17:18	24-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR1	Sunny	17:06	24-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR10	Sunny	16:32	24-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR5	Sunny	16:55	24-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	2018-11-12	ASR6	Sunny	16:44	24-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2018-11-15	AQMS1	Sunny	17:05	24-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR1	Sunny	16:54	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR10	Sunny	16:19	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR5	Sunny	16:42	24-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	2018-11-15	ASR6	Sunny	16:30	24-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	2018-11-18	AQMS1	Sunny	11:56	24-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR1	Sunny	11:44	24-hour TSP	94	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR10	Sunny	11:10	24-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR5	Sunny	11:33	24-hour TSP	129	ug/m3
TMCLKL	HY/2012/08	2018-11-18	ASR6	Sunny	11:21	24-hour TSP	78	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2018-11-21	AQMS1	Sunny	16:58	24-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR1	Sunny	16:46	24-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR10	Sunny	16:13	24-hour TSP	146	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR5	Sunny	16:34	24-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	2018-11-21	ASR6	Sunny	16:24	24-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	2018-11-24	AQMS1	Sunny	12:20	24-hour TSP	66	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR1	Sunny	12:08	24-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR10	Sunny	11:36	24-hour TSP	71	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR5	Sunny	11:57	24-hour TSP	122	ug/m3
TMCLKL	HY/2012/08	2018-11-24	ASR6	Sunny	11:46	24-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2018-11-27	AQMS1	Cloudy	16:53	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR1	Cloudy	16:41	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR10	Cloudy	16:06	24-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR5	Cloudy	16:29	24-hour TSP	86	ug/m3
TMCLKL	HY/2012/08	2018-11-27	ASR6	Cloudy	16:17	24-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2018-11-30	AQMS1	Sunny	12:17	24-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR1	Sunny	12:04	24-hour TSP	81	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR10	Sunny	11:30	24-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR5	Sunny	11:53	24-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2018-11-30	ASR6	Sunny	11:41	24-hour TSP	70	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)**
18/11/03	0:00	0.9	49
18/11/03	1:00	0.4	136
18/11/03	2:00	0.4	309
18/11/03	3:00	0.4	274
18/11/03	4:00	0.4	289
18/11/03	5:00	0.4	304
18/11/03	6:00	0.9	47
18/11/03	7:00	0.9	35
18/11/03	8:00	0.9	102
18/11/03	9:00	0.9	105
18/11/03	10:00	0.9	80
18/11/03	11:00	1.3	81
18/11/03	12:00	0.9	323
18/11/03	13:00	0.9	96
18/11/03	14:00	0.9	136
18/11/03	15:00	0.9	52
18/11/03	16:00	0.4	232
18/11/03	17:00	0.4	90
18/11/03	18:00	0.9	86
18/11/03	19:00	0.9	115
18/11/03	20:00	0.9	26
18/11/03	21:00	0.9	20
18/11/03	22:00	0.9	92
18/11/03	23:00	0.9	53
18/11/04	0:00	1.3	21
18/11/04	1:00	0.4	58
18/11/04	2:00	0.4	31
18/11/04	3:00	0.9	39
18/11/04	4:00	0.9	53
18/11/04	5:00	0.9	11
18/11/04	6:00	1.3	11
18/11/04	7:00	1.8	56
18/11/04	8:00	1.3	44
18/11/04	9:00	1.3	46
18/11/04	10:00	0.9	51
18/11/04	11:00	0.9	92
18/11/04	12:00	0.9	122
18/11/04	13:00	1.3	101
18/11/04	14:00	1.8	162
18/11/04	15:00	2.7	117
18/11/04	16:00	2.2	118
18/11/04	17:00	2.2	104
18/11/04	18:00	2.2	114
18/11/04	19:00	1.3	89
18/11/04	20:00	0.9	74
18/11/04	21:00	0.9	107
18/11/04	22:00	1.3	114
18/11/04	23:00	1.3	36
18/11/06	0:00	2.7	95
18/11/06	1:00	2.7	93
18/11/06	2:00	2.2	98
18/11/06	3:00	0.9	62
18/11/06	4:00	1.3	95
18/11/06	5:00	0.4	312

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)**
18/11/06	6:00	0.9	53
18/11/06	7:00	1.3	51
18/11/06	8:00	1.3	76
18/11/06	9:00	3.1	101
18/11/06	10:00	3.1	132
18/11/06	11:00	4	144
18/11/06	12:00	3.6	124
18/11/06	13:00	3.6	143
18/11/06	14:00	2.7	139
18/11/06	15:00	2.2	131
18/11/06	16:00	1.3	120
18/11/06	17:00	1.8	97
18/11/06	18:00	2.2	101
18/11/06	19:00	1.3	121
18/11/06	20:00	1.3	80
18/11/06	21:00	1.3	93
18/11/06	22:00	2.2	93
18/11/06	23:00	1.3	81
18/11/07	0:00	1.3	68
18/11/07	1:00	1.3	48
18/11/07	2:00	0.9	44
18/11/07	3:00	1.3	43
18/11/07	4:00	0.9	37
18/11/07	5:00	0.9	12
18/11/07	6:00	0.4	28
18/11/07	7:00	1.3	89
18/11/07	8:00	2.7	93
18/11/07	9:00	3.6	119
18/11/07	10:00	3.1	116
18/11/07	11:00	3.6	141
18/11/07	12:00	3.6	143
18/11/07	13:00	2.7	138
18/11/07	14:00	2.7	132
18/11/07	15:00	1.8	139
18/11/07	16:00	0.9	154
18/11/07	17:00	0.4	210
18/11/07	18:00	0.4	282
18/11/07	19:00	0.4	259
18/11/07	20:00	0.4	318
18/11/07	21:00	0	-
18/11/07	22:00	0.9	78
18/11/07	23:00	0.4	327
18/11/09	0:00	3.1	34
18/11/09	1:00	3.6	39
18/11/09	2:00	2.7	42
18/11/09	3:00	2.2	24
18/11/09	4:00	2.2	37
18/11/09	5:00	2.7	29
18/11/09	6:00	1.8	12
18/11/09	7:00	1.3	2
18/11/09	8:00	1.8	19
18/11/09	9:00	1.8	46
18/11/09	10:00	1.3	31
18/11/09	11:00	1.8	37

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)**
18/11/09	12:00	1.3	158
18/11/09	13:00	1.3	145
18/11/09	14:00	3.1	126
18/11/09	15:00	4	112
18/11/09	16:00	3.1	137
18/11/09	17:00	2.7	108
18/11/09	18:00	1.8	97
18/11/09	19:00	2.2	82
18/11/09	20:00	1.8	91
18/11/09	21:00	2.2	61
18/11/09	22:00	2.2	72
18/11/09	23:00	2.2	79
18/11/10	0:00	3.1	93
18/11/10	1:00	1.8	99
18/11/10	2:00	2.2	87
18/11/10	3:00	3.1	98
18/11/10	4:00	2.7	80
18/11/10	5:00	3.6	70
18/11/10	6:00	3.1	66
18/11/10	7:00	3.6	95
18/11/10	8:00	3.6	94
18/11/10	9:00	3.1	66
18/11/10	10:00	4.5	94
18/11/10	11:00	4.5	84
18/11/10	12:00	4.5	88
18/11/10	13:00	4	91
18/11/10	14:00	3.1	117
18/11/10	15:00	2.2	81
18/11/10	16:00	1.3	98
18/11/10	17:00	2.2	82
18/11/10	18:00	1.8	95
18/11/10	19:00	0.9	55
18/11/10	20:00	0.4	65
18/11/10	21:00	0.9	66
18/11/10	22:00	0.9	79
18/11/10	23:00	0.9	22
18/11/12	0:00	0.4	301
18/11/12	1:00	0.4	285
18/11/12	2:00	0.4	296
18/11/12	3:00	0.9	100
18/11/12	4:00	2.2	94
18/11/12	5:00	1.3	93
18/11/12	6:00	0.9	313
18/11/12	7:00	0.9	329
18/11/12	8:00	0.9	288
18/11/12	9:00	1.3	303
18/11/12	10:00	1.3	133
18/11/12	11:00	1.8	200
18/11/12	12:00	1.3	131
18/11/12	13:00	1.3	217
18/11/12	14:00	1.3	281
18/11/12	15:00	1.8	262
18/11/12	16:00	0.9	291
18/11/12	17:00	0.9	304

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)**
18/11/12	18:00	1.3	79
18/11/12	19:00	1.8	93
18/11/12	20:00	1.3	99
18/11/12	21:00	0.9	93
18/11/12	22:00	0.9	68
18/11/12	23:00	0.9	92
18/11/13	0:00	1.8	54
18/11/13	1:00	1.3	43
18/11/13	2:00	1.3	44
18/11/13	3:00	0.9	51
18/11/13	4:00	1.8	25
18/11/13	5:00	1.8	52
18/11/13	6:00	0.9	15
18/11/13	7:00	1.3	13
18/11/13	8:00	2.2	38
18/11/13	9:00	1.3	34
18/11/13	10:00	1.3	132
18/11/13	11:00	1.3	217
18/11/13	12:00	0.9	140
18/11/13	13:00	0.9	125
18/11/13	14:00	0.9	187
18/11/13	15:00	2.2	129
18/11/13	16:00	3.1	139
18/11/13	17:00	2.7	131
18/11/13	18:00	2.2	85
18/11/13	19:00	2.7	100
18/11/13	20:00	2.2	95
18/11/13	21:00	2.2	89
18/11/13	22:00	3.6	94
18/11/13	23:00	2.7	74
18/11/15	0:00	2.7	93
18/11/15	1:00	2.7	79
18/11/15	2:00	3.1	96
18/11/15	3:00	3.1	79
18/11/15	4:00	2.2	56
18/11/15	5:00	2.2	34
18/11/15	6:00	2.7	67
18/11/15	7:00	2.7	61
18/11/15	8:00	3.6	76
18/11/15	9:00	3.6	97
18/11/15	10:00	3.6	98
18/11/15	11:00	3.6	96
18/11/15	12:00	4	107
18/11/15	13:00	4	107
18/11/15	14:00	4.9	104
18/11/15	15:00	4.5	86
18/11/15	16:00	4	97
18/11/15	17:00	3.1	92
18/11/15	18:00	2.2	70
18/11/15	19:00	2.2	78
18/11/15	20:00	2.2	86
18/11/15	21:00	2.7	80
18/11/15	22:00	3.1	62
18/11/15	23:00	3.1	62

