

**Contract No. HY/2012/07
Tuen Mun – Chek Lap Kok Link –
Southern Connection Viaduct Section**

*Seventh Quarterly Environmental Monitoring &
Audit (EM&A) Report*

19 January 2016

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Contract No. HY/2012/07

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

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EXECUTIVE SUMMARY

Under *Contract No. HY/2012/07*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Southern Connection Viaduct 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). Ramboll Environ Hong Kong Ltd. was employed by the HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) in accordance with *Environmental Permit No. EP-354/2009/A*. Further applications for variation of environmental permit (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 Contract commenced on 31 October 2013 and will be tentatively completed by 2018. The impact monitoring of the EM&A programme, including air quality, noise, water quality and marine ecological monitoring as well as environmental site inspections, commenced on 31 October 2013.

This is the seventh quarterly EM&A report presenting the EM&A works carried out during the period from 1 June to 31 August 2015 for the Southern Connection Viaduct Section 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:

June 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling and
- Installation of pier head segment

Land-based Works

- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Pre-drilling works;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and

- Slope work of Slopes 9SE-B/C9 and 9SE-B/F85.

July 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling; and,
- Installation of pier head segment.

Land-based Works

- Pre-drilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Pre-drilling works;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaducts A & B.

August 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling; and,
- Installation of pier head segment.

Land-based Works

- Pre-drilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaducts A & B.

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

24-hour TSP monitoring	18 sessions
1-hour TSP monitoring	18 sessions
Noise monitoring	18 sessions
Water quality monitoring	38 sessions
Dolphin monitoring	6 sessions
Joint Environmental site inspection	13 sessions

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Levels was recorded for air quality monitoring in the reporting period.

Breaches of Action and Limit Levels for Noise

No exceedance of Action and Limit Levels was recorded for construction noise monitoring in the reporting period.

Breaches of Action and Limit Levels for Water Quality

No exceedance of Action and Limit Levels was recorded for water quality monitoring in the reporting period.

Impact Dolphin Monitoring

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June and August 2015, whilst no unacceptable impact from the construction activities of the TM-CLKL Southern Connection Viaduct Section on Chinese White Dolphins was noticeable from general observations during the dolphin monitoring in this reporting quarter.

Daily marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. No Passive Acoustic Monitoring (PAM) was implemented as the marine piling works were not carried out outside the daylight hours in this reporting period. No sighting of the Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphin) was recorded in the monitoring period during the exclusion zone monitoring.

Environmental Complaints, Non-compliance & Summons

One (1) complaint with regard to dust emission from dump truck was received on 18 June 2015.

Reporting Change

There was no reporting change in this reporting period.

Upcoming Works for the Next Reporting Period

Works to be undertaken in the coming quarter include the following:

September 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling; and,
- Installation of pier head segment.

Land-based Works

- Predrilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaduct A.

October 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Installation of deck segment and pier head segment.

Land-based Works

- Predrilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaduct A.

November 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly; and
- Installation of deck segment and pier head segment.

Land-based Works

- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Installation of pier head segment; and
- Slope work of Viaduct A.

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are mainly associated with air quality, noise, marine water quality, marine ecology and waste management issue.

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 (*EP-354/2009A*) was issued on 8 December 2010. Further applications for variation of environmental permit (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Contract No. HY/2012/07*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Southern Connection Viaduct Section of TM-CLKL (“the Contract”) 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) in accordance with *Environmental Permit No. EP-354/2009/A*.

The construction phase of the Contract commenced on 31 October 2013 and will be tentatively be completed by 2018. The impact monitoring phase of the EM&A programme, including air quality, noise, water quality and marine ecological monitoring as well environmental site inspections, commenced on 31 October 2013.

The general layout plan of the Contract components is presented in *Figures 1.1 & 1.2a to l*.

