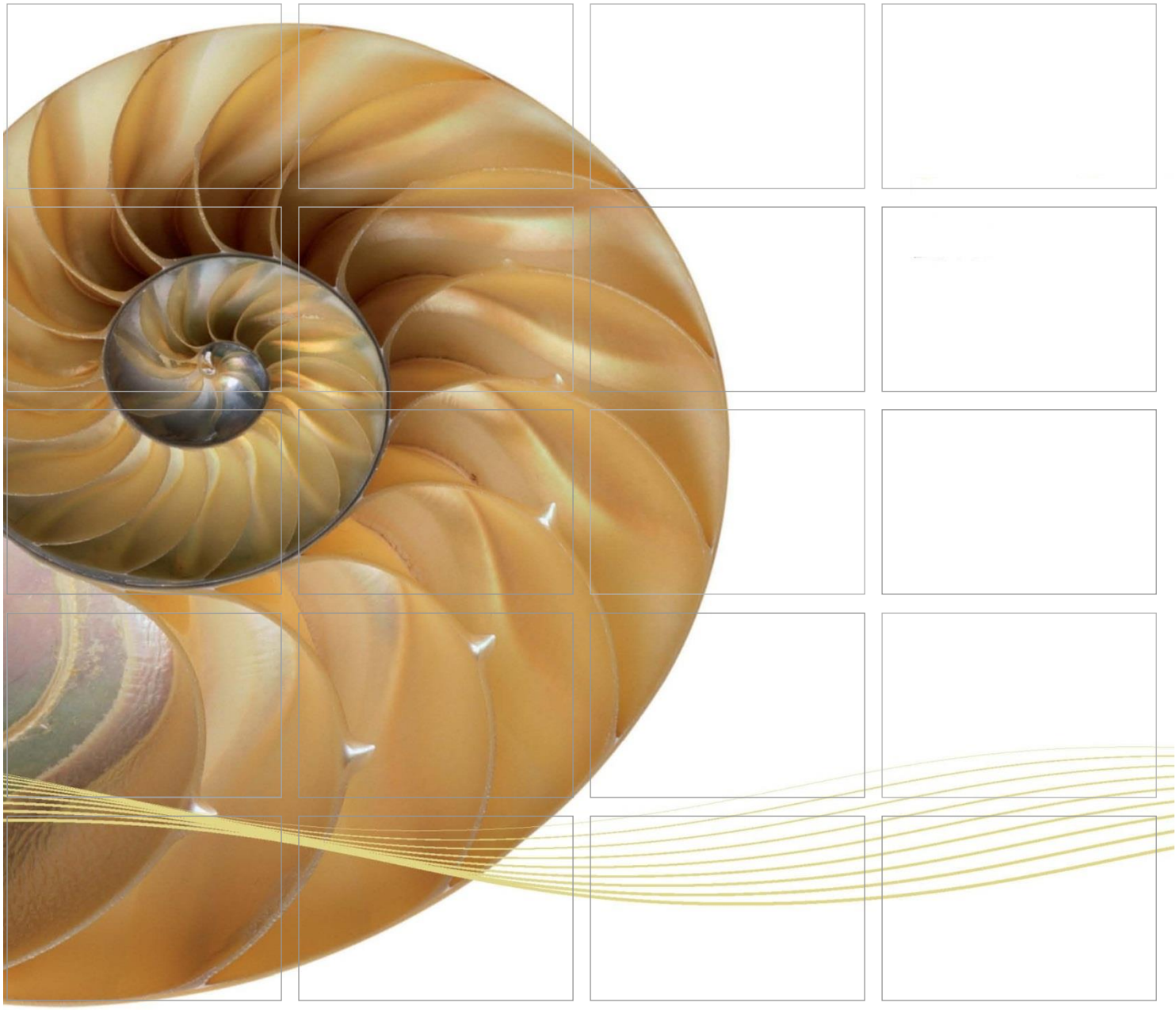
Report



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

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

10 August 2017

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

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The business of sustainability

RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_5703L.17 11 August 2017

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

Attention: Messrs. Andy Westmoreland / Roger Man

Dear Sirs,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2012/08 TM-CLKL Northern Connection Sub-sea Tunnel Section
45th Monthly EM&A Report for July 2017 (EP-354/2009/D)

Reference is made to the Monthly Environmental Monitoring and Audit (EM&A) Report (July 2017) (ET's ref.: "0212330_45th Monthly EM&A_20170810.doc" dated 10 Aug. 2017) certified by the ET Leader and provided to us via e-mail on 11 Aug. 2017.

Please be informed that we have no adverse comments on the captioned Report. We write to verify the captioned submission in accordance with Condition 4.4 of EP-354/2009/D. Please be reminded that our verification of this report does not release any obligations under the EM&A Manual or under the applicable Environmental Permit for this Project, including obtaining prior agreement from the relevant authorities for any proposed changes to the EM&A programme as per Condition 4.1 of the EP.

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

Yours sincerely,

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

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

Internal: DY, YH, PSC, ENPO Site

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www.Ramboll-Environ.com

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

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

Document Code: 0212330_45th Monthly EM&A_20170810.doc

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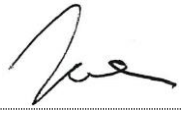
Client:	Project No:
DBJV	0212330
Summary:	Date: 10 August 2017
This document presents the Forty-fifth Monthly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.	Approved by:  *Mr Craig Reid* *Partner*
	Certified by:  *Mr Jovy Tam* *ET Leader*

	45th Monthly EM&A Report	VAR	JT	CAR	10/08/17
Revision	Description	By	Checked	Approved	Date

Distribution

☐ Internal

☒ Public

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

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

This is the Forty-fifth Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 31 July 2017 for the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section* (the "Project") in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, major activities in the reporting period included:

Land-based Works

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

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

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

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

Implementation of Marine Mammal Exclusion Zone

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

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Three (3) Action Level exceedances and zero (0) Limit Level exceedance of 1-hour TSP were recorded in the air quality monitoring of this reporting month. Investigation report is provided in Appendix K.

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 August 2017 include the following:

Land-based Works

- Box Culvert Extension at Works Area – Portion N-A;
- Construction of North Ventilation Building – Portion N-C;
- Construction of Cross Passage Tympanum – TBM tunnel;
- Cross Passage Lining Installation – TBM Tunnel;

- Excavation of Sub-sea Tunnel – TBM tunnel;
- Corbel Construction – TBM Tunnel; and
- Bulk Excavation – Portion S-A.

There will be no dredging, reclamation or marine sheet piling works in open waters in the next monitoring period.

Future Key Issues

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

1 INTRODUCTION

1.1 BACKGROUND

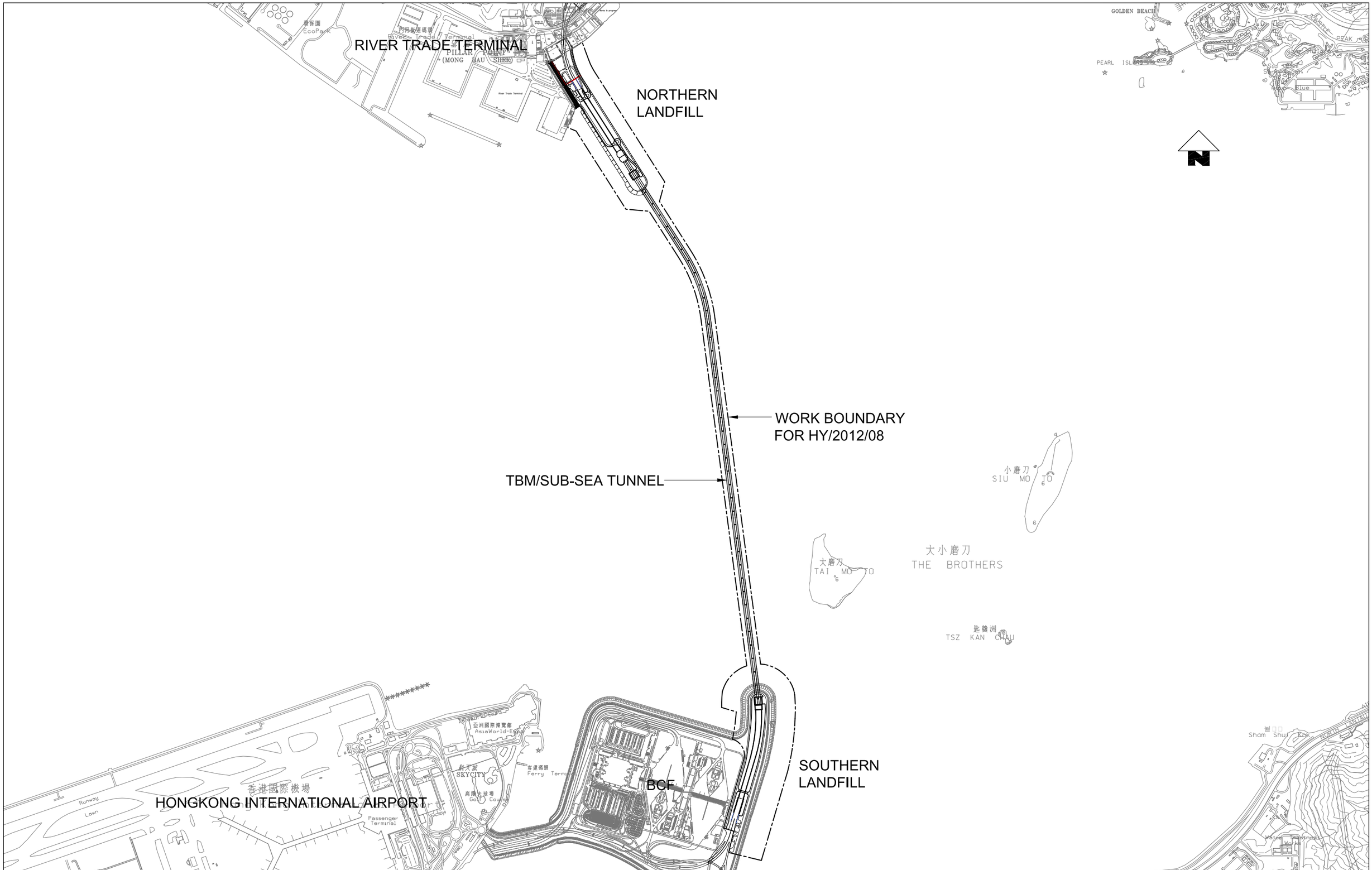
According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated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

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

Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of TM-CLKL while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET). Ramboll Environ Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

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

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



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				Drawn By	DAI
				Approved By	SPo PP
A	FIRST ISSUE	11SEP13	PKV	Date	11SEP2013
Rev.	Description	Date	Checked		

Main Contractor

香寶嘉 Dragages HongKong

A member of the Bouygues Construction group

BOUYGUES TRAVAUX PUBLICS

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Client

路政署 HIGHWAYS DEPARTMENT

Contractor's Designer

ARUP Ove Arup & Partners Hong Kong Limited

Project

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

Drawing Title

Figure 1.1

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

1.2 SCOPE OF REPORT

This is the Forty-fifth 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 July 2017.

1.3 ORGANIZATION STRUCTURE

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

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Highways Department	Engr 22/HZMB	Chow Man Lung, Andrew	2762 4110	2762 4110
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Roger Man	2293 6388	2293 6300
		Andrew Westmoreland	2293 6360	2293 6300
ENPO / IEC (Ramboll Environ Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Dr. F.C. Tsang	3465 2851	3465 2899
Contractor (Dragages – Bouygues Joint Venture)	Environmental Manager	C.F. Kwong	2293 7322	2293 7499
	Environmental Officer	Bryan Lee	2293 7323	2293 7499
	24-hour complaint hotline	Rachel Lam	2293 7330	
ET (ERM-HK)	ET Leader	Jovy Tam	2271 3113	2723 5660

1.4 SUMMARY OF CONSTRUCTION WORKS

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

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

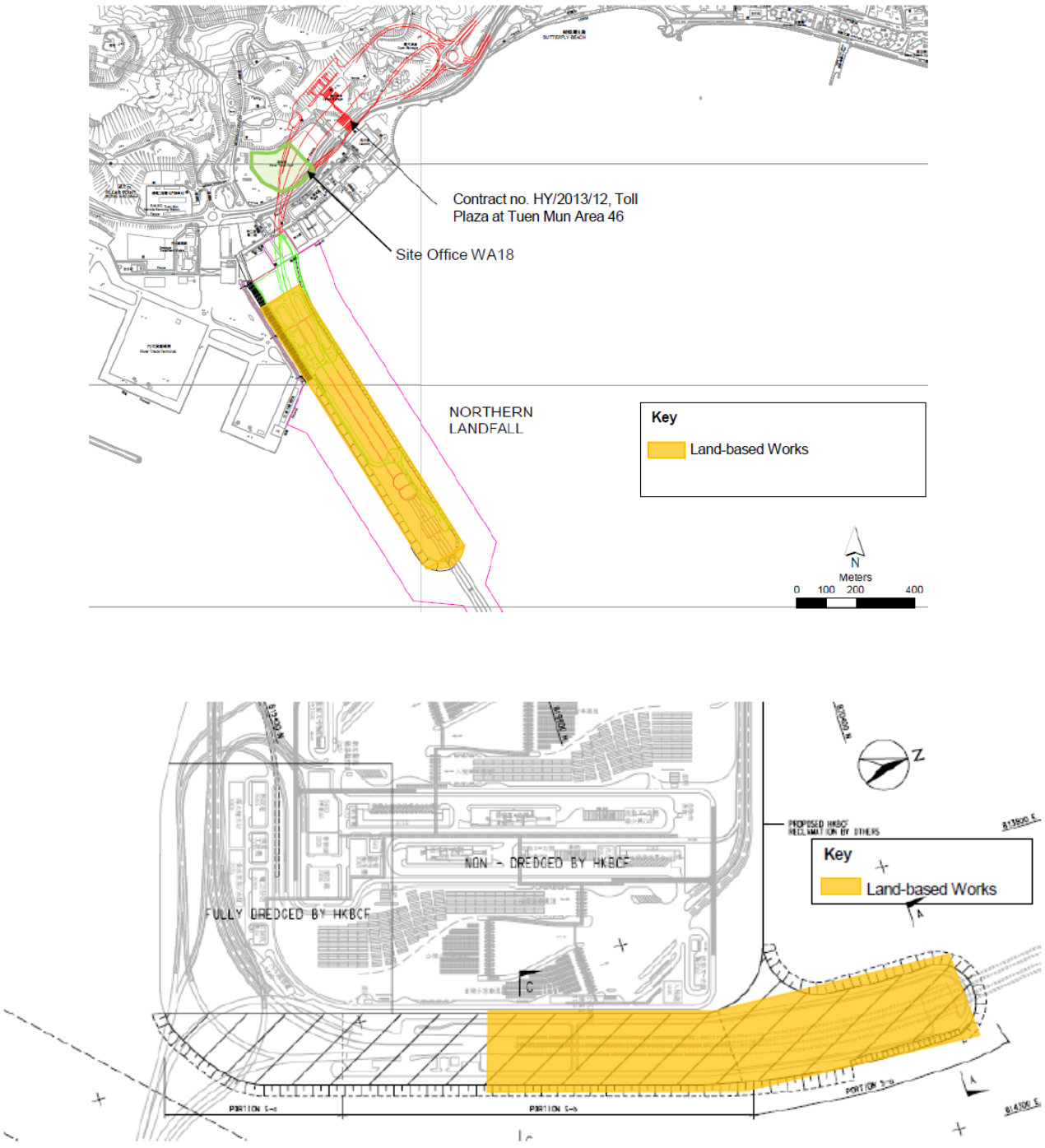
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.3*.

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

Table 1.2 Summary of Construction Activities Undertaken during the Reporting Period

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

Figure 1.2 Locations of Construction Activities – July 2017



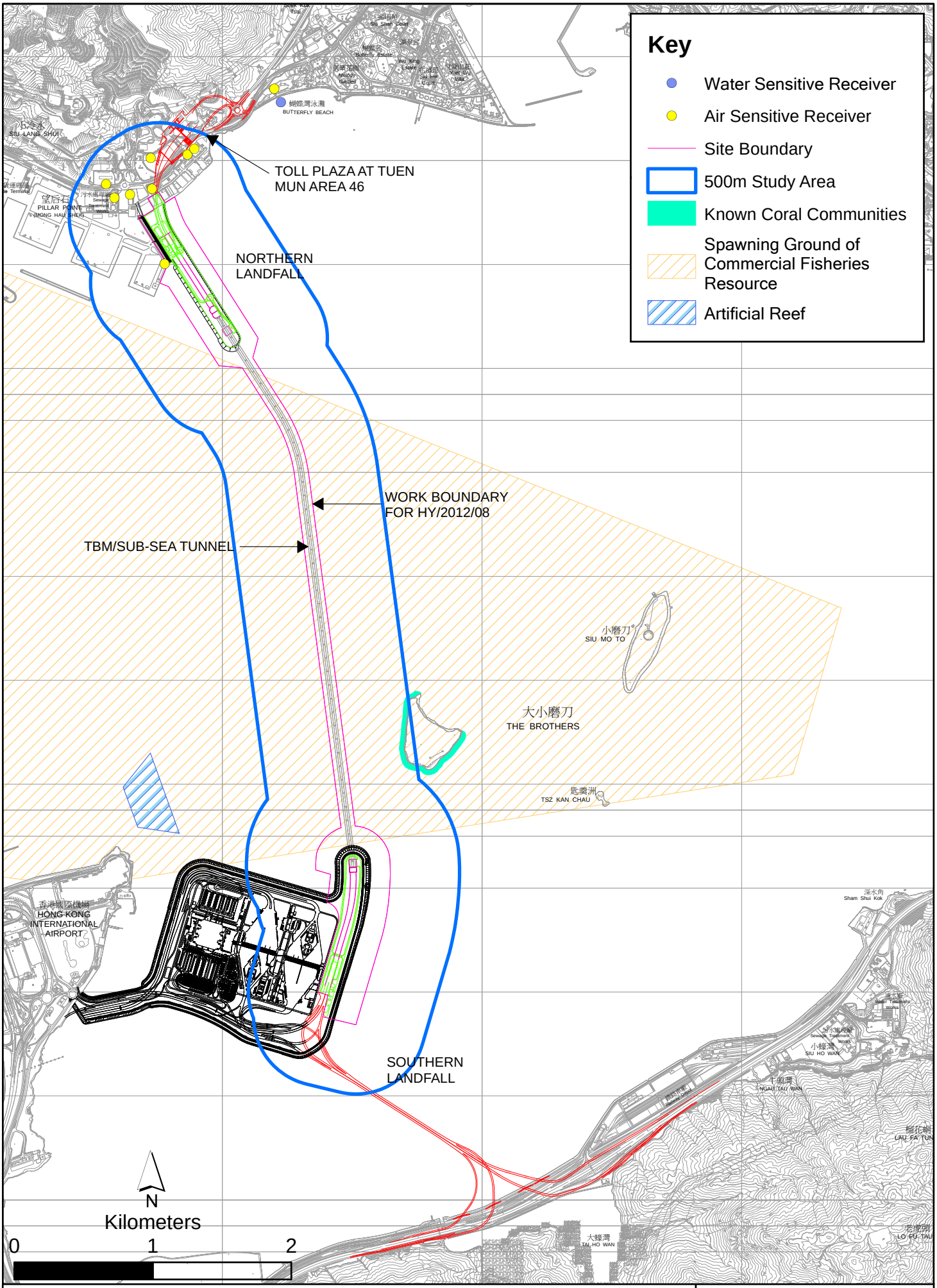


Figure 1.3 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

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Date: 15/4/2014

Environmental Resources Management

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

2.1 AIR QUALITY

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual and the Enhanced TSP Monitoring Plan, impact 1-hour TSP monitoring was conducted three (3) times every six (6) days and impact 24-hour TSP monitoring was carried out once every six (6) days when the highest dust impact was expected. 1-hr and 24-hr TSP monitoring frequency was increased to three times per day every three days and daily every three days, respectively, as excavation works for launching shaft commenced on 24 October 2014.

High volume samplers (HVSs) were used to carry out the 1-hour and 24-hour TSP monitoring on 2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 July 2017 at the five (5) air quality monitoring stations in accordance with the requirements stipulated in the Updated EM&A Manual (*Figure 2.1*; *Table 2.1*). Wind meter was installed at the rooftop of ASR5 for logging wind speed and wind direction. Details of the equipment deployed are provided in *Table 2.2*. Copies of the calibration certificates for the equipment are presented in *Appendix E*.

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

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	2, 5, 8, 11, 14, 17, 20, 23, 26 and 29 July 2017	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	

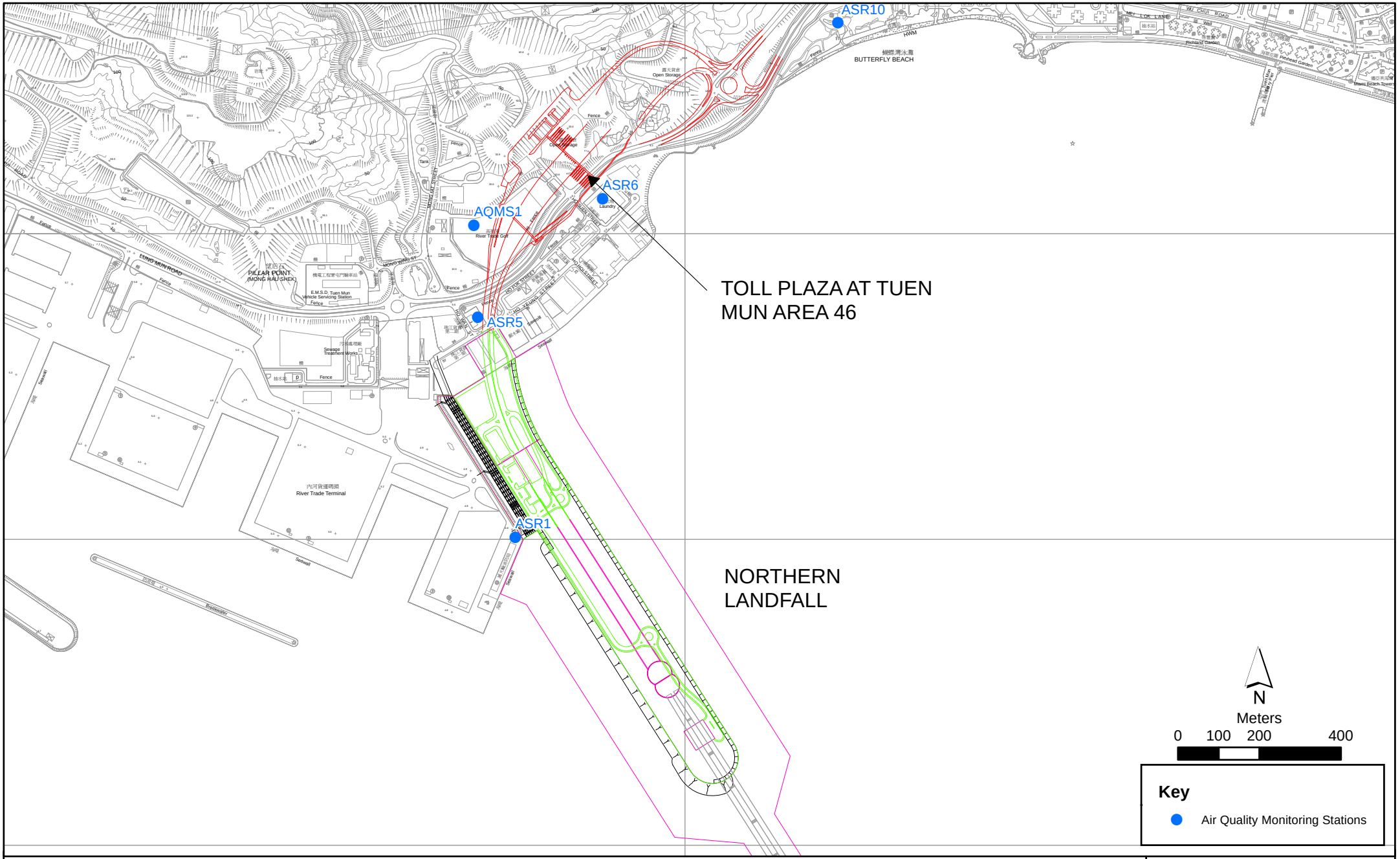

Figure 2.1

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 July 2017 is provided in *Appendix F*.

2.1.4 Results and Observations

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

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

Station	Average (µg/m³)	Range (µg/m³)	Action Level (µg/m³)	Limit Level (µg/m³)
ASR1	83	40 - 225	331	500
ASR5	92	32 - 370	340	500
AQMS1	66	30 – 224	335	500
ASR6	86	36 - 401	338	500
ASR10	69	37 - 475	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	71	39 - 152	213	260
ASR5	50	34 - 100	238	260
AQMS1	44	35 - 77	213	260
ASR6	50	38 - 114	238	260
ASR10	46	21 - 99	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 monitoring events were undertaken in which no Action or Limit Level exceedances of 1-hr TSP were recorded in this reporting month. No Action or Limit Level exceedances for 24-hr TSP were record.

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

2.2 WATER QUALITY MONITORING

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

2.3 DOLPHIN MONITORING

2.3.1 Monitoring Requirements

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

2.3.2 Monitoring Equipment

Table 2.7 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 2.8* below.

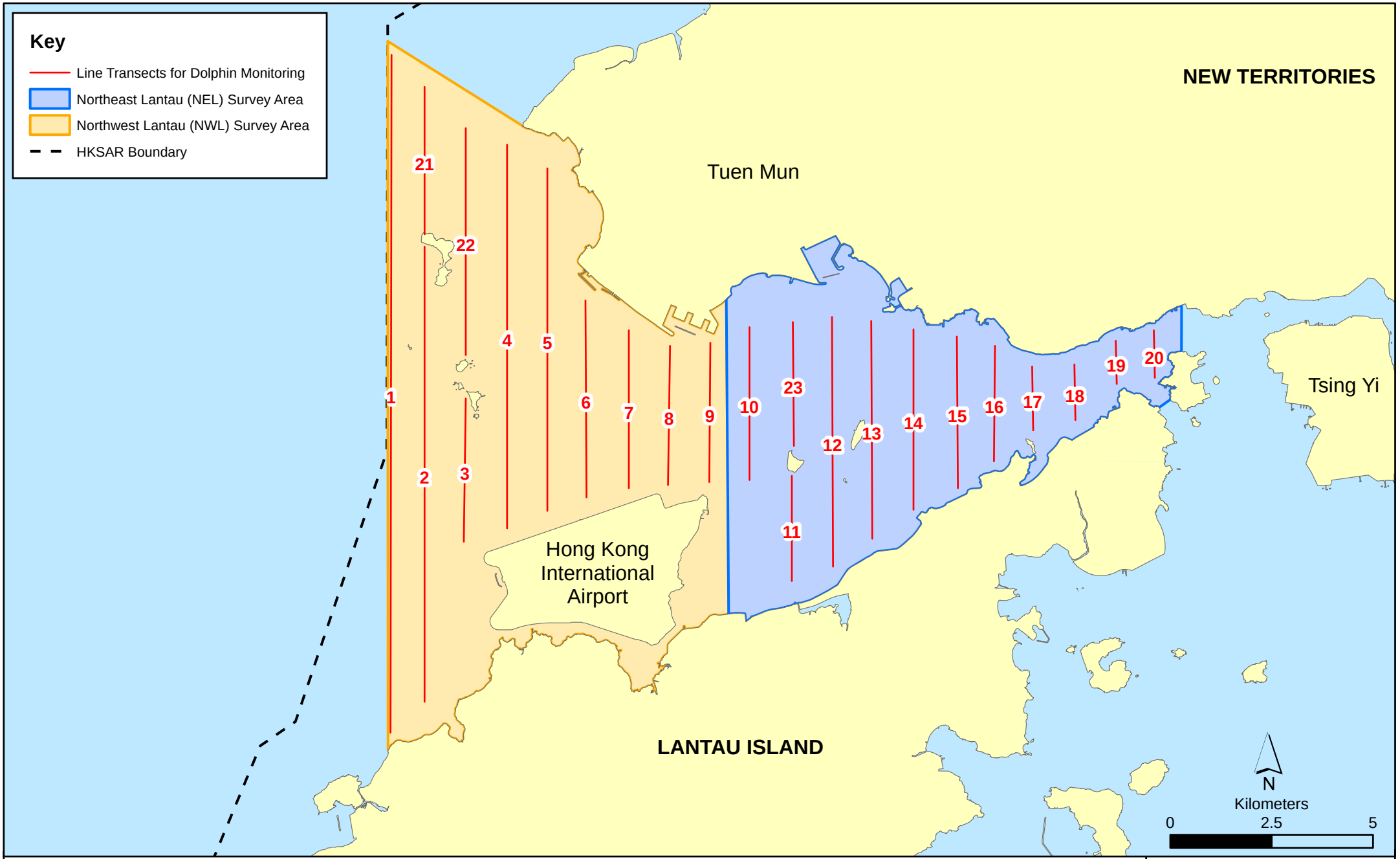

Figure 2.2

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

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Date: 29/11/2013

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Table 2.6 Impact Dolphin Monitoring Line Transect Co-ordinates

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

2.3.5 Action & Limit Levels

The Action and Limit levels of 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 20, 24, 27 and 28 of July 2017. The dolphin monitoring schedule for the reporting month is shown in *Appendix F*.

2.3.7 *Results & Observations*

A total of 265.21 km of survey effort was collected, with 99.4% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) in July 2017. Among the two areas, 96.30 km and 168.91 km of survey effort were collected from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 194.61 km and 70.60 km respectively. The survey efforts are summarized in *Appendix I*.

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

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

Encounter rates of Chinese White Dolphins are deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort 3 or below) in July 2017 with the results present in *Tables 2.7* and *2.8*.