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)**
18/11/16	0:00	2.7	68
18/11/16	1:00	2.7	96
18/11/16	2:00	2.2	83
18/11/16	3:00	2.7	94
18/11/16	4:00	3.6	91
18/11/16	5:00	3.1	85
18/11/16	6:00	3.1	88
18/11/16	7:00	3.1	90
18/11/16	8:00	3.6	83
18/11/16	9:00	4	100
18/11/16	10:00	3.6	101
18/11/16	11:00	4	82
18/11/16	12:00	3.6	108
18/11/16	13:00	3.1	119
18/11/16	14:00	4	116
18/11/16	15:00	4	121
18/11/16	16:00	3.1	121
18/11/16	17:00	3.6	117
18/11/16	18:00	3.1	92
18/11/16	19:00	1.8	79
18/11/16	20:00	1.3	101
18/11/16	21:00	1.8	82
18/11/16	22:00	1.3	89
18/11/16	23:00	1.3	106
18/11/18	0:00	3.6	75
18/11/18	1:00	2.7	87
18/11/18	2:00	2.7	79
18/11/18	3:00	3.1	80
18/11/18	4:00	3.6	107
18/11/18	5:00	2.7	110
18/11/18	6:00	1.8	91
18/11/18	7:00	1.8	93
18/11/18	8:00	1.8	91
18/11/18	9:00	2.2	101
18/11/18	10:00	2.2	86
18/11/18	11:00	3.1	93
18/11/18	12:00	4	92
18/11/18	13:00	3.1	101
18/11/18	14:00	1.8	117
18/11/18	15:00	2.2	112
18/11/18	16:00	1.3	75
18/11/18	17:00	0.9	293
18/11/18	18:00	0.4	339
18/11/18	19:00	0.9	290
18/11/18	20:00	0.9	292
18/11/18	21:00	0.4	322
18/11/18	22:00	0.4	270
18/11/18	23:00	0.4	293
18/11/19	0:00	0	-
18/11/19	1:00	1.8	305
18/11/19	2:00	1.8	286
18/11/19	3:00	1.8	299
18/11/19	4:00	2.2	348
18/11/19	5:00	0.9	88
18/11/19	6:00	1.8	34
18/11/19	7:00	2.2	13

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)**
18/11/19	8:00	2.7	18
18/11/19	9:00	1.3	213
18/11/19	10:00	1.8	37
18/11/19	11:00	1.8	221
18/11/19	12:00	1.8	224
18/11/19	13:00	2.2	251
18/11/19	14:00	1.8	298
18/11/19	15:00	1.8	295
18/11/19	16:00	1.3	285
18/11/19	17:00	0.9	281
18/11/19	18:00	0.4	166
18/11/19	19:00	0.4	157
18/11/19	20:00	1.3	334
18/11/19	21:00	0.9	347
18/11/19	22:00	0.9	64
18/11/19	23:00	0.9	87
18/11/21	0:00	4	98
18/11/21	1:00	2.2	89
18/11/21	2:00	1.8	58
18/11/21	3:00	0.9	73
18/11/21	4:00	1.8	91
18/11/21	5:00	1.3	47
18/11/21	6:00	1.8	94
18/11/21	7:00	3.1	86
18/11/21	8:00	2.2	96
18/11/21	9:00	2.7	89
18/11/21	10:00	2.2	82
18/11/21	11:00	1.3	76
18/11/21	12:00	1.3	277
18/11/21	13:00	1.8	262
18/11/21	14:00	1.8	265
18/11/21	15:00	1.3	274
18/11/21	0:00	4	98
18/11/21	1:00	2.2	89
18/11/21	2:00	1.8	58
18/11/21	3:00	0.9	73
18/11/21	4:00	1.8	91
18/11/21	5:00	1.3	47
18/11/21	6:00	1.8	94
18/11/21	7:00	3.1	86
18/11/21	8:00	2.2	96
18/11/21	9:00	2.7	89
18/11/21	10:00	2.2	82
18/11/21	11:00	1.3	76
18/11/21	12:00	1.3	277
18/11/21	13:00	1.8	262
18/11/21	14:00	1.8	265
18/11/21	15:00	1.3	274
18/11/21	16:00	0.9	273
18/11/21	17:00	0.9	295
18/11/21	18:00	0.4	335
18/11/21	19:00	3.1	330
18/11/21	20:00	1.8	317
18/11/21	21:00	1.8	322
18/11/21	22:00	1.3	19
18/11/21	23:00	0.9	302
18/11/22	0:00	0.9	14

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)**
18/11/22	1:00	1.3	328
18/11/22	2:00	1.3	300
18/11/22	3:00	1.3	319
18/11/22	4:00	1.8	294
18/11/22	5:00	0.9	225
18/11/22	6:00	0.9	293
18/11/22	7:00	1.3	309
18/11/22	8:00	1.3	1
18/11/22	9:00	2.7	42
18/11/22	10:00	2.7	56
18/11/22	11:00	3.6	32
18/11/22	12:00	2.2	18
18/11/22	13:00	1.8	29
18/11/22	14:00	1.8	24
18/11/22	15:00	1.8	14
18/11/22	16:00	1.8	33
18/11/22	17:00	1.3	29
18/11/22	18:00	1.3	17
18/11/22	19:00	1.3	338
18/11/22	20:00	1.8	330
18/11/22	21:00	1.3	346
18/11/22	22:00	0.9	20
18/11/22	23:00	1.8	5
18/11/24	0:00	0.4	81
18/11/24	1:00	1.3	83
18/11/24	2:00	1.3	51
18/11/24	3:00	1.3	46
18/11/24	4:00	1.3	55
18/11/24	5:00	1.3	50
18/11/24	6:00	1.8	40
18/11/24	7:00	2.2	47
18/11/24	8:00	2.7	91
18/11/24	9:00	2.7	108
18/11/24	10:00	2.7	118
18/11/24	11:00	2.2	109
18/11/24	12:00	2.7	120
18/11/24	13:00	2.2	129
18/11/24	14:00	2.2	138
18/11/24	15:00	1.8	111
18/11/24	16:00	1.8	138
18/11/24	17:00	1.8	139
18/11/24	18:00	0.4	144
18/11/24	19:00	0.9	303
18/11/24	20:00	0.4	327
18/11/24	21:00	0.4	76
18/11/24	22:00	0.4	72
18/11/24	23:00	0.4	61
18/11/25	0:00	0.4	49
18/11/25	1:00	1.3	33
18/11/25	2:00	0.9	22
18/11/25	3:00	0.4	26
18/11/25	4:00	0.4	90
18/11/25	5:00	0.4	89
18/11/25	6:00	1.3	30
18/11/25	7:00	1.3	55
18/11/25	8:00	1.8	44
18/11/25	9:00	1.8	25

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)**
18/11/25	10:00	1.3	27
18/11/25	11:00	2.2	42
18/11/25	12:00	0.9	316
18/11/25	13:00	0.4	84
18/11/25	14:00	0.9	49
18/11/25	15:00	0.9	24
18/11/25	16:00	0.4	91
18/11/25	17:00	0.4	25
18/11/25	18:00	0.9	42
18/11/25	19:00	0.4	21
18/11/25	20:00	0.4	73
18/11/25	21:00	0.4	61
18/11/25	22:00	0.9	43
18/11/25	23:00	0.9	39
18/11/27	0:00	0.9	39
18/11/27	1:00	1.3	54
18/11/27	2:00	1.3	36
18/11/27	3:00	1.8	37
18/11/27	4:00	1.8	15
18/11/27	5:00	1.8	22
18/11/27	6:00	2.2	22
18/11/27	7:00	2.2	40
18/11/27	8:00	1.3	22
18/11/27	9:00	1.3	44
18/11/27	10:00	1.3	44
18/11/27	11:00	0.9	18
18/11/27	12:00	1.3	21
18/11/27	13:00	2.2	341
18/11/27	14:00	1.8	327
18/11/27	15:00	1.3	13
18/11/27	16:00	0.9	26
18/11/27	17:00	0.9	94
18/11/27	18:00	1.3	96
18/11/27	19:00	0.4	83
18/11/27	20:00	0.9	100
18/11/27	21:00	0	-
18/11/27	22:00	0.4	98
18/11/27	23:00	0	-
18/11/28	0:00	0	-
18/11/28	1:00	0	-
18/11/28	2:00	0	-
18/11/28	3:00	0.4	82
18/11/28	4:00	0.4	91
18/11/28	5:00	0	-
18/11/28	6:00	0.9	68
18/11/28	7:00	0.4	58
18/11/28	8:00	1.8	57
18/11/28	9:00	0.9	358
18/11/28	10:00	1.3	42
18/11/28	11:00	1.3	123
18/11/28	12:00	0.9	144
18/11/28	13:00	1.3	118
18/11/28	14:00	1.3	89
18/11/28	15:00	2.2	79
18/11/28	16:00	1.3	118
18/11/28	17:00	1.3	117
18/11/28	18:00	0.9	16

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)**
18/11/28	19:00	0.9	93
18/11/28	20:00	1.3	287
18/11/28	21:00	1.3	38
18/11/28	22:00	0.9	44
18/11/28	23:00	0.4	101
18/11/30	0:00	1.3	44
18/11/30	1:00	1.3	49
18/11/30	2:00	1.3	48
18/11/30	3:00	0.9	54
18/11/30	4:00	0.9	74
18/11/30	5:00	1.3	76
18/11/30	6:00	1.8	64
18/11/30	7:00	1.8	73
18/11/30	8:00	3.1	89
18/11/30	9:00	3.1	106
18/11/30	10:00	4	106
18/11/30	11:00	2.7	102
18/11/30	12:00	3.1	116
18/11/30	13:00	3.1	116
18/11/30	14:00	3.6	121
18/11/30	15:00	3.6	110
18/11/30	16:00	3.6	117
18/11/30	17:00	3.1	122
18/11/30	18:00	2.2	108
18/11/30	19:00	1.8	100
18/11/30	20:00	2.7	89
18/11/30	21:00	3.1	90
18/11/30	22:00	1.3	62
18/11/30	23:00	1.3	62