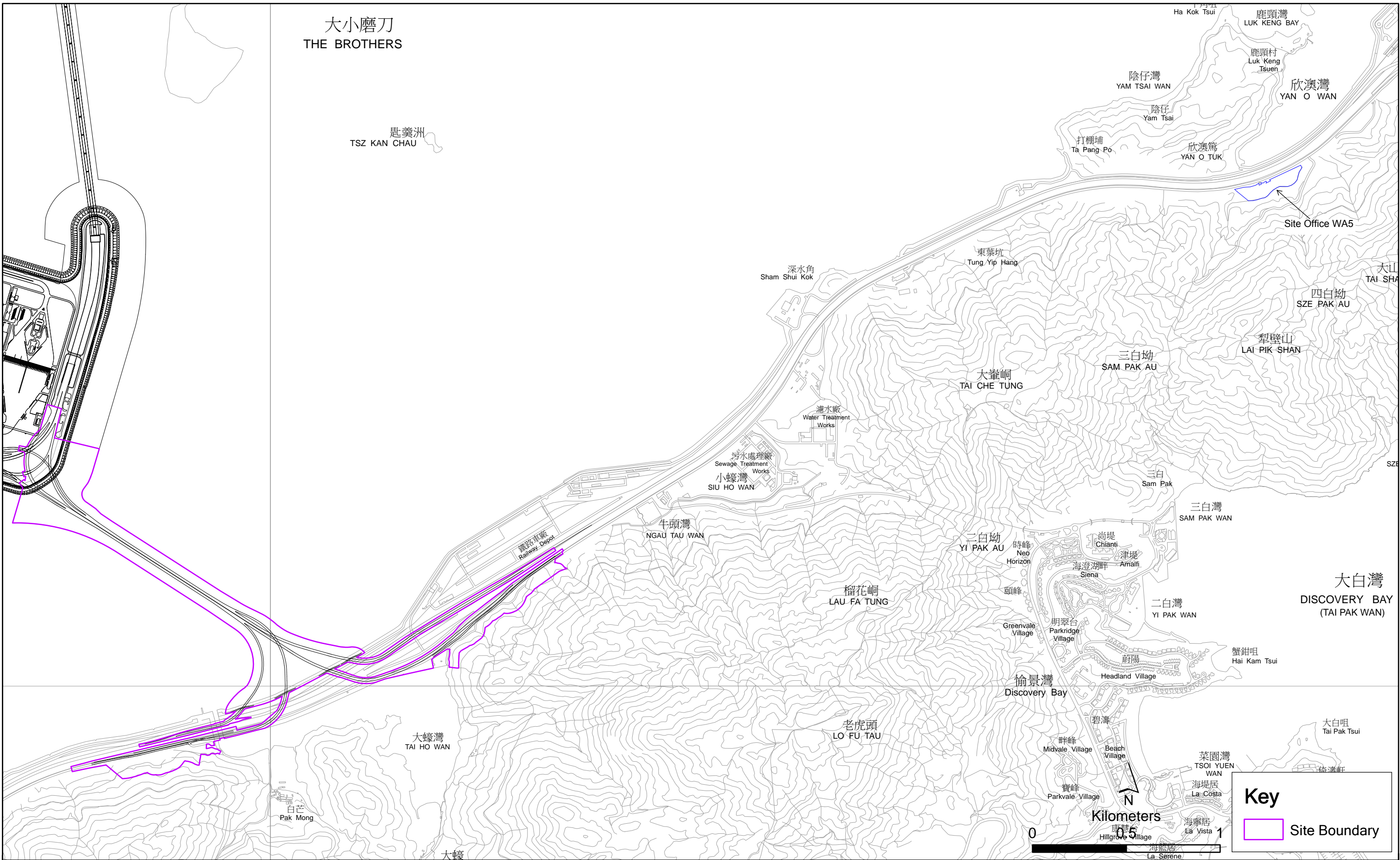


Figure 1.1

General Layout Plan of the Project

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Date: 6/8/2014

Environmental Resources Management



ERM

1.2 SCOPE OF REPORT

This is the Seventh Quarterly EM&A Report under the *Contract No. HY/2012/07 Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section*. This report presents a summary of the environmental monitoring and audit works from 1 June to 31 August 2015.

1.3 ORGANIZATION STRUCTURE

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

Table 1.1 *Contact Information of Key Personnel*

Party	Position	Name	Telephone	Fax
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Daniel Ip	3553 3800	2492 2057
	Resident Engineer	Kingman Chan	3691 2950	3691 2899
ENPO / IEC (Ramboll Environ Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3547 2133	3465 2899
	IEC	Dr. F.C. Tsang	3547 2134	3465 2899
Contractor (Gammon Construction Limited)	Environmental Manager	Brian Kam	3520 0387	3520 0486
	Environmental Officer	Roy Leung	3520 0387	3520 0486
	24-hour Complaint Hotline		9738 4332	
ET (ERM-HK)	ET Leader	Jovy Tam	2271 3113	2723 5660

1.4 SUMMARY OF CONSTRUCTION WORKS

The construction phase of the Contract commenced on 31 October 2013. The rolling construction programme for the period of June to August 2015 is shown in *Appendix B*.

As informed by the Contractor, details of the major works carried out in this reporting period are listed below:

June 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;

- Marine piling and
- Installation of pier head segment

Land-based Works

- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Pre-drilling works;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and
- Slope work of Slopes 9SE-B/C9 and 9SE-B/F85.

July 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling; and,
- Installation of pier head segment.

Land-based Works

- Predrilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Pre-drilling works;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaducts A & B.

August 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling; and,
- Installation of pier head segment.