Table 2.7 Individual Survey Event Encounter Rates

		Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	**Primary Lines Only**
NEL	Set 1: July 20th / 24th	0.0	0.0
	Set 2: July 27th / 28th	0.0	0.0
NWL	Set 1: July 20th / 24th	1.64	14.79
	Set 2: July 27th / 28th	0.0	0.0

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

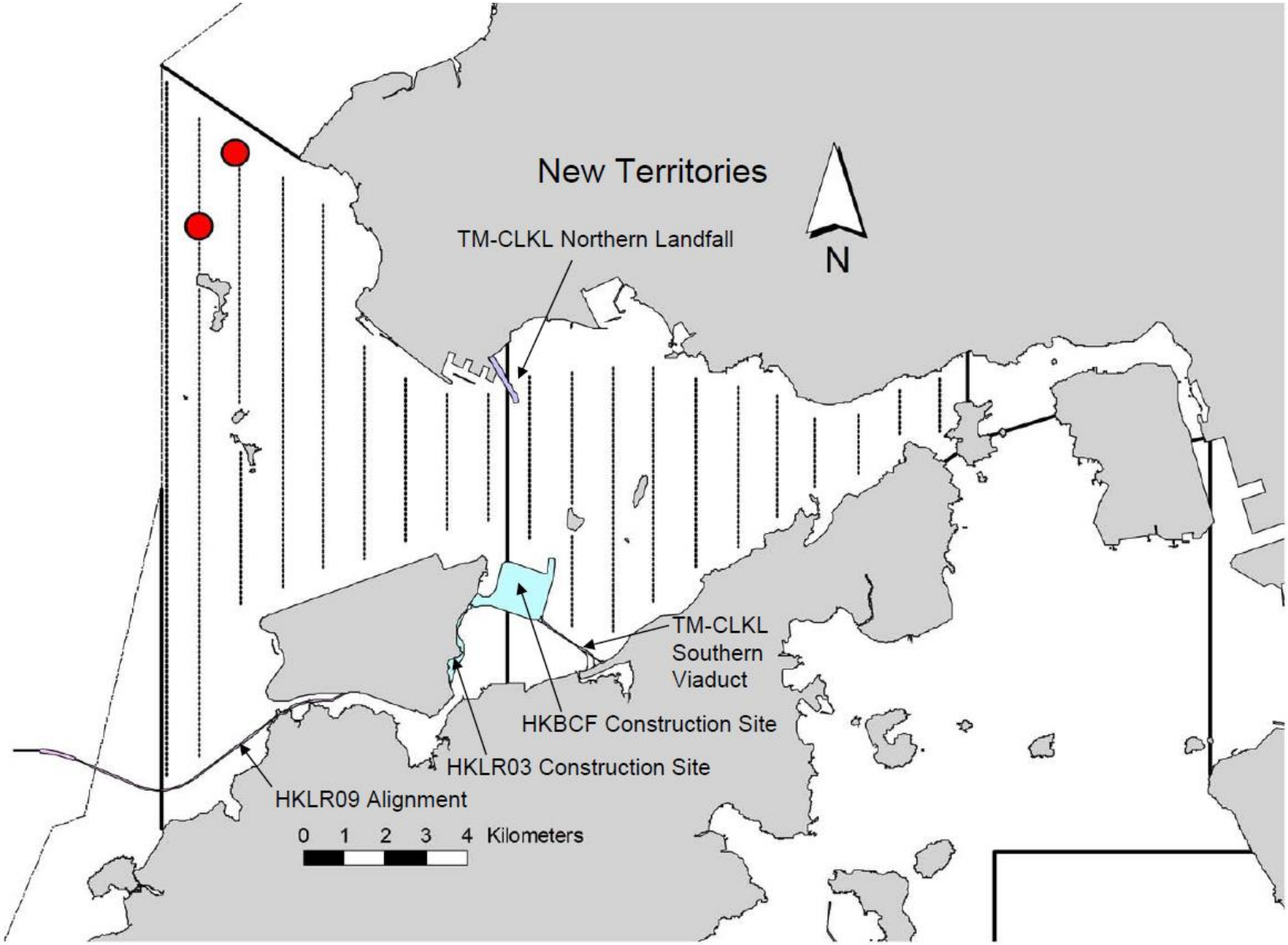

Figure 2.3

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

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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	0.8	1.2	7.3	6.6

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

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

2.3.8 Implementation of Marine Mammal Exclusion Zone

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

2.4 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting month, four (4) site inspections were carried out on 5, 12, 19 and 26 July 2017.

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

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

Inspection Date	Observations	Recommendations/ Remarks
5 July 2017	Works Area - TBM Tunnel • Cement bags should be covered with tarpaulin sheets. • Drip tray should be provided to the chemical containers. Works Area - Portion S-B • Stagnant water should be pumped to the wastewater treatment facility. • Accumulated rubbish should be put in the skip.	Works Area - TBM Tunnel • The Contractor was reminded to cover the cement bags with tarpaulin sheets. • The Contractor was reminded to provide drip tray to the chemical containers. Works Area - Portion S-B • The Contractor was reminded to pump the stagnant water to the wastewater treatment facility. • The Contractor was reminded to put the accumulated rubbish in the skip.
12 July 2017	Works Area – Portion N-C • Accumulated waste in the skip should be removed. Works Area - Portion S-B • Accumulated waste in the skip should be removed.	Works Area – Portion N-C • The Contractor was reminded to remove the accumulated waste in the skip. Works Area - Portion S-B • The Contractor was reminded to remove the accumulated waste in the skip.
19 July 2017	Works Area – Portion S-B • Sand bags should be provided to prevent the leakage of cement water to the main road.	Works Area – Portion S-B • The Contractor was reminded to provide sand bags to prevent the leakage of cement water to the main road.
26 July 2017	Reminder from SOR. Works Area - Portion N-A • The abandoned wheel washing facilities should be filled up with sand to avoid breeding of mosquitoes.	Reminder from SOR. Works Area - Portion N-A • The Contractor was reminded to fill the abandoned wheel washing facilities with sand to avoid breeding of mosquitoes.

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

2.5 WASTE MANAGEMENT STATUS

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

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

Table 2.10 Quantities of Different Waste Generated in the Reporting Month

Month/Year	Inert Construction Waste [a] (tonnes)	Inert Construction Waste Re-used (tonnes)	Non-inert Construction Waste [b] (tonnes)	Recyclable Materials [c] (kg)	Chemical Wastes (kg)	Marine Sediment (m^3)	
						Category L	Category M (M_p & M_f)
July 2017	652	0	272	0	0	0	0

Notes:

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

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

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

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

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

2.6 *ENVIRONMENTAL LICENSES AND PERMITS*

The status of environmental licensing and permit is summarized in *Table 2.11* below.

Table 2.11 Summary of Environmental Licensing and Permit Status

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-354/2009/D	13 March 2015	Throughout the Contract	HyD	Application for VEP on 3 March 2015 to supersede EP-354/2009/C
Construction Dust Notification	363510	19 August 2013	Throughout the Contract	DBJV	Northern Landfall
Construction Dust Notification	403620	10 June 2016	Throughout the Contract	DBJV	Southern Landfall
Chemical Waste Registration	5213-422-D2516-01	10 September 2013	Throughout the Contract	DBJV	Northern Landfall
Chemical Waste Registration	5213-422-D2516-02	18 January 2017	Throughout the Contract	DBJV	Northern Landfall
Chemical Waste Registration	5213-951-D2591-01	25 May 2016	Throughout the Contract	DBJV	Southern Landfall
Construction Waste Disposal Account	7018108	28 August 2013	Throughout the Contract	DBJV	Waste disposal in Contract No. HY/2012/08
Waste Water Discharge License	WT00017707-2013	18 November 2013	30 November 2018	DBJV	For site WA18
Waste Water Discharge License	WT00019248-2014	5 June 2014	30 June 2019	DBJV	For site Portion N6 and Reclamation Area E
Waste Water Discharge License	WT00025944-2016	15 December 2016	31 December 2021	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0247-17	19 May 2017	9 November 2017	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0279-17	13 June 2017	12 December 2017	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	PP-RS0012-17	13 June 2017	30 August 2017	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0143-17	29 March 2017	28 September 2017	DBJV	For Portion N6
Construction Noise Permit	GW-RS0165-17	1 March 2017	2 September 2017	DBJV	For Southern Landfall

Notes:

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

Three (3) Action Level or Limit Level of air quality exceedances were recorded in the air quality monitoring of this reporting month. Investigation report is provided in Appendix K.

Cumulative statistics are provided in *Appendix K*.

2.9 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

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

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

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

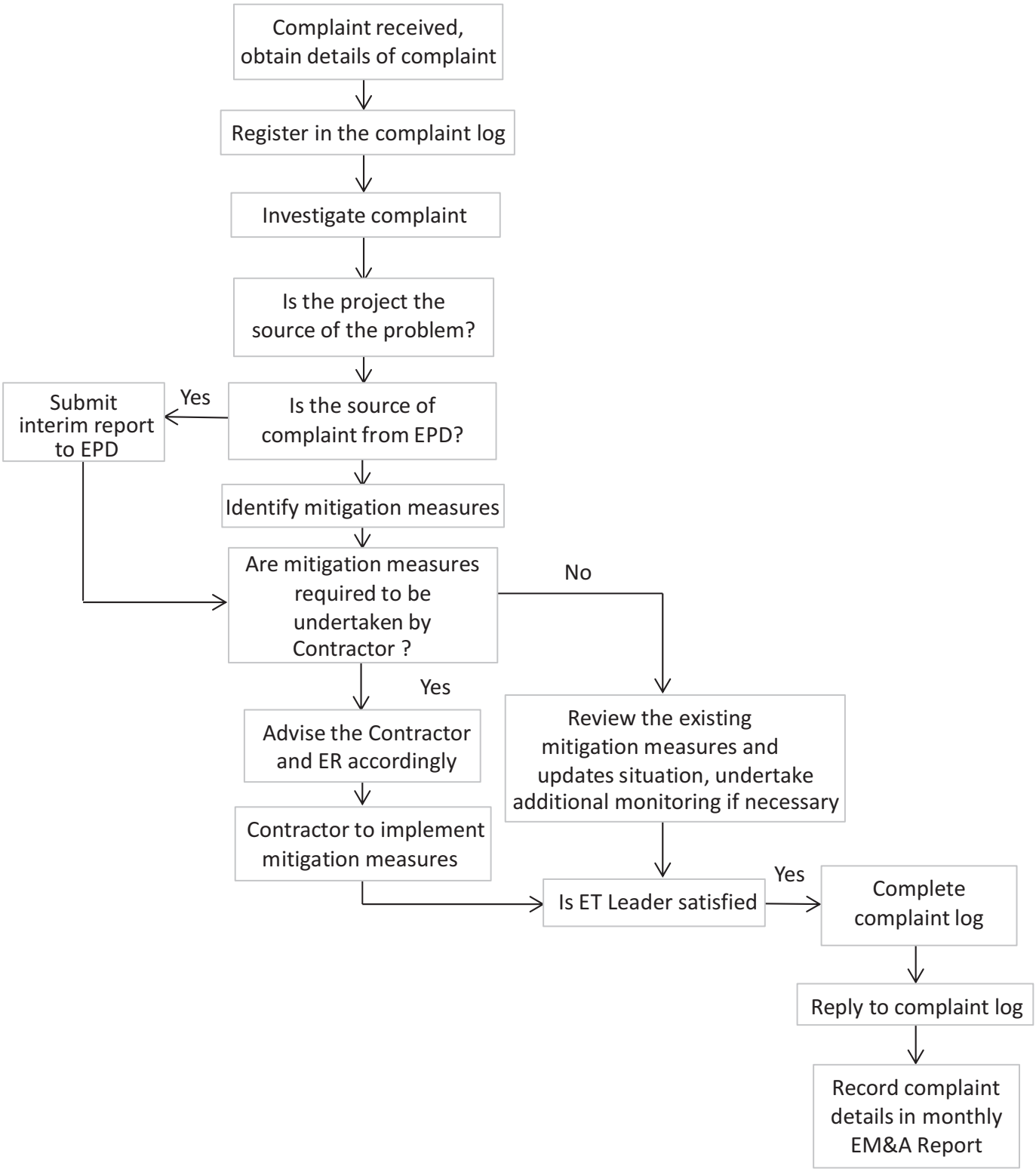


Figure 2.4 Environmental Complaint Handling Procedure

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

Environmental Resources Management

ERM

3 FUTURE KEY ISSUES

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING MONTH

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

Table 3.1 Construction Works to Be Undertaken in the Coming Month

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

3.2 KEY ISSUES FOR THE COMING MONTH

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

3.3 MONITORING SCHEDULE FOR THE COMING MONTH

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

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

This Forty-fifth Monthly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 31 July 2017, in accordance with the Updated EM&A Manual and the requirements of EP-354/2009/D.

Air quality (including 1-hour TSP and 24-hour TSP) and dolphin monitoring were carried out in this reporting month. Three (3) Action Level exceedances and zero (0) Limit Level exceedance of 1-hour TSP were recorded in the air quality monitoring of this reporting month. Investigation report is provided in Appendix K.

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

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

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

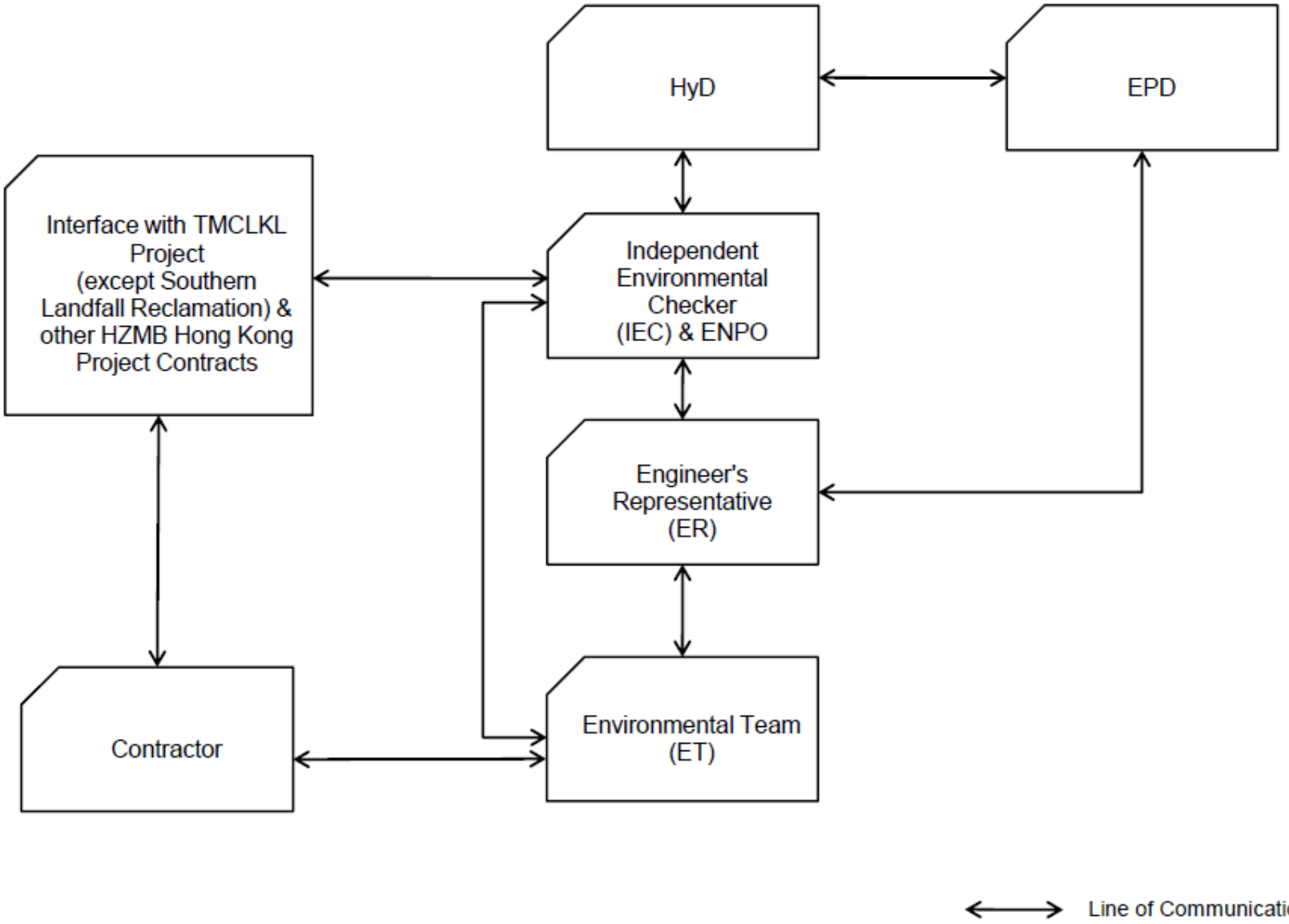
No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A

Project Organization for Environmental Works



Appendix A1

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

DATE: 06/03/2013

Environmental Resources Management

ERM

Appendix B

Construction Programme

Activity Name	2017 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TMCLK - Northern Connection Sub-Sea Tunnel Section									
Contract Dates									
Commencement and Completion Dates									
KD05 - Completion of Section 1A2 - Portion N1 to N4						KD05 - Completion of Section 1A2 - Portion N1 to N4			
KD07 - Completion of Section 1C - Portion N5 & N7						KD07 - Completion of Section 1C - Portion N5 & N7			
Site Possession Date									
Portions: X1,(N10,11,13 & 14) - Sth Landfall									
Handover Date									
Portions: N1 ~ N4						Portions: N1 ~ N4			
Portions: N5 & N7						Portions: N5 & N7			
Portion: N6A						Portion: N6A			
General Submissions									
PAYMENT MILESTONE									
Design and Design Checking of the Works									
MS 2.5 Submit AIP for seawall modification works at Southern Landfall	odification works at Southern Landfall								
MS 2.6 Approve AIP for seawall modification works at Southern Landfall by the Supervising Officer		MS 2.6 Approve AIP for seawall modification works at Southern Landfall by the Supervising Officer							
MS 2.7 Submit DDA for seawall modification works at Southern Landfall			MS 2.7 Submit DDA for seawall modification works at Southern Landfall						
MS 2.8 Approve DDA for seawall modification works at Southern Landfall by the Supervising Officer							MS 2.8 Approve DDA for seawall modification works		
MS 2.44 Approve DDA for South Ventilation Building by the Supervising Officer									
MS 2.52 Approve DDA for Facilities Provision for TCSS by the Supervising Officer									
MS 2.60 Approve DDA for Drainage, Sewerage, Waterworks and Utilities at Northern Landfall by the Supervi									
MS 2.69 Submit draft Operation and Maintenance Manual for all Tunnels and Cross Passgaes									
MS 2.70 Accept Operation and Maintenance Manual for all Tunnels and Cross Passgaes by the Supervising									
MS 2.71 Submit draft Operation and Maintenance Manual for all works except Tunnels and Cross Passgaes									
MS 2.72 Accept Operation and Maintenance Manual for all works except Tunnels and Cross Passgaes by the									
MS 2.73 Complete the whole of the activities under this Cost Centre to the satisfaction of the Supervising Offic							MS 2.73 Complete the whole of the activities under th		
Tunnel Boring Machine (TBM) and Back-up Equipment for TBM Tunnel									
MS 3.1.6 Removal of TBM for Southbound Tunnel from Site after the completion of TBM Tunnel	uthbound Tunnel from Site after the completion of TBM Tunnel								
MS 3.1.12 Removal of TBM for Northbound Tunnel from Site after the completion of TBM Tunnel	oval of TBM for Northbound Tunnel from Site after the completion of TBM Tunnel								
MS 3.1.25 Demolition of Slurry Treatment Plant on completion	olition of Slurry Treatment Plant on completion								
MS 3.1.26 Complete the whole of the activities under this Cost Centre Part to the satisfaction of the Supervisin									
TBM Tunnel									
MS 3.3.4 Complete walls of retrieval shaft									
MS 3.3.5 Complete excavation to formation level for retrieval shaft and complete casting of base slab	complete casting of base slab								
MS 3.3.6 Complete all necessary works of retrieval shaft to facilitate retrieval of TBM	rieval of TBM								
MS 3.3.45 Completion of excavation, support and permanent lining for 60% of the total length (measured on									
MS 3.3.46 Completion of excavation, support and permanent lining for 62.5% of the total length (measured o	on plan) of the								
MS 3.3.47 Completion of excavation, support and permanent lining for 65% of the total length (measured on	n plan) of the N								
MS 3.3.48 Completion of excavation, support and permanent lining for 67.5% of the total length (measured o	on plan) of the								
MS 3.3.49 Completion of excavation, support and permanent lining for 70% of the total length (measured on	n plan) of the N								
MS 3.3.50 Completion of excavation, support and permanent lining for 72.5% of the total length (measured o	length (measured on plan) of the								
MS 3.3.51 Completion of excavation, support and permanent lining for 75% of the total length (measured on	ength (measured on plan) of the N								
MS 3.3.52 Completion of excavation, support and permanent lining for 77.5% of the total length (measured o	length (measured on plan) of the								
MS 3.3.53 Completion of excavation, support and permanent lining for 80% of the total length (measured on	ength (measured on plan) of the N								
MS 3.3.54 Completion of excavation, support and permanent lining for 82.5% of the total length (measured o	82.5% of the total length (measured on plan) of the								
MS 3.3.55 Completion of excavation, support and permanent lining for 85% of the total length (measured on	85% of the total length (measured on plan) of the N								
MS 3.3.56 Completion of excavation, support and permanent lining for 87.5% of the total length (measured o	87.5% of the total length (measured on plan) of the								
MS 3.3.57 Completion of excavation, support and permanent lining for 90% of the total length (measured on	90% of the total length (measured on plan) of the N								
MS 3.3.58 Completion of excavation, support and permanent lining for 92.5% of the total length (measured o	r 92.5% of the total length (measured on plan) of the								
MS 3.3.59 Completion of excavation, support and permanent lining for 95% of the total length (measured on	ermanent lining for 95% of the total length (measured on plan) of the N								
MS 3.3.60 Completion of excavation, support and permanent lining for 97.5% of the total length (measured o	ermanent lining for 97.5% of the total length (measured on plan) of the								
MS 3.3.61 Completion of excavation, support and permanent lining for 100% of the total length (measured or	ermanent lining for 100% of the total length (measured on plan) of the								
MS 3.3.111 Completion of excavation, support and permanent lining for 87.5% of the total length (measured	al length (measured on plan) of th								
MS 3.3.112 Completion of excavation, support and permanent lining for 90% of the total length (measured on	r 90% of the total length (measured on plan) of the								
MS 3.3.113 Completion of excavation, support and permanent lining for 92.5% of the total length (measured	r 92.5% of the total length (measured on plan) of th								
MS 3.3.114 Completion of excavation, support and permanent lining for 95% of the total length (measured on	r 95% of the total length (measured on plan) of the								
MS 3.3.115 Completion of excavation, support and permanent lining for 97.5% of the total length (measured	r 97.5% of the total length (measured on plan) of th								
MS 3.3.116 Completion of excavation, support and permanent lining for 100% of the total length (measured o	r 100% of the total length (measured on plan) of the								
MS 3.3.118 Complete tunnel internal structures for 50% of total length (measured on plan) of the Northbound	rnal structures for 50% of total length (measured on plan) of the Northbound TBM Tunnel								
MS 3.3.119 Complete tunnel internal structures for 75% of total length (measured on plan) of the Northbound				MS 3.3.119 Complete tunnel internal structures for 75% of total length (measured on plan) of the Northbound TBM Tunnel					
MS 3.3.120 Complete tunnel internal structures for 100% of total length (measured on plan) of the Northboun							MS 3.3.120 Complete tunnel internal structures for 1		
MS 3.3.122 Complete tunnel internal structures for 50% of total length (measured on plan) of the Southbounc	rnal structures for 50% of total length (measured on plan) of the Southbound TBM Tunnel								
MS 3.3.123 Complete tunnel internal structures for 75% of total length (measured on plan) of the Southbounc				MS 3.3.123 Complete tunnel internal structures for 75% of total length (measured on plan) of the Southbound TBM Tunnel					
MS 3.3.124 Complete tunnel internal structures for 100% of total length (measured on plan) of the Southbour							MS 3.3.124 Complete tunnel internal structures for 1		
MS 3.3.125 Complete drainage and sewerage installations of the Northbound TBM Tunnel							MS 3.3.125 Complete drainage and sewerage instal		
MS 3.3.126 Complete drainage and sewerage installations of the Southbound TBM Tunnel							MS 3.3.126 Complete drainage and sewerage instal		
Cross Passages for TBM Tunnel									
MS 3.3.1 Complete 50% of ground treatment for excavation of all Type 1 Cross Passages(Percentage to be c	1 Cross Passages(Percentage to be certified for 50%								
MS 3.3.2 Complete 100% of ground treatment for excavation of all Type 1 Cross Passages(Percentage to be				MS 3.3.2 Complete 100% of ground treatment for excavation of all Type 1 Cross Passages(Percentage to be					
MS 3.3.3 Complete 50% of ground treatment for excavation of all Type 2 Cross Passages(Percentage to be c	2 Cross Passages(Percentage to be certified for 50%								
MS 3.3.4 Complete 100% of ground treatment for excavation of all Type 2 Cross Passages(Percentage to be				MS 3.3.4 Complete 100% of ground treatment for excavation of all Type 2 Cross Passages(Percentage to be certified for 10					
MS 3.3.5 Complete 50% of excavation and support for all Type 1 Cross Passages(Percentage to be certified f	for all Type 1 Cross Passages(Percentage to be certified for 50% comple								
MS 3.3.6 Complete 100% of excavation and support for all Type 1 Cross Passages(Percentage to be certified				MS 3.3.6 Complete 100% of excavation and support for all Type 1 Cross Passages(Percentage to be certifie					
MS 3.3.7 Complete 50% of excavation and support for all Type 2 Cross Passages(Percentage to be certified f	for all Type 2 Cross Passages(Percentage to be certified for 50% comple								
MS 3.3.8 Complete 100% of excavation and support for all Type 2 Cross Passages(Percentage to be certified					MS 3.3.8 Complete 100% of excavation and support for all Type 2 Cross Passages(Perce				
MS 3.3.9 Complete 50% of permanent lining and internal structures for all Type 1 Cross Passages(Percentag	anent lining and internal structures for all Type 1 Cross Passages(Percentage to be certifi								
MS 3.3.10 Complete 100% of permanent lining and internal structures for all Type 1 Cross Passages(Percent						MS 3.3.10 Complete 100% of permanent lining and internal structures			
MS 3.3.11 Complete 50% of permanent lining and internal structures for all Type 2 Cross Passages(Percenta	plete 50% of permanent lining and internal structures for all Type 2 Cross Passages(Percentage to be certif								
MS 3.3.12 Complete 100% of permanent lining and internal structures for all Type 2 Cross Passages(Percent						MS 3.3.12 Complete 100% of permanent lining and internal structures			
Cut-and-cover Tunnels at Southern Landfalls									
MS 4.1.1 Complete 10% of total length (measured on plan) of temporary retaining walls for excavation of Cut-									
MS 4.1.2 Complete 20% of total length (measured on plan)of temporary retaining walls for excavation of Cut-									
MS 4.1.3 Complete 30% of total length (measured on plan) of temporary retaining walls for excavation of Cut-									
MS 4.1.4 Complete 40% of total length (measured on plan) of temporary retaining walls for excavation of Cut-									
MS 4.1.5 Complete 50% of total length (measured on plan) of temporary retaining walls for excavation of Cut-									
MS 4.1.6 Complete 60% of total length (measured on plan) of temporary retaining walls for excavation of Cut-									

Project ID: TMCLK DWPF 17W30

Data Date: 30-Jul-17

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

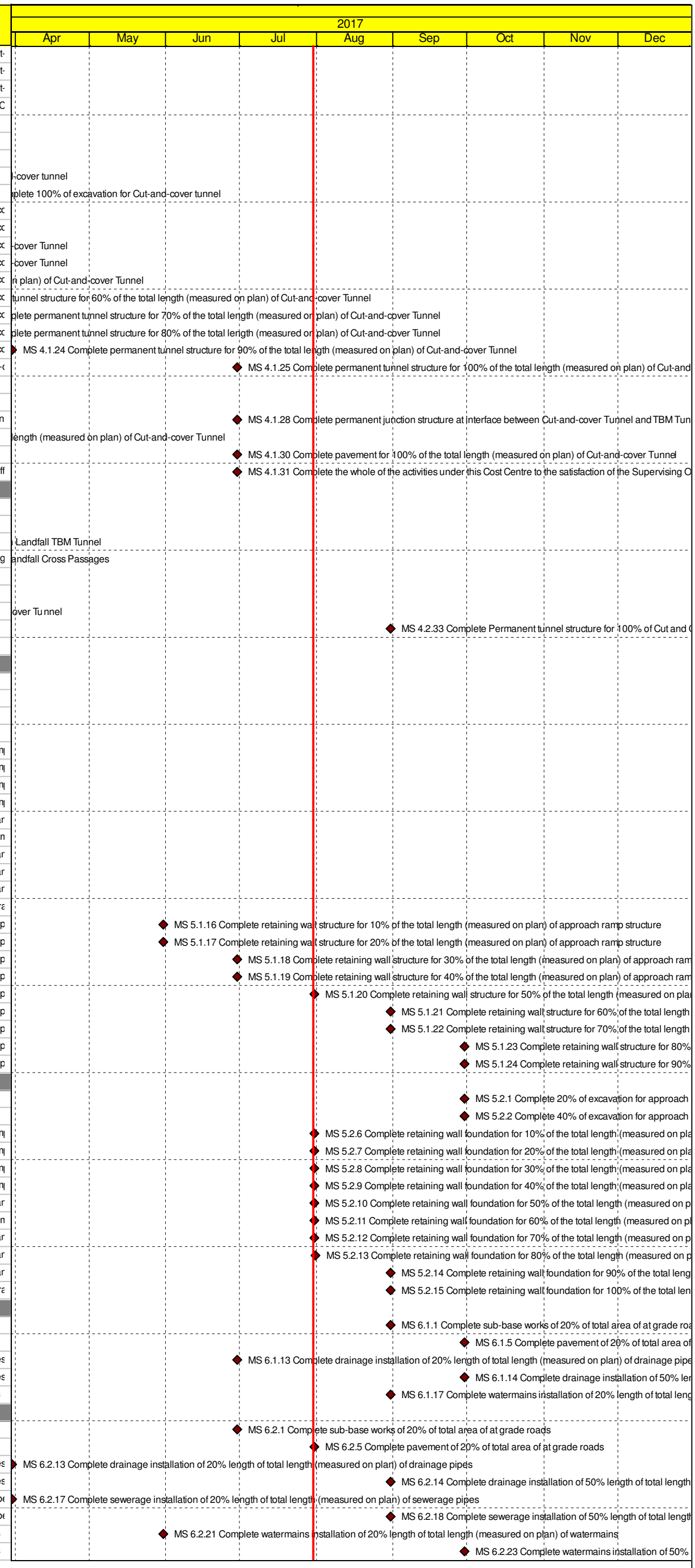
Detailed Works Programme (Rev. F)