Appendix I

Impact Dolphin Monitoring Survey

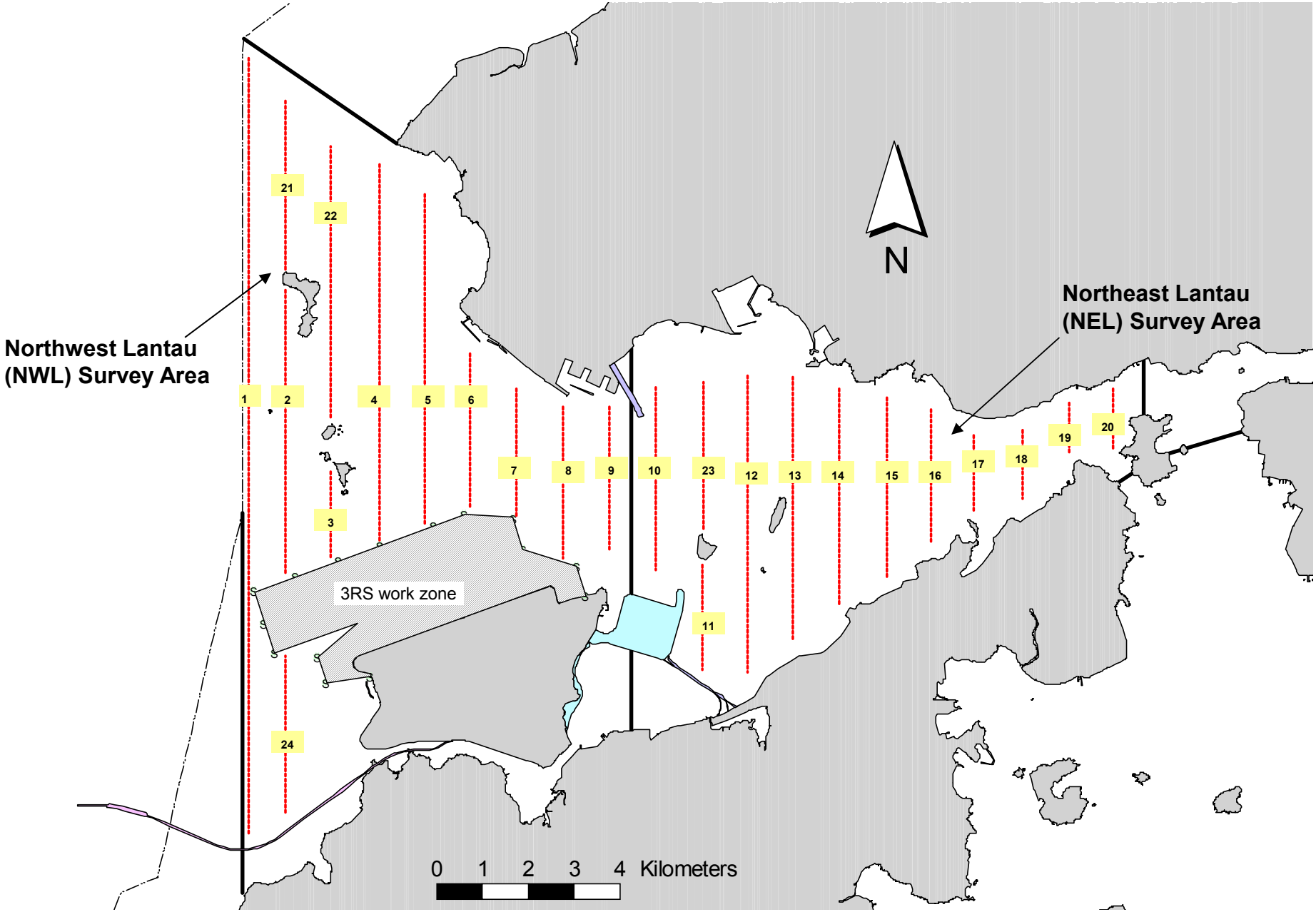


Figure 1. Transect Line Layout in Northwest and Northeast Lantau Survey Areas

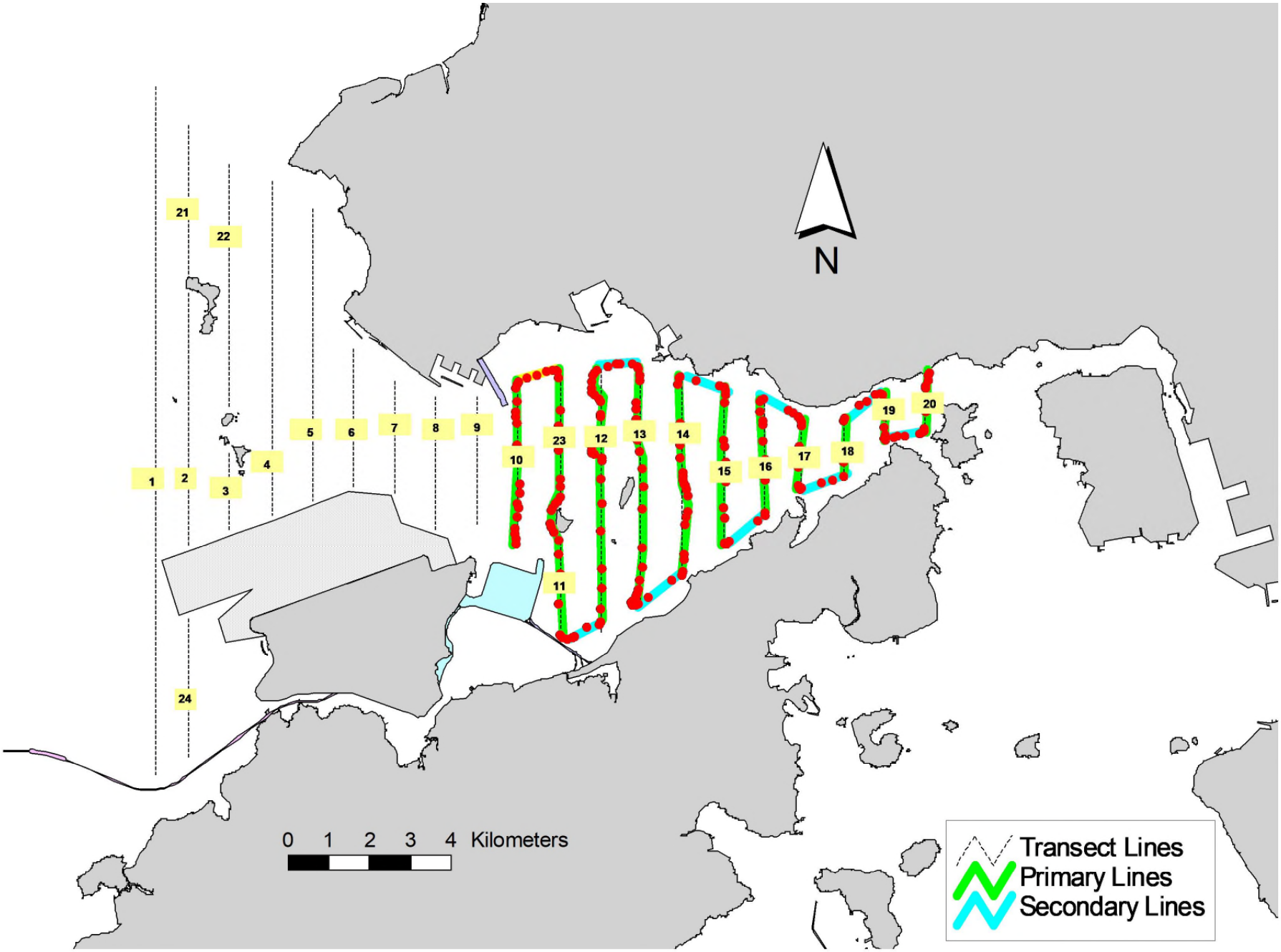


Figure 2. Survey Route on November 1st, 2018 (from HKLR03 project)