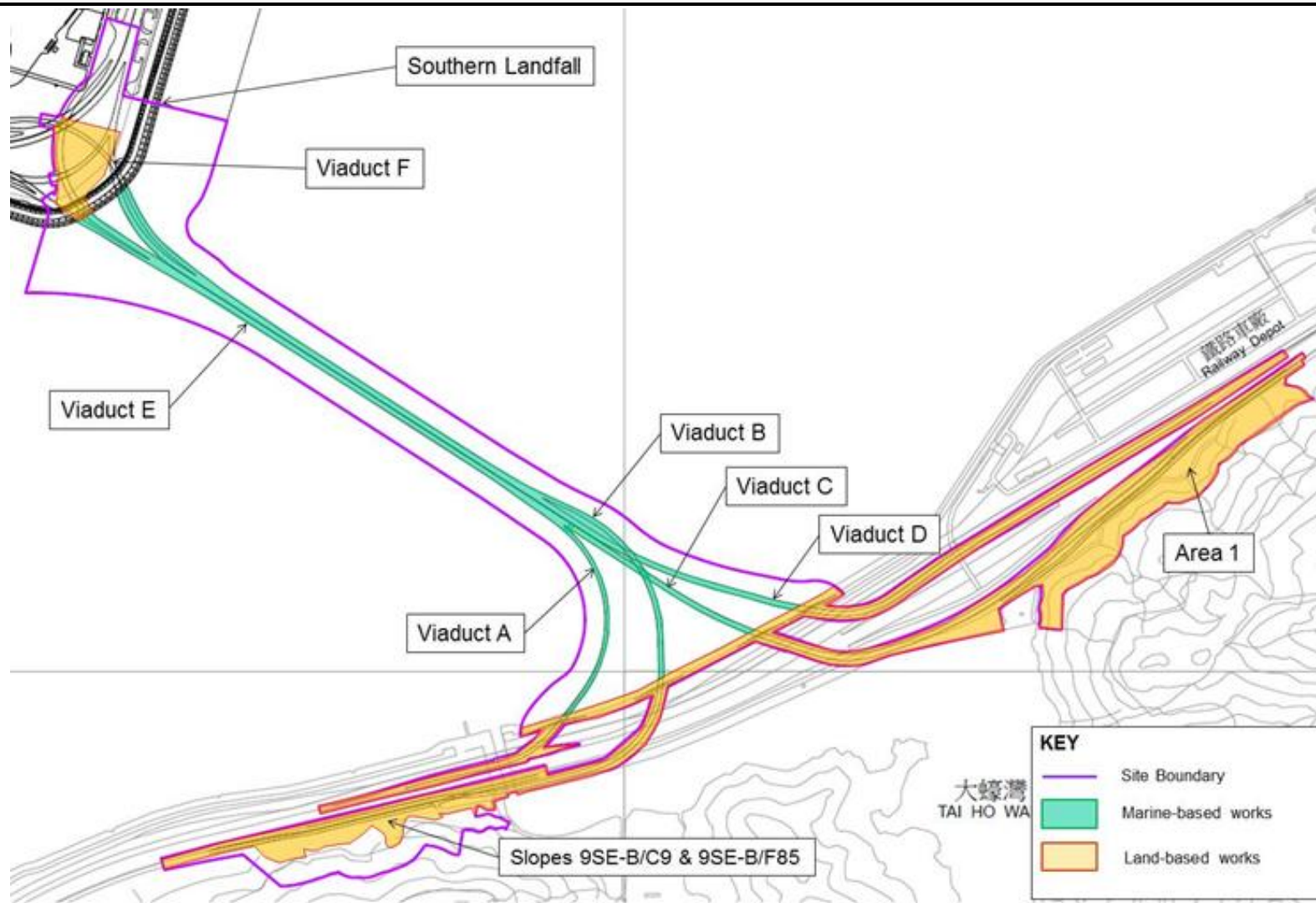
Land-based Works

- Predrilling at Viaduct F;

- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaducts A & B.

The locations of the construction activities are shown in *Figure 1.3*. The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.4*.

Figure 1.3 Locations of Construction Activities in the Reporting Period



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

1.5

SUMMARY OF EM&A PROGRAMME REQUIREMENTS

The EM&A programme required environmental monitoring for air quality, noise, 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 described in the following sections, which include:

- Monitoring parameters;
- Monitoring schedules for the reporting months and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event Action Plan;
- Results and observations;
- Environmental mitigation measures, as recommended in the approved EIA Report; and
- Environmental requirement in contract documents.

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

The baseline air quality monitoring undertaken by the Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects (HKZMB) during October 2011 has included the two monitoring stations ASR9A and ASR9C for this project. Thus, the baseline monitoring results and Action/ Limit Level presented in HKZMB Baseline Monitoring Report ⁽¹⁾ are adopted for this Project.

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual, impact 1-hour TSP monitoring was conducted three (3) times every six (6) days while the highest dust impact was expected. Impact 24-hour TSP monitoring was carried out once every six (6) days. The Action and Limit Levels of the air quality monitoring is provided in *Appendix D*.

1-hour TSP and 24-hour TSP monitoring were conducted at 2 alternative air quality monitoring stations, ASR8A (Area 4) and ASR9 (Entrance of MTR Depot) during the reporting period in accordance with the requirement of the Updated EM&A Manual. The monitoring stations are indicated in *Figure 2.1* and details are presented in *Table 2.1*.

High Volume Samplers (HVSs) were used for carrying out 1-hour and 24-hour TSP monitoring during the reporting period. The HVSs meets all requirements of the Updated EM&A Manual. Brand and model of the equipment are given in *Table 2.2*.

Wind data monitoring equipment was installed at Area 4 during the reporting period for logging wind speed and wind direction. The wind sensor was setup such that it was clear of obstructions or turbulence caused by building. The wind data monitoring equipment is recalibrated at least once every six months.

⁽¹⁾ Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation. Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.

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

Monitoring Station ⁽¹⁾	Monitoring Period	Location	Description	Parameters & Frequency
ASR8A	2, 8, 11, 17, 23 and 29 June 2015;	Area 4	On ground at the Area 4	<ul style="list-style-type: none"> 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times per day every 6 days 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour every 6 days
ASR9	2, 7, 13, 16, 22 and 28 July 2015; 3, 6, 12, 18, 24 and 27 August 2015	MTR Depot	On the ground nearby MTR Depot Entrance	

Note:

(1) Air Quality Monitoring Stations ASR9A and ASR9C at Siu Ho Wan MTRC Depot proposed in accordance with the Updated EM&A were relocated to ASR9 and ASR8A respectively.

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 Sensor	Global Water (Wind Speed Sensor: WE550; Wind Direction Sensor: WE570)
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 are provided in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

2.1.3 *Monitoring Schedule for the Reporting Quarter*

The schedules for air quality monitoring in the reporting quarter are provided in *Appendix E*.

2.1.4 *Results and Observations*

The monitoring results for 1-hour TSP and 24-hour TSP are summarized in *Tables 2.3* and *2.4*, respectively. Monitoring results are presented graphically in *Appendix F*. Detailed impact air quality monitoring results and meteorological information were reported in the *Twentieth to Twenty-second Monthly EM&A Report*.

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

Month	Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
June 2015	ASR 8A	59	41 - 95	394	500
	ASR 9	71	48 - 119	393	500
July 2015	ASR 8A	63	41 - 139	394	500
	ASR 9	73	41 - 116	393	500

Month	Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
August 2015	ASR 8A	88	58 - 148	394	500
	ASR 9	104	60 - 165	393	500

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

Month	Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
June 2015	ASR 8A	45	42 - 47	178	260
	ASR 9	47	45 - 49	178	260
July 2015	ASR 8A	51	44 - 75	178	260
	ASR 9	56	47 - 89	178	260
August 2015	ASR 8A	61	48 - 85	178	260
	ASR 9	68	51 - 101	178	260

The major dust sources in the reporting period include construction activities under the Contract as well as nearby traffic emissions.

In this reporting period, a total of eighteen (18) monitoring events were undertaken within the reporting period, in which no Action or Limit Level exceedance for 1-hour and 24-hour TSP for air quality was recorded during the reporting period.

2.2 NOISE MONITORING

The baseline noise monitoring undertaken by the Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects (HKZMB) during the period of 18 October to 1 November 2011 has included the monitoring station NSR1 for this project. Thus, the baseline monitoring results and Action/ Limit Level presented in *HKZMB Baseline Monitoring Report* ⁽¹⁾ are adopted for this Project.

2.2.1 *Monitoring Requirements and Equipment*

In accordance with the Updated EM&A Manual, impact noise monitoring should be conducted once per week during the construction phase of the Contract.