Three Months Rolling Programme

Progress as of 30-Jul-17

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

Activity Name
MS 4.1.7 Complete 70% of total length (measured on plan) of temporary retaining walls for excavation of Cut-
MS 4.1.8 Complete 80% of total length (measured on plan) of temporary retaining walls for excavation of Cut-
MS 4.1.9 Complete 90% of total length (measured on plan) of temporary retaining walls for excavation of Cut-
MS 4.1.10 Complete 100% of total length (measured on plan) of temporary retaining walls for excavation of C
MS 4.1.11
MS 4.1.12 Complete 40% of excavation for Cut-and-cover tunnel
MS 4.1.13 Complete 60% of excavation for Cut-and-cover tunnel
MS 4.1.14 Complete 80% of excavation for Cut-and-cover tunnel
MS 4.1.15 Complete 100% of excavation for Cut-and-cover tunnel
MS 4.1.16 Complete permanent tunnel structure for 10% of the total length (measured on plan) of Cut-and-cc
MS 4.1.17 Complete permanent tunnel structure for 20% of the total length (measured on plan) of Cut-and-cc
MS 4.1.18 Complete permanent tunnel structure for 30% of the total length (measured on plan) of Cut-and-cc
MS 4.1.19 Complete permanent tunnel structure for 40% of the total length (measured on plan) of Cut-and-cc
MS 4.1.20 Complete permanent tunnel structure for 50% of the total length (measured on plan) of Cut-and-cc
MS 4.1.21 Complete permanent tunnel structure for 60% of the total length (measured on plan) of Cut-and-cc
MS 4.1.22 Complete permanent tunnel structure for 70% of the total length (measured on plan) of Cut-and-cc
MS 4.1.23 Complete permanent tunnel structure for 80% of the total length (measured on plan) of Cut-and-cc
MS 4.1.24 Complete permanent tunnel structure for 90% of the total length (measured on plan) of Cut-and-cc
MS 4.1.25 Complete permanent tunnel structure for 100% of the total length (measured on plan) of Cut-and-c
MS 4.1.26 Complete excavation for 50% of total length (measured on plan) of all Cross Passages
MS 4.1.27 Complete excavation for 100% of total length (measured on plan) of all Cross Passages
MS 4.1.28 Complete permanent junction structure at interface between Cut-and-cover Tunnel and TBM Tunn
MS 4.1.29 Complete pavement for 50% of the total length (measured on plan) of Cut-and-cover Tunnel
MS 4.1.30 Complete pavement for 100% of the total length (measured on plan) of Cut-and-cover Tunnel
MS 4.1.31 Complete the whole of the activities under this Cost Centre to the satisfaction of the Supervising Off
Cut-and-cover Tunnel at Northern Landfall
MS 4.2.22 Complete tunnel internal structure for 50% of NB Northern Landfall TBM Tunnel
MS 4.2.23 Complete tunnel internal structure for 100% of NB Northern Landfall TBM Tunnel
MS 4.2.25 Complete tunnel internal structure for 100% of SB Northern Landfall TBM Tunnel
MS 4.2.29 Complete 100% of permanent lining and internal structures for all Northern Landfall Cross Passag
MS 4.2.30 Complete Permanent tunnel structure for 25% of Cut and Cover Tunnel
MS 4.2.31 Complete Permanent tunnel structure for 50% of Cut and Cover Tunnel
MS 4.2.32 Complete Permanent tunnel structure for 75% of Cut and Cover Tunnel
MS 4.2.33 Complete Permanent tunnel structure for 100% of Cut and Cover Tunnel
MS 4.2.34 Complete Permanent junction structure at interface between Cut-and-cover and TBM Tunnel
Approach Ramp Structures to Cut-and-cover Tunnel at Southern Landfall
MS 5.1.2 Complete 40% of excavation for approach ramp structures
MS 5.1.3 Complete 60% of excavation for approach ramp structures
MS 5.1.4 Complete 80% of excavation for approach ramp structures
MS 5.1.5 Complete 100% of excavation for approach ramp structures
MS 5.1.6 Complete retaining wall foundation for 10% of the total length (measured on plan) of approach ramp
MS 5.1.7 Complete retaining wall foundation for 20% of the total length (measured on plan) of approach ramp
MS 5.1.8 Complete retaining wall foundation for 30% of the total length (measured on plan) of approach ramp
MS 5.1.9 Complete retaining wall foundation for 40% of the total length (measured on plan) of approach ramp
MS 5.1.10 Complete retaining wall foundation for 50% of the total length (measured on plan) of approach rar
MS 5.1.11 Complete retaining wall foundation for 60% of the total length (measured on plan) of approach ran
MS 5.1.12 Complete retaining wall foundation for 70% of the total length (measured on plan) of approach rar
MS 5.1.13 Complete retaining wall foundation for 80% of the total length (measured on plan) of approach rar
MS 5.1.14 Complete retaining wall foundation for 90% of the total length (measured on plan) of approach rar
MS 5.1.15 Complete retaining wall foundation for 100% of the total length (measured on plan) of approach ra
MS 5.1.16 Complete retaining wall structure for 10% of the total length (measured on plan) of approach ramp
MS 5.1.17 Complete retaining wall structure for 20% of the total length (measured on plan) of approach ramp
MS 5.1.18 Complete retaining wall structure for 30% of the total length (measured on plan) of approach ramp
MS 5.1.19 Complete retaining wall structure for 40% of the total length (measured on plan) of approach ramp
MS 5.1.20 Complete retaining wall structure for 50% of the total length (measured on plan) of approach ramp
MS 5.1.21 Complete retaining wall structure for 60% of the total length (measured on plan) of approach ramp
MS 5.1.22 Complete retaining wall structure for 70% of the total length (measured on plan) of approach ramp
MS 5.1.23 Complete retaining wall structure for 80% of the total length (measured on plan) of approach ramp
MS 5.1.24 Complete retaining wall structure for 90% of the total length (measured on plan) of approach ramp
Approach Ramp Structures to Cut-and-cover Tunnel at Northern Landfall
MS 5.2.1 Complete 20% of excavation for approach ramp structures
MS 5.2.2 Complete 40% of excavation for approach ramp structures
MS 5.2.6 Complete retaining wall foundation for 10% of the total length (measured on plan) of approach ramp
MS 5.2.7 Complete retaining wall foundation for 20% of the total length (measured on plan) of approach ramp
MS 5.2.8 Complete retaining wall foundation for 30% of the total length (measured on plan) of approach ramp
MS 5.2.9 Complete retaining wall foundation for 40% of the total length (measured on plan) of approach ramp
MS 5.2.10 Complete retaining wall foundation for 50% of the total length (measured on plan) of approach rar
MS 5.2.11 Complete retaining wall foundation for 60% of the total length (measured on plan) of approach ran
MS 5.2.12 Complete retaining wall foundation for 70% of the total length (measured on plan) of approach rar
MS 5.2.13 Complete retaining wall foundation for 80% of the total length (measured on plan) of approach rar
MS 5.2.14 Complete retaining wall foundation for 90% of the total length (measured on plan) of approach rar
MS 5.2.15 Complete retaining wall foundation for 100% of the total length (measured on plan) of approach ra
At grade Roads at Southern Landfall
MS 6.1.1 Complete sub-base works of 20% of total area of at grade roads
MS 6.1.5 Complete pavement of 20% of total area of at grade roads
MS 6.1.13 Complete drainage installation of 20% length of total length (measured on plan) of drainage pipes
MS 6.1.14 Complete drainage installation of 50% length of total length (measured on plan) of drainage pipes
MS 6.1.17 Complete watermains installation of 20% length of total length (measured on plan) of watermains
At grade Roads at Northern Landfall
MS 6.2.1 Complete sub-base works of 20% of total area of at grade roads
MS 6.2.5 Complete pavement of 20% of total area of at grade roads
MS 6.2.13 Complete drainage installation of 20% length of total length (measured on plan) of drainage pipes
MS 6.2.14 Complete drainage installation of 50% length of total length (measured on plan) of drainage pipes
MS 6.2.17 Complete sewerage installation of 20% length of total length (measured on plan) of sewerage pipe
MS 6.2.18 Complete sewerage installation of 50% length of total length (measured on plan) of sewerage pipe
MS 6.2.21 Complete watermains installation of 20% length of total length (measured on plan) of watermains
MS 6.2.23 Complete watermains installation of 50% length of total length (measured on plan) of watermains



Project ID: TMCLK DWPF 17W30

Data Date: 30-Jul-17

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

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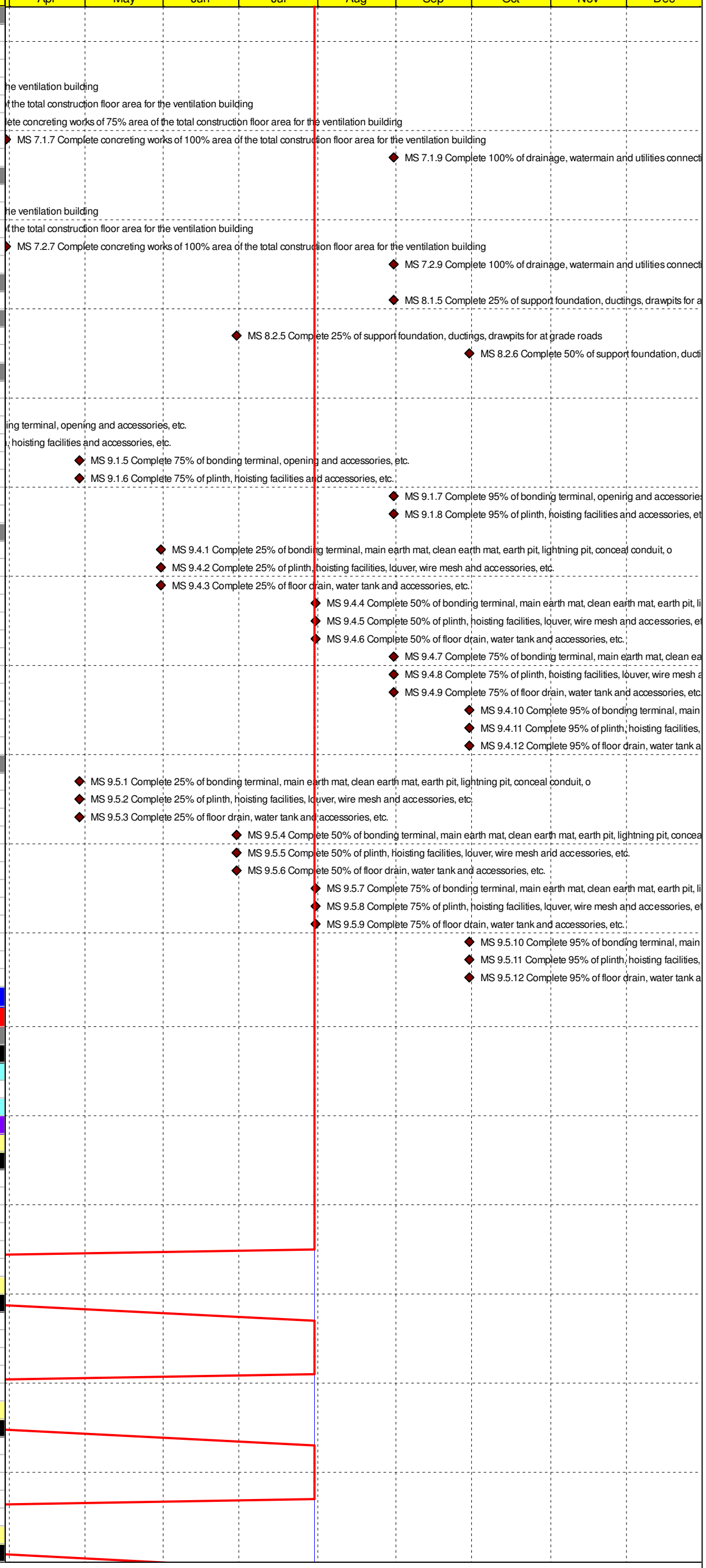
Activity Name
South Ventilation Buildings
MS 7.1.1 Complete 100% of cofferdam for excavation
MS 7.1.2 Complete 100% of excavation to the formation level
MS 7.1.3 Complete 100% of foundation for the ventilation building
MS 7.1.4 Complete concreting works of 25% area of the total construction floor area for the ventilation buildin
MS 7.1.5 Complete concreting works of 50% area of the total construction floor area for the ventilation buildin
MS 7.1.6 Complete concreting works of 75% area of the total construction floor area for the ventilation buildin
MS 7.1.7 Complete concreting works of 100% area of the total construction floor area for the ventilation buildi
MS 7.1.9 Complete 100% of drainage, watermain and utilities connection works for the ventilation building
North Ventilation Buildings
MS 7.2.4 Complete concreting works of 25% area of the total construction floor area for the ventilation buildin
MS 7.2.5 Complete concreting works of 50% area of the total construction floor area for the ventilation buildin
MS 7.2.6 Complete concreting works of 75% area of the total construction floor area for the ventilation buildin
MS 7.2.7 Complete concreting works of 100% area of the total construction floor area for the ventilation buildi
MS 7.2.9 Complete 100% of drainage, watermain and utilities connection works for the ventilation building
Facilities Provision for TCSS for At Grade Roads at Southern Landfall
MS 8.1.5 Complete 25% of support foundation, ductings, drawpits for at grade roads
Facilities Provision for TCSS for At Grade Roads at Northern Landfall
MS 8.2.5 Complete 25% of support foundation, ductings, drawpits for at grade roads
MS 8.2.6 Complete 50% of support foundation, ductings, drawpits for at grade roads
Facilities Provision for E&M Works for TBM Tunnel, Cut & Cover Tunnels and Cr
MS 9.1.1 Complete 25% of bonding terminal, opening and accessories, etc.
MS 9.1.2 Complete 25% of plinth, hoisting facilities and accessories, etc.
MS 9.1.3 Complete 50% of bonding terminal, opening and accessories, etc.
MS 9.1.4 Complete 50% of plinth, hoisting facilities and accessories, etc.
MS 9.1.5 Complete 75% of bonding terminal, opening and accessories, etc.
MS 9.1.6 Complete 75% of plinth, hoisting facilities and accessories, etc.
MS 9.1.7 Complete 95% of bonding terminal, opening and accessories, etc.
MS 9.1.8 Complete 95% of plinth, hoisting facilities and accessories, etc.
Facilities Provision for E&M Works for South Ventilation Building
MS 9.4.1 Complete 25% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, conceal
MS 9.4.2 Complete 25% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.4.3 Complete 25% of floor drain, water tank and accessories, etc.
MS 9.4.4 Complete 50% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, conceal
MS 9.4.5 Complete 50% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.4.6 Complete 50% of floor drain, water tank and accessories, etc.
MS 9.4.7 Complete 75% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, conceal
MS 9.4.8 Complete 75% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.4.9 Complete 75% of floor drain, water tank and accessories, etc.
MS 9.4.10 Complete 95% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, concea
MS 9.4.11 Complete 95% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.4.12 Complete 95% of floor drain, water tank and accessories, etc.
Facilities Provision for E&M Works for North Ventilation Building
MS 9.5.1 Complete 25% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, conceal
MS 9.5.2 Complete 25% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.5.3 Complete 25% of floor drain, water tank and accessories, etc.
MS 9.5.4 Complete 50% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, conceal
MS 9.5.5 Complete 50% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.5.6 Complete 50% of floor drain, water tank and accessories, etc.
MS 9.5.7 Complete 75% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, conceal
MS 9.5.8 Complete 75% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.5.9 Complete 75% of floor drain, water tank and accessories, etc.
MS 9.5.10 Complete 95% of bonding terminal, main earth mat, clean earth mat, earth pit, lightning pit, concea
MS 9.5.11 Complete 95% of plinth, hoisting facilities, louver, wire mesh and accessories, etc.
MS 9.5.12 Complete 95% of floor drain, water tank and accessories, etc.
Construction
Northern Landfall
Box Culvert Extension
Construction
Ch000-010 Culvert Outfall
Removal of temporary bulk head
CH100-150 Land Section
ELS & Structure
Pile A41/A39 CJ to Pile A39/A37 CJ (Bay 7)
Box Culvert Structure
Pile cap construction
Base slab construction including kicker
Removal of strut S1
Sliding formworks 1st assembly
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile A39/A37 CJ to Pile A37/A35 CJ (Bay 8)
Box Culvert Structure
Pile cap construction
Base slab construction including kicker
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile A37/A35 CJ to Pile A35/A33 CJ (Bay 9)
Box Culvert Structure
Pile cap construction
Base slab construction including kicker
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile A35/A33 CJ to Pile A33/P117 CJ (Bay 10)
Box Culvert Structure



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Planned Bar
Planned Bar - Critical
Planned Milestone
Progress bar
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Activity Name	2017 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pile cap construction									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Ch150-250 Marine Section									
ELS & Structure									
Pile A33/P117 CJ to Pile P113/P109 CJ (Bay 11)									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P113/P109 CJ to Pile P105/P101 CJ (Bay 12)									
Box Culvert Structure									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P105/P101 CJ to Pile P97/P93 CJ (Bay 13)									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P97/P93 CJ to Pile P89/P85 CJ (Bay 14)									
Box Culvert Structure									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P89/P85 CJ to Pile P81/P77 CJ (Bay 15)									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P81/P77 CJ to Pile P73/P69 CJ (Bay 16)									
Box Culvert Structure									
Removal of strut S2 & Backfilling up to required level									
Ch250-380 Marine Section									
ELS & Structure									
Public Fill - Phase 2 Reclamation - along combi wall system									
Pile P73/P69 CJ to Pile P65/P61 CJ (Bay17)									
ELS									
Excavation to 0.5m below strut S1									
Installation of strut S1									
Excavation to FEL									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
System Formwork Assembly & Setup									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P65/P61 CJ to Pile P57/P53 CJ (Bay 18)									
ELS									
Excavation to 0.5m below strut S1									
Installation of strut S1									
Excavation to FEL									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P57/P53 CJ to Pile P49/P45 CJ (Bay 19)									
ELS									
Excavation to 0.5m below strut S1									
Installation of strut S1									
Excavation to FEL									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P49/P45 CJ to Pile P41/P37 CJ (Bay 20)									
ELS									
Excavation to 0.5m below strut S1									
Installation of strut S1									
Excavation to FEL									
Box Culvert Structure									
Base slab construction including kicker									
Removal of strut S1									
Walls & top slab construction									
Removal of strut S2 & Backfilling up to required level									
Pile P41/P37 CJ to Pile P33/P29 CJ (Bay 21)									
ELS									
Excavation to 0.5m below strut S1									
Installation of strut S1									
Excavation to FEL									
Box Culvert Structure									
Base slab construction including kicker									

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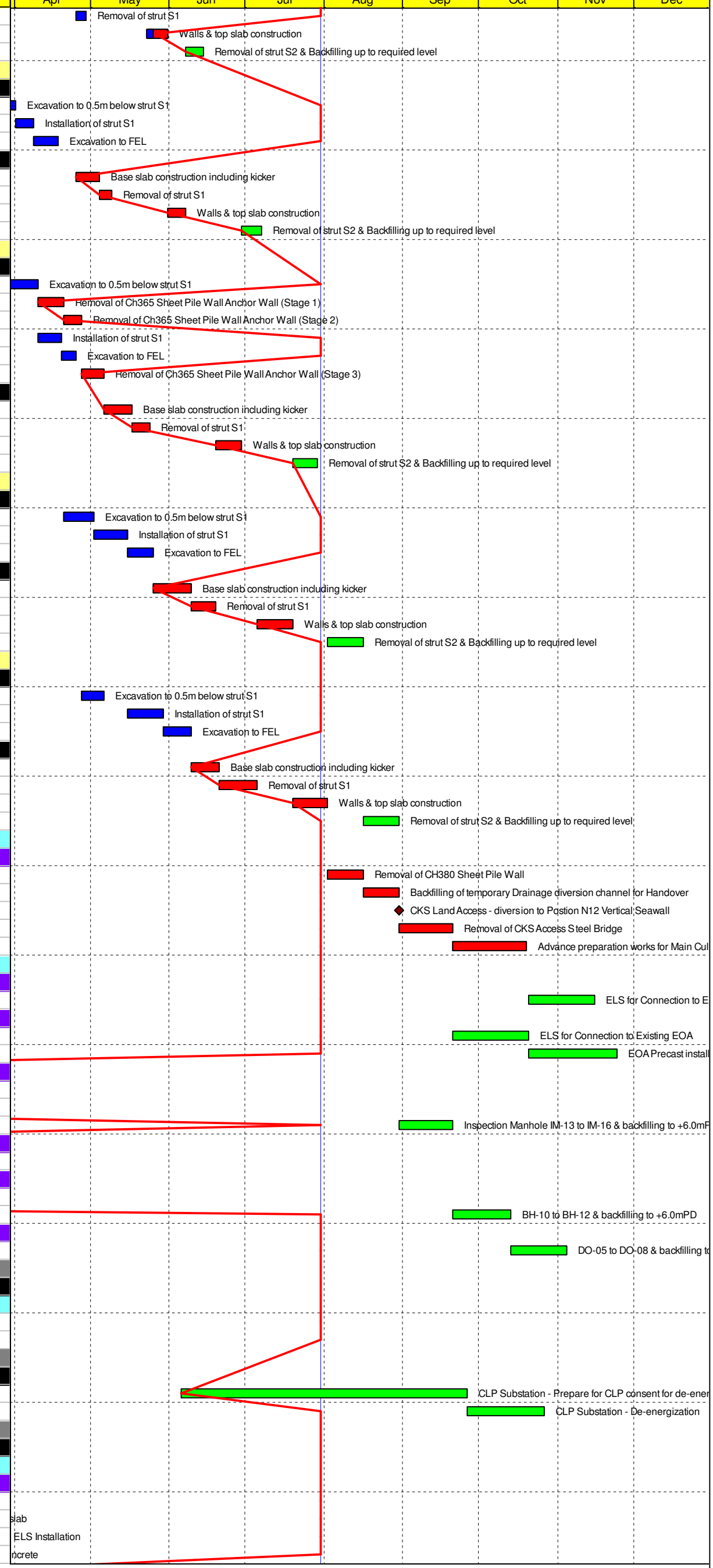
Activity Name
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile P33/P29 CJ to Pile P25/P21 CJ (Bay 22)
ELS
Excavation to 0.5m below strut S1
Installation of strut S1
Excavation to FEL
Box Culvert Structure
Base slab construction including kicker
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile P25/P21 CJ to Pile P17/P13 CJ (Bay 23)
ELS
Excavation to 0.5m below strut S1
Removal of Ch365 Sheet Pile Wall Anchor Wall (Stage 1)
Removal of Ch365 Sheet Pile Wall Anchor Wall (Stage 2)
Installation of strut S1
Excavation to FEL
Removal of Ch365 Sheet Pile Wall Anchor Wall (Stage 3)
Box Culvert Structure
Base slab construction including kicker
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile P17/P13 CJ to Pile P09/P05 CJ (Bay 24)
ELS
Excavation to 0.5m below strut S1
Installation of strut S1
Excavation to FEL
Box Culvert Structure
Base slab construction including kicker
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Pile P09/P05 CJ to End Wall CJ (Bay 25)
ELS
Excavation to 0.5m below strut S1
Installation of strut S1
Excavation to FEL
Box Culvert Structure
Base slab construction including kicker
Removal of strut S1
Walls & top slab construction
Removal of strut S2 & Backfilling up to required level
Ch380-399 Connection Section
Connection to Existing Culvert
Removal of CH380 Sheet Pile Wall
Backfilling of temporary Drainage diversion channel for Handover
CKS Land Access - diversion to Postion N12 Vertical Seawall
Removal of CKS Access Steel Bridge
Advance preparation works for Main Culvert Structure Connection
Miscellaneous works
Connection to Existing EOB
ELS for Connection to Existing EOB
Connection to Existing EOA
ELS for Connection to Existing EOA
EOA Precast installation & Connection
Inspection Manhole (IM)
Inspection Manhole IM-01 to IM-04 & backfilling to +6.0mPD
Inspection Manhole IM-05 to IM-08 & backfilling to +6.0mPD
Inspection Manhole IM-13 to IM-16 & backfilling to +6.0mPD
Stop Log Opening (SLO)
SLO-01 to SLO-05 & backfilling to +6.0mPD
Balance Hole (BH)
BH-01 to BH-03 & backfilling to +6.0mPD
BH-10 to BH-12 & backfilling to +6.0mPD
Desilting Opening (DO)
DO-05 to DO-08 & backfilling to +6.0mPD
North Ventilation Shaft
Construction
North Ventilation Shaft Structure
NVS - ML03 Tunnel Structure
NVS - ML02 Tunnel Structure
CLP Temporary Substation
Construction
CLP Substation - Prepare for CLP consent for de-energization
CLP Substation - De-energization
TMCLK VO-008 - Construction of Viaduct Foundations at Portion N6A
Viaduct Pile Cap
Construction
Pier G1b
Pile Cap G1b - ELS Foundation
Pile Cap G1b - Removal of Existing ground slab
Pile Cap G1b - Excavation & ELS Installation
Pile Cap G1b - Blinding Concrete



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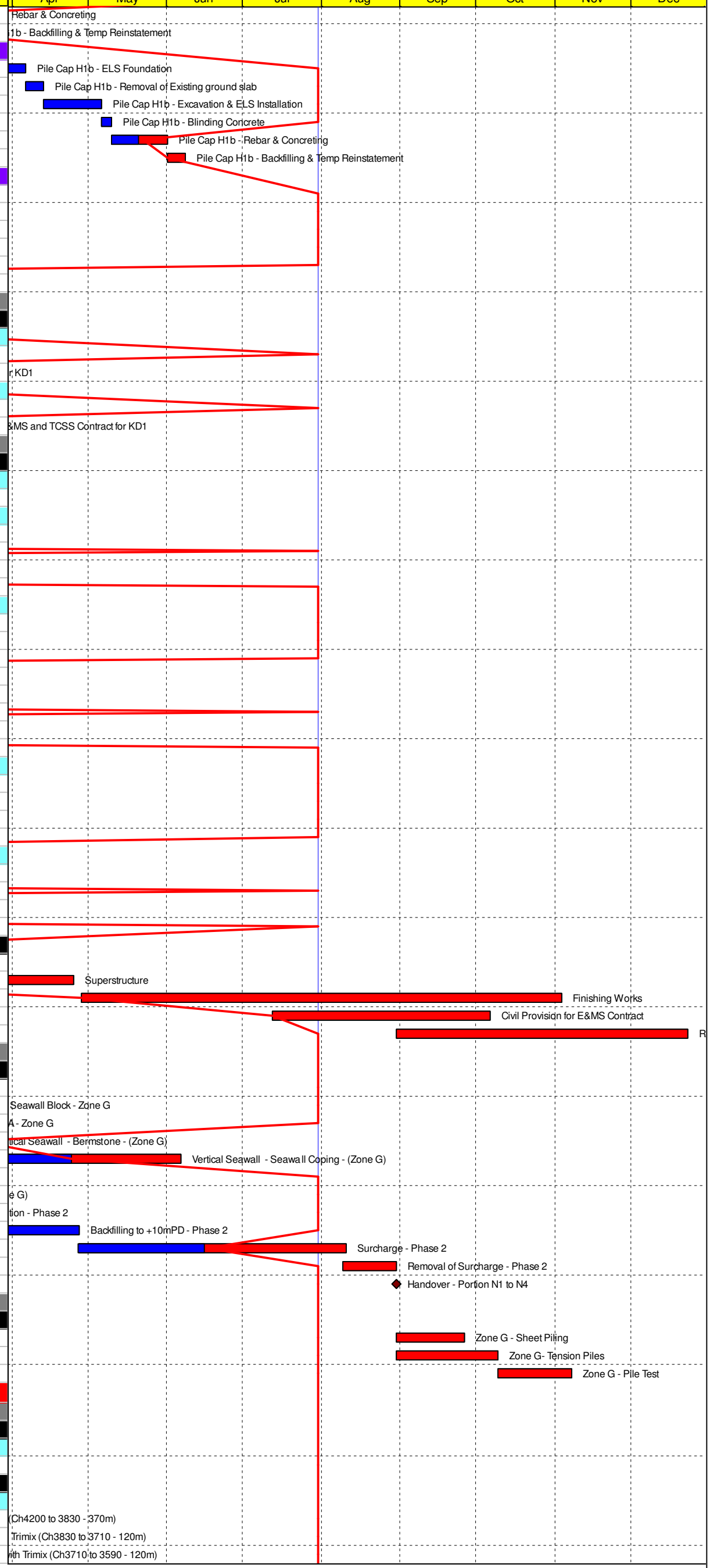
Activity Name
Pile Cap G1b - Rebar & Concreting
Pile Cap G1b - Backfilling & Temp Reinstatement
Pier H1b
Pile Cap H1b - ELS Foundation
Pile Cap H1b - Removal of Existing ground slab
Pile Cap H1b - Excavation & ELS Installation
Pile Cap H1b - Blinding Concrete
Pile Cap H1b - Rebar & Concreting
Pile Cap H1b - Backfilling & Temp Reinstatement
Pier H1c
Pile Cap H1c - Preparation for ELS
Pile Cap H1c - Removal of Existing ground slab
Pile Cap H1c - Excavation & ELS Installation
Pile Cap H1c - Blinding Concrete
Pile Cap H1c - Rebar & Concreting
Pile Cap H1c - Backfilling & Temp Reinstatement
North Approach TBM Tunnelling & Cross Passage
Construction
North Approach Tunnel Internal Structure - NB
NB - North TBM Tunnel - OHVD Slab installation
NB - North TBM Tunnel - Fire proofing and Provision to E&MS and TCSS Contract for KD1
North Approach Tunnel Internal Structure - SB
SB - North TBM Tunnel - OHVD Slab installation
SB - North TBM Tunnel - Fire proofing & Provision to E&MS and TCSS Contract for KD1
North Ventilation Building
Design Submission
(A11) Submissons to Design Advisory Panel of ArchSD
ArchSD's comment
(I1) DDA for North Vent.Bldgs. GBP & Arch.Submission
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
(I1) DDA for North & South Vent.Bldg. ABWF works
Designer to Reply RtC + Update Submission
Submit Updated DDA to SO/ ICE/ IPs
ICE Approval & Issue Check Cert
Submit ICE Check Cert to SO
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
(I2) DDA for North Vent.Bldgs.Structural Design incl.Vent.Connections
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
(I3) DDA for North & South Vent.Bldgs. Service and E&M Provision
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
Construction
Substructure
Superstructure
Finishing Works
Civil Provision for E&MS Contract
Remaining Finishing Works
North Reclamation (Phase 2)
Construction
VS - Rock Grade 400 - Zone G
VS - Levelling Stone & Seawall Block - Zone G
VS - Rock Type A - Zone G
Vertical Seawall - Bermstone - (Zone G)
Vertical Seawall - Seawall Coping - (Zone G)
Sand Blanket (Zone G)
Band Drain (Zone G)
Reclamation - Phase 2
Backfilling to +10mPD - Phase 2
Surcharge - Phase 2
Removal of Surcharge - Phase 2
Handover - Portion N1 to N4
North Approach Ramp
Construction
Zone G - Sheet Piling
Zone G- Tension Piles
Zone G - Pile Test
Sub-sea Tunnel
Sub-sea TBM Tunnelling
Design Submission
(G3) DDA for TBM Tunnel Internal Structures (Sub-sea)
Sub-sea Tunnel - Precast Gallery Fabrication
Construction
Sub-sea TBM Tunnel - NB ID12.2m - S881
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch4200 to 3830 - 370m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS sandy with Trimix (Ch3830 to 3710 - 120m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch3710 to 3590 - 120m)