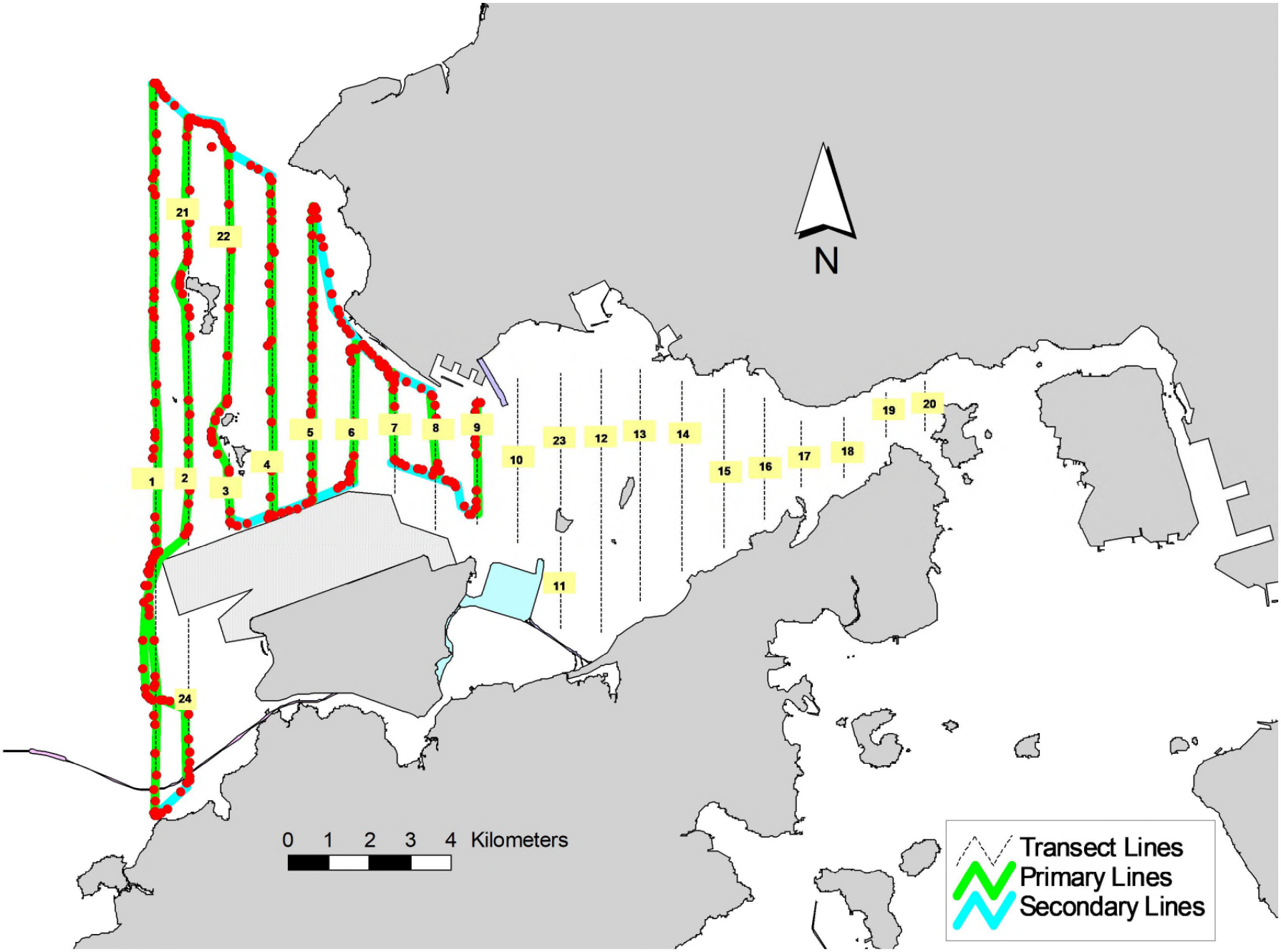


Figure 3. Survey Route on November 6th, 2018 (from HKLR03 project)

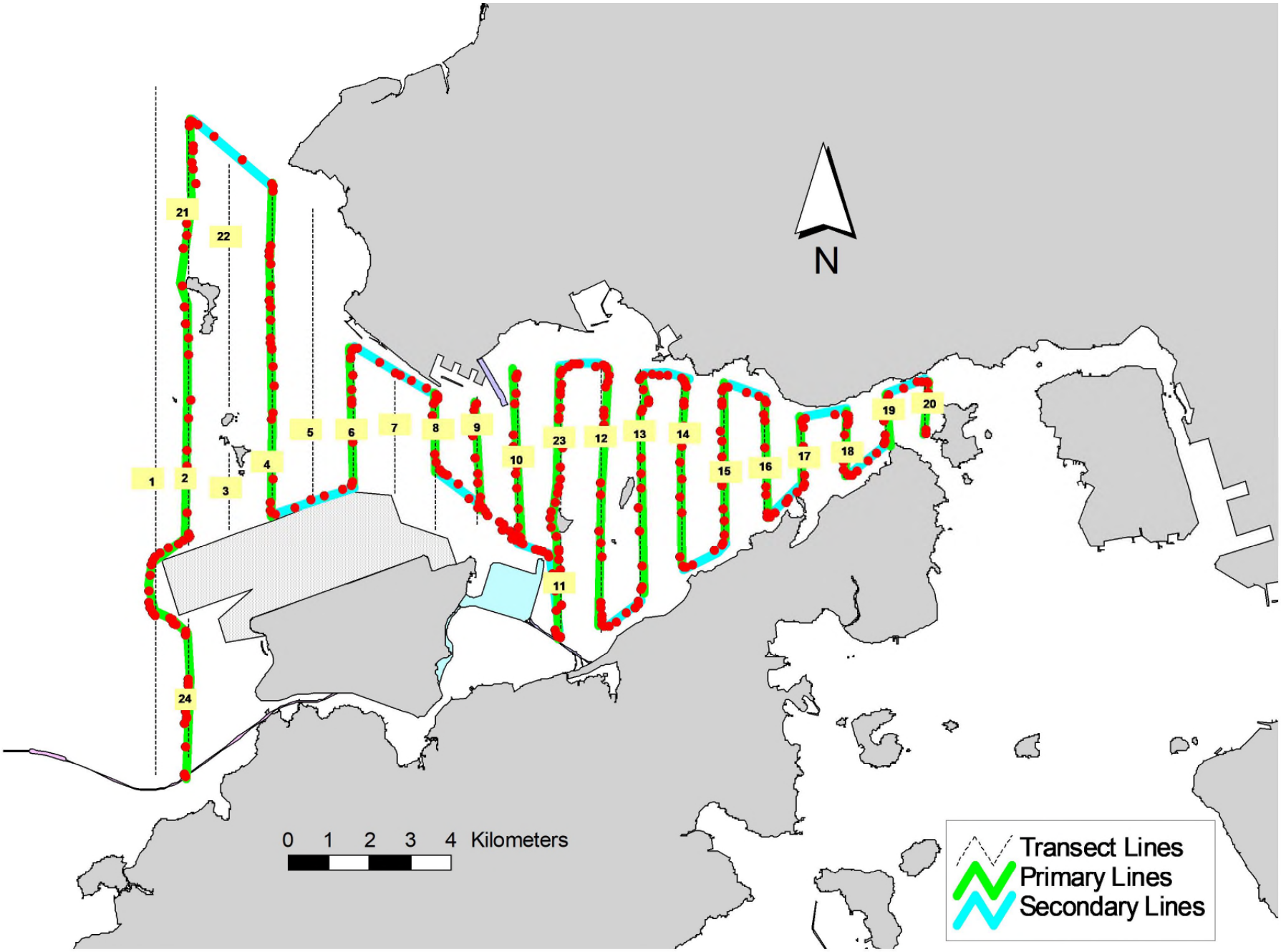


Figure 4. Survey Route on November 8th, 2018 (from HKLR03 project)

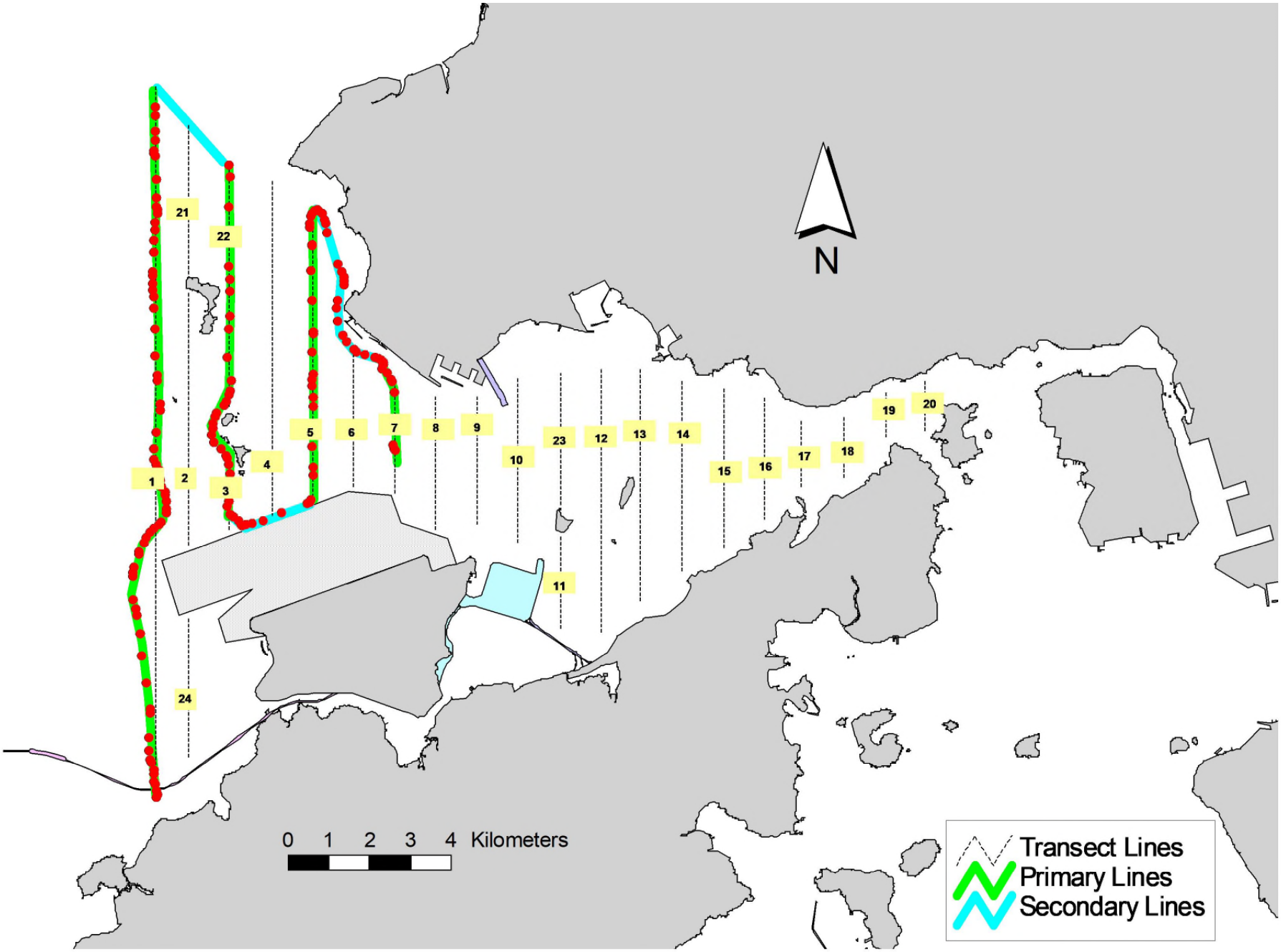


Figure 5. Survey Route on November 13th, 2018 (from HKLR03 project)