Noise monitoring was conducted at the alternative noise monitoring station, NSR1A (Pak Mong Village Pavilion) during the reporting period in accordance with the requirement of Updated EM&A Manual. *Figure 2.2* shows the location of the monitoring station. *Table 2.5* describes the details of the monitoring station.

Noise monitoring was performed using sound level meter at the designated monitoring station in the reporting quarter. The deployed sound level meter complies with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. Brand and model of the equipment is given in *Table 2.6*.

⁽¹⁾ Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation. Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.

Table 2.5 *Location of Impact Noise Monitoring Station and Monitoring Dates in this Reporting Period*

Monitoring Station	Monitoring Period	Location	Parameters & Frequency
NSR1A	2, 8, 11, 17, 23 and 29 June 2015; 2, 7, 13, 16, 22 and 28 July 2015; 3, 6, 12, 18, 24 and 27 August 2015	Pak Mong Village Pavilion	<ul style="list-style-type: none"> 30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays (Monday to Saturday). L_{eq}, L_{10} and L_{90} would be recorded. At least once a week

Note:
(1) Noise Monitoring Station NSR1 at Pak Mong Village proposed in accordance with the Updated EM&A was relocated to NSR1A.

Table 2.6 *Noise Monitoring Equipment*

Equipment	Brand and Model
Integrated Sound Level Meter	Rion NL-31
Acoustic Calibrator	Rion NC-73

2.2.2 *Action and Limit Levels*

The Action and Limit levels of the noise monitoring are provided in *Appendix D*. The Event and Action plan is presented in *Appendix J*.

2.2.3 *Monitoring Schedule for the Reporting Quarter*

The schedules for noise monitoring in the reporting quarter are provided in *Appendix E*.

2.2.4 *Results and Observations*

The monitoring results for noise monitoring are summarized in *Table 2.7*. Monitoring results are presented graphically in *Appendix G* and detailed impact noise monitoring results are reported in the *Twentieth to Twenty-second Monthly EM&A Report*.

Table 2.7 *Summary of Construction Noise Monitoring Results at NSR1A in the Reporting Period*

Month	Average, dB(A), L_{eq} (30mins)	Range, dB(A), L_{eq} (30mins)	Limit Level, dB(A), L_{eq} (30mins)
June 2015	59	58 - 60	75
July 2015	60	53 - 61	75
August 2015	58	57 - 60	75

A total of eighteen (18) monitoring events were undertaken in the reporting period with no Action Level and Limit Level exceedance recorded at the monitoring station in the reporting period. No action is thus required to be undertaken in accordance with the Event Action Plan presented in *Appendix J*.

Major noise sources during the noise monitoring included construction activities, nearby traffic noise and aircraft noise.

2.3

WATER QUALITY MONITORING

The baseline water quality monitoring undertaken by the Hong Kong – Zhuhai – Macao Bridge Hong Kong Projects (HKZMB) between 6 and 31 October 2011 has included all monitoring stations except SR4a for the Project. Thus, the baseline monitoring results except for station SR4a and Action/Limit Level presented in HKZMB Baseline Monitoring Report ⁽¹⁾ are adopted for this Project. Baseline water quality monitoring was conducted at station SR4a from 29 August to 24 September 2013.

2.3.1

Monitoring Requirements and Equipment

Impact water quality monitoring was carried out to ensure that any deterioration of water quality was detected, and that timely action was taken to rectify the situation. Impact water quality monitoring was undertaken three days per week during the construction period at seven water quality monitoring stations in accordance with the Updated EM&A Manual (*Figure 2.3; Table 2.8*).

Table 2.8 *Locations of Water Quality Monitoring Stations and the Corresponding Monitoring Requirements*

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850	<ul style="list-style-type: none"> • Temperature(°C) • pH(pH unit) • Turbidity (NTU) • Water depth (m) • Salinity (ppt) 	3 water depths: 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Contract.
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497	<ul style="list-style-type: none"> • DO (mg/L and % of saturation) • SS (mg/L) 		
IS8	Impact Station(Close to HKBCF construction site)	814251	818412			
SR4	Sensitive receiver (Tai Ho Inlet)	814760	817867			
SR4a	Sensitive receiver	815247	818067			
CS(Mf)3	Control Station	809989	821117			
CS(Mf)5	Control Station	817990	821129			

⁽¹⁾ Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation. Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
Notes:						
In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded.						

Table 2.9 summarizes the equipment used in the impact water quality monitoring programme.

Table 2.9 Water Quality Monitoring Equipment

Equipment	Brand and Model
DO, Temperature meter and Salinity	YSI Pro2030
Turbidimeter	HACH Model 2100Q
pH meter	HANNA HI8314 & Thermo Scientific Orion 2 Star
Positioning Equipment	Koden913MK2 with KBG-3 DGPS antenna
Water Depth Detector	Speedtech Instrument SM-5
Water Sampler	Kemmerer 1520 (1520-C25) 2.2L with messenger

2.3.2 Action & Limit Levels

The Action and Limit Levels of the water quality monitoring are provided in *Appendix D*.

2.3.3 Monitoring Schedule for the Reporting Quarter

The schedules for water quality monitoring in the reporting quarter are provided in *Appendix E*. The WQM on 7 July 2015 was cancelled due to adverse weather.

2.3.4 Results and Observations

Impact water quality monitoring was conducted at all designated monitoring stations in the reporting period. Monitoring results are presented graphically in *Appendix H* and detailed impact water quality monitoring results were reported in the *Twentieth to Twenty-second Monthly EM&A Reports*.

In this reporting period, a total of thirty-eight (38) monitoring events were undertaken with no Action Level and Limit Level exceedance recorded at the monitoring station in the reporting period. No action is thus required to be undertaken in accordance with the Event Action Plan presented in *Appendix J*.

The SS levels at IS8 on 25 July 2015 and IS(Mf)16 on 1 August 2015 during mid-ebb tide were higher than the corresponding Action Level but not higher than 120% of the upstream control station at the same tide on same day. Thus the results were not regarded as exceedances.

2.4 *DOLPHIN MONITORING*

2.4.1 *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.