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Activity Name
NB - Sub-sea TBM Tunnel - ALLUVIUMS sandy with Trimix (Ch3590 to 3460 - 130m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch3460 to 3360 - 100m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS sandy with Trimix (Ch3360 to 3160 - 200m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch3160 to 3060 - 100m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch3060 to 2920 - 140m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2920 to 2820 - 100m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS sandy with Trimix (Ch2820 to 2720 - 100m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2720 to 2673 - 47m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2673 to 2574 - 99m)
NB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2574 to 2512 - 62m)
S881 - TBM Removal at Southern Landfall
Sub-sea TBM Tunnel - SB ID12.2m - S882
SB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2694 to 2595 - 99m)
SB - Sub-sea TBM Tunnel - ALLUVIUMS silty with Trimix (Ch2595 to 2533 - 62m)
SB - TBM Removal at Southern Landfall
Sub-sea TBM Tunnel - NB - Precast Invert Gallery
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP27
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP26
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP25
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP24
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP23
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP22
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP21
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP20
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP19
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP18
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP17
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP16
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP15
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP14
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP13
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP12
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP11
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP10
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP09
NB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP08
Sub-sea TBM Tunnel - SB - Precast Invert Gallery
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP21
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP20
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP19
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP18
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP17
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP16
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP15
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP14
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP13
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP12
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP11
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP10
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP09
SB - Sub-sea TBM Tunnel - Precast Invert Gallery - Completion to CP08
Sub-sea Tunnel Cross Passage & Internal Structure
Construction
Sub-sea Tunnel Cross Passage
CP38 - ML03 - Ch5510
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP37 - ML03 - Ch5413
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP36 - ML03 - Ch5315
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP35 - ML03 - Ch5217
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP34 - ML03 - Ch5118
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP33 - ML03 - Ch5020
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP32 - ML03 - Ch4921
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization

Project ID: TMCLK DWPF 17W30

Data Date: 30-Jul-17

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

Detailed Works Programme (Rev. F)

Three Months Rolling Programme

Progress as of 30-Jul-17

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12-Feb-14	TMCLK/DBJGEN/PRG/98507	WYu	SPo
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28-Aug-14	TMCLK/DBJGEN/PRG/98507 Rev.C	CLa	WYu
30-Oct-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity Name	2017 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CP - Remaining Internal Structure & Finishing	g Internal Structure & Finishing								
CP31 - ML03 - Ch4823									
CP - Pipe Jacking Method - Setup & Assembly									
CP - Piping Jacking Method - Break-in & Excavation	ak-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	- Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	ning Internal Structure & Finishing								
CP30 - ML03 - Ch4724									
CP - Pipe Jacking Method - Setup & Assembly									
CP - Piping Jacking Method - Break-in & Excavation	thod - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	g Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	P - Remaining Internal Structure & Finishing								
CP29 - ML03 - Ch4626									
CP - Pipe Jacking Method - Setup & Assembly									
CP - Piping Jacking Method - Break-in & Excavation	Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	king Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP28 - ML03 - Ch4527									
CP - Pipe Jacking Method - Setup & Assembly									
CP - Piping Jacking Method - Break-in & Excavation	g Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	- Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP27 - ML03 - Ch4429									
CP - Pipe Jacking Method - Setup & Assembly	ly								
CP - Piping Jacking Method - Break-in & Excavation	ping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP26 - ML03 - Ch4330									
CP - Pipe Jacking Method - Setup & Assembly	embly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP25 - ML03 - Ch4232									
CP - Pipe Jacking Method - Setup & Assembly	Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP24 - ML03 - Ch4133									
CP - Pipe Jacking Method - Setup & Assembly	& Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP23 - ML03 - Ch4035									
CP - Pipe Jacking Method - Setup & Assembly	- Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP22 - ML03 - Ch3936									
CP - Pipe Jacking Method - Setup & Assembly	od - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP21 - ML03 - Ch3838									
CP - Pipe Jacking Method - Setup & Assembly	Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP20 - ML03 - Ch3739									
CP - Pipe Jacking Method - Setup & Assembly	ng Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP19 - ML03 - Ch3641									
CP - Pipe Jacking Method - Setup & Assembly	king Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP18 - ML03 - Ch3542									
CP - Pipe Jacking Method - Setup & Assembly	Jacking Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP17 - ML03 - Ch3444									
CP - Pipe Jacking Method - Setup & Assembly	Pipe Jacking Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP16 - ML03 - Ch3345									
CP - Pipe Jacking Method - Setup & Assembly	P - Pipe Jacking Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP15 - ML03 - Ch3247									
CP - Pipe Jacking Method - Setup & Assembly	CP - Pipe Jacking Method - Setup & Assembly								
CP - Piping Jacking Method - Break-in & Excavation	CP - Piping Jacking Method - Break-in & Excavation								
CP - Pipe Jacking Method - Break-out & Demobilization	CP - Pipe Jacking Method - Break-out & Demobilization								
CP - Remaining Internal Structure & Finishing	CP - Remaining Internal Structure & Finishing								
CP14 - ML03 - Ch3148									

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

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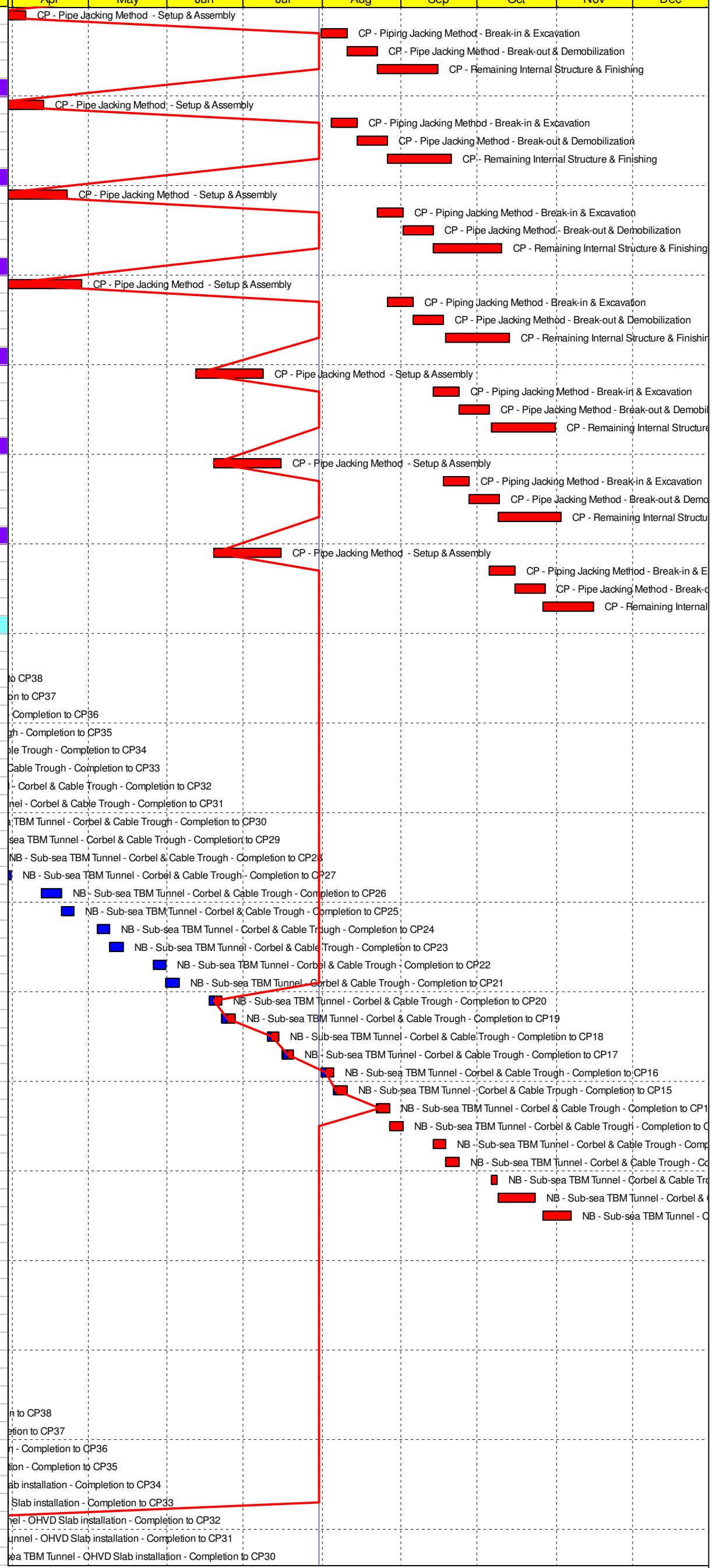
30-Oct-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity Name
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP13 - ML03 - Ch3050
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP12 - ML03 - Ch2951
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP11 - ML03 - Ch2853
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP10 - ML03 - Ch2754
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP09 - ML03 - Ch2656
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
CP08 - ML03 - Ch2557
CP - Pipe Jacking Method - Setup & Assembly
CP - Piping Jacking Method - Break-in & Excavation
CP - Pipe Jacking Method - Break-out & Demobilization
CP - Remaining Internal Structure & Finishing
Sub-sea TBM Tunnel - NB - Remaining Internal Structure
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP40
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP39
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP38
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP37
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP36
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP35
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP34
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP33
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP32
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP31
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP30
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP31
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP30
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP29
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP28
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP27
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP26
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP25
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP24
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP23
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP22
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP21
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP20
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP19
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP18
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP17
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP16
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP15
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP14
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP13
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP12
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP11
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP10
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP09
NB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP08
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP48
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP47
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP46
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP45
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP44
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP43
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP42
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP41
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP40
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP39
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP38
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP37
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP36
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP35
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP34
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP33
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP32
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP31
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP30



Project ID: TMCLK DWPF 17W30

Data Date: 30-Jul-17

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

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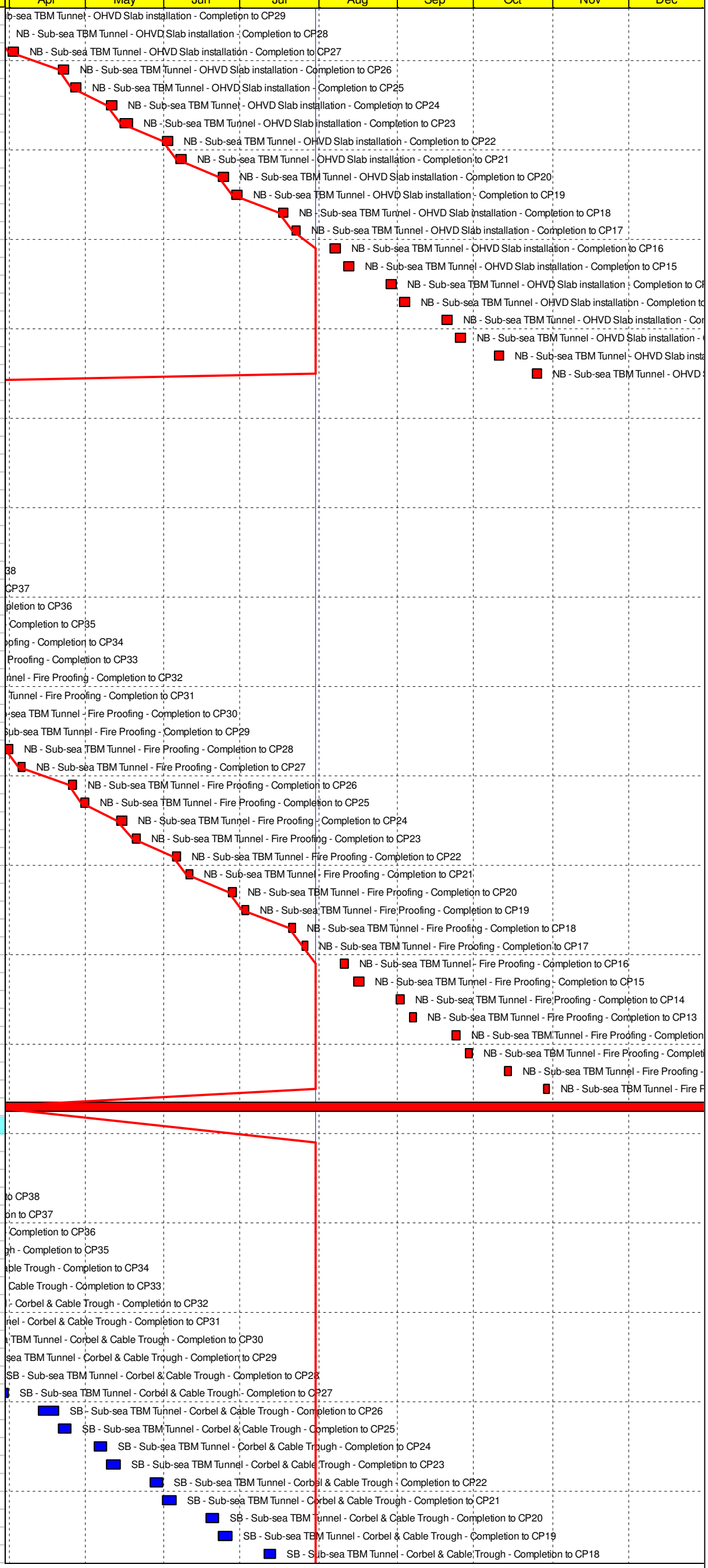
30-Oct-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity Name
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP29
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP28
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP27
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP26
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP25
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP24
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP23
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP22
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP21
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP20
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP19
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP18
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP17
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP16
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP15
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP14
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP13
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP12
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP11
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP10
NB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP09
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP48
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP47
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP46
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP45
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP44
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP43
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP42
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP41
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP40
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP39
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP38
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP37
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP36
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP35
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP34
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP33
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP32
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP31
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP30
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP29
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP28
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP27
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP26
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP25
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP24
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP23
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP22
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP21
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP20
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP19
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP18
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP17
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP16
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP15
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP14
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP13
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP12
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP11
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP10
NB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP09
NB - Sub-sea TBM Tunnel - Road Level Fire Proofing
Sub-sea TBM Tunnel - SB - Remaining Internal Structure
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP41
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP40
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP39
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP38
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP37
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP36
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP35
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP34
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP33
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP32
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP31
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP30
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP29
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP28
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP27
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP26
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP25
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP24
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP23
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP22
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP21
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP20
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP19
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP18



Project ID: TMCLK DWPF 17W30

Data Date: 30-Jul-17

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

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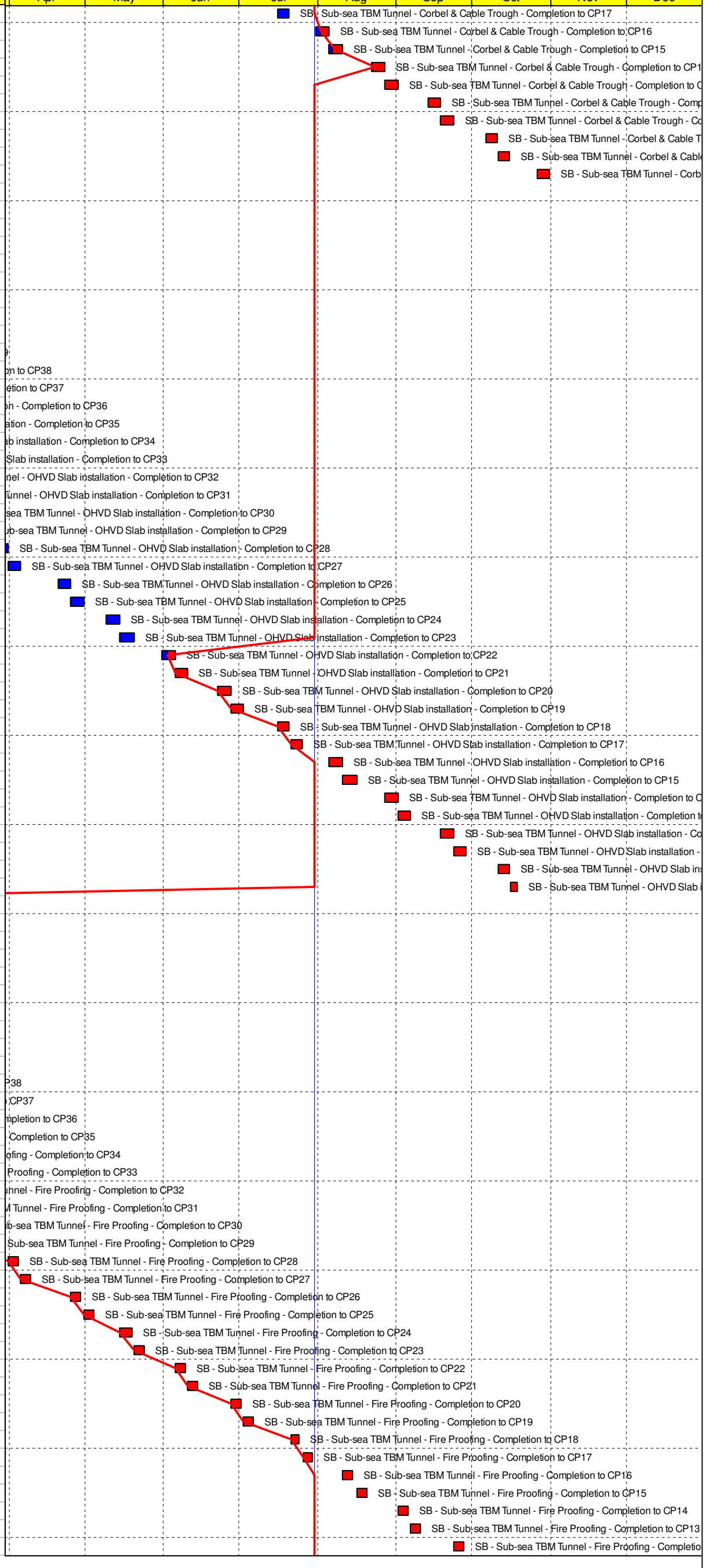
28-Aug-14	TMCLK/DBJGEN/PRG/98507 Rev.C	CLa	WYu
30-Oct-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity Name
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP17
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP16
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP15
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP14
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP13
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP12
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP11
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP10
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP09
SB - Sub-sea TBM Tunnel - Corbel & Cable Trough - Completion to CP08
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP48
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP47
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP46
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP45
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP44
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP43
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP42
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP41
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP40
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP39
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP38
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP37
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP36
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP35
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP34
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP33
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP32
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP31
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP30
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP29
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP28
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP27
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP26
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP25
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP24
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP23
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP22
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP21
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP20
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP19
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP18
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP17
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP16
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP15
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP14
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP13
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP12
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP11
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP10
SB - Sub-sea TBM Tunnel - OHVD Slab installation - Completion to CP09
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP48
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP47
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP46
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP45
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP44
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP43
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP42
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP41
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP40
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP39
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP38
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP37
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP36
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP35
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP34
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP33
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP32
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP31
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP30
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP29
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP28
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP27
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP26
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP25
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP24
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP23
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP22
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP21
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP20
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP19
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP18
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP17
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP16
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP15
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP14
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP13
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP12



Project ID: TMCLK DWPF 17W30

Data Date: 30-Jul-17

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

TMCLK - Northern Connection Sub-Sea Tunnel Section

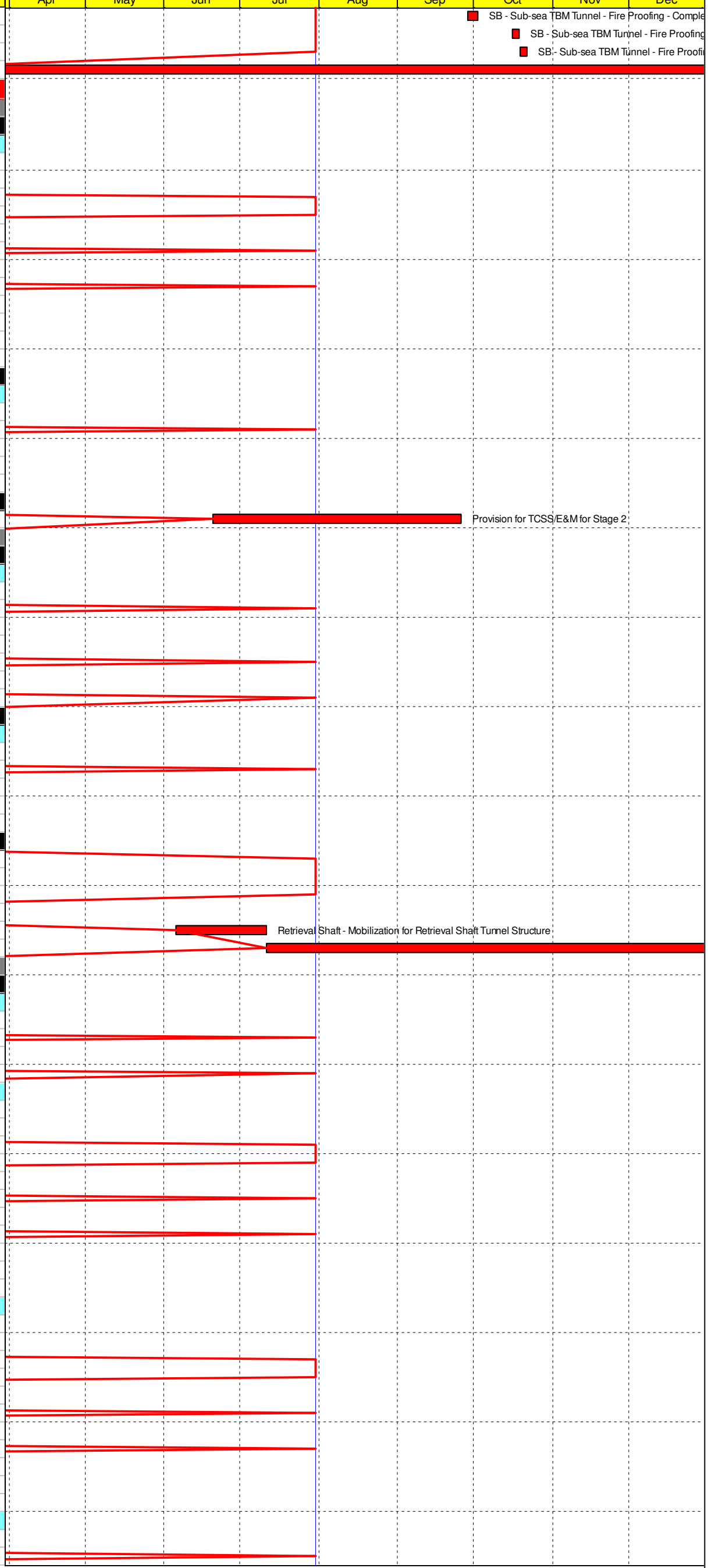
Detailed Works Programme (Rev. F)

Three Months Rolling Programme

Progress as of 30-Jul-17

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

Activity Name
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP11
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP10
SB - Sub-sea TBM Tunnel - Fire Proofing - Completion to CP09
SB - Remaining Fire Proofing in Tunnel
Southern Landfall
South Cut & Cover Tunnel
Design Submission
(E2) DDA for South C&C Box & Approach Ramp
Review & Comment by JV
Designer prepare DDA
Formal Submission of DDA to ICE/ IPs
Advanced Submission to SO
IPs/ SO's Advance Comments/ ICE Comments
Comments Received
Designer to Reply RtC + Update Submission
Submit Updated DDA to SO/ ICE/ IPs
ICE Approval & Issue Check Cert
Submit ICE Check Cert to SO
IPs Review
SO's Review
Method Statement Submission
Method Statement of Construction Methodology of C&C Tunnels
Preparation Method Statement for C&C Tunnels
Submit Method Statement to SO
SO Reviews & Comments
Re-submission
SO's Review
Construction
Provision for TCSS/E&M for Stage 2
South Retrieval Shaft
Design Submission
(F4) Gantry Crane Support/Foundations in Southern Landfall
Designer to Reply RtC + Update Submission
Submit Updated IFA to SO/ ICE/ IPs
ICE Approval & Issue Check Cert
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
Method Statement Submission
Method Statement of Construction Methodology of Retrieval Shaft
Preparation Method Statement for Retrieval Shaft
Submit Method Statement to SO
SO Reviews & Comments
Re-submission
SO's Review
Construction
Retrieval Shaft - Excavation - Soft by ramp
Retrieval Shaft - Excavation - Soft by vertical mean (Fill material)
Retrieval Shaft - Excavation - Soft (other than Fill)
Retrieval Shaft - Temp. Slab/Prepare for TBM Breakthrough
Retrieval Shaft - Mobilization for Retrieval Shaft Tunnel Structure
Retrieval Shaft - Tunnel Structure
South Ventilation Building
Design Submission
(I1) DDA for South Vent.Bldg. GBP & Arch.Submission
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
(I2) DDA for South Vent.Bldg. Foundation Design
Review & Comment by JV
Designer prepare DDA
Formal Submission of DDA to ICE/ IPs
Advanced Submission to SO
IPs/ SO's Advance Comments/ ICE Comments
Comments Received
Designer to Reply RtC + Update Submission
Submit Updated DDA to SO/ ICE/ IPs
ICE Approval & Issue Check Cert
IPs Review
SO's Review
(I2) DDA for South Vent.Bldg.Structural Design incl.Vent.Connections
Review & Comment by JV
Designer prepare DDA
Formal Submission of DDA to ICE/ IPs
Advanced Submission to SO
IPs/ SO's Advance Comments/ ICE Comments
Comments Received
Designer to Reply RtC + Update Submission
Submit Updated DDA to SO/ ICE/ IPs
ICE Approval & Issue Check Cert
IPs Review
SO's Review
(J1) DDA Temp.works for Construction of Sth.Vent.Bldg.
Designer to Reply RtC + Update Submission
Submit Updated DDA to SO/ ICE/ IPs



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Planned Milestone
Progress bar
Progress Milestone