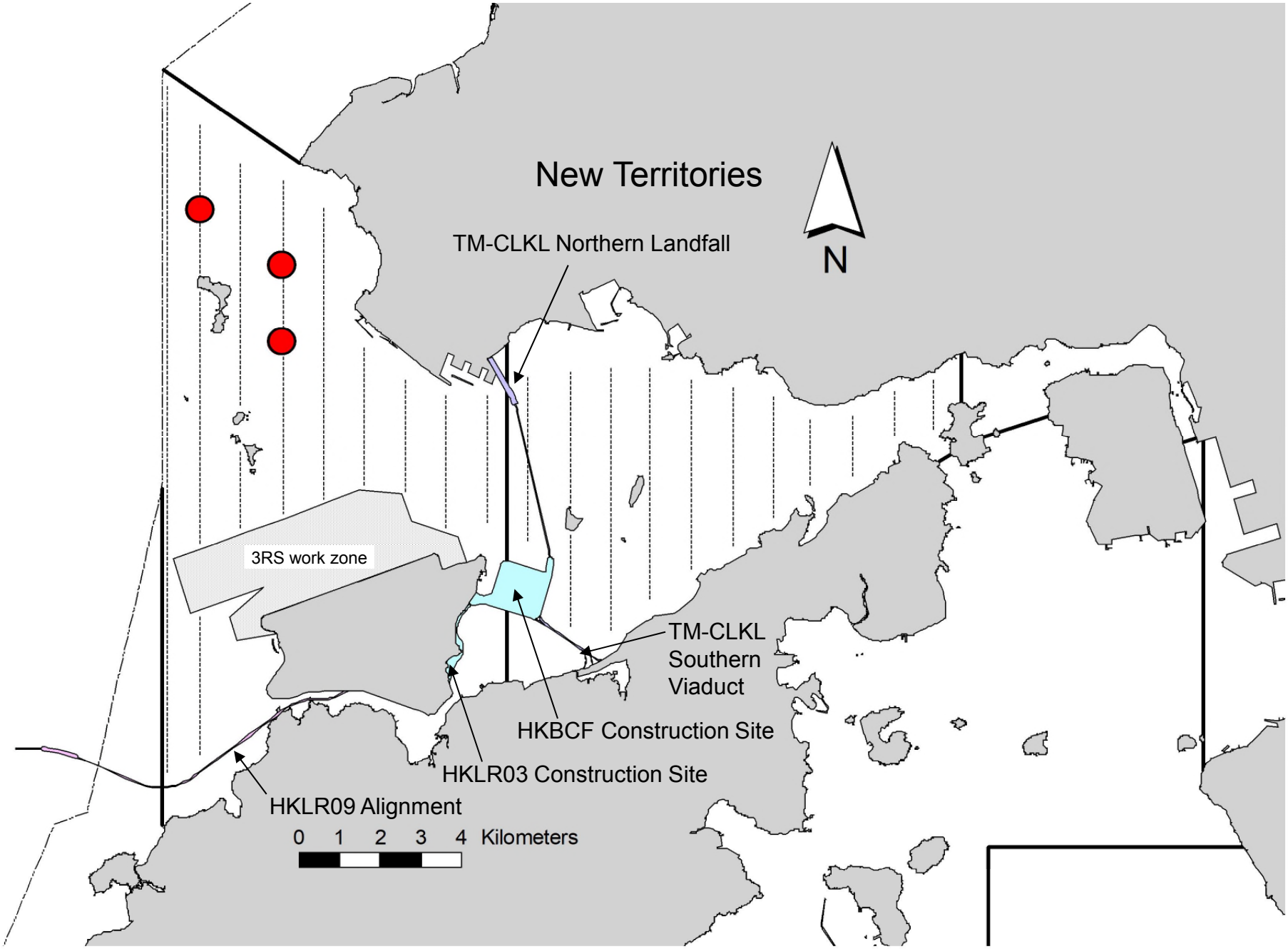


Figure 6. Distribution of Chinese White Dolphin Sightings during November 2018 HKLR03 Monitoring Surveys

Appendix I. HKLR03 Survey Effort Database (November 2018)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
1-Nov-18	NE LANTAU	2	10.78	AUTUMN	STANDARD36826	HKLR	P
1-Nov-18	NE LANTAU	3	19.78	AUTUMN	STANDARD36826	HKLR	P
1-Nov-18	NE LANTAU	4	6.85	AUTUMN	STANDARD36826	HKLR	P
1-Nov-18	NE LANTAU	2	4.88	AUTUMN	STANDARD36826	HKLR	S
1-Nov-18	NE LANTAU	3	7.41	AUTUMN	STANDARD36826	HKLR	S
6-Nov-18	NW LANTAU	2	32.12	AUTUMN	STANDARD36826	HKLR	P
6-Nov-18	NW LANTAU	3	19.50	AUTUMN	STANDARD36826	HKLR	P
6-Nov-18	NW LANTAU	4	6.80	AUTUMN	STANDARD36826	HKLR	P
6-Nov-18	NW LANTAU	2	17.37	AUTUMN	STANDARD36826	HKLR	S
6-Nov-18	NW LANTAU	3	7.91	AUTUMN	STANDARD36826	HKLR	S
6-Nov-18	NW LANTAU	4	2.70	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NW LANTAU	3	9.12	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NW LANTAU	4	16.42	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NW LANTAU	5	1.50	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NW LANTAU	3	5.80	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NW LANTAU	4	5.75	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NW LANTAU	5	1.40	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NE LANTAU	2	21.83	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NE LANTAU	3	13.92	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NE LANTAU	4	1.30	AUTUMN	STANDARD36826	HKLR	P
8-Nov-18	NE LANTAU	2	7.10	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NE LANTAU	3	5.64	AUTUMN	STANDARD36826	HKLR	S
8-Nov-18	NE LANTAU	4	0.81	AUTUMN	STANDARD36826	HKLR	S
13-Nov-18	NW LANTAU	2	18.07	AUTUMN	STANDARD36826	HKLR	P
13-Nov-18	NW LANTAU	3	14.72	AUTUMN	STANDARD36826	HKLR	P
13-Nov-18	NW LANTAU	2	6.80	AUTUMN	STANDARD36826	HKLR	S
13-Nov-18	NW LANTAU	3	1.71	AUTUMN	STANDARD36826	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (November 2018)

(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
6-Nov-18	1	1107	1	NW LANTAU	2	364	ON	HKLR	825486	807443	AUTUMN	NONE	P
6-Nov-18	2	1119	2	NW LANTAU	2	221	ON	HKLR	827280	807456	AUTUMN	NONE	P
6-Nov-18	3	1202	2	NW LANTAU	2	84	ON	HKLR	828546	805451	AUTUMN	NONE	P

Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in (November 2018)

ID#	DATE	STG#	AREA
NL261	06/11/18	3	NW LANTAU
NL286	06/11/18	2	NW LANTAU
NL328	06/11/18	3	NW LANTAU

Appendix IV. Photographs of Identified Individual Dolphins in November 2018 (HKLR03)

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	79
	Limit	0	5
24-hr TSP	Action	0	8
	Limit	0	4
Water Quality	Action	0	20
	Limit	0	1
Impact Dolphin Monitoring	Action	0	11
	Limit	1	14

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 (November 2018)	0	0	0
Total No. received since project commencement	16	1	0

Email message

Environmental Resources Management

2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660

To	Ramboll 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	9 November 2018

ERM

Dear Sir or Madam,

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

0212330_31October2018_1hrTSP_Station ASR5

One Action Level Exceedance was recorded on 31 October 2018.

Regards,

Dr Jasmine Ng
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_31October2018_1hrTSP_Station ASR5** **[Total No. of Exceedances = 1]**	
Date	31 October 2018 (Measured) 9 November 2018 (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 ASR5 (371 µg/m3) during 1345– 1445 hrs.	
Works Undertaken (at the time of monitoring event)	On 31 October 2018, TBM tunnel works and surcharge removal were carried out on site.	
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, the majority of ground construction works on 31 October 2018 were surcharge removal at Works Area Portion N-C and TBM tunnel works. During the period of the land-based construction works, the Contractor has implemented the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual (e.g. water spraying on exposed soil within the Project site and associated works areas; exposed soil covered by tarpaulin sheets). • The exceedance is unlikely to be due to the project as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Water spraying record is provided in Annex A. Based on the above, the exceedances are unlikely to be due to the project.	

Actions Taken / To Be Taken	According to the construction information provided by the Contractor, surcharge removal at Portion N-C and TBM tunnel works were carried out on 31 October 2018. Site inspection was carried out on 31 October 2018 and ASR5 was also inspected. Water spraying was applied to prevent dust. Photos taken during AQM and site inspection were provided in Annex A. No significant dust impact was observed at ASR5. Based on the above, no additional action is required. The Contractor has been reminded to implement 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 sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site) throughout the construction period.
Remarks	The monitoring results, wind data and the locations of air quality monitoring stations are attached.