2.4.2 *Monitoring Equipment*

Table 2.10 summarizes the equipment used for the impact dolphin monitoring.

Table 2.10 *Dolphin Monitoring Equipment*

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

2.4.3 *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.

2.4.4 *Monitoring Location*

The impact dolphin monitoring was carried out in the NEL and NWL along the line transect as depicted in *Figure 2.4*. The co-ordinates of all transect lines are shown in *Table 2.11* below.

Table 2.11 Impact Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	814577 (815456)	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805475	815457 (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	820690 (820880)	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	820847 (821123)	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	820892 (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	818449 (818853)	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807				
12	End Point	815542	824882				

Note:

Northing co-ordinates in bracket are the adjusted co-ordinates since August 2015 due to obstruction of permanent structures associated with construction works. Approval of the adjustments from EPD was received in July 2015.

2.4.5 *Action & Limit Levels*

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

2.4.6 *Monitoring Schedule for the Reporting Period*

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

2.4.7 *Results & Observations*

A total of 900.64 km of survey effort was collected, with 92.8% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 345.58 km and 555.06 km of survey effort were conducted in NEL and NWL survey areas respectively. The total survey effort conducted on primary lines was 655.74 km, while the effort on secondary lines was 244.90 km. Survey effort conducted on both primary and secondary lines were considered as on-effort survey data. The survey efforts are summarized in *Appendix I*.

During the six sets of monitoring surveys in June to August 2015, a total of twelve (12) groups of forty-two (42) Chinese White Dolphins were sighted. All dolphin sightings were made during on-effort search, and all of them were made on primary lines. In this quarterly period, all except one (1) dolphin groups were sighted in NWL, while one (1) group of a lone animal was sighted in NEL. Notably, this was the first dolphin sighted in NEL since monitoring surveys in July 2014. Summary table of the dolphin sightings is shown in *Appendix I*.

Encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) in the reporting period with the results presented in *Tables 2.12* and *2.13*.

Table 2.12 Individual Survey Event Encounter Rates

Survey Area	Survey period	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: 2 nd & 10 th Jun 2015	0.00	0.00
	Set 2: 24 th & 26 th Jun 2015	2.64	2.64
	Set 3: 2 nd & 7 th Jul 2015	0.00	0.00
	Set 4: 22 nd & 27 th Jul 2015	0.00	0.00
	Set 5: 10 th & 14 th Aug 2015	0.00	0.00
	Set 6: 19 th & 28 th Aug 2015	0.00	0.00
NWL	Set 1: 2 nd & 10 th Jun 2015	1.51	15.15
	Set 2: 24 th & 26 th Jun 2015	0.00	0.00
	Set 3: 2 nd & 7 th Jul 2015	1.69	3.38
	Set 4: 22 nd & 27 th Jul 2015	3.46	6.92
	Set 5: 10 th & 14 th Aug 2015	0.00	0.00
	Set 6: 19 th & 28 th Aug 2015	8.53	29.84

Note: Dolphin Encounter Rates are deduced from the six sets of surveys (two surveys in each set) in the reporting period in Northeast (NEL) and Northwest Lantau (NWL)

Table 2.13 Quarterly Average Encounter Rates

Survey Area	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)	
	June - August 2015	September - November 2011	June - August 2015	September - November 2011
Northeast Lantau	0.44 ± 1.08	6.00 ± 5.05	0.44 ± 1.08	22.19 ± 26.81
Northwest Lantau	2.53 ± 3.20	9.85 ± 5.85	9.21 ± 11.57	44.66 ± 29.85

Note: encounter rates deduced from the baseline monitoring period (September - November 2011) have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions

Except one (1) group of ten (10) individuals was sighted, group size of Chinese White Dolphins ranged from one (1) to five (5) individuals per group in North Lantau region during June 2015 to August 2015. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in *Table 2.14*.

Table 2.14 Comparison of Quarterly Average Encounter Rates

	Average Dolphin Group Size	
	June - August 2015	September - November 2011
Overall	3.50 ± 2.65 (n = 12)	3.72 ± 3.13 (n = 66)
Northeast Lantau	1.00 (n = 1)	3.18 ± 2.16 (n = 17)
Northwest Lantau	3.73 ± 2.65 (n = 11)	3.92 ± 3.40 (n = 49)

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June and August 2015. During this quarter of dolphin monitoring, no unacceptable impact from the activities of this Contract on Chinese White Dolphins was noticeable from the general observations.

Although the dolphins infrequently occurred along the alignment of TMCLKL Southern Connection Viaduct in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL, and many individuals have shifted away from the important habitat around the Brothers Islands.

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

2.4.8 *Marine Mammal Exclusion Zone Monitoring*

Daily marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. No Passive Acoustic Monitoring (PAM) was implemented as the marine piling works were not carried out outside the daylight hours in this reporting period. No sighting of the Indo-Pacific humpback dolphin *Sousa chinensis* (i.e. Chinese White Dolphin) was recorded in the monitoring period during the exclusion zone monitoring.

2.5 *EM&A SITE INSPECTION*

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. Thirteen (13) site inspections were carried out in the reporting quarter on 2, 10, 17 and 25 June 2015; 2, 9, 14, 22 and 30 July 2015; 7, 12, 19 and 27 August 2015.

Key observations during the site inspections in this reporting period are summarized in *Table 2.15*.