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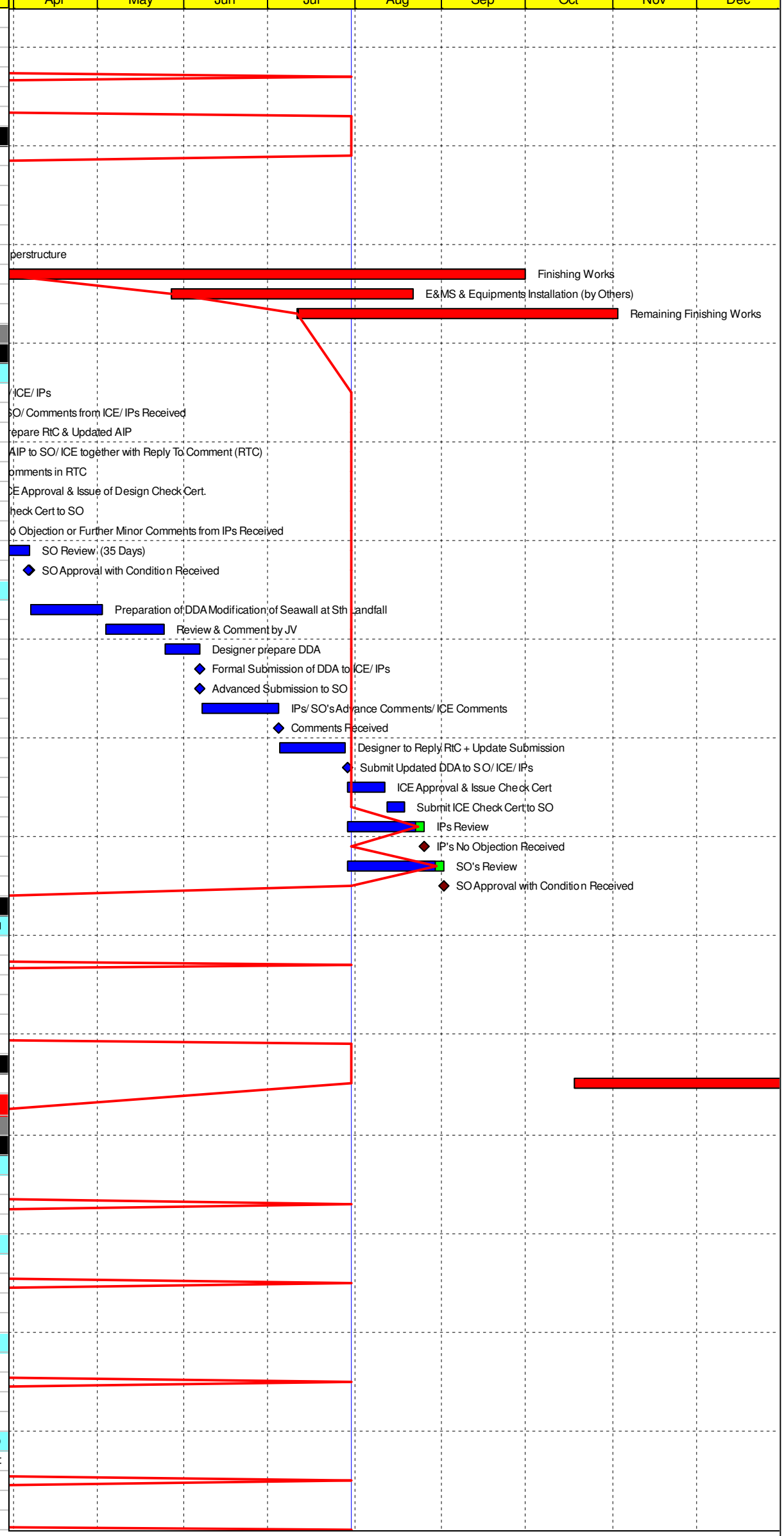
30-Oct-15	TMCLK/DBJGEN/PRG/98507 Rev.F	WYu	

Activity Name
ICE Approval & Issue Check Cert
Submit ICE Check Cert to SO
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
Construction
Mobilization & Setting Up Piling Rigs
S - Pile Test
S -Sheet Piling
S- Excavation
Substructure
Superstructure
Finishing Works
E&MS & Equipments Installation (by Others)
Remaining Finishing Works
South Surface Roadworks, Utility & Drainage works
Design Submission
(E1) AIP - Southern Landfall Seawall Modification
Review & Comment by SO/ ICE/ IPs
Advance Commants from SO/ Comments from ICE/ IPs Received
Designer to Prepare RtC & Updated AIP
Submisson of AIP to SO/ ICE together with Reply To Comment (RTC)
Reply to IPs Comments in RTC
ICE Approval & Issue of Design Check Cert.
Check Cert to SO
No Objection or Further Minor Comments from IPs Received
SO Review (35 Days)
SO Approval with Condition Received
(E1) DDA - Southern Landfall Seawall Modification
Preparation of DDA Modification of Seawall at Sth Landfall
Review & Comment by JV
Designer prepare DDA
Formal Submission of DDA to ICE/ IPs
Advanced Submission to SO
IPs/ SO's Advance Comments/ ICE Comments
Comments Received
Designer to Reply RtC + Update Submission
Submit Updated DDA to SO/ ICE/ IPs
ICE Approval & Issue Check Cert
Submit ICE Check Cert to SO
IPs Review
IP's No Objection Received
SO's Review
SO Approval with Condition Received
Method Statement Submission
Method Statement of Ground Treatment for TBMs Passing under Southern La
Preparation Method Statement for Ground Improvement in South Landfall
Submit Method Statement to SO
SO Reviews & Comments
Re-submission
SO's Review
SO's Approval
Construction
South Landfall - Seawall Modification
Testing & Commissioning/Inspection & Handover
Final Inspection & Handover
Design Submission
(A12) Maintenance Matrix
Prepare Re-submission
2nd Submission
SO's Condition Approval
(A13) Operation & Maintenance Manual
Preparation of Operation and Maintenance Manual
1st Submission
SO's Comments for 1st Submission
Prepare Re-submission
(A14) As-built & As-fabricated Drawings
Preparation of As-built and As-fabricated Drawings
1st Submission
SO's Comments for 1st Submission
Prepare Re-submission
(A15) Health & Safety File incl.As-built Dwgs & Records,Maintenance Schedul
Preparation of Health and Safety File including as-built drawings and records, maintenance schedules, op
1st Submission
SO's Comments for 1st Submission
Prepare Re-submission



Project ID: TMCLK DWPF 17W30

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TMCLK - Northern Connection Sub-Sea Tunnel Section

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

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Air Quality									
4.8.1	3.8	An effective watering programme of twice daily watering with complete coverage, is estimated to reduce by 50%. This is recommended for all areas in order to reduce dust levels to a minimum;	All areas / throughout construction period	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8. 1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8. 1	3.8	Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓

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

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

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		<>
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit.	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		✓
WATER QUALITY									
Marine Works (Sequence A)									
6.1 Figure 6.2a Appendix D6a	Annex A	Construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. The protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2a and detailed in Appendix D6a. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation;	All areas/ prior to dredging and backfilling works	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 50% public fill to be used for all seawall filling below +2.5mPD for TM-CLKL southern and northern landfalls.	TM-CLKL seawall filling	Contractor	TM-EIAO		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	a maximum of 30% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL southern landfall	TM-CLKL southern landfall reclamation filling	Contractor	TM-EIAO		Y		N/A
6.1	-	a maximum of 100% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL northern landfall	TM-CLKL northern landfall reclamation filling	Contractor	TM-EIAO		Y		✓
6.1	-	Use of cage type silt curtains round allgrab dredgers during the HKBCF, HKLR and TM-CLKL southern reclamation works.	All areas dredging works	Contractor	TM-EIAO		Y		✓
	Figure 1.1 of Annex C	A layer of floating type silt curtain will be applied when dredging and reclamation works are being undertaken at Portion N-a as shown in Figure 1.1 of Annex C of the EM&A Manual.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	Trailer suction hopper dredgers shall not allow mud to overflow.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	The use of Lean Material Overboard (LMOB) systems shall be prohibited.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1 Figure 6.2b Appendix D6b	Annex A	For other parts of the reclamation works construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. It should be noted that the protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2b and detailed in Appendices D6b. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation; - Reclamation filling for Portion D of HKBCF; Reclamation filling for FSD berth of HKBCF; and - Reclamation dredging and filling for Portion 1 of HKLR;	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		✓
6.1	-	The filling material for the other parts of the works are the same as Sequence A;	All other areas/backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	5.7	Cage type silt curtain (with steel enclosure) shall be used for grab dredgers working in the site of HKBCF and TM- CLKL southern reclamation. Cage type silt curtains will be applied round all grab dredgers at other works area.	HKBCF, HKLR and TM-CLKL grab dredging	Contractor	TM-EIAO		Y		✓
6.1	Annex A	A layer of floating type silt curtain will be applied around all works as defined in Appendix D6b.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	TM-CLKL northern landfall: - Reclamation filling shall not proceed until at least 200m section of leading seawall at both the east and west sides of the reclamation are formed above +2.5 mPD, except for 100m gaps for marine access;	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
General Marine Works									
6.1	-	Use of TBM for the construction of the submarine tunnel.	Tunnel works / Construction phase	Contractor	TM-EIAO		Y		N/A
6.1	-	Export dredged spoils from NWWCZ.	All areas as much as possible / dredging activities	Contractor	DASO Permit conditions		Y		✓
6.1	-	Where public fill is proposed for filling below +2.5mPD, the fine content in the public fill will be controlled to 25%	All areas/ backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	-	Where sand fill is proposed for filling below +2.5mPD, the fine content in the sand fill will be controlled to 5%.	All areas/ backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	-	Mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	5.2	Silt curtain shall have proved effectiveness from the producer and shall be fully maintained throughout the works by the contractor.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The daily maximum production rates shall not exceed those assumed in the water quality assessment.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The dredging and filling works shall be scheduled to spread the works evenly over a working day.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Land Works									
6.1	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Sewage effluent and discharges from on- site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.1	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	5.8	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.1	-	The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal Ordinance		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	✓
6.1	Section 5	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✓
Water Quality Monitoring									
6.1	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period. One year operation phase water quality monitoring at designated stations.	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	✓
ECOLOGY									
8.14	6.3	Specification for and implement pre, during and post construction dolphin abundance monitoring.	All Areas/Detailed Design/ during construction works/post construction	Design Consultant/ Contractor	TMEIA	Y	Y	Y	✓
8.14	6.3,6.5	Specification and implementation of 250m dolphin exclusion zone.	All dredging and reclamation areas/Detailed Design/during all reclamation and dredging works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600m2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	N/A. To be implemented by AFCD.
8.14	6.3, 6.5	Specification and implementation of marine vessel control specifications	All areas/Detailed Design/during construction works	Design Consultant/ Contractor	TMEIA	Y	Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
8.14	6.3, 6.5	Design and implementation of acoustic decoupling methods for dredging and reclamation works	All areas/ Detailed Design/during dredging and reclamation works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.5	Audit coral translocation success	Post translocation	Contractor	TMEIA		Y		✓
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		N/A
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Construction activities should be restricted to the proposed works boundary.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
LANDSCAPE AND VISUAL									
10.9	7.6	The colour and shape of the toll control buildings, ventilation building and administration building shall adopt a design which could blend it into the vicinity elements, and the details will be developed in detailed design stage (DM2)	All areas/detailed design	Design Consultant	TMEIA	Y			N/A
10.9	7.6	Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5)	All areas/detailed design	Design Consultant	TMEIA	Y			N/A
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓

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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	
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The surplus surcharge should be transferred to a fill bank	Reclamation areas / after surcharge works	Contractor	TMEIA		Y		N/A
12.6	8.1	Rock armour from the existing seawall should be reused on the new sloping seawall as far as possible	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	No waste shall be burnt on site.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Provisions to be made in contract documents to allow and promote the use of recycled aggregates where appropriate.	Detailed Design	Design Consultant	TMEIA	Y			✓
12.6	8.1	The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Dredged marine mud shall be disposed of in a gazetted marine disposal ground under the requirements of the Dumping at Seas Ordinance.	Reclamation areas / throughout dredging works	Contractor	TMEIA		Y		✓
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The Contractor should recycle as many C&D materials (this is a waste section) as possible on-site. The public fill and C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal. Where practicable, the concrete and masonry should be crushed and used as fill materials. Steel reinforcement bar should be collected for use by scrap steel mills. Different areas of the sites should be considered for segregation and storage activities.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All falsework will be steel instead of wood.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Chemical waste producers should register with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows: *f* suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; *f* Having a capacity of <450L unless the specifications have been approved by the EPD; and w Chinese according to the instructions prescribed in Schedule 2 of the Regulations. *f* Clearly labelled and used solely for the storage of chemical wastes; *f* Enclosed with at least 3 sides; *f* Impermeable floor and bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest; *f* Adequate ventilation; *f* Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and *f* Incompatible materials are adequately separated.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on-site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A

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EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
CULTURAL HERITAGE									
11.8	Section 9	EM&A in the form of audit of the mitigation measures	All areas / throughout construction period	Highways Department	EIAO-TM		Y		N/A

*** Remarks:**

✓	Compliance of Mitigation Measures
<>	Compliance of Mitigation but need improvement
x	Non-compliance of Mitigation Measures
▲	Non-compliance of Mitigation Measures but rectified by Contractor
Δ	Deficiency of Mitigation Measures but rectified by Contractor
N/A	Not Applicable in Reporting Period

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

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	:	11/06/2017

Sampler

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

Calibration Orifice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	304

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.2	3.305	1.603	55	54.32
2	13 holes	8.8	2.930	1.423	49	48.40
3	10 holes	6.0	2.419	1.178	42	41.48
4	7 holes	4.0	1.975	0.965	36	35.55
5	5 holes	2.5	1.562	0.767	30	29.63

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):29.176 Intercept(b):7.236 Correlation Coefficient(r): 0.9996

Checked by: Magnum Fan Date: 15/06/2017

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR10
Calibrated by	:	P.F.Yeung
Date	:	11/06/2017

Sampler

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

Calibration Orifice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	304

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.4	3.335	1.617	57	56.30
2	13 holes	9.0	2.963	1.439	50	49.38
3	10 holes	6.2	2.459	1.197	43	42.47
4	7 holes	4.2	2.024	0.989	36	35.55
5	5 holes	2.4	1.530	0.752	28	27.65

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

Sampler Calibration Relationship (Linear Regression)

Slope(m):32.549 Intercept(b): 3.252 Correlation Coefficient(r): 0.9992

Checked by: Magnum Fan Date: 15/06/17

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AQMS1
Calibrated by	:	P.F.Yeung
Date	:	11/06/2017

Sampler

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

Calibration Orifice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	304

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.8	3.393	1.645	56	55.31
2	13 holes	9.4	3.028	1.470	50	49.38
3	10 holes	6.7	2.556	1.244	43	42.47
4	7 holes	4.5	2.095	1.023	35	34.57
5	5 holes	2.4	1.530	0.752	27	26.67

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

Sampler Calibration Relationship (Linear Regression)

Slope(m):32.222 Intercept(b):2.151 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 15/06/2017

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 1
Calibrated by	:	P.F.Yeung
Date	:	11/06/2017

Sampler

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

Calibration Orifice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	304

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.2	3.305	1.603	54	53.33
2	13 holes	9.3	3.012	1.462	49	48.39
3	10 holes	6.5	2.518	1.226	42	41.48
4	7 holes	4.2	2.024	0.989	34	33.58
5	5 holes	2.6	1.593	0.782	27	26.67

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

Sampler Calibration Relationship (Linear Regression)

Slope(m):32.166 Intercept(b):1.696 correlation Coefficient(r): 0.9997

Checked by: Magnum Fan Date: 15/06/2017

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 6
Calibrated by	:	P.F.Yeung
Date	:	11/06/2017

Sampler

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

Calibration Orfice and Standard Calibration Relationship

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

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1008
Ta(K)	:	304

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.6	3.364	1.631	56	55.31
2	13 holes	9.2	2.996	1.455	50	49.38
3	10 holes	6.6	2.537	1.235	44	43.46
4	7 holes	4.5	2.095	1.023	36	35.55
5	5 holes	2.7	1.623	0.796	29	28.64

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):31.945 Intercept(b): 3.243 Correlation Coefficient(r): 0.9991

Checked by: Magnum Fan Date: 15/06/2017

TISCH Environmental

TISCH ENVIRONMENTAL, INC.
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ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

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

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

DATA TABULATION

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

CALCULATIONS

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

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

For subsequent flow rate calculations:

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

ENVIROTECH SERVICES CO.

Calibration Report of Wind Meter

Date of Calibration : 18 April 2017

Brand of Test Meter: Davis

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

Location : Roof of Tuen Mun Firestation

Procedures :

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

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

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

Results:

Wind Still Test

Wind Speed (m/s)
0.00

Wind Speed Test

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

Wind Direction Test

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

Calibrated by: Ho

Yeung Ping Fai
(Technical Officer)

Checked by : Fat

Ho Kam Fat
(Senior Technical Officer)