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 31/10/2018

Water truck was used for dust control during surcharge removal. (Works Area Portion N-C)

Water truck was used for dust control during surcharge removal. (Works Area Portion N-C)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 31/10/2018

Water spraying was applied on the main haul road. (Works Area Portion N-C)

Water truck was used for dust control. (Works Area Portion N-C)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 31/10/2018

Water truck was used for dust control. (Works Area Portion N-C)

Water spraying was applied on the main haul road. (Works Area Portion N-C)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 31/10/2018

Water spraying was applied on the main haul road. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-A)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 31/10/2018

Water spraying was applied to prevent dust. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-A)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 31/10/2018

Water truck was used for dust control. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-A)

ERM

Annex A Photos taken during AQM inspection

*Note: Photos taken on 31/10/2018

ASR5

ASR5

TMCLKL	HY/2012/08	31/10/2018	AQMS1	Sunny	14:08	1-hour TSP	161	ug/m3
TMCLKL	HY/2012/08	31/10/2018	AQMS1	Sunny	15:10	1-hour TSP	210	ug/m3
TMCLKL	HY/2012/08	31/10/2018	AQMS1	Sunny	16:12	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR1	Sunny	13:57	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR1	Sunny	14:59	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR1	Sunny	16:01	1-hour TSP	134	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR10	Sunny	13:22	1-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR10	Sunny	14:24	1-hour TSP	122	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR10	Sunny	15:26	1-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR5	Sunny	13:45	1-hour TSP	371	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR5	Sunny	14:47	1-hour TSP	293	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR5	Sunny	15:49	1-hour TSP	303	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR6	Sunny	13:33	1-hour TSP	234	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR6	Sunny	14:35	1-hour TSP	194	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR6	Sunny	15:37	1-hour TSP	210	ug/m3
TMCLKL	HY/2012/08	31/10/2018	AQMS1	Sunny	17:14	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR1	Sunny	17:03	24-hour TSP	121	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR10	Sunny	16:28	24-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR5	Sunny	16:51	24-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	31/10/2018	ASR6	Sunny	16:39	24-hour TSP	130	ug/m3

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)**
18/10/31	0:00	2.2	342
18/10/31	1:00	2.2	355
18/10/31	2:00	2.7	346
18/10/31	3:00	3.1	14
18/10/31	4:00	3.1	32
18/10/31	5:00	2.2	37
18/10/31	6:00	1.8	18
18/10/31	7:00	2.2	6
18/10/31	8:00	3.6	33
18/10/31	9:00	3.6	13
18/10/31	10:00	1.8	284
18/10/31	11:00	1.8	36
18/10/31	12:00	3.1	46
18/10/31	13:00	3.6	29
18/10/31	14:00	2.2	27
18/10/31	15:00	1.8	39
18/10/31	16:00	2.2	39
18/10/31	17:00	1.8	22
18/10/31	18:00	2.2	339
18/10/31	19:00	0.9	324
18/10/31	20:00	0.9	118
18/10/31	21:00	2.7	4
18/10/31	22:00	3.1	357
18/10/31	23:00	2.2	334

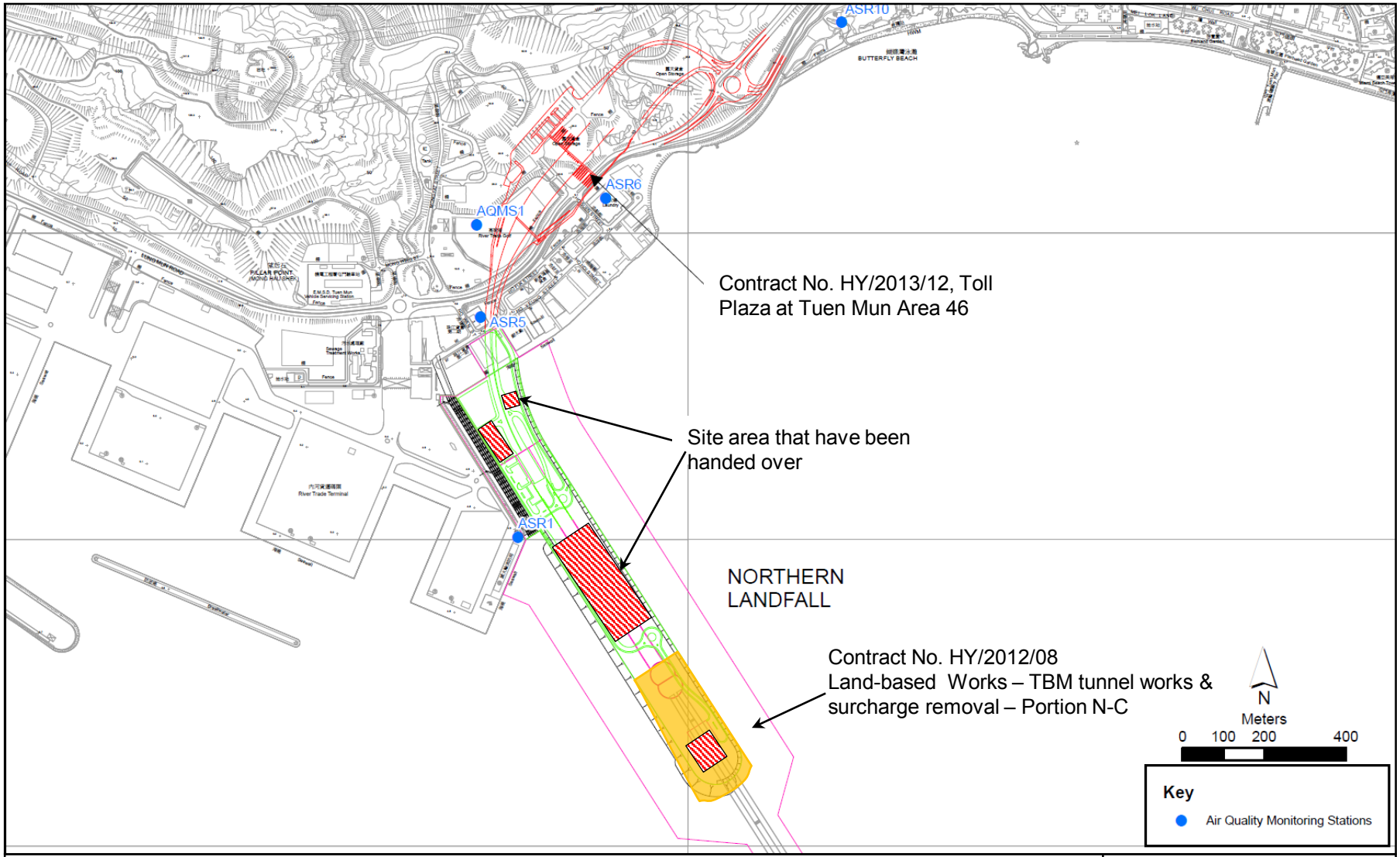


Figure 1

Indicative Construction Works Area on 31 October 2018

DATE: 06/03/2013

Environmental Resources Management

ERM

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營	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: 29-Oct-2018 to 至 04-Nov 2018

	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	√	√	√	√	√	√	√
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	√	√	√	√	√	√	√
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。

Email message

Environmental Resources Management

2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660

To	Ramboll 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	16 November 2018

Dear Sir or Madam,

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

0212330_6November2018_1hrTSP_Station ASR1

One Action Level Exceedance was recorded on 6 November 2018.

Regards,

Dr Jasmine Ng
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_6November2018_1hrTSP_Station ASR1** **[Total No. of Exceedances = 1]**	
Date	6 November 2018 (Measured) 15 November 2018 (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 (376 µg/m3) during 1450– 1550 hrs.	
Works Undertaken (at the time of monitoring event)	On 6 November 2018, TBM tunnel works and surcharge removal were carried out on site.	
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, the majority of ground construction works on 6 November 2018 were surcharge removal at Works Area Portion N-C and TBM tunnel works. During the period of the land-based construction works, the Contractor has implemented the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual (e.g. water spraying on exposed soil within the Project site and associated works areas; exposed soil covered by tarpaulin sheets). • The exceedance is unlikely to be due to the project as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Water spraying record is provided in Annex A. Based on the above, the exceedances are unlikely to be due to the project.	

Actions Taken / To Be Taken	According to the construction information provided by the Contractor, surcharge removal at Portion N-C and TBM tunnel works were carried out on 6 November 2018. Dust suppression measures were properly implemented. Water spraying was applied to prevent dust. Photos are provided in Annex A. Photos taken during AQM are also provided in Annex A. No significant dust impact was observed at ASR1. Based on the above, no additional action is required. The Contractor has been reminded to implement 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 sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site) throughout the construction period.
Remarks	The monitoring results and the locations of air quality monitoring stations are attached.

Annex A Photos provided by the Contractor

*Note: Photos taken on 6/11/2018

Water truck was used for dust control during surcharge removal. (Works Area Portion N-C)

Water spraying was applied on the main haul road. (Works Area Portion N-C)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 6/11/2018

Water spraying was applied on the main haul road. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-C)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 6/11/2018

Exposed soil is covered by tarpaulin sheets. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-A)

ERM

Annex A Photos provided by the Contractor

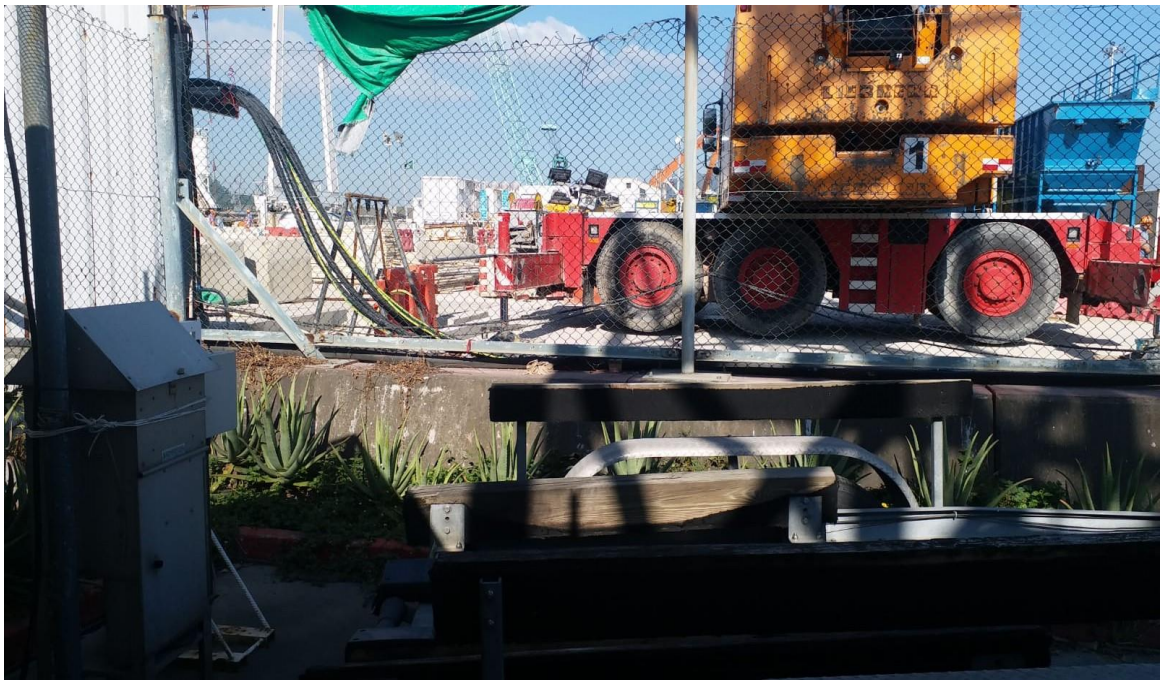
*Note: Photos taken on 6/11/2018

Water spraying was applied on the main haul road. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-A)