Table 2.15 Specific Observations Identified during the Weekly Site Inspection in this Reporting Period

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
2 June 2015	<p>Pier E11</p> <ul style="list-style-type: none"> Excessive soil was found in gutter. Stagnant water was accumulated in drip tray. <p>Pier E6</p> <ul style="list-style-type: none"> A label for sediment was missing on barge. <p>Barge G39</p> <ul style="list-style-type: none"> Some chemical containers were not placed in drip tray. 	<p>Pier E11</p> <ul style="list-style-type: none"> Gutter should be cleaned up regularly. Stagnant water should be removed to avoid runoff. <p>Pier E6</p> <ul style="list-style-type: none"> Type of sediment should be properly labelled.. <p>Barge G39</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray.
10 June 2015	<p>Area 1</p> <ul style="list-style-type: none"> Refuse was found in drainage. Some chemical containers were not placed in drip tray 	<p>Area 1</p> <ul style="list-style-type: none"> Refuse in drainage should be cleaned up. Chemical containers should be placed in drip tray.
17 June 2015	<p>Pier E13</p> <ul style="list-style-type: none"> The updated dumping permit was not displayed. A generator was not placed on acoustic decoupling pad. A drip tray was not plugged. 	<p>Pier E13</p> <ul style="list-style-type: none"> The updated dumping permit should be displayed. Generator on marine platform should be placed on acoustic decoupling pad. Drip tray should be plugged.
25 June 2015	<p>Site Entrance 4A</p> <ul style="list-style-type: none"> Cover of a dump truck was damaged. Excessive soil was found in drainage. Chemical containers were not placed in drip tray. <p>Barge G39</p> <ul style="list-style-type: none"> Chemical containers were not placed in drip tray. 	<p>Site Entrance 4A</p> <ul style="list-style-type: none"> Cover of a dump truck should be able to effectively cover dusty material. Soil in drainage should be cleaned up. Bund or sandbag should be provided to avoid soil runoff into drainage. Chemical containers should be placed in drip tray. <p>Barge G39</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray.
2 July 2015	<p>Area 1</p> <ul style="list-style-type: none"> Chemical containers were not placed in drip tray. Refuse was found in drainage. <p>Area 2</p> <ul style="list-style-type: none"> EP was not displayed. 	<p>Area 1</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray. Refuse in drainage should be cleaned up regularly. <p>Area 2</p> <ul style="list-style-type: none"> EP should be displayed.
9 July 2015	<p>Pier A2</p> <ul style="list-style-type: none"> Gutter was not properly installed. <p>Seafront</p> <ul style="list-style-type: none"> A drip tray was not plugged. A power pack was not placed in drip tray. Checklist for a wet sep was not displayed. 	<p>Pier A2</p> <ul style="list-style-type: none"> Gutter should be properly installed. <p>Seafront</p> <ul style="list-style-type: none"> Drip tray should be plugged. Power pack should be placed in drip tray. Checklist for wet sep should be displayed.

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
14 July 2015	<p>Area 1</p> <ul style="list-style-type: none"> The ground was partially dry. Some chemical containers were not placed in drip tray. The old EP was displayed. <p>Site Access 4A</p> <ul style="list-style-type: none"> A drip tray for air compressor contained stagnant water. <p>Pier D12 A</p> <ul style="list-style-type: none"> Stagnant water was accumulated in drip tray. <p>Pier D10</p> <ul style="list-style-type: none"> The ground was partially dry. Some chemical containers were not placed in drip tray. 	<p>Area 1</p> <ul style="list-style-type: none"> Unpaved area should be watered to avoid dust emission. Chemical containers should be placed in drip tray. The old EP was removed immediately. <p>Site Access 4A</p> <ul style="list-style-type: none"> Stagnant water in drip tray should be removed to avoid overflow. <p>Pier D12 A</p> <ul style="list-style-type: none"> Stagnant water in drip tray should be removed to avoid overflow. <p>Pier D10</p> <ul style="list-style-type: none"> Unpaved area should be watered to avoid dust emission. Chemical containers should be placed in drip tray.
22 July 2015	<p>Slope B/F8</p> <ul style="list-style-type: none"> Oil stain was found in drainage. Chemical containers were not placed in drip tray. <p>Slope B/C9</p> <ul style="list-style-type: none"> Chemical containers of Aqua Sed were not labelled. <p>Seafront</p> <ul style="list-style-type: none"> Chemical containers were not placed in drip tray. 	<p>Slope B/F8</p> <ul style="list-style-type: none"> Oil stain in drainage should be removed. Chemical containers should be placed in drip tray. <p>Slope B/C9</p> <ul style="list-style-type: none"> Chemical containers should be labelled. <p>Seafront</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray.
30 July 2015	<p>Pier D5</p> <ul style="list-style-type: none"> A drip tray for generator was not plugged. A decoupling mat was damaged. A part of gutter was damaged. <p>Barge Kiu Lik (next to Pier A7)</p> <ul style="list-style-type: none"> A drip tray for generator was not plugged. Some chemical containers were not placed in drip tray. <p>Pier E12</p> <ul style="list-style-type: none"> A generator was not placed on acoustic decoupling mat. 	<p>Pier D5</p> <ul style="list-style-type: none"> Drip tray for generator should be plugged. Damaged decoupling mat should be replaced by new decoupling mat. Damaged gutter should be repaired to avoid runoff. <p>Barge Kiu Lik (next to Pier A7)</p> <ul style="list-style-type: none"> Drip tray for generator should be plugged. Chemical containers should be placed in drip tray. <p>Pier E12</p> <ul style="list-style-type: none"> Generator should be placed on acoustic decoupling mat.
7 August 2015	<p>Pier C3</p> <ul style="list-style-type: none"> Stagnant water was accumulated in drip tray <p>Pier E12</p> <ul style="list-style-type: none"> Gutter was not properly installed. 	<p>Pier C3</p> <ul style="list-style-type: none"> Stagnant water in drip tray should be cleaned up to avoid runoff. <p>Pier E12</p> <ul style="list-style-type: none"> Gutter should be properly installed to avoid runoff.