Appendix F

EM&A Monitoring Schedules

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

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

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

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

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

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

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

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

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

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

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

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

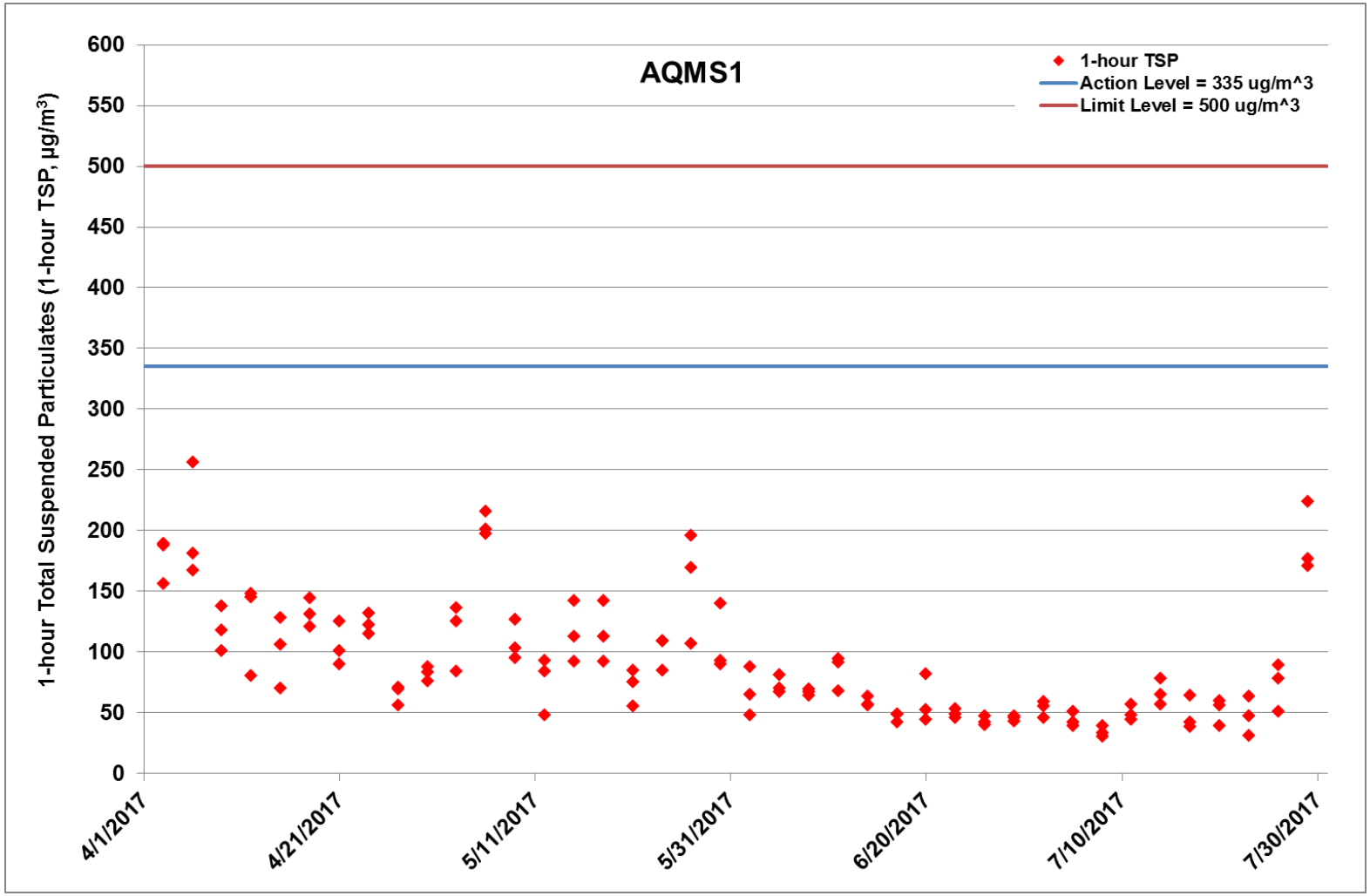

Figure G.1 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

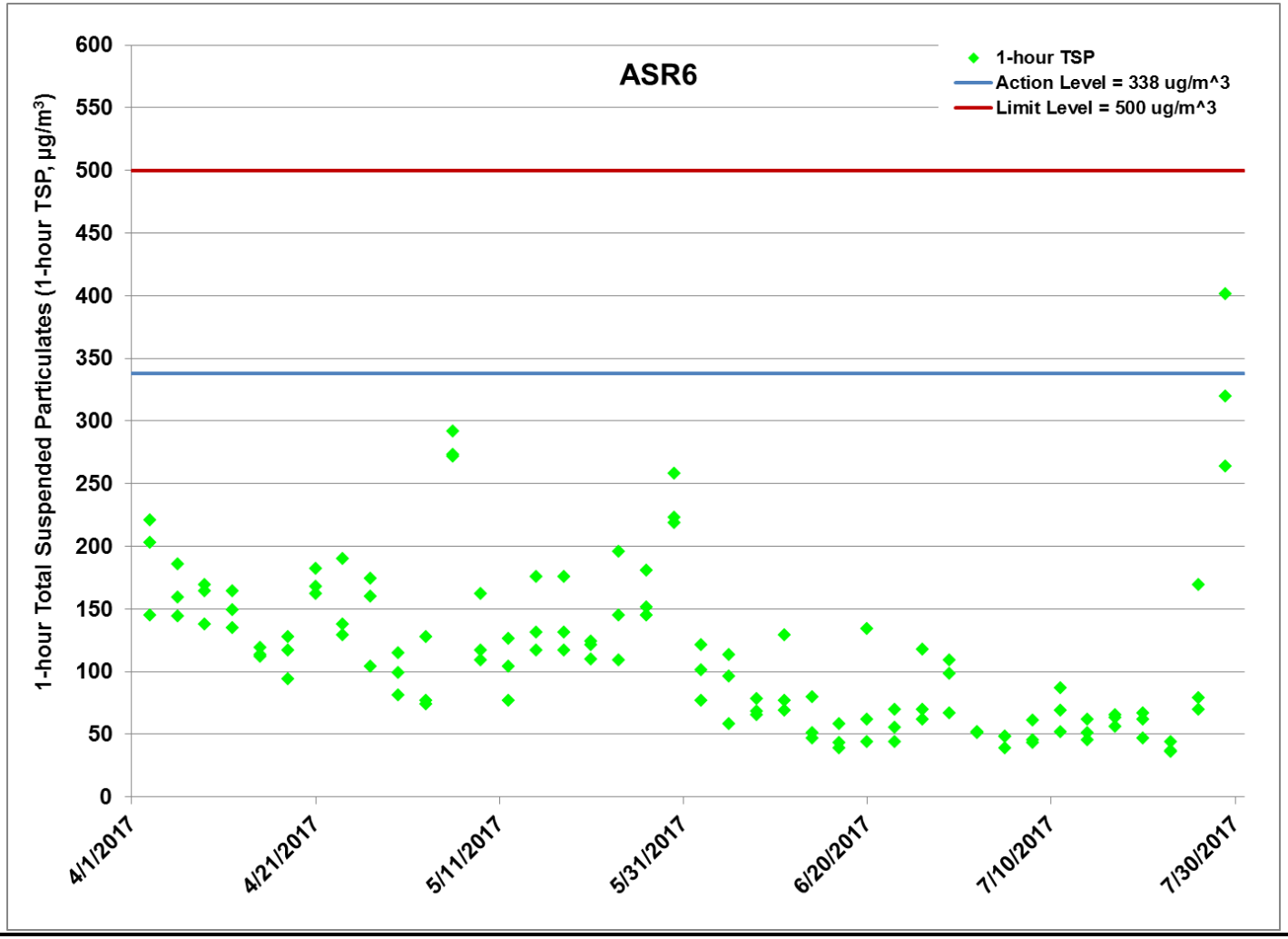

Figure G.2 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

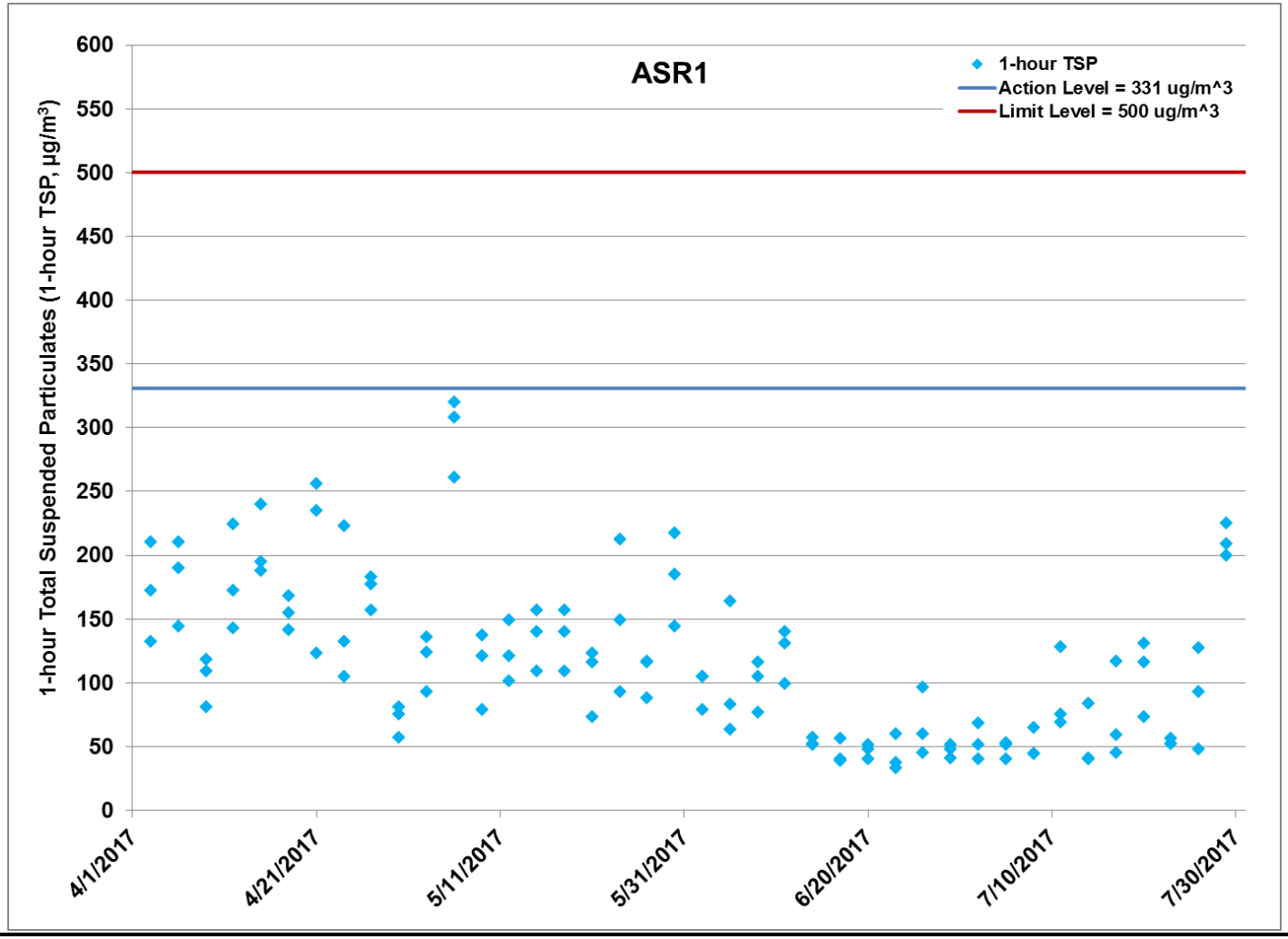

Figure G.3 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

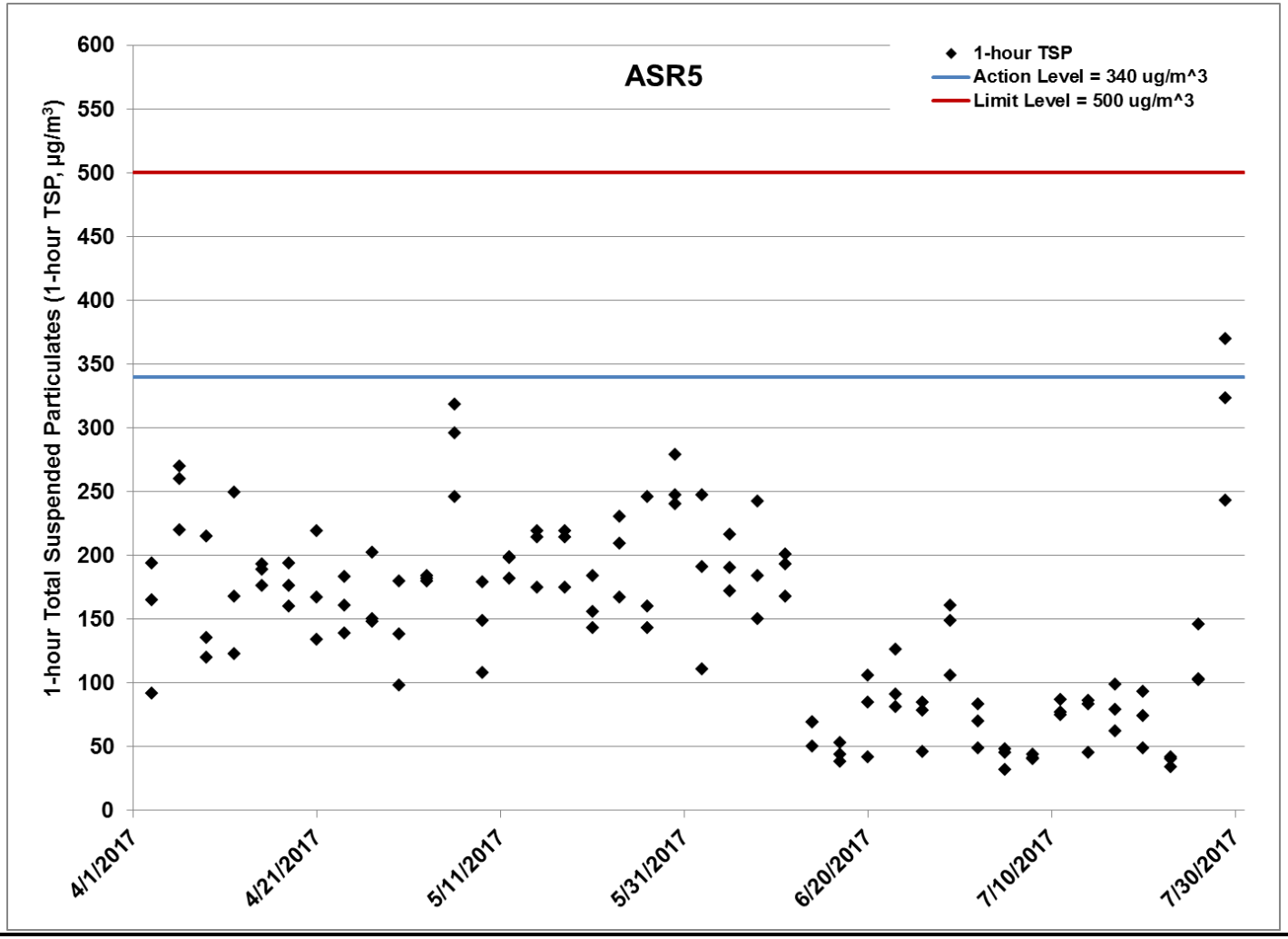

Figure G.4 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

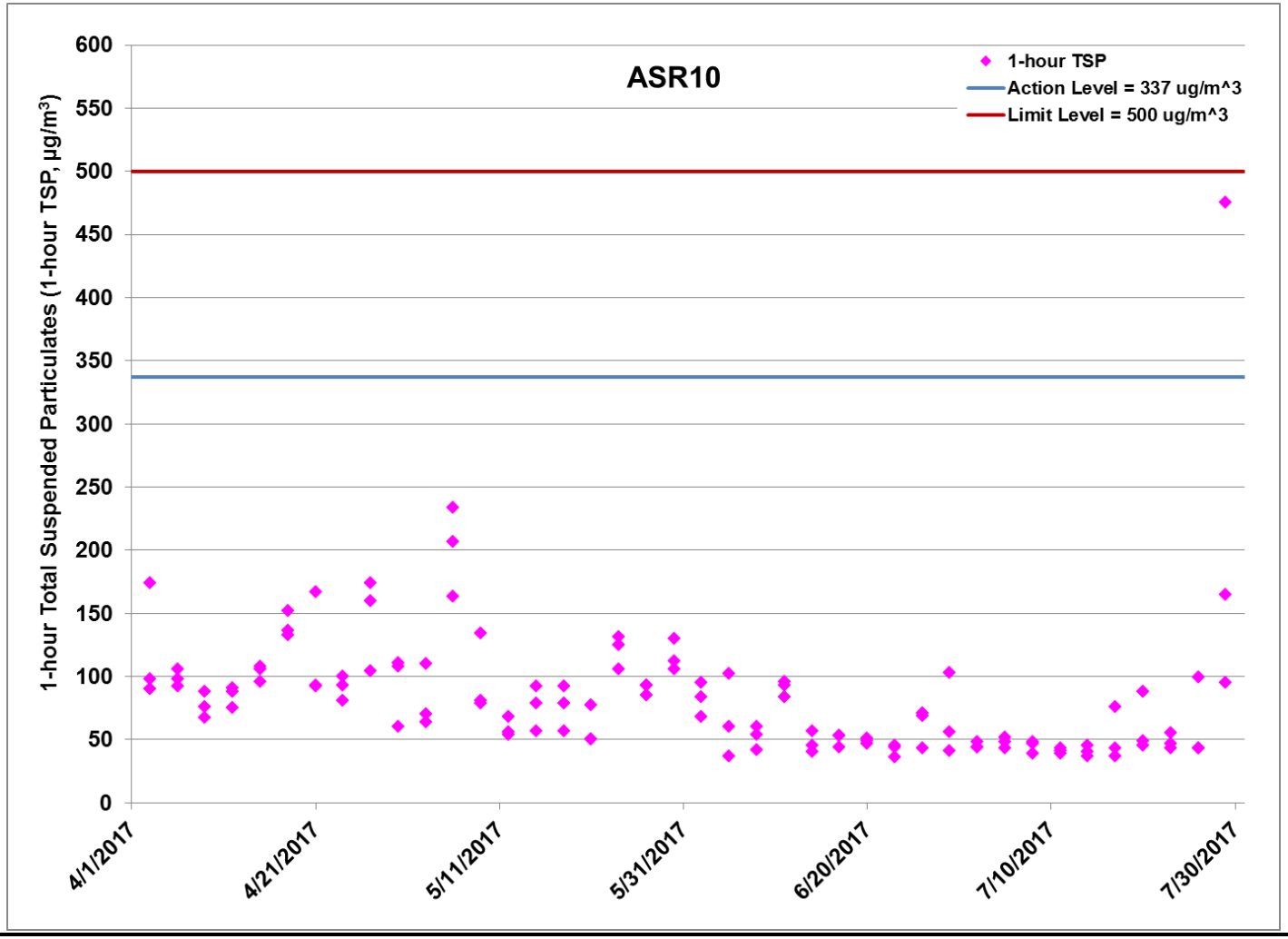

Figure G.5 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

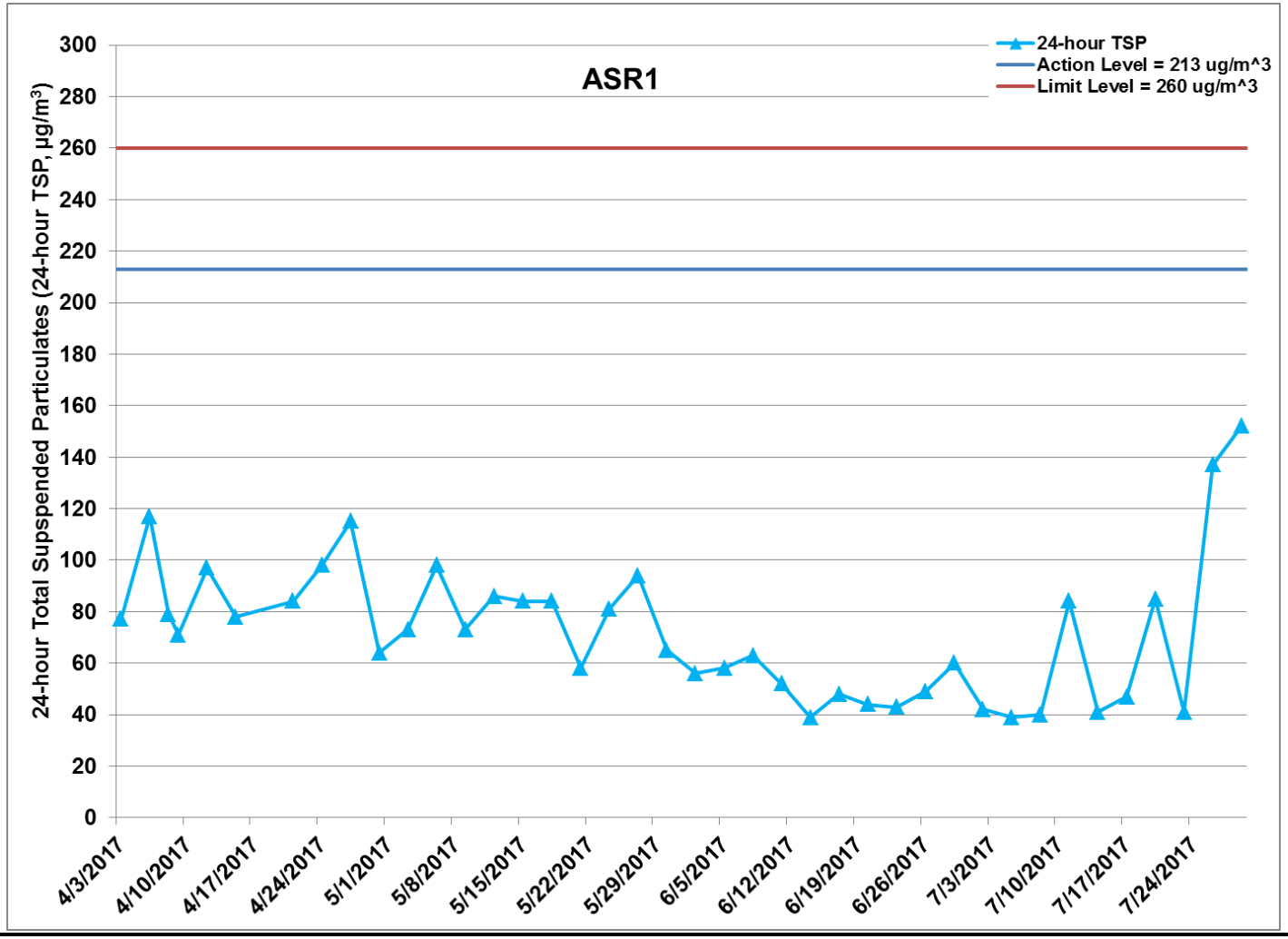

Figure G.6 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

ERM

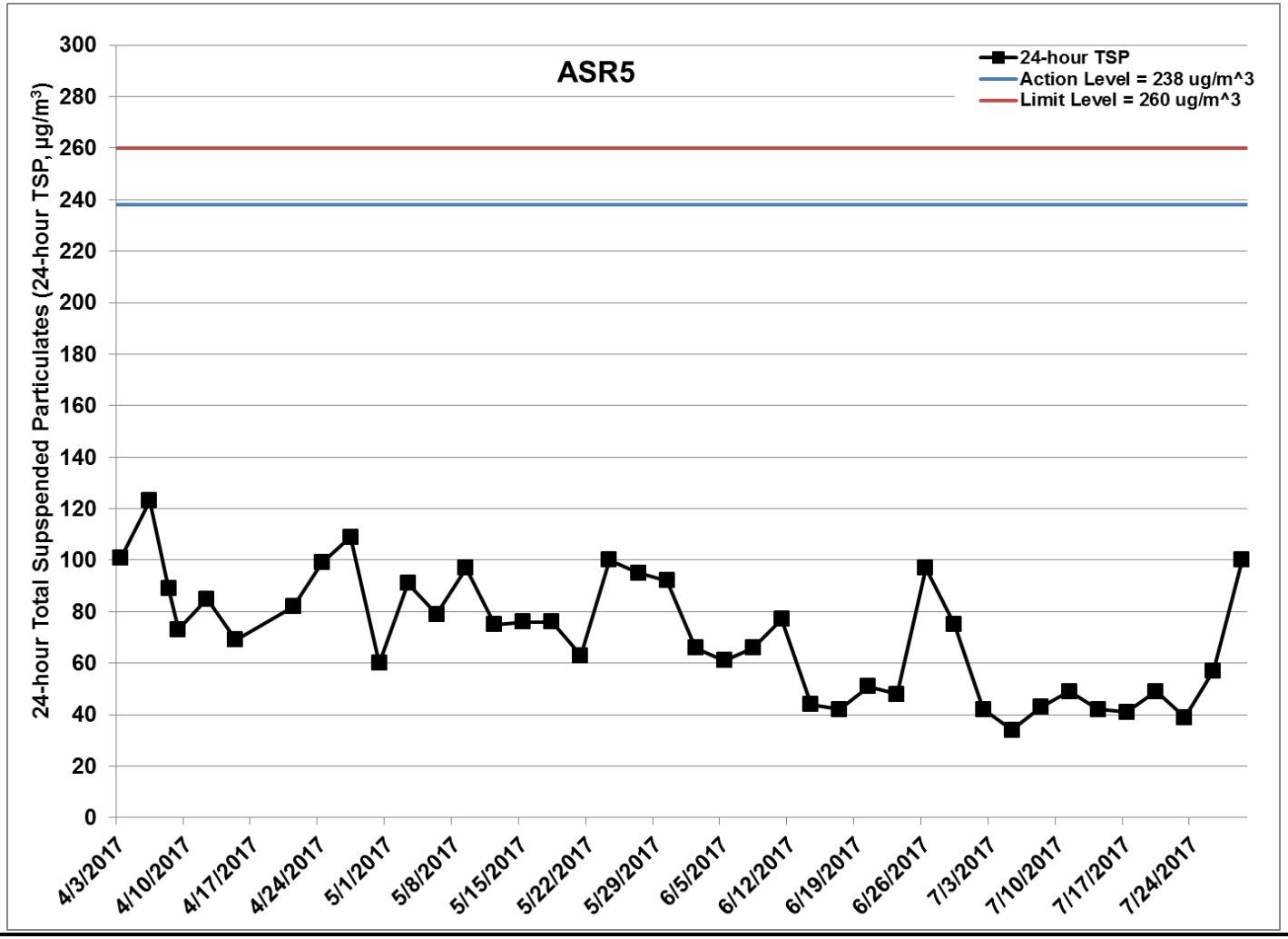

Figure G.7 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

ERM

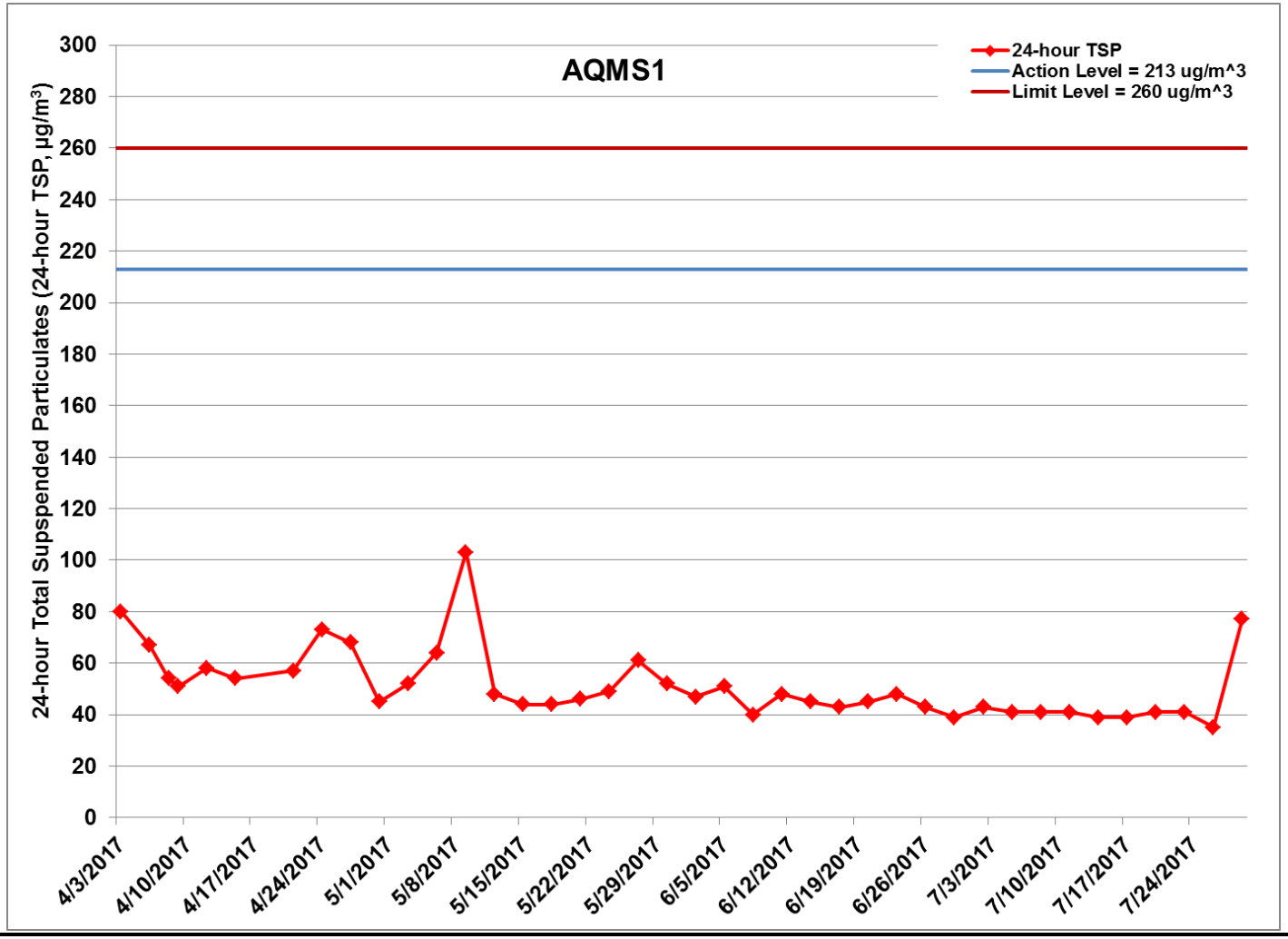

Figure G.8 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

ERM

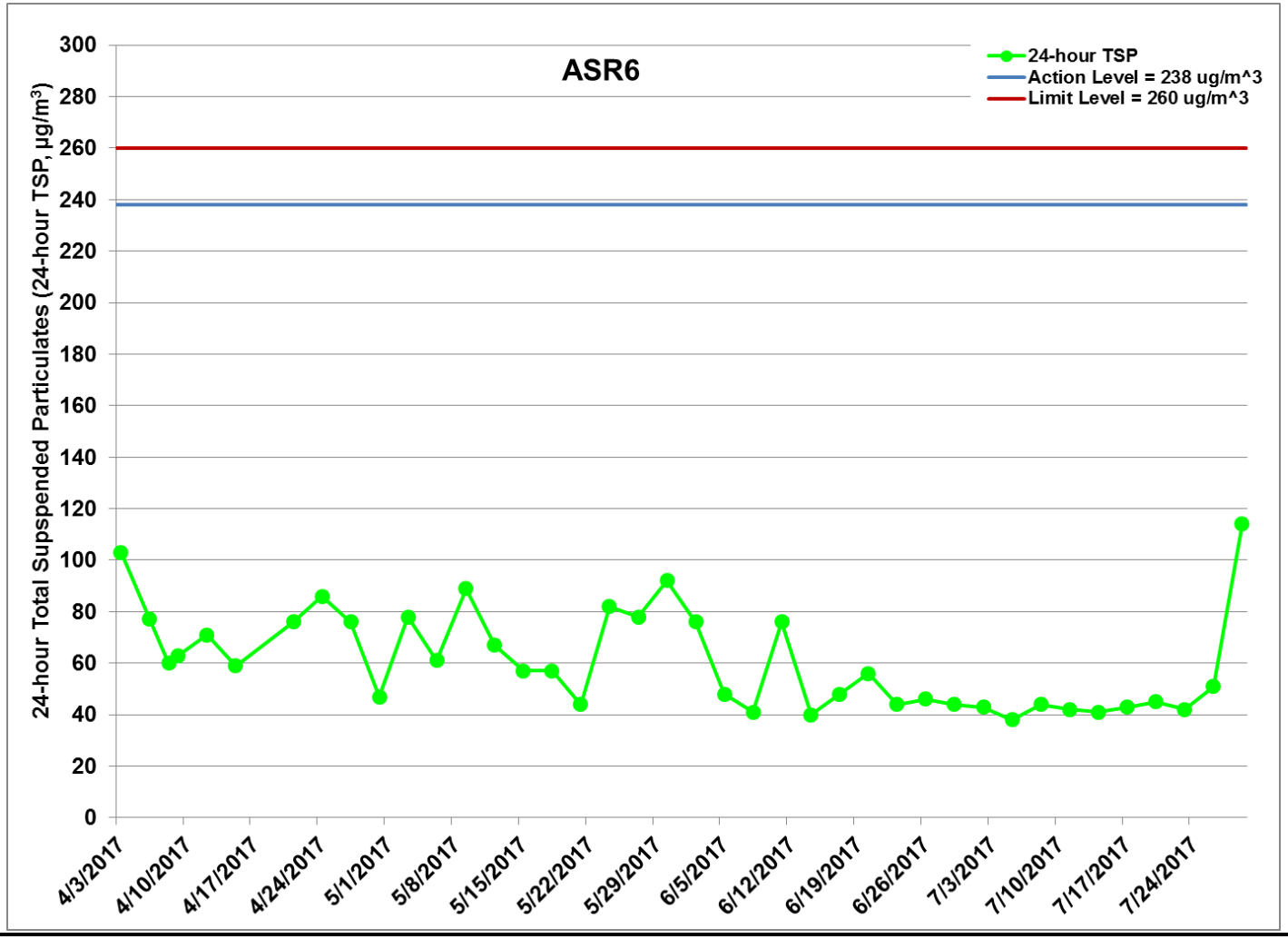

Figure G.9 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

ERM

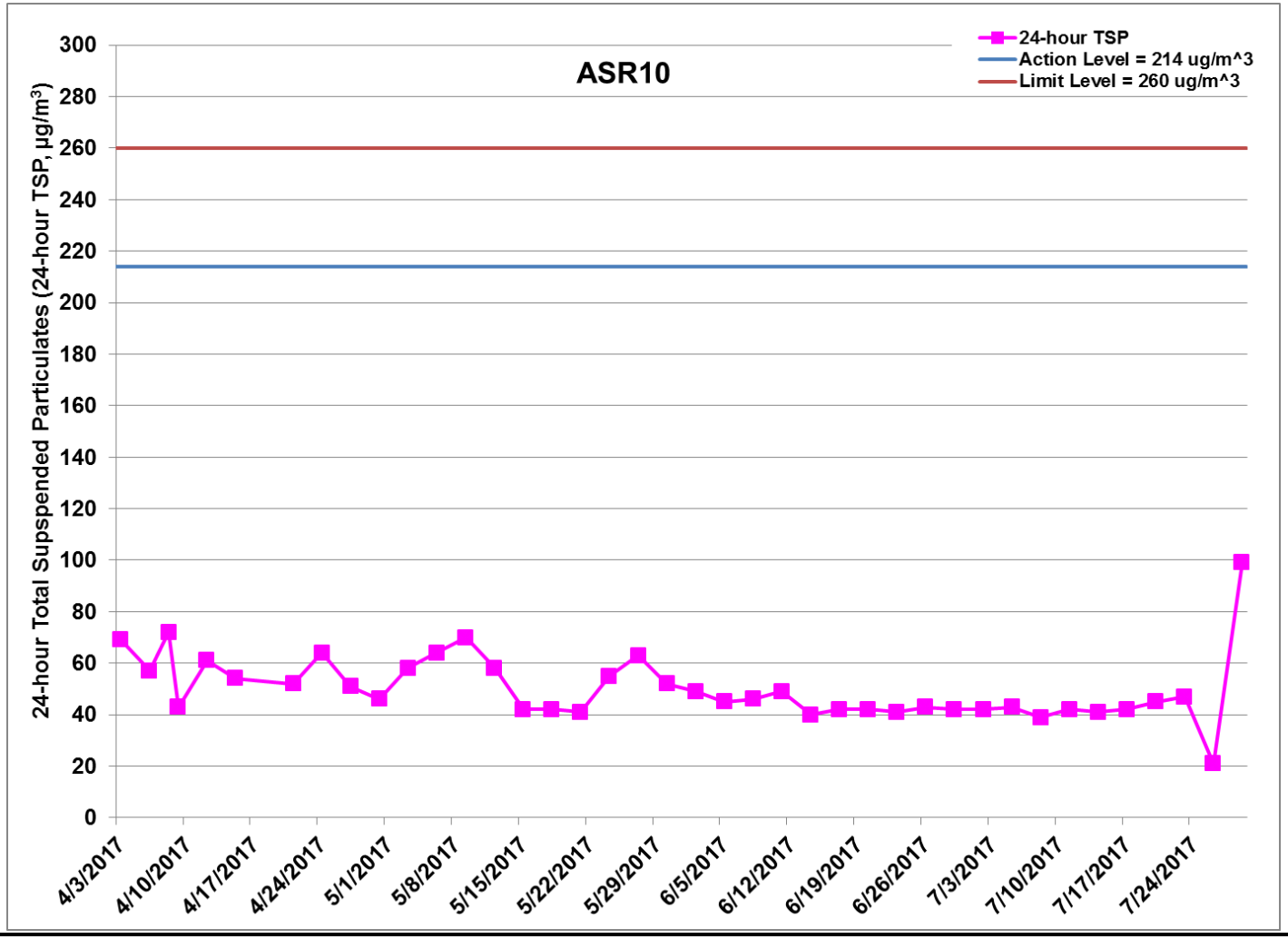

Figure G.10 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 April 2017 and 31 July 2017 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Box Culvert Extension, Construction of North Ventilation Building and Bulk Excavation (1/4/2017 – 31/7/2017) *Ref: 0212330_Impact AQM graphs_July 2017_REV a.xlsx*

ERM

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-02	AQMS1	Sunny	09:44	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2017-07-02	AQMS1	Sunny	10:46	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2017-07-02	AQMS1	Sunny	11:48	1-hour TSP	46	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR1	Sunny	09:33	1-hour TSP	68	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR1	Sunny	10:35	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR1	Sunny	11:37	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR10	Sunny	09:02	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR10	Sunny	10:04	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR10	Sunny	11:06	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR5	Sunny	09:23	1-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR5	Sunny	10:25	1-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR5	Sunny	11:27	1-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR6	Sunny	09:13	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR6	Sunny	10:15	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR6	Sunny	11:17	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-05	AQMS1	Cloudy	14:32	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-05	AQMS1	Cloudy	15:34	1-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-05	AQMS1	Cloudy	16:36	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR1	Cloudy	14:22	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR1	Cloudy	15:24	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR1	Cloudy	16:26	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR10	Cloudy	13:50	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR10	Cloudy	14:52	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR10	Cloudy	15:54	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR5	Cloudy	14:11	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR5	Cloudy	15:13	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR5	Cloudy	16:15	1-hour TSP	32	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR6	Cloudy	14:00	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR6	Cloudy	15:02	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR6	Cloudy	16:04	1-hour TSP	39	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-08	AQMS1	Cloudy	09:28	1-hour TSP	33	ug/m3
TMCLKL	HY/2012/08	2017-07-08	AQMS1	Cloudy	10:30	1-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	2017-07-08	AQMS1	Cloudy	11:32	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR1	Cloudy	09:17	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR1	Cloudy	10:19	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR1	Cloudy	11:21	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR10	Cloudy	08:45	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR10	Cloudy	09:47	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR10	Cloudy	10:49	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR5	Cloudy	09:06	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR5	Cloudy	10:08	1-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR5	Cloudy	11:00	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR6	Cloudy	08:55	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR6	Cloudy	09:57	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR6	Cloudy	10:59	1-hour TSP	61	ug/m3
TMCLKL	HY/2012/08	2017-07-11	AQMS1	Sunny	13:24	1-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2017-07-11	AQMS1	Sunny	14:26	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-11	AQMS1	Sunny	15:28	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR1	Sunny	13:13	1-hour TSP	128	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR1	Sunny	14:15	1-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR1	Sunny	15:17	1-hour TSP	69	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR10	Sunny	12:41	1-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR10	Sunny	13:43	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR10	Sunny	14:45	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR5	Sunny	13:03	1-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR5	Sunny	14:05	1-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR5	Sunny	15:07	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR6	Sunny	12:52	1-hour TSP	87	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR6	Sunny	13:54	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR6	Sunny	14:56	1-hour TSP	69	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-14	AQMS1	Sunny	10:13	1-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2017-07-14	AQMS1	Sunny	11:15	1-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2017-07-14	AQMS1	Sunny	12:17	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR1	Sunny	10:02	1-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR1	Sunny	11:04	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR1	Sunny	12:06	1-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR10	Sunny	09:30	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR10	Sunny	10:32	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR10	Sunny	11:34	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR5	Sunny	09:51	1-hour TSP	83	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR5	Sunny	10:53	1-hour TSP	86	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR5	Sunny	11:55	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR6	Sunny	09:40	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR6	Sunny	10:42	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR6	Sunny	11:44	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-17	AQMS1	Rainy	13:50	1-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	2017-07-17	AQMS1	Rainy	14:52	1-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2017-07-17	AQMS1	Rainy	15:54	1-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR1	Rainy	13:40	1-hour TSP	117	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR1	Rainy	14:42	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR1	Rainy	15:44	1-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR10	Rainy	13:08	1-hour TSP	76	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR10	Rainy	14:10	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR10	Rainy	15:12	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR5	Rainy	13:30	1-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR5	Rainy	14:32	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR5	Rainy	15:34	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR6	Rainy	13:19	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR6	Rainy	14:21	1-hour TSP	65	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR6	Rainy	15:23	1-hour TSP	63	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-20	AQMS1	Sunny	13:55	1-hour TSP	60	ug/m3
TMCLKL	HY/2012/08	2017-07-20	AQMS1	Sunny	14:57	1-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-20	AQMS1	Sunny	15:59	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR1	Sunny	13:45	1-hour TSP	116	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR1	Sunny	14:47	1-hour TSP	131	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR1	Sunny	15:49	1-hour TSP	73	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR10	Sunny	13:13	1-hour TSP	88	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR10	Sunny	14:15	1-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR10	Sunny	15:17	1-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR5	Sunny	13:34	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR5	Sunny	14:36	1-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR5	Sunny	15:38	1-hour TSP	74	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR6	Sunny	13:24	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR6	Sunny	14:26	1-hour TSP	62	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR6	Sunny	15:28	1-hour TSP	67	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	15:05	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	16:07	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	17:09	1-hour TSP	31	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	14:54	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	15:56	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	16:58	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	14:22	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	15:24	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	16:26	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	14:44	1-hour TSP	34	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	15:46	1-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	16:48	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	14:33	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	15:35	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	16:37	1-hour TSP	36	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	13:50	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	14:52	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	15:54	1-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	13:39	1-hour TSP	127	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	14:41	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	15:43	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	13:07	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	14:09	1-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	15:11	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	13:29	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	14:31	1-hour TSP	146	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	15:33	1-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	13:18	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	14:20	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	15:22	1-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	14:02	1-hour TSP	177	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	15:04	1-hour TSP	171	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	16:06	1-hour TSP	224	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	13:52	1-hour TSP	225	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	14:54	1-hour TSP	200	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	15:56	1-hour TSP	209	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	13:20	1-hour TSP	165	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	14:22	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	15:24	1-hour TSP	475	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	13:41	1-hour TSP	243	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	14:43	1-hour TSP	323	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	15:45	1-hour TSP	370	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	13:30	1-hour TSP	264	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	14:32	1-hour TSP	320	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	15:34	1-hour TSP	401	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-02	AQMS1	Sunny	12:50	24-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR1	Sunny	12:39	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR10	Sunny	12:08	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR5	Sunny	12:29	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-02	ASR6	Sunny	12:19	24-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-05	AQMS1	Cloudy	17:38	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR1	Cloudy	17:28	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR10	Cloudy	16:56	24-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR5	Cloudy	17:17	24-hour TSP	34	ug/m3
TMCLKL	HY/2012/08	2017-07-05	ASR6	Cloudy	17:06	24-hour TSP	38	ug/m3
TMCLKL	HY/2012/08	2017-07-08	AQMS1	Cloudy	12:34	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR1	Cloudy	12:23	24-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR10	Cloudy	11:51	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR5	Cloudy	12:12	24-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-08	ASR6	Cloudy	12:01	24-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-11	AQMS1	Sunny	16:30	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR1	Sunny	16:19	24-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR10	Sunny	15:47	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR5	Sunny	16:09	24-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2017-07-11	ASR6	Sunny	15:58	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-14	AQMS1	Sunny	13:19	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR1	Sunny	13:08	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR10	Sunny	12:36	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR5	Sunny	12:57	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-14	ASR6	Sunny	12:46	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-17	AQMS1	Rainy	16:56	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR1	Rainy	16:46	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR10	Rainy	16:14	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR5	Rainy	16:36	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-17	ASR6	Rainy	16:25	24-hour TSP	43	ug/m3