Annex A Photos taken during AQM inspection

*Note: Photos taken on 6/11/2018



ASR1

ASR1

TMCLKL	HY/2012/08	6/11/2018	AQMS1	Sunny	13:59	1-hour TSP	82	ug/m3
TMCLKL	HY/2012/08	6/11/2018	AQMS1	Sunny	15:01	1-hour TSP	110	ug/m3
TMCLKL	HY/2012/08	6/11/2018	AQMS1	Sunny	16:03	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR1	Sunny	13:48	1-hour TSP	126	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR1	Sunny	14:50	1-hour TSP	376	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR1	Sunny	15:52	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR10	Sunny	13:13	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR10	Sunny	14:15	1-hour TSP	50	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR10	Sunny	15:17	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR5	Sunny	13:37	1-hour TSP	181	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR5	Sunny	14:39	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR5	Sunny	15:41	1-hour TSP	138	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR6	Sunny	13:25	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR6	Sunny	14:27	1-hour TSP	96	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR6	Sunny	15:29	1-hour TSP	91	ug/m3
TMCLKL	HY/2012/08	6/11/2018	AQMS1	Sunny	17:05	24-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR1	Sunny	16:54	24-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR10	Sunny	16:19	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR5	Sunny	16:43	24-hour TSP	90	ug/m3
TMCLKL	HY/2012/08	6/11/2018	ASR6	Sunny	16:31	24-hour TSP	65	ug/m3

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)**
18/11/06	0:00	2.7	95
18/11/06	1:00	2.7	93
18/11/06	2:00	2.2	98
18/11/06	3:00	0.9	62
18/11/06	4:00	1.3	95
18/11/06	5:00	0.4	312
18/11/06	6:00	0.9	53
18/11/06	7:00	1.3	51
18/11/06	8:00	1.3	76
18/11/06	9:00	3.1	101
18/11/06	10:00	3.1	132
18/11/06	11:00	4	144
18/11/06	12:00	3.6	124
18/11/06	13:00	3.6	143
18/11/06	14:00	2.7	139
18/11/06	15:00	2.2	131
18/11/06	16:00	1.3	120
18/11/06	17:00	1.8	97
18/11/06	18:00	2.2	101
18/11/06	19:00	1.3	121
18/11/06	20:00	1.3	80
18/11/06	21:00	1.3	93
18/11/06	22:00	2.2	93
18/11/06	23:00	1.3	81

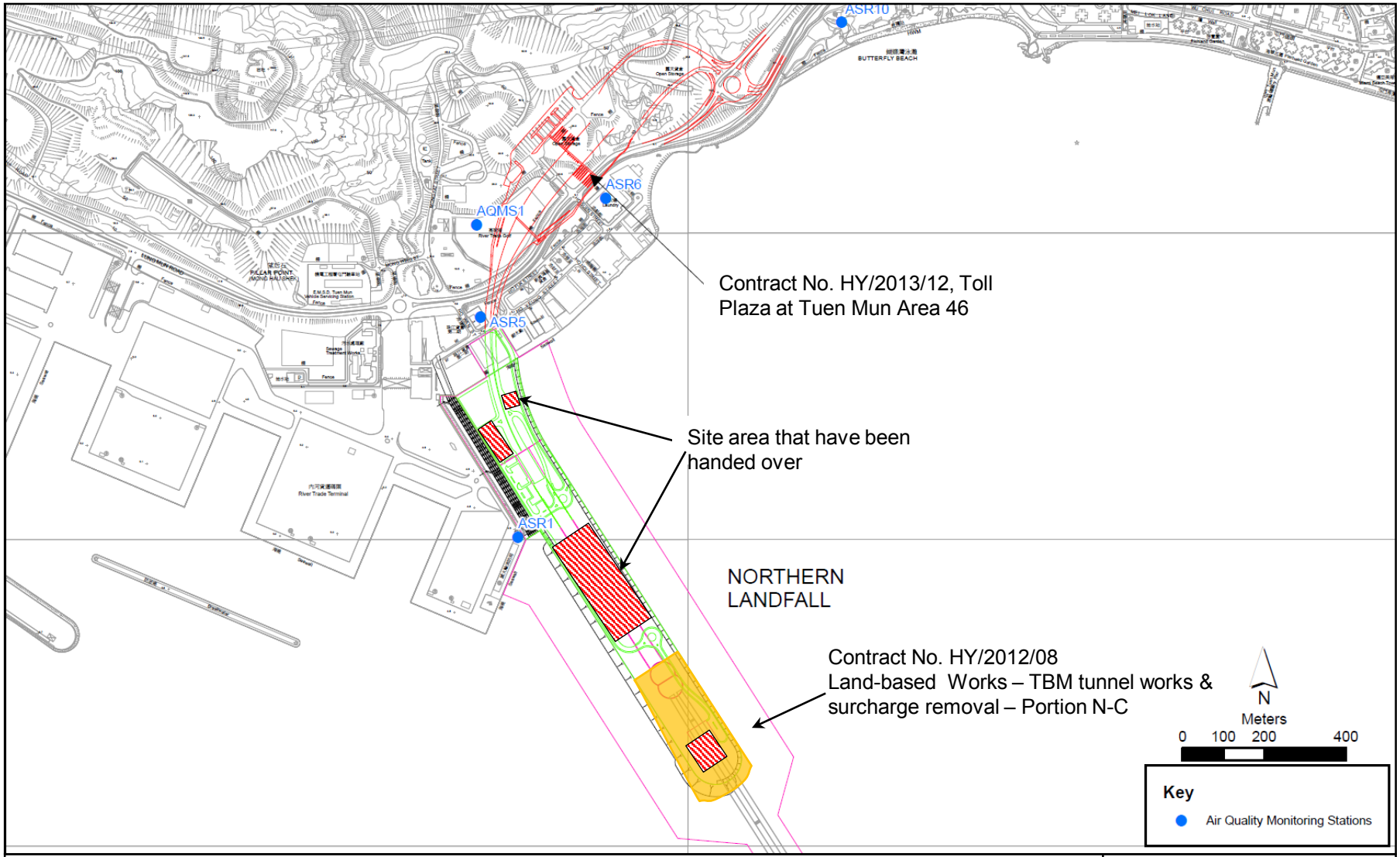


Figure 1

Indicative Construction Works Area on 6 November 2018

DATE: 06/03/2013

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660

To	Ramboll 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	21 November 2018

ERM

Dear Sir or Madam,

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

0212330_12November2018_1hrTSP_Station ASR1
0212330_12November2018_1hrTSP_Station ASR5
0212330_12November2018_1hrTSP_Station ASR5
0212330_12November2018_1hrTSP_Station ASR5
0212330_12November2018_1hrTSP_Station ASR6

Five Action Level Exceedance was recorded on 12 November 2018.

Regards,

Dr Jasmine Ng
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_12November2018_1hrTSP_Station ASR1** **0212330_12November2018_1hrTSP_Station ASR5** **0212330_12November2018_1hrTSP_Station ASR5** **0212330_12November2018_1hrTSP_Station ASR5** **0212330_12November2018_1hrTSP_Station ASR6** **[Total No. of Exceedances = 5]**	
Date	12 November 2018 (Measured) 20 November 2018 (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 (395 µg/m3) during 1502 – 1602 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR5 (371 µg/m3) during 1349 – 1449 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR5 (425 µg/m3) during 1451 – 1551 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR5 (377 µg/m3) during 1553 – 1653 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR6 (343 µg/m3) during 1440– 1540 hrs.	
Works Undertaken (at the time of monitoring event)	On 12 November 2018, TBM tunnel works and surcharge removal was carried out on site.	

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, the majority of construction works on 12 November 2018 was TBM tunnel works. During the period of the land-based construction works, the Contractor has implemented the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual (e.g. water spraying on exposed soil within the Project site and associated works areas; exposed soil covered by tarpaulin sheets). • The exceedance is unlikely to be due to the project as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Water spraying record is provided in Annex A. • With reference to the recorded wind direction (ranged between 217^{o} and 304^{o}, blowing from a Westerly direction) and wind speed (ranged from 0.9 to 1.3 m/s) during the period of the observed 1-hr TSP exceedances, Stations ASR1, ASR5 and ASR6 are located upstream to the construction works at Portion N-C. Thus the observed exceedances should not be affected by the dust, if any, generated by the construction activities under this Contract. Based on the above, the exceedances are unlikely to be due to the project.
Actions Taken / To Be Taken	According to the construction information provided by the Contractor, TBM tunnel works and surcharge removal was carried out on 12 November 2018. Dust suppression measures were properly implemented. Water spraying was applied to prevent dust. Follow-up site inspection was carried out on 23 November 2018. Water spraying was applied to areas with stockpiling and exposed ground. Photos are provided in Annex A. Photos taken during AQM are also provided in Annex A. The Contractor has been reminded to implement 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 sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site) throughout the construction period.
Remarks	The monitoring results, wind data, water spraying record and the locations of air quality monitoring stations are attached.