Inspection Date	Location & Environmental Observations	Recommendations/ Remarks
12 August 2015	<p>Area 1</p> <ul style="list-style-type: none"> Chemical containers were placed too close to the natural habitat. Chemical containers were placed without drip tray. Soil stockpile next to drainage was not well covered. <p>Pier B14</p> <ul style="list-style-type: none"> Chemical containers were placed without drip tray. 	<p>Area 1</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray and away from natural habitat. Tarpaulin sheet or hydroseeding should be provided to the soil stockpile next to drainage. <p>Pier B14</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray.
19 August 2015	<p>Pier E6</p> <ul style="list-style-type: none"> Some chemical containers were not placed in drip tray. An expired dumping permit was displayed. <p>Pier E12</p> <ul style="list-style-type: none"> A drip tray was not plugged. <p>Pier B13</p> <ul style="list-style-type: none"> Refuse was found accumulated onsite. 	<p>Pier E6</p> <ul style="list-style-type: none"> Chemical containers should be placed in drip tray. Expired dumping permit should not be displayed. <p>Pier E12</p> <ul style="list-style-type: none"> Drip tray should be plugged. <p>Pier B13</p> <ul style="list-style-type: none"> Refuse should be regularly cleaned up
27 August 2015	<p>Abutment D</p> <ul style="list-style-type: none"> A label of chemical container was damaged. Checklist of wetsep was not displayed. Stagnant water was found in a drip tray for air compressor. <p>Pier E1</p> <ul style="list-style-type: none"> Excessive soil was found in gutter <p>Pier C4</p> <ul style="list-style-type: none"> A generator was not well placed on decoupling pad. 	<p>Abutment D</p> <ul style="list-style-type: none"> Chemical container should be properly labeled. Checklist of wetsep should be displayed. Stagnant water in drip tray should be removed to avoid runoff. <p>Pier E1</p> <ul style="list-style-type: none"> Excessive soil should be cleaned up regularly. <p>Pier C4</p> <ul style="list-style-type: none"> Stationary PME should be well placed on decoupling pad.

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

2.6 WASTE MANAGEMENT STATUS

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

Wastes generated during this reporting period include mainly construction wastes (inert and non-inert), imported fill, recyclable materials, chemical wastes and marine sediments (Categories L & M). Reference has been made to the waste flow table prepared by the Contractor (*Appendix K*). The quantities of different types of wastes are summarized in *Table 2.16*.

Table 2.16 Quantities of Different Waste Generated in the Reporting Period

Month/ Year	Inert Construction Waste ^(a) (m ³)	Imported Fill (m ³)	Inert Construction Waste Re- used (m ³)	Non-inert Construction Waste ^(b) (kg)	Recyclable Materials ^(c) (kg)	Chemical Wastes (kg)	Marine Sediment (m ³)	
							Category L	Category M
June 2015	7,166	0	1,351	89,930	119	17	324	287
July 2015	2,322	78	992	111,570	105	1,400	0	0
August 2015	1,265	0	105	87,760	133	1,200	0	0
Total	10,753	78	2,448	289,260	357	2,617	324	287

Notes:

- (a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill.
- (b) Non-inert construction wastes include general refuse disposed at landfill.
- (c) Recyclable materials include metals, paper, cardboard, plastics, timber and others.

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

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

2.7 ENVIRONMENTAL LICENSES AND PERMITS

The status of environmental licensing and permit is summarized in *Table 2.17* below.

Table 2.17 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-Mar-15	N/A	HyD	Tuen Mun- Chek Lap Kok Link
Construction Dust Notification	361571	5-Jul-13	N/A	GCL	-
Construction Dust Notification	362093	17-Jul-13	N/A	GCL	For Area 23
Chemical Waste Registration	5213-961-G2380-13	10-Oct-13	N/A	GCL	Chemical waste produced in Contract HY/2012/07 (Area 1 adjacent to Cheng Tung Road, Siu Ho Wan)
Chemical Waste Registration	5213-961-G2380-14	10-Oct-13	N/A	GCL	Chemical waste produced in Contract HY/2012/07 (Area 2 adjacent to Cheung Tung Road, Pak Mong Village)
Chemical Waste Registration	5213-974-G2588-03	4-Nov-13	N/A	GCL	Chemical waste produced in Contract HY/2012/07 (WA5 adjacent to Cheung Tung Road, Yam O)
Chemical Waste Registration	5213-951-G2380-17	12-Jun-14	N/A	GCL	Viaducts A, B, C, D & E
Construction Waste Disposal Account	7017735	10-Jul-13	N/A	GCL	-
Construction Waste Disposal Account	7019470	3-Mar-14	N/A	GCL	Vessel CHIT Account
Waste Water Discharge License	WT00019017-2014	13-May-14	31-May-19	GCL	Discharge for marine portion
Waste Water Discharge License	WT00019018-2014	13-May-14	31-May-19	GCL	Discharge for land portion
Construction Noise Permit	Nil	N/A	N/A	GCL	For Piling Works
Construction Noise Permit for night works and works in general holidays	GW-RW0093-15	26-Feb-15	26-Aug-15	GCL	General works at WA5

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Construction Noise Permit for night works and works in general holidays	GW-RS0307-15	27-Mar-15	27-Sep-15	GCL	For Load unload at NLH near Viaduct D
Construction Noise Permit for night works and works in general holidays	GW-RS0691-15	23-Jun-15	22-Dec-15	GCL	For Broad Permit
Construction Noise Permit for night works and works in general holidays	GW-RS0078-15	28-Jan-15	29-Jul-15	GCL	For Plant mobilization using tractor with trailer
Construction Noise Permit for night works and works in general holidays	GW-RS0539-15	14-May-15	31-Jul-15	GCL	B9-B16 Pier Head Segments Erection
Construction Noise Permit for night works and works in general holidays	GW-RS0137-15	12-Feb-15	15-Aug-15	GCL	Pre-casted pile cap shell installation at E10-E13
Construction Noise Permit for night works and works in general holidays	GW-RW0695-15	30-Jun-15	30-Nov-15	GCL	Segment Erection between B6-B11 by LG1
Construction Noise Permit for night works and works in general holidays	GW-RS0491-15	8-May-15	30-Jun-15	GCL	TTA Case 009 Ch.2.1E-4.2E
Construction Noise Permit for night works and works in general holidays	GW-RS0489-15	8-May-15	7-Aug-15	GCL	B8 Pier Head Temp Works Lifting
Construction Noise Permit for night works and works in general holidays	GW-RS0539-15	14-May-15	31-Jul-15	GCL	B9-B16 Pier Head Segments Erection
Construction Noise Permit for night works and works in general holidays	GW-RS0769-15	15-Jul-15	30-Sep-15	GCL	TTA Case 009 Ch.2.1E-4.2E
Construction Noise Permit for night works and works in general holidays	GW-RW0422-15	21-Aug-15	25-Jan-16	GCL	General works at WA5
Construction Noise Permit for night works and works in general holidays	GW-RS0911-15	27-Aug-15	26-Feb-16	GCL	Broad Permit for Seg. Launching at Land Portion
Construction Noise Permit for night works and works in general holidays	GW-RS0855-15	12-Aug-15	11-Feb-16	GCL	Pier construction at C7, D8, D9
Construction Noise Permit for night works and works in general holidays	GW-RW0861-15	13-Aug-15	30-Sep-15	GCL	Portal beam installation at Pier D14
Marine Dumping Permit	EP/MD/16-020	22-May-15	26-Jun-15	GCL	For dumping Type I (Dedicated Site) and Type II sediment