Project	Works	Date	Station	Weather	Start time	Parameters	Results	units
TMCLKL	HY/2012/08	2017-07-20	AQMS1	Sunny	17:01	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR1	Sunny	16:51	24-hour TSP	85	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR10	Sunny	16:19	24-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR5	Sunny	16:46	24-hour TSP	49	ug/m3
TMCLKL	HY/2012/08	2017-07-20	ASR6	Sunny	16:30	24-hour TSP	45	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	18:11	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	18:00	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	17:28	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	17:50	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	17:39	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	16:56	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	16:45	24-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	16:13	24-hour TSP	21	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	16:35	24-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	16:24	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	17:08	24-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	16:58	24-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	16:26	24-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	16:47	24-hour TSP	100	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	16:36	24-hour TSP	114	ug/m3

Appendix H

Meteorological Data

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/02	0:00	1.8	130
17/07/02	1:00	0.9	125
17/07/02	2:00	1.3	135
17/07/02	3:00	0.9	122
17/07/02	4:00	0.9	74
17/07/02	5:00	0.4	345
17/07/02	6:00	0.4	12
17/07/02	7:00	0.4	322
17/07/02	8:00	0.4	256
17/07/02	9:00	0.9	170
17/07/02	10:00	1.8	181
17/07/02	11:00	1.8	176
17/07/02	12:00	2.2	138
17/07/02	13:00	0.9	200
17/07/02	14:00	1.8	249
17/07/02	15:00	0.9	146
17/07/02	16:00	0.9	175
17/07/02	17:00	0.9	182
17/07/02	18:00	0.9	141
17/07/02	19:00	0.4	289
17/07/02	20:00	0.9	284
17/07/02	21:00	0.4	293
17/07/02	22:00	0.4	288
17/07/02	23:00	1.3	166
17/07/03	0:00	2.2	140
17/07/03	1:00	3.1	137
17/07/03	2:00	2.2	129
17/07/03	3:00	1.8	182
17/07/03	4:00	2.2	178
17/07/03	5:00	2.7	144
17/07/03	6:00	2.2	17
17/07/03	7:00	1.3	223
17/07/03	8:00	0.4	230
17/07/03	9:00	2.7	311
17/07/03	10:00	1.3	357
17/07/03	11:00	2.2	311
17/07/03	12:00	0.4	309
17/07/03	13:00	0.9	349
17/07/03	14:00	0.4	305
17/07/03	15:00	0	-
17/07/03	16:00	0.9	192
17/07/03	17:00	1.8	195
17/07/03	18:00	1.8	200
17/07/03	19:00	0.9	95
17/07/03	20:00	0.9	74
17/07/03	21:00	1.3	81
17/07/03	22:00	1.8	95
17/07/03	23:00	2.2	90
17/07/05	0:00	0.4	10
17/07/05	1:00	0.9	105
17/07/05	2:00	1.3	95
17/07/05	3:00	1.3	76
17/07/05	4:00	1.3	81
17/07/05	5:00	0.9	77
17/07/05	6:00	1.3	69

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/05	7:00	0.9	80
17/07/05	8:00	1.3	100
17/07/05	9:00	1.8	124
17/07/05	10:00	2.7	112
17/07/05	11:00	3.6	85
17/07/05	12:00	4.5	93
17/07/05	13:00	4.9	91
17/07/05	14:00	5.4	122
17/07/05	15:00	4.9	84
17/07/05	16:00	4.9	85
17/07/05	17:00	4.9	111
17/07/05	18:00	3.1	70
17/07/05	19:00	3.1	94
17/07/05	20:00	3.6	97
17/07/05	21:00	3.1	89
17/07/05	22:00	2.7	90
17/07/05	23:00	4	93
17/07/06	0:00	2.7	92
17/07/06	1:00	2.7	95
17/07/06	2:00	4	88
17/07/06	3:00	4.5	79
17/07/06	4:00	3.1	101
17/07/06	5:00	2.2	64
17/07/06	6:00	1.8	96
17/07/06	7:00	1.3	74
17/07/06	8:00	2.7	93
17/07/06	9:00	2.2	95
17/07/06	10:00	2.2	91
17/07/06	11:00	1.3	64
17/07/06	12:00	2.2	93
17/07/06	13:00	1.8	84
17/07/06	14:00	2.7	93
17/07/06	15:00	3.1	100
17/07/06	16:00	1.8	91
17/07/06	17:00	1.3	118
17/07/06	18:00	2.2	71
17/07/06	19:00	1.8	95
17/07/06	20:00	3.1	92
17/07/06	21:00	3.6	94
17/07/06	22:00	4	92
17/07/06	23:00	4	91
17/07/08	0:00	0.9	93
17/07/08	1:00	0.4	68
17/07/08	2:00	1.3	92
17/07/08	3:00	0.4	22
17/07/08	4:00	0.4	349
17/07/08	5:00	0.4	351
17/07/08	6:00	2.7	122
17/07/08	7:00	2.7	88
17/07/08	8:00	1.8	93
17/07/08	9:00	0.9	14
17/07/08	10:00	0.4	191
17/07/08	11:00	0.4	90
17/07/08	12:00	1.3	75
17/07/08	13:00	1.3	80

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/08	14:00	1.3	71
17/07/08	15:00	2.7	93
17/07/08	16:00	1.8	88
17/07/08	17:00	0.9	84
17/07/08	18:00	2.2	86
17/07/08	19:00	0.9	92
17/07/08	20:00	0.9	355
17/07/08	21:00	0.4	68
17/07/08	22:00	0.9	80
17/07/08	23:00	1.8	77
17/07/09	0:00	2.2	94
17/07/09	1:00	2.7	100
17/07/09	2:00	2.7	135
17/07/09	3:00	1.8	141
17/07/09	4:00	1.8	136
17/07/09	5:00	0.4	170
17/07/09	6:00	0.9	142
17/07/09	7:00	1.8	133
17/07/09	8:00	1.8	131
17/07/09	9:00	1.8	129
17/07/09	10:00	1.8	169
17/07/09	11:00	2.2	171
17/07/09	12:00	1.8	134
17/07/09	13:00	1.3	226
17/07/09	14:00	1.3	197
17/07/09	15:00	2.7	230
17/07/09	16:00	3.6	136
17/07/09	17:00	2.2	145
17/07/09	18:00	1.8	140
17/07/09	19:00	1.3	132
17/07/09	20:00	0.9	171
17/07/09	21:00	0.4	142
17/07/09	22:00	1.8	144
17/07/09	23:00	1.3	116
17/07/11	0:00	1.8	93
17/07/11	1:00	1.3	91
17/07/11	2:00	0.9	88
17/07/11	3:00	0.9	96
17/07/11	4:00	1.3	97
17/07/11	5:00	1.3	100
17/07/11	6:00	0.9	71
17/07/11	7:00	0.9	75
17/07/11	8:00	1.3	94
17/07/11	9:00	2.7	87
17/07/11	10:00	2.7	126
17/07/11	11:00	2.7	119
17/07/11	12:00	2.7	104
17/07/11	13:00	2.7	115
17/07/11	14:00	3.6	113
17/07/11	15:00	2.7	120
17/07/11	16:00	3.6	134
17/07/11	17:00	4.5	148
17/07/11	18:00	4	132
17/07/11	19:00	3.1	141
17/07/11	20:00	2.2	117

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/11	21:00	2.2	95
17/07/11	22:00	1.8	88
17/07/11	23:00	0.9	86
17/07/12	0:00	0.9	94
17/07/12	1:00	1.3	65
17/07/12	2:00	1.3	68
17/07/12	3:00	0.9	66
17/07/12	4:00	0.4	69
17/07/12	5:00	0	-
17/07/12	6:00	0	-
17/07/12	7:00	0	-
17/07/12	8:00	0	-
17/07/12	9:00	0.9	92
17/07/12	10:00	1.3	149
17/07/12	11:00	2.2	133
17/07/12	12:00	3.1	129
17/07/12	13:00	3.1	134
17/07/12	14:00	2.7	140
17/07/12	15:00	3.1	116
17/07/12	16:00	3.6	121
17/07/12	17:00	3.6	135
17/07/12	18:00	3.1	139
17/07/12	19:00	2.2	95
17/07/12	20:00	1.8	93
17/07/12	21:00	1.8	88
17/07/12	22:00	1.3	91
17/07/12	23:00	0.9	74
17/07/14	0:00	1.3	92
17/07/14	1:00	0.9	101
17/07/14	2:00	0.9	95
17/07/14	3:00	1.3	89
17/07/14	4:00	0.9	65
17/07/14	5:00	0.4	69
17/07/14	6:00	0.9	66
17/07/14	7:00	1.3	70
17/07/14	8:00	1.8	92
17/07/14	9:00	2.7	88
17/07/14	10:00	3.1	111
17/07/14	11:00	3.1	117
17/07/14	12:00	2.2	140
17/07/14	13:00	3.6	136
17/07/14	14:00	4	95
17/07/14	15:00	4.5	88
17/07/14	16:00	3.6	93
17/07/14	17:00	4.9	94
17/07/14	18:00	4.5	92
17/07/14	19:00	4	99
17/07/14	20:00	4	102
17/07/14	21:00	4	89
17/07/14	22:00	3.1	100
17/07/14	23:00	2.7	94
17/07/15	0:00	2.7	96
17/07/15	1:00	2.2	97
17/07/15	2:00	2.2	90
17/07/15	3:00	0.9	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)**
17/07/15	4:00	0	-
17/07/15	5:00	0.4	95
17/07/15	6:00	0.9	84
17/07/15	7:00	0.9	103
17/07/15	8:00	2.2	94
17/07/15	9:00	2.2	91
17/07/15	10:00	3.1	117
17/07/15	11:00	4	120
17/07/15	12:00	5.4	116
17/07/15	13:00	4.5	128
17/07/15	14:00	5.8	114
17/07/15	15:00	4.9	93
17/07/15	16:00	4	95
17/07/15	17:00	4.5	112
17/07/15	18:00	4.5	94
17/07/15	19:00	5.4	91
17/07/15	20:00	4	93
17/07/15	21:00	2.7	58
17/07/15	22:00	1.8	92
17/07/15	23:00	3.6	94
17/07/17	0:00	2.2	61
17/07/17	1:00	1.8	92
17/07/17	2:00	1.8	58
17/07/17	3:00	1.3	56
17/07/17	4:00	0.9	93
17/07/17	5:00	0.9	15
17/07/17	6:00	0.9	13
17/07/17	7:00	0.9	16
17/07/17	8:00	1.3	93
17/07/17	9:00	0.9	84
17/07/17	10:00	0.9	91
17/07/17	11:00	0.9	87
17/07/17	12:00	0.4	85
17/07/17	13:00	0.9	89
17/07/17	14:00	2.7	94
17/07/17	15:00	3.1	96
17/07/17	16:00	1.8	172
17/07/17	17:00	4	151
17/07/17	18:00	2.2	92
17/07/17	19:00	3.1	94
17/07/17	20:00	4	95
17/07/17	21:00	4.5	133
17/07/17	22:00	4	141
17/07/17	23:00	2.7	99
17/07/18	0:00	1.3	41
17/07/18	1:00	4.5	98
17/07/18	2:00	3.1	89
17/07/18	3:00	1.8	66
17/07/18	4:00	2.2	92
17/07/18	5:00	4	94
17/07/18	6:00	3.1	96
17/07/18	7:00	2.7	59
17/07/18	8:00	3.6	97
17/07/18	9:00	1.8	94
17/07/18	10:00	1.8	91
17/07/18	11:00	1.3	55

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/18	12:00	2.2	103
17/07/18	13:00	1.3	104
17/07/18	14:00	0.9	82
17/07/18	15:00	0.9	85
17/07/18	16:00	0.9	201
17/07/18	17:00	0.4	221
17/07/18	18:00	0.9	16
17/07/18	19:00	2.2	83
17/07/18	20:00	4	95
17/07/18	21:00	3.1	84
17/07/18	22:00	0.9	19
17/07/18	23:00	0.9	85
17/07/20	0:00	0	-
17/07/20	1:00	0	-
17/07/20	2:00	0.9	96
17/07/20	3:00	0.9	102
17/07/20	4:00	1.3	88
17/07/20	5:00	0.4	62
17/07/20	6:00	0.4	93
17/07/20	7:00	0.9	96
17/07/20	8:00	1.3	91
17/07/20	9:00	1.3	94
17/07/20	10:00	2.7	92
17/07/20	11:00	3.1	91
17/07/20	12:00	3.6	124
17/07/20	13:00	3.1	146
17/07/20	14:00	3.6	150
17/07/20	15:00	3.1	93
17/07/20	16:00	1.8	87
17/07/20	17:00	3.1	86
17/07/20	18:00	3.6	88
17/07/20	19:00	2.7	94
17/07/20	20:00	2.2	98
17/07/20	21:00	1.3	91
17/07/20	22:00	2.2	93
17/07/20	23:00	1.3	86
17/07/21	0:00	1.3	100
17/07/21	1:00	1.3	92
17/07/21	2:00	0.4	97
17/07/21	3:00	0.4	39
17/07/21	4:00	0	-
17/07/21	5:00	0.4	56
17/07/21	6:00	0	-
17/07/21	7:00	0	-
17/07/21	8:00	0.9	71
17/07/21	9:00	2.2	92
17/07/21	10:00	3.6	104
17/07/21	11:00	3.6	85
17/07/21	12:00	3.6	92
17/07/21	13:00	3.1	64
17/07/21	14:00	4	58
17/07/21	15:00	3.6	59
17/07/21	16:00	4	84
17/07/21	17:00	4	96
17/07/21	18:00	4	115
17/07/21	19:00	4.5	93
17/07/21	20:00	3.6	97

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/21	21:00	2.7	86
17/07/21	22:00	2.2	53
17/07/21	23:00	2.7	94
17/07/23	0:00	1.8	50
17/07/23	1:00	0	-
17/07/23	2:00	0	-
17/07/23	3:00	0	-
17/07/23	4:00	0	-
17/07/23	5:00	0.9	316
17/07/23	6:00	1.3	309
17/07/23	7:00	1.8	324
17/07/23	8:00	1.3	315
17/07/23	9:00	1.3	306
17/07/23	10:00	1.8	314
17/07/23	11:00	1.8	274
17/07/23	12:00	1.3	268
17/07/23	13:00	1.3	185
17/07/23	14:00	3.6	93
17/07/23	15:00	3.6	87
17/07/23	16:00	4	96
17/07/23	17:00	4	88
17/07/23	18:00	3.1	94
17/07/23	19:00	1.8	97
17/07/23	20:00	1.3	49
17/07/23	21:00	1.3	13
17/07/23	22:00	1.3	97
17/07/23	23:00	0.4	85
17/07/24	0:00	0.9	54
17/07/24	1:00	0.4	46
17/07/24	2:00	0.4	110
17/07/24	3:00	0.4	58
17/07/24	4:00	0.4	93
17/07/24	5:00	0.4	62
17/07/24	6:00	0.4	92
17/07/24	7:00	0	-
17/07/24	8:00	0.4	58
17/07/24	9:00	0.9	114
17/07/24	10:00	0.9	132
17/07/24	11:00	1.8	169
17/07/24	12:00	1.3	85
17/07/24	13:00	1.3	135
17/07/24	14:00	2.7	132
17/07/24	15:00	2.7	140
17/07/24	16:00	3.1	128
17/07/24	17:00	2.7	115
17/07/24	18:00	3.1	94
17/07/24	19:00	2.2	92
17/07/24	20:00	1.3	97
17/07/24	21:00	1.3	82
17/07/24	22:00	1.8	86
17/07/24	23:00	1.8	87
17/07/26	0:00	0.9	62
17/07/26	1:00	0.4	57
17/07/26	2:00	0.4	92
17/07/26	3:00	0	-
17/07/26	4:00	0.9	298
17/07/26	5:00	0.4	305

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/26	6:00	0.9	300
17/07/26	7:00	0.4	351
17/07/26	8:00	0	-
17/07/26	9:00	1.3	140
17/07/26	10:00	0.9	278
17/07/26	11:00	1.3	228
17/07/26	12:00	0.9	205
17/07/26	13:00	0.9	197
17/07/26	14:00	1.8	199
17/07/26	15:00	1.8	226
17/07/26	16:00	3.1	140
17/07/26	17:00	3.1	135
17/07/26	18:00	2.7	62
17/07/26	19:00	2.2	94
17/07/26	20:00	1.8	95
17/07/26	21:00	0.4	66
17/07/26	22:00	0.4	3
17/07/26	23:00	0.4	92
17/07/27	0:00	1.3	96
17/07/27	1:00	1.3	91
17/07/27	2:00	1.3	54
17/07/27	3:00	0.9	59
17/07/27	4:00	0.9	51
17/07/27	5:00	0.4	346
17/07/27	6:00	0.9	352
17/07/27	7:00	0.9	339
17/07/27	8:00	1.3	327
17/07/27	9:00	1.8	16
17/07/27	10:00	1.3	347
17/07/27	11:00	1.3	349
17/07/27	12:00	1.3	91
17/07/27	13:00	1.8	52
17/07/27	14:00	2.2	94
17/07/27	15:00	3.1	137
17/07/27	16:00	2.2	94
17/07/27	17:00	3.1	96
17/07/27	18:00	2.7	89
17/07/27	19:00	2.7	87
17/07/27	20:00	2.2	89
17/07/27	21:00	2.7	95
17/07/27	22:00	2.2	97
17/07/27	23:00	2.7	99
17/07/29	0:00	1.3	96
17/07/29	1:00	1.3	52
17/07/29	2:00	1.3	98
17/07/29	3:00	0.9	55
17/07/29	4:00	0	-
17/07/29	5:00	0	-
17/07/29	6:00	1.3	326
17/07/29	7:00	1.3	330
17/07/29	8:00	0	-
17/07/29	9:00	0.4	58
17/07/29	10:00	0.4	170
17/07/29	11:00	0.9	348
17/07/29	12:00	1.3	275
17/07/29	13:00	1.8	273
17/07/29	14:00	2.7	201

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
17/07/29	15:00	3.1	205
17/07/29	16:00	1.8	200
17/07/29	17:00	0.9	274
17/07/29	18:00	2.2	298
17/07/29	19:00	1.8	312
17/07/29	20:00	0.9	277
17/07/29	21:00	0.9	315
17/07/29	22:00	0.4	308
17/07/29	23:00	0.9	320
17/07/30	0:00	0.9	317
17/07/30	1:00	0.9	309
17/07/30	2:00	0.9	315
17/07/30	3:00	1.3	287
17/07/30	4:00	2.2	312
17/07/30	5:00	1.8	309
17/07/30	6:00	2.2	304
17/07/30	7:00	2.2	310
17/07/30	8:00	0.9	278
17/07/30	9:00	1.3	269
17/07/30	10:00	2.2	295
17/07/30	11:00	3.6	298
17/07/30	12:00	2.2	312
17/07/30	13:00	2.2	307
17/07/30	14:00	2.2	315
17/07/30	15:00	2.2	276
17/07/30	16:00	1.8	267
17/07/30	17:00	1.8	205
17/07/30	18:00	0.9	220
17/07/30	19:00	0.4	270
17/07/30	20:00	0.9	284
17/07/30	21:00	0.9	265
17/07/30	22:00	0.9	307
17/07/30	23:00	1.3	311

Appendix I

Impact Dolphin Monitoring Survey

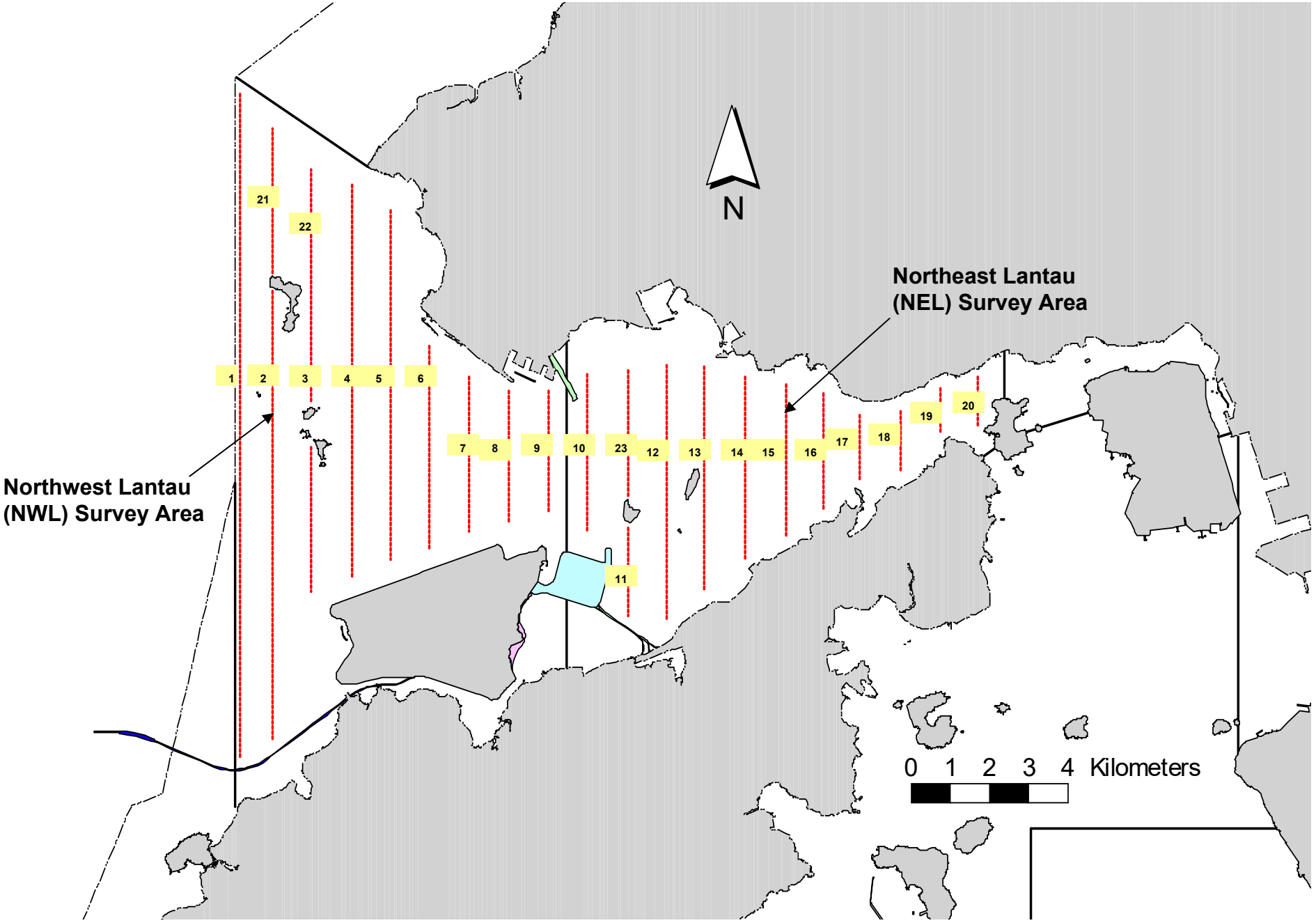

Figure 1. Transect Line Layout in Northwest and Northeast Lantau Survey Areas

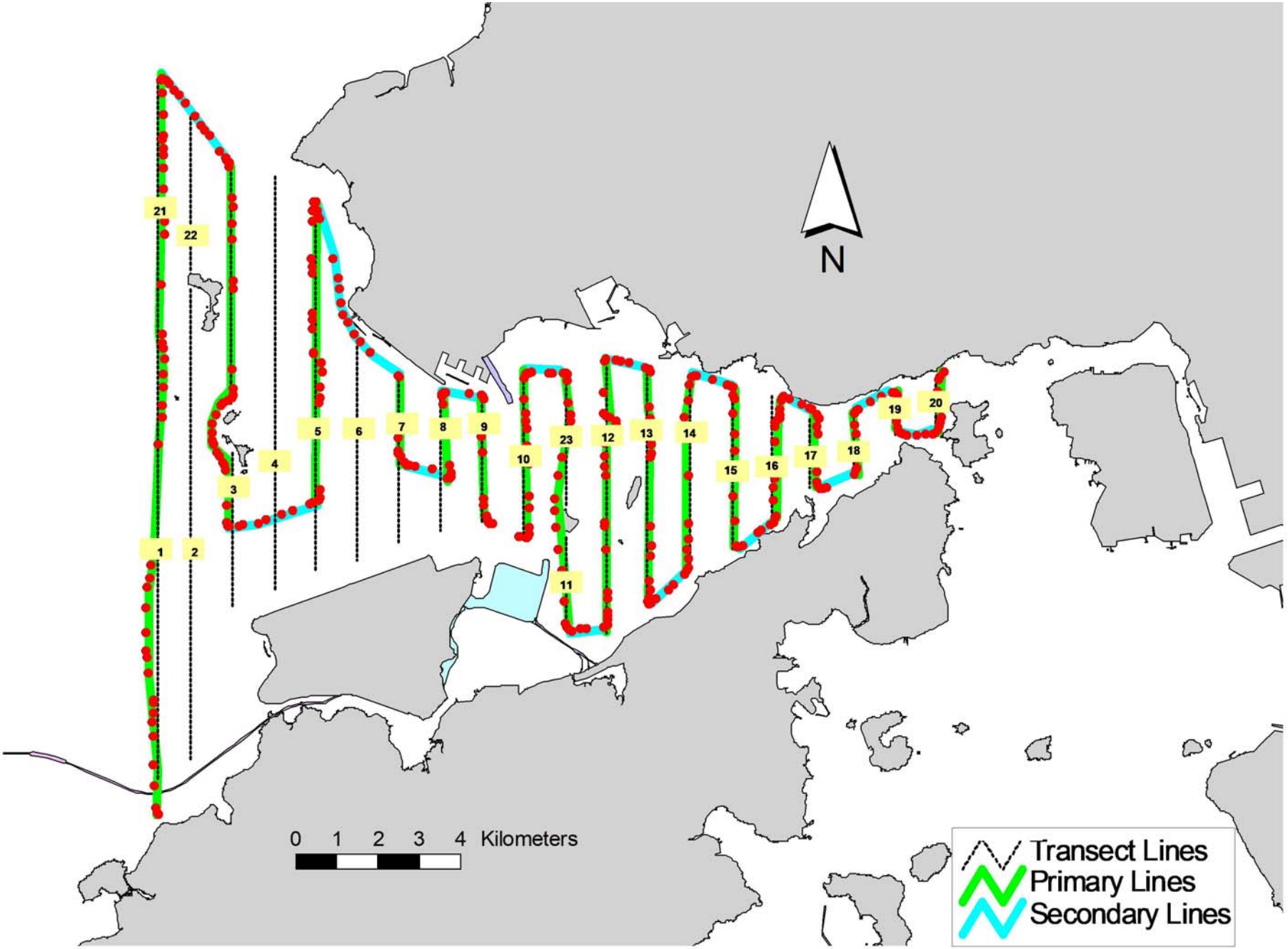

Figure 2. Survey Route on July 20th, 2017 (from HKLR03 project)