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 12/11/2018

Water truck was used for dust control during surcharge removal. (Works Area Portion N-C)

Water spraying was applied on the main haul road. (Works Area Portion N-C)

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 12/11/2018

Water spraying was applied on the main haul road. (Works Area Portion N-A)

Water spraying was applied on the main haul road. (Works Area Portion N-C)

Annex A Photos taken during site inspection

*Note: Photos taken on 23/11/2018

Water spraying was applied on the main haul road. (Works Area Portion N-A)

Water truck was used for dust control during surcharge removal. (Works Area Portion N-C)

ERM

Annex A Photos taken during AQM inspection

*Note: Photos taken on 12/11/2018

ASR1

ASR5

ERM

Annex A Photos taken during AQM inspection

*Note: Photos taken on 12/11/2018

ASR5

ASR5

TMCLKL	HY/2012/08	12/11/2018	AQMS1	Sunny	14:12	1-hour TSP	311	ug/m3
TMCLKL	HY/2012/08	12/11/2018	AQMS1	Sunny	15:14	1-hour TSP	272	ug/m3
TMCLKL	HY/2012/08	12/11/2018	AQMS1	Sunny	16:16	1-hour TSP	292	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR1	Sunny	14:00	1-hour TSP	148	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR1	Sunny	15:02	1-hour TSP	395	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR1	Sunny	16:04	1-hour TSP	193	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR10	Sunny	13:26	1-hour TSP	242	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR10	Sunny	14:28	1-hour TSP	164	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR10	Sunny	15:30	1-hour TSP	197	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR5	Sunny	13:49	1-hour TSP	371	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR5	Sunny	14:51	1-hour TSP	425	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR5	Sunny	15:53	1-hour TSP	377	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR6	Sunny	13:38	1-hour TSP	262	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR6	Sunny	14:40	1-hour TSP	343	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR6	Sunny	15:42	1-hour TSP	259	ug/m3
TMCLKL	HY/2012/08	12/11/2018	AQMS1	Sunny	17:18	24-hour TSP	80	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR1	Sunny	17:06	24-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR10	Sunny	16:32	24-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR5	Sunny	16:55	24-hour TSP	136	ug/m3
TMCLKL	HY/2012/08	12/11/2018	ASR6	Sunny	16:44	24-hour TSP	103	ug/m3

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)**
18/11/12	0:00	0.4	301
18/11/12	1:00	0.4	285
18/11/12	2:00	0.4	296
18/11/12	3:00	0.9	100
18/11/12	4:00	2.2	94
18/11/12	5:00	1.3	93
18/11/12	6:00	0.9	313
18/11/12	7:00	0.9	329
18/11/12	8:00	0.9	288
18/11/12	9:00	1.3	303
18/11/12	10:00	1.3	133
18/11/12	11:00	1.8	200
18/11/12	12:00	1.3	131
18/11/12	13:00	1.3	217
18/11/12	14:00	1.3	281
18/11/12	15:00	1.8	262
18/11/12	16:00	0.9	291
18/11/12	17:00	0.9	304
18/11/12	18:00	1.3	79
18/11/12	19:00	1.8	93
18/11/12	20:00	1.3	99
18/11/12	21:00	0.9	93
18/11/12	22:00	0.9	68
18/11/12	23:00	0.9	92

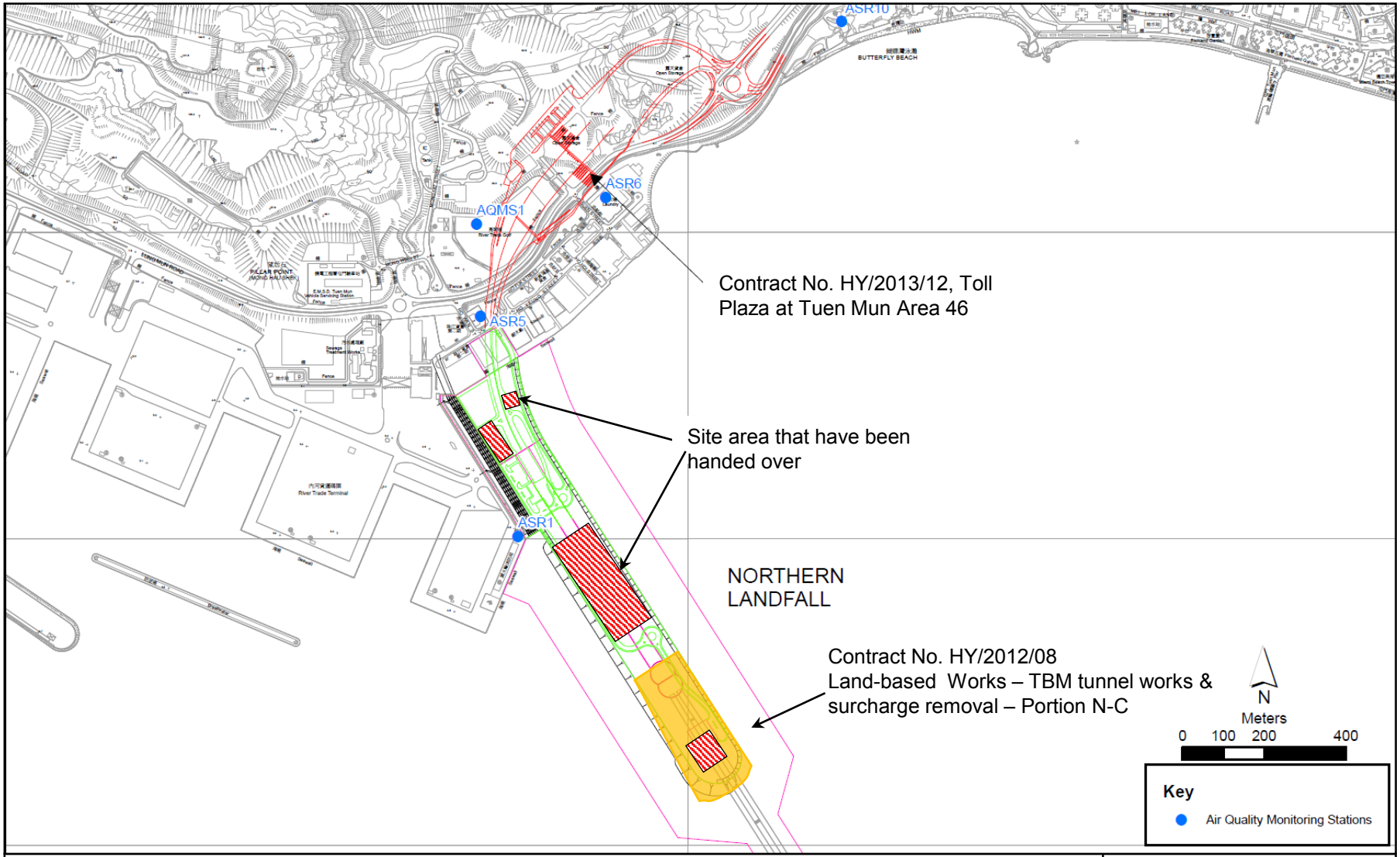


Figure 1

Indicative Construction Works Area on 12 November 2018

DATE: 06/03/2013

Environmental Resources Management

ERM

Dragages - Bouygues Joint Venture 實嘉 - 布依格聯營	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: 12-Nov-2018 to 至 18-Nov-2018

	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	√	√	√	√	√	√	√
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	√	√	√	√	√	√	√
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。

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 November 2018 [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	1221.977	0.000	0.000	0.000	1221.977
Jan-2018	7.165	0.000	0.000	0.000	7.165
Feb-2018	1.762	0.000	0.000	0.000	1.762
Mar-2018	66.457	0.000	0.000	62.274	4.183
Apr-2018	123.942	0.000	0.000	50.648	73.294
May-2018	127.964	0.000	0.000	62.822	65.142
Jun-2018	102.987	0.000	0.000	55.385	47.602
Half Year Sub-total	430.277	0.000	0.000	231.129	199.148
Jul-2018	43.768	0.000	0.000	0.000	43.768
Aug-2018	57.809	0.000	0.000	40.722	17.087
Sep-2018	39.763	0.000	0.000	11.276	28.487
Oct-2018	108.689	0.000	0.653	79.694	28.342
Nov-2018	155.310	0.000	25.702	116.028	13.580
Dec-2018					
Project Total Quantities	2057.593	0.000	26.355	478.849	1552.389

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	619.380	619.380	4.150	4.150	6.870	6.870	33.150	33.150	8.259
Jan-2018	241.500	241.500	0.200	0.200	0.000	0.000	2.800	2.800	0.272
Feb-2018	256.940	256.940	0.200	0.200	0.000	0.000	0.000	0.000	0.258
Mar-2018	229.360	229.360	0.000	0.000	0.000	0.000	2.000	2.000	0.459
Apr-2018	195.550	195.550	0.000	0.000	0.000	0.000	8.600	8.600	0.281
May-2018	93.010	93.010	0.300	0.300	0.000	0.000	10.400	10.400	0.686
Jun-2018	0.000	0.000	0.000	0.000	1.060	1.060	0.000	0.000	0.408
Half Year Sub-total	1016.36	1016.36	0.700	0.700	1.060	1.060	23.800	23.800	2.364
Jul-2018	0.000	0.000	0.000	0.000	0.770	0.770	0.000	0.000	0.768
Aug-2018	980.56	980.56	0.300	0.300	0.000	0.000	0.000	0.000	0.749
Sep-2018	838.04	838.04	0.000	0.000	0.000	0.000	0.000	0.000	0.445
Oct-2018	2702.35	2702.35	0.000	0.000	0.000	0.000	0.000	0.000	0.437
Nov-2018	380.78	380.78	0.000	0.000	0.000	0.000	1.400	1.400	0.448
Dec-2018									
Project Total Quantities	6537.47	6537.47	5.150	5.150	8.700	8.700	60.350	60.350	13.470

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)
2550.000	0.000	50.000	500.000	2000.000

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)
7000.00	7.50	9.50	65.00	15.000

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).