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Marine Dumping Permit	EP/MD/15-257	2-Apr-15	7-Oct-15	GCL	For dumping Type I sediment

2.8 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

In response to the site audit findings, the Contractor has carried out corrective actions.

A summary of the Environmental Mitigation and Enhancement Measure Implementation Schedules (EMIS) is presented in *Appendix C*. The necessary mitigation measures were implemented properly for this Contract.

2.9 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

Results for 1-hour TSP, 24-hour TSP, construction noise and water quality complied with the Action/ Limit levels in the reporting period.

The construction impact on depth-averaged SS was assessed by comparing the quarterly mean values of depth-averaged SS with the relevant ambient mean values. Except CS(Mf)3, SR4, IS8 and IS(Mf)9 during mid-flood tide, results showed that the quarterly means of depth-averaged SS at all sampling stations during both mid-ebb and mid-flood tides were higher than the corresponding ambient means (*Table 2.18*). One-way ANOVA was conducted to examine whether there is significant difference of depth-averaged SS between ambient levels and results in this quarter. Statistical significant differences were only found at control stations CS(Mf)3 ($F_{1,68} = 11.6, p = 0.001$) and CS(Mf)5 ($F_{1,72} = 10.6, p = 0.002$) during mid-ebb tide between ambient level and impact monitoring of this quarter. No significant difference was detected at impact monitoring stations. The analytical results suggested that the increased SS levels are likely due to the natural fluctuation in the western waters of Hong Kong. The ET will monitor the trend of depth-averaged SS in the upcoming quarters to determine whether there is any change in water quality associated with this Project and further mitigation measures will be recommended if deemed necessary.

Table 2.18 *Comparison between Quarterly Mean and Ambient Mean Values of Depth-averaged Suspended Solids*

Station	Baseline Mean		Ambient Mean ^(a)		Quarterly Mean (June 2015 to August 2015)	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
CS(Mf)3	9.2	12.8	12.0	16.6	15.8	14.5
CS(Mf)5	9.2	11.5	11.9	14.9	15.3	14.9
SR4	10.3	12.3	13.4	16.0	15.1	14.4
SR4a	9.1	9.8	11.9	12.7	15.1	14.3
IS8	11.3	13.5	14.6	17.6	14.9	14.5
IS(Mf)9	10.9	14.3	14.2	18.5	14.8	14.3
IS(Mf)16	11.4	10.3	14.8	13.4	15.5	14.4

Notes:

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

One (1) Limit Level exceedance was recorded for impact dolphin monitoring in this reporting quarter. Following the review of the monitoring data and marine works details as per the procedure stipulated in the Event and Action Plan of the Updated EM&A Manual, there was no unacceptable impact on dolphin usage in the North Lantau region associated with construction works under this Contract. Investigation findings were detailed in *Appendix L*.

2.10 *SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS*

The Environmental Complaint Handling Procedure is provided in *Figure 2.5*.

One (1) environmental complaint with regard to dust emission from vehicles of this Project was received on 18 June 2015. An investigation was carried out by ET on 18 June 2015. Another investigation was conducted by EPD with SOR and Contractor on 19 June 2015. The complaint was followed-up in accordance with the Environmental Complaint Handling Procedure. Detailed investigation report for the complaint is presented in *Appendix L*.

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING QUARTER

As informed by the Contractor, the major works for the Contract in the coming quarter are summarized below:

September 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Marine piling; and,
- Installation of pier head segment.

Land-based Works

- Predrilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Land piling;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaduct A.

October 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly;
- Installation of deck segment and pier head segment.

Land-based Works

- Predrilling at Viaduct F;
- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Installation of pier head segment;
- Additional land GI, trial pits & lab testing;
- Relocation of MTRC fence; and,
- Slope work of Viaduct A.

November 2015

Marine Works

- Construction and installation of pile caps;
- Uninstallation of marine piling platform;
- Pier construction;
- Launching gantry assembly; and
- Installation of deck segment and pier head segment.

Land-based Works

- Construction and installation of pile caps;
- Pier construction;
- Re-alignment of Cheung Tung Road;
- Installation of pier head segment; and
- Slope work of Viaduct A.

3.2 *KEY ISSUES FOR THE COMING QUARTER*

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

3.3 *MONITORING SCHEDULE FOR THE COMING QUARTER*

Impact monitoring for air quality, noise, marine water quality and dolphin monitoring are scheduled to continue for the next reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress.

4.1 CONCLUSIONS

This Seventh Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 June to 31 August 2015, in accordance with the Updated EM&A Manual and the requirements of the *Environmental Permit (EP-354/2009/D)*.

Neither Action Level nor Limit Level exceedances were observed for air quality, noise and water quality monitoring in this reporting period.

A total of twelve (12) groups of forty-two (42) Chinese White Dolphins were sighted during the six sets of survey from June to August 2015. Whilst one (1) Limit Level exceedance was recorded for the quarterly dolphin monitoring data between June and August 2015, no unacceptable impact from the activities of this Contract on Chinese White Dolphins was noticeable from the general observations. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

Environmental site inspection was carried out thirteen (13) times in the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audits.

One (1) environmental complaint regarding dust emission from vehicles of this Project was received in the reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not recommended at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.