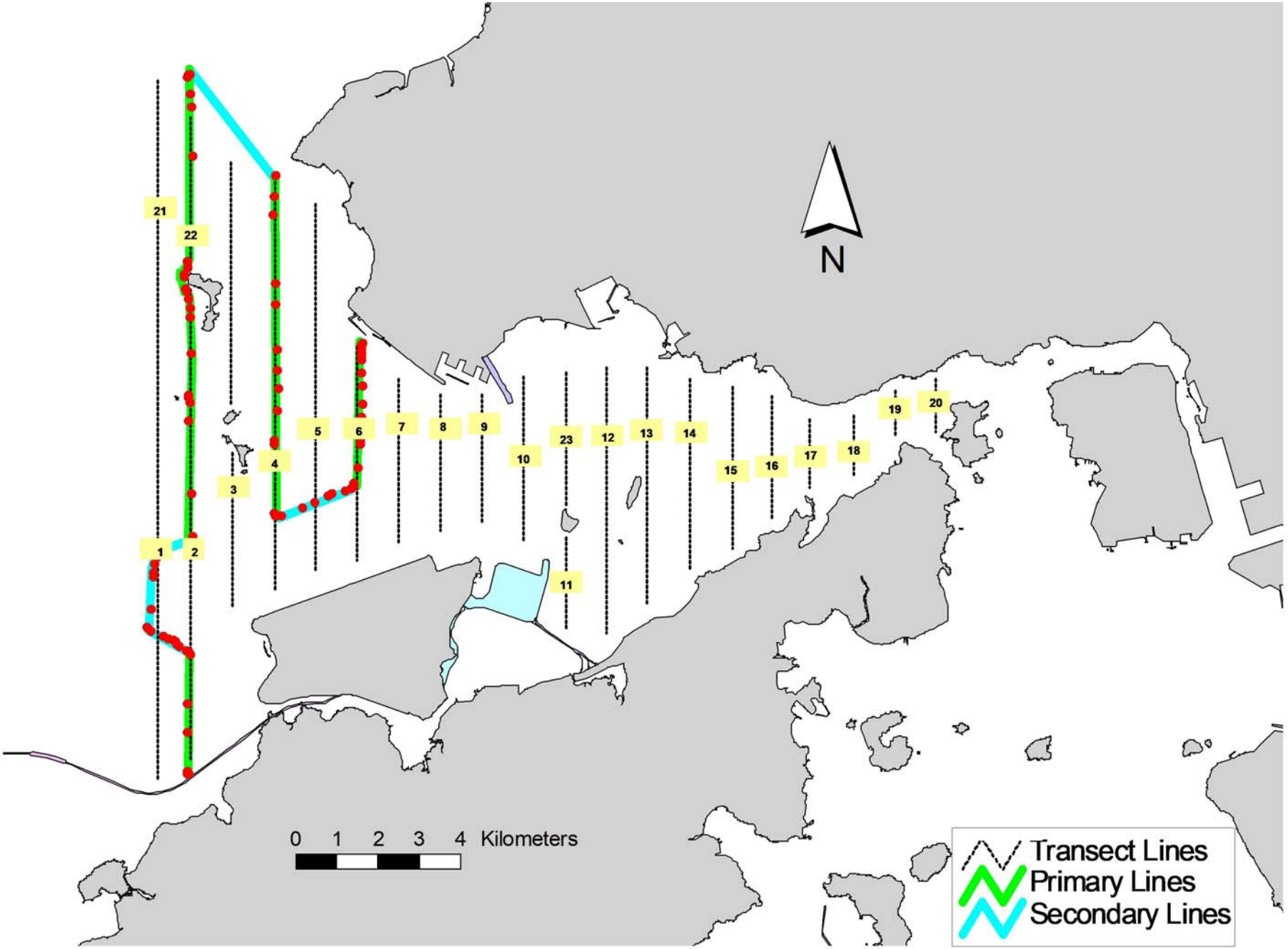

Figure 3. Survey Route on July 24th, 2017 (from HKLR03 project)

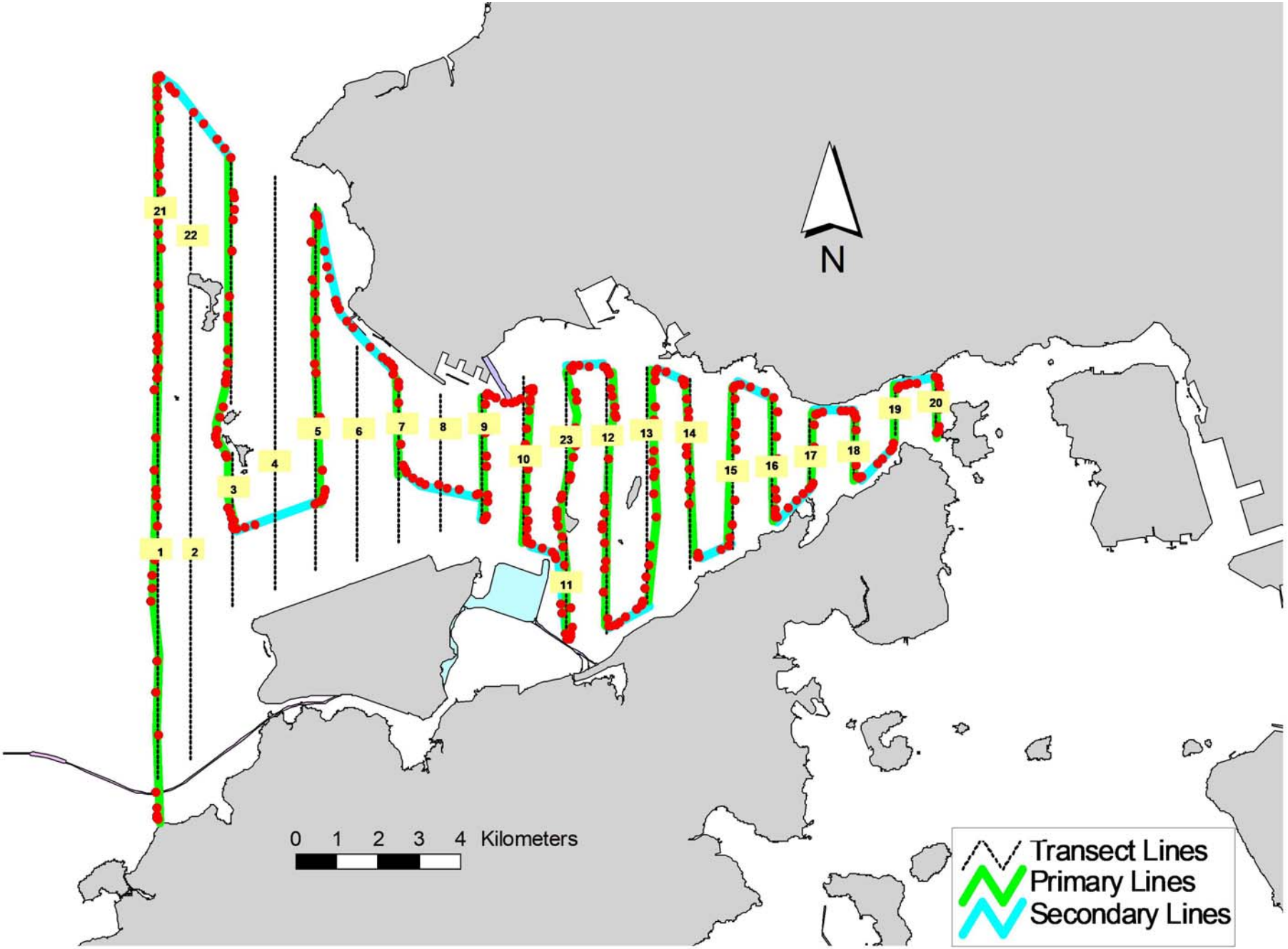

Figure 4. Survey Route on July 27th, 2017 (from HKLR03 project)

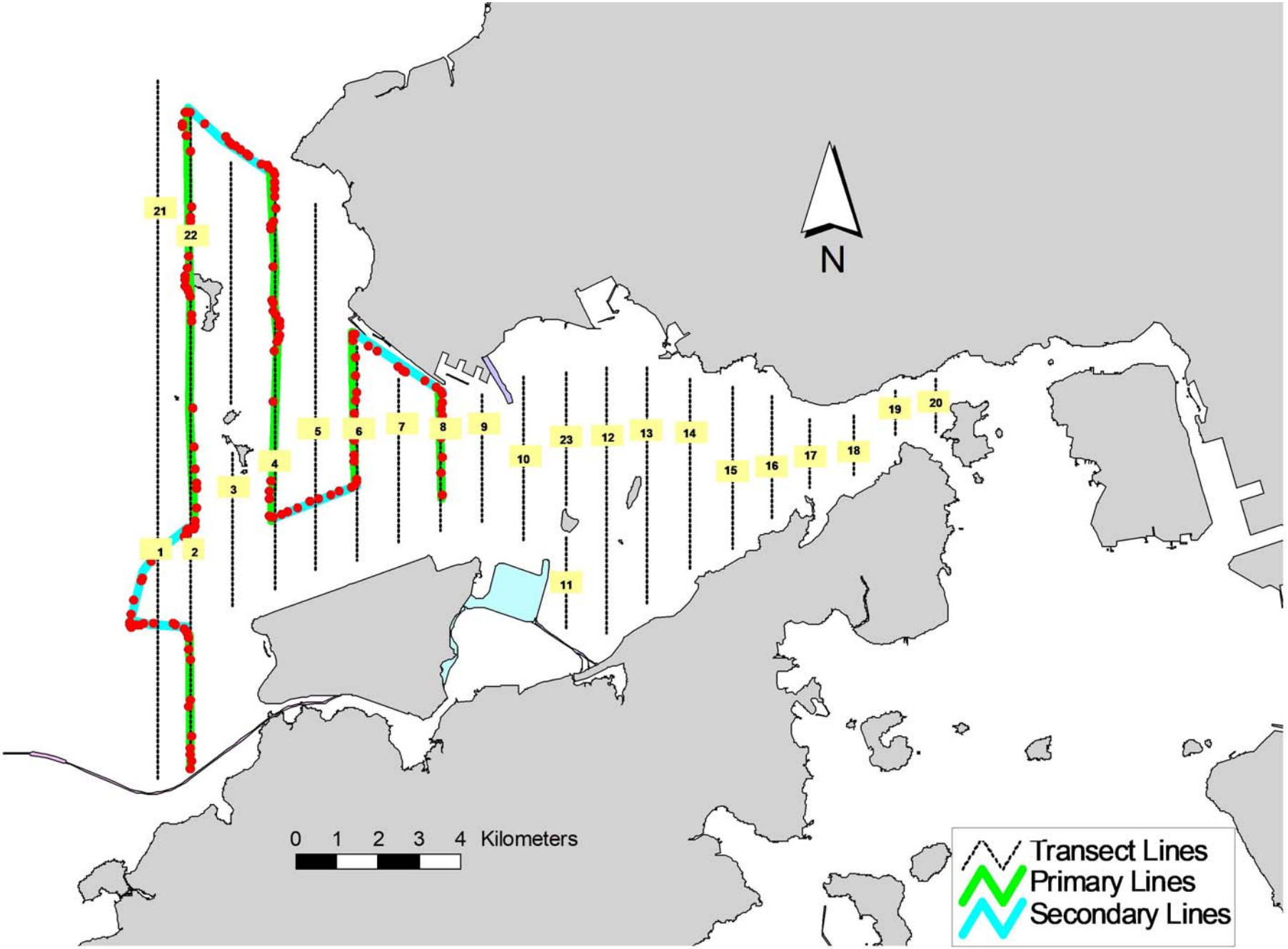

Figure 5. Survey Route on July 28th, 2017 (from HKLR03 project)

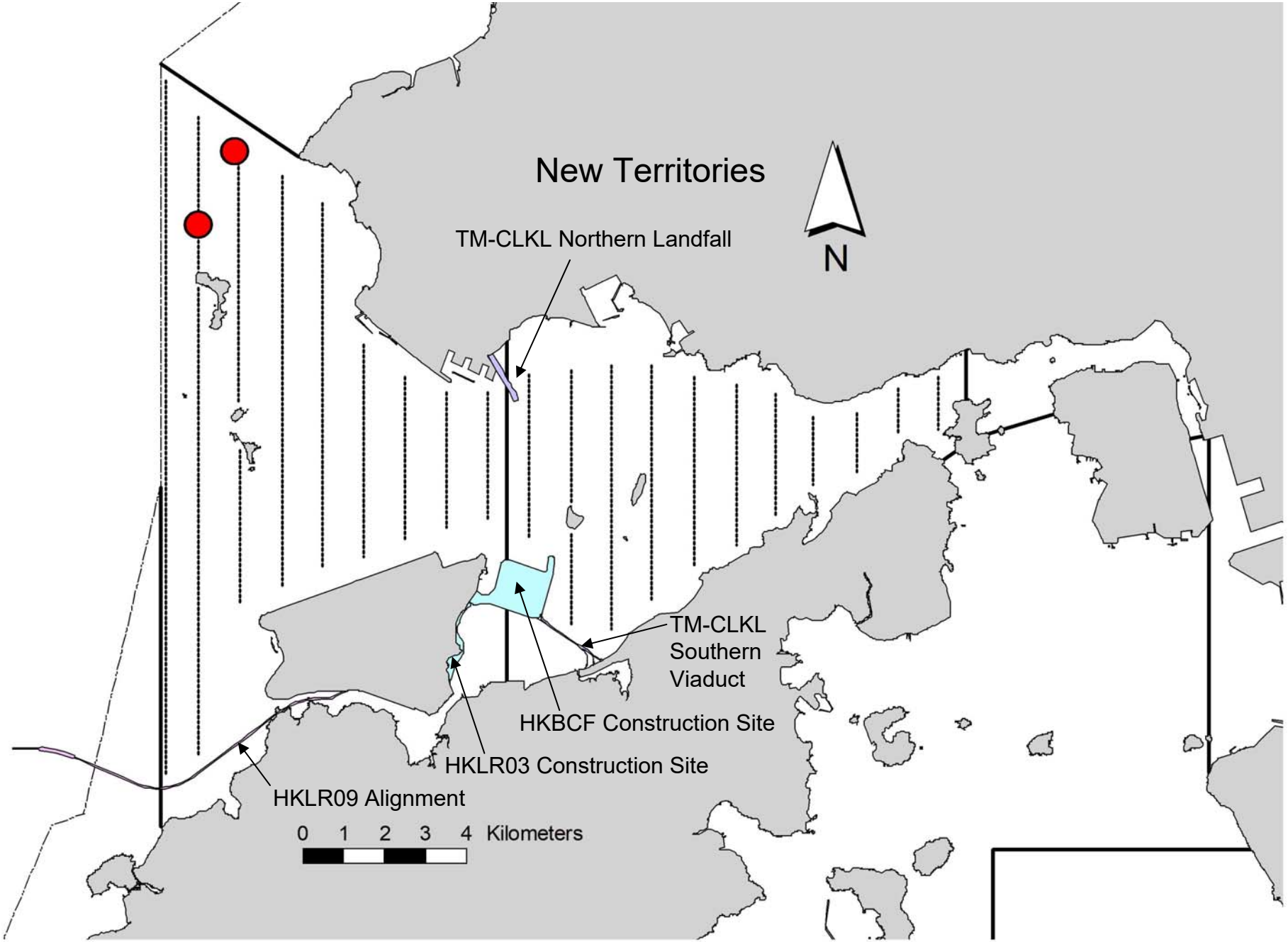

Figure 6. Distribution of Chinese White Dolphin Sightings during July 2017 HKLR03 Monitoring Surveys

Appendix I. HKLR03 Survey Effort Database (July 2017)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
20-Jul-17	NW LANTAU	2	18.97	SUMMER	STANDARD36826	HKLR	P
20-Jul-17	NW LANTAU	3	18.23	SUMMER	STANDARD36826	HKLR	P
20-Jul-17	NW LANTAU	2	7.00	SUMMER	STANDARD36826	HKLR	S
20-Jul-17	NW LANTAU	3	5.70	SUMMER	STANDARD36826	HKLR	S
20-Jul-17	NW LANTAU	4	1.60	SUMMER	STANDARD36826	HKLR	S
20-Jul-17	NE LANTAU	1	3.80	SUMMER	STANDARD36826	HKLR	P
20-Jul-17	NE LANTAU	2	31.92	SUMMER	STANDARD36826	HKLR	P
20-Jul-17	NE LANTAU	1	1.20	SUMMER	STANDARD36826	HKLR	S
20-Jul-17	NE LANTAU	2	10.58	SUMMER	STANDARD36826	HKLR	S
24-Jul-17	NW LANTAU	2	20.28	SUMMER	STANDARD36826	HKLR	P
24-Jul-17	NW LANTAU	3	3.38	SUMMER	STANDARD36826	HKLR	P
24-Jul-17	NW LANTAU	2	6.35	SUMMER	STANDARD36826	HKLR	S
27-Jul-17	NW LANTAU	2	32.62	SUMMER	STANDARD36826	HKLR	P
27-Jul-17	NW LANTAU	3	3.79	SUMMER	STANDARD36826	HKLR	P
27-Jul-17	NW LANTAU	2	12.69	SUMMER	STANDARD36826	HKLR	S
27-Jul-17	NE LANTAU	2	22.18	SUMMER	STANDARD36826	HKLR	P
27-Jul-17	NE LANTAU	3	13.60	SUMMER	STANDARD36826	HKLR	P
27-Jul-17	NE LANTAU	2	11.02	SUMMER	STANDARD36826	HKLR	S
27-Jul-17	NE LANTAU	3	2.00	SUMMER	STANDARD36826	HKLR	S
28-Jul-17	NW LANTAU	1	2.10	SUMMER	STANDARD36826	HKLR	P
28-Jul-17	NW LANTAU	2	19.21	SUMMER	STANDARD36826	HKLR	P
28-Jul-17	NW LANTAU	3	4.53	SUMMER	STANDARD36826	HKLR	P
28-Jul-17	NW LANTAU	2	10.69	SUMMER	STANDARD36826	HKLR	S
28-Jul-17	NW LANTAU	3	1.77	SUMMER	STANDARD36826	HKLR	S

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

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

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
24-Jul-17	1	1111	9	NW LANTAU	2	243	ON	HKLR	828092	805439	SUMMER	NONE	P
27-Jul-17	1	1131	2	NW LANTAU	2	16	ON	HKLR	829774	806339	SUMMER	NONE	S

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

ID#	DATE	STG#	AREA
NL46	24/07/17	1	NW LANTAU
NL49	24/07/17	1	NW LANTAU
NL105	24/07/17	1	NW LANTAU
NL123	24/07/17	1	NW LANTAU
NL202	24/07/17	1	NW LANTAU
NL286	24/07/17	1	NW LANTAU
WL05	27/07/17	1	NW LANTAU
WL11	27/07/17	1	NW LANTAU

Appendix IV. Photographs of Identified Individual Dolphins in July 2017 (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	3	33
	Limit	0	2
24-hr TSP	Action	0	5
	Limit	0	1
Water Quality	Action	0	6
	Limit	0	1
Impact Dolphin Monitoring	Action	0	9
	Limit	0	9

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

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

Email message

Environmental Resources Management

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Quarry Bay, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
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To	Ramboll Environ - Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Air Quality Impact Monitoring
Date	29 July 2017

ERM

Dear Sir or Madam,

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

0212330_29July2017_1hrTSP_Station ASR10
0212330_29July2017_1hrTSP_Station ASR5
0212330_29July2017_1hrTSP_Station ASR6

A total of three Action Level Exceedances were recorded on 29 July 2017.

Regards,

Mr Jovy Tam
Environmental Team Leader

ERM-Hong Kong, Limited

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

Air Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_29July2017_1hrTSP_Station ASR10** **0212330_29July2017_1hrTSP_Station ASR5** **0212330_29July2017_1hrTSP_Station ASR6** **[Total No. of Exceedances = 3]**	
Date	29 July 2017 (Measured) 7 August 2017 (Laboratory results received by ERM)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10 and AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	1-hr TSP (µg/m³)	ASR10 = 337 ASR5 = 340 ASR6 = 338
	24-hr TSP (µg/m³)	ASR10 = 214 ASR5 = 238 ASR6 = 238
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 ASR10 (475 µg/m³) during 1524 - 1624 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR6 (401 µg/m³) during 1534 - 1634 hrs. Action Level Exceedance for 1-hr TSP is observed at ASR5 (370 µg/m³) during 1545 - 1645hrs.	
Works Undertaken (at the time of monitoring event)	On 29 July 2017, Surcharge filling was carried out at Works Area Portion N-A and Construction of Ventilation Building at Portion N-C.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance(s) are 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 29 July 2017 were Surcharge Filling at Works Area Portion N-A and Construction of Ventilation Building at Portions N-C 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 by water trucks on exposed soil within the Project site and associated work areas; use of wheel washing facilities). • Whilst exceedances of Action Level were observed at ASR10, ASR5 and ASR6, the 24-hr TSP level at the monitoring station (ASR10 = 99 µg/m³, ASR5 = 100µg/m³, ASR6 = 114µg/m³) on 29 July 2017 were in compliance with the Action and Limit Levels. • Same level and extent of construction works were carried out at the same works area on 23th July and 26th July whilst no exceedance was recorded. It is thus considered that the observed exceedances for 1-hour TSP at ASR10, ASR5 and ASR6 may represent sporadic event associated with traffic emissions and anthropogenic activities during afternoon rush hour at Lung Mun Road. • As stated in the EIA report (Section 4.2.3), the background TSP level of Tuen Mun is higher than the other region of Hong Kong, thus the exceedances may be also contributed cumulatively by the other construction works / traffic within the Tuen Mun Area rather than causing by the construction works of the Project.	

Actions Taken / To Be Taken	Based on the record of weekly site inspection on 26 July 2017 and 2 August 2017, no dust nuisance was recorded at the Northern Landfall and activities conducted in this Contract's work has strictly followed the requirements stated in the EP (EP-354/2009/C) (see photo records on *Annex A*). Inspection of the AQM stations has also been carried out on 4 August 2017. No significant dust impact was observed at all stations. In addition, the Contractor has implemented the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual (e.g. use of water truck on exposed soil within the Project site and associated work areas; use of wheel washing facilities) throughout the construction period, no additional mitigation is deemed necessary. The Enhanced TSP Monitoring has commenced on 24 October 2014, the ET will monitor for future trends in exceedances.
Remarks	The monitoring results and the locations of air quality monitoring stations are attached.

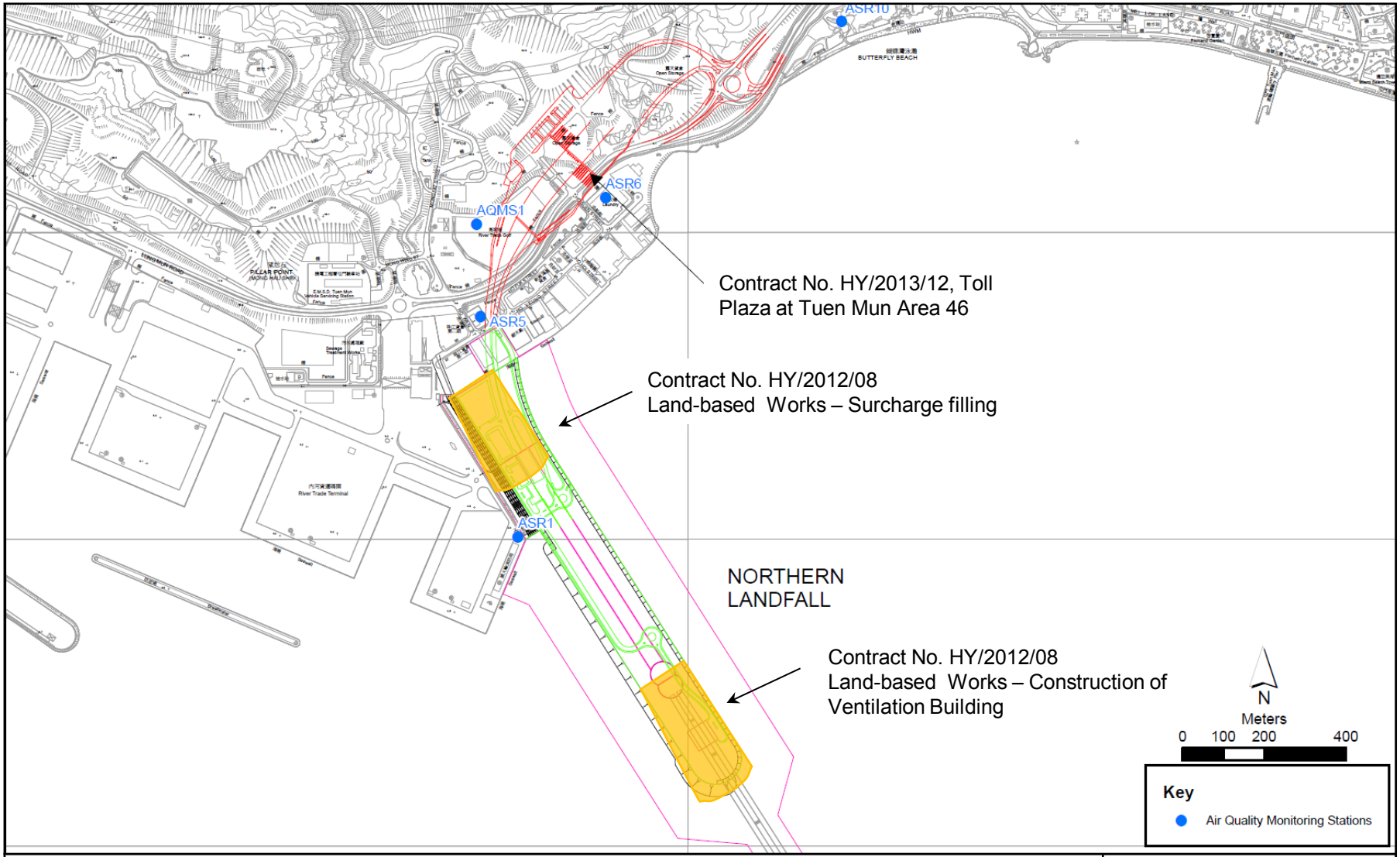

Figure 1

Indicative Construction Works Area on 29 July 2017

DATE: 06/03/2013

Environmental Resources Management

ERM

Project	Works	Date	Station	Weather	Start time	Parameters	Results	Unit
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	15:05	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	16:07	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	17:09	1-hour TSP	31	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	14:54	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	15:56	1-hour TSP	56	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	16:58	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	14:22	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	15:24	1-hour TSP	55	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	16:26	1-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	14:44	1-hour TSP	34	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	15:46	1-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	16:48	1-hour TSP	40	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	14:33	1-hour TSP	44	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	15:35	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	16:37	1-hour TSP	36	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	13:50	1-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	14:52	1-hour TSP	89	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	15:54	1-hour TSP	78	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	13:39	1-hour TSP	127	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	14:41	1-hour TSP	93	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	15:43	1-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	13:07	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	14:09	1-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	15:11	1-hour TSP	43	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	13:29	1-hour TSP	103	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	14:31	1-hour TSP	146	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	15:33	1-hour TSP	102	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	13:18	1-hour TSP	79	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	14:20	1-hour TSP	169	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	15:22	1-hour TSP	70	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	14:02	1-hour TSP	177	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	15:04	1-hour TSP	171	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	16:06	1-hour TSP	224	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	13:52	1-hour TSP	225	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	14:54	1-hour TSP	200	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	15:56	1-hour TSP	209	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	13:20	1-hour TSP	165	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	14:22	1-hour TSP	95	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	15:24	1-hour TSP	475	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	13:41	1-hour TSP	243	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	14:43	1-hour TSP	323	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	15:45	1-hour TSP	370	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	13:30	1-hour TSP	264	ug/m3

TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	14:32	1-hour TSP	320	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	15:34	1-hour TSP	401	ug/m3
TMCLKL	HY/2012/08	2017-07-23	AQMS1	Cloudy	18:11	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR1	Cloudy	18:00	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR10	Cloudy	17:28	24-hour TSP	47	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR5	Cloudy	17:50	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	2017-07-23	ASR6	Cloudy	17:39	24-hour TSP	42	ug/m3
TMCLKL	HY/2012/08	2017-07-26	AQMS1	Sunny	16:56	24-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR1	Sunny	16:45	24-hour TSP	137	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR10	Sunny	16:13	24-hour TSP	21	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR5	Sunny	16:35	24-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	2017-07-26	ASR6	Sunny	16:24	24-hour TSP	51	ug/m3
TMCLKL	HY/2012/08	2017-07-29	AQMS1	Sunny	17:08	24-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR1	Sunny	16:58	24-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR10	Sunny	16:26	24-hour TSP	99	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR5	Sunny	16:47	24-hour TSP	100	ug/m3
TMCLKL	HY/2012/08	2017-07-29	ASR6	Sunny	16:36	24-hour TSP	114	ug/m3

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Annex A Photo Records taken during Weekly Site Inspection

*Note: Photos taken on 26/7/2017

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

Use of water truck on exposed soil within the Project site and associated work areas.
(Works Area Portion N-C)

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 July 2017 [to be submitted not later than the 15th day of each month following reporting month]

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

Month	Monthly Break-down of Inert Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	1097.465	0.000	0.000	0.000	1097.465
Jan-2017	60.781	0.000	0.000	0.000	60.781
Feb-2017	17.367	0.000	0.000	0.000	17.367
Mar-2017	7.508	0.000	0.000	0.000	7.508
Apr-2017	15.603	0.000	0.000	0.000	15.603
May-2017	12.358	0.000	0.000	0.000	12.358
Jun-2017	0.194	0.000	0.000	0.000	0.194
Half Year Sub-total					
Jul-2017	0.652	0.000	0.000	0.000	0.652
Aug-2017					
Sep-2017					
Oct-2017					
Nov-2017					
Dec-2017					
Project Total Quantities	1211.9284	0.000	0.000	0.000	1211.9284

Month	**Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly**								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	1.850	1.850	3.150	3.150	6.870	6.870	9.450	9.450	4.935
Jan-2017	0.000	0.000	0.000	0.000	0.000	0.000	3.400	3.400	0.257
Feb-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.340
Mar-2017	0.000	0.000	0.000	0.000	0.000	0.000	6.100	6.100	0.286
Apr-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.237
May-2017	0.000	0.000	0.000	0.000	0.000	0.000	10.400	10.400	0.300
Jun-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317
Half Year Sub-total	0.000	0.000	0.200	0.200	0.000	0.000	19.900	19.900	1.737
Jul-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.272
Aug-2017									
Sep-2017									
Oct-2017									
Nov-2017									
Dec-2017									
Project Total Quantities	1.850	1.850	3.350	3.350	6.870	6.870	29.350	29.350	6.927

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
20.000	0.000	0.000	0.000	20.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
0.000	0.500	0.000	0.000	0.100

Notes:

(1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).

(2) The waste flow table shall also include C&D materials to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m^3. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).