


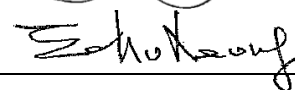
# China Harbour Engineering Company Limited

Contract No. HY/2010/02

## Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works

### Quarterly EM&A Summary Report for March 2016 – May 2016

[12/2016]

	Name	Signature
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5 January 2017

By Fax (3698 5999) and By Post

Ove Arup & Partners  
Chief Resident Engineer's Office  
5 Ying Hei Road, Tung Chung, Lantau  
Hong Kong

Attention: Mr. Paul Appleton

Dear Sir,

**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/2010/02 – HZMB HKBCF – Reclamation Works  
Quarterly EM&A Report for March 2016 to May 2016**

Reference is made to the Environmental Team's submission of the Quarterly Environmental Monitoring & Audit Report for March 2016 to May 2016 certified by the ET Leader (ET's ref.: "60249820/C/RMKY16122802" dated 28 December 2016) and provided to us via e-mail on 28 December 2016.

We are pleased to inform you that we have no adverse comment on the captioned Quarterly Environmental Monitoring & Audit Report for March 2016 to May 2016.

Please be reminded that our verification to your report does not release any of your obligations in the EM&A Manual under the applicable Environmental Permit(s) for this Project.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,  
For and on behalf of  
Ramboll Environ Hong Kong Limited



Raymond Dai  
Independent Environmental Checker

c.c.	HyD	Mr. Vico Cheung	(By Fax: 3188 6614)
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Internal: DY, YH, ENPO Site

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## EXECUTIVE SUMMARY

Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works (here below, known as “the Contract”) mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL). It is a designated Project and is governed by the current permits for the Project, i.e. the amended Environmental Permits (EPs) issued on 11 April 2016 (EP-353/2009/K) and 13 March 2015 (EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only).

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project’s reclamation works (i.e. the Engineer for the Contract).

China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Contract.

Ramboll Environ Hong Kong Limited. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Contract for carrying out the environmental monitoring and audit (EM&A) works.

The construction phase of the Project under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2017. The EM&A programme, including air quality, noise, water quality and dolphin monitoring and environmental site inspections, was commenced on 12 March 2012.

This report documents the findings of EM&A works conducted in the period between 1 March 2016 and 31 May 2016. As informed by the Contractor, major activities in the reporting quarter were:-

### **Marine-base**

- Sloping Seawalls
- Rubble Mound Seawall
- Rock fill
- Maintenance of silt curtain & silt screen at sea water intake of HKIA (As informed by the Contractor, the silt curtain at NE Airport Cooling Water Intake has been removed on 10 May 2016.)

### **Land-base**

- Surcharge removal & laying
- Deep Cement Mixing
- Installations of Precast Culverts except sloping outfalls
- Construction of Sloping Outfalls
- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2

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

24-hour Total Suspended Particulates (TSP) monitoring	16 sessions
1-hour TSP monitoring	16 sessions
Noise monitoring	13 sessions
Impact water quality monitoring	38 sessions
Impact dolphin monitoring	6 surveys
Joint Environmental site inspection	13 sessions

#### **Breaches of Action and Limit Levels for Air Quality**

All 1-Hour TSP and 24-Hour TSP results were below the Action and Limit Level in the reporting quarter.

#### **Breaches of Action and Limit Levels for Noise**

For construction noise, no exceedance was recorded at all monitoring stations in the reporting quarter.

#### **Breaches of Action and Limit Levels for Water Quality**

For water quality monitoring, one (1) Limit level impact water quality monitoring exceedance at monitoring station SR(4)N has been recorded on 20 May 2016 during flood tide. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

#### **Breaches of Action and Limit Levels for Impact Dolphin Monitoring**

One (1) Limit Level exceedance of dolphin monitoring was recorded in the reporting quarter. After investigation, it was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified nor separate from the other stress factors. Event Action Plan for Impact Dolphin Monitoring was triggered. For detail of investigation, please refer to appendix L.

#### **Implementation Status and Review of Environmental Mitigation Measures**

Most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting quarter.

The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Project. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

#### **Complaint, Notification of Summons and Successful Prosecution**

No environmental complaint, notification of summons or prosecution was received in the reporting period

## 1 INTRODUCTION

### 1.1 Background

- 1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works (here below, known as “the Contract”) mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).
- 1.1.2 The environmental impact assessment (EIA) reports (Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – EIA Report (Register No. AEIAR-145/2009) (HKBCFEIA) and Tuen Mun – Chek Lap Kok Link – EIA Report (Register No. AEIAR-146/2009) (TMCLKLEIA), and their environmental monitoring and audit (EM&A) Manuals (original EM&A Manuals), for the Project were approved by Environmental Protection Department (EPD) in October 2009.
- 1.1.3 EPD subsequently issued the Environmental Permit (EP) for HKBCF in November 2009 (EP-353/2009) and the Variation of Environmental Permit (VEP) in June 2010 (EP-353/2009/A), November 2010 (EP-353/2009/B), November 2011 (EP-353/2009/C), March 2012 (EP-353/2009/D), October 2012 (EP-353/2009/E), April 2013 (EP-353/2009/F), August 2013 (EP-353/2009/G), January 2015 (EP-353/2009/H), July 2015 (EP-353/2009/I), February 2016 (EP-353/2009/J) and April 2016 (EP-353/2009/K). Similarly, EPD issued the Environmental Permit (EP) for TMCLKL in November 2009 (EP-354/2009) and the Variation of Environmental Permit (VEP) in December 2010 (EP-354/2009/A), January 2014 (EP-354/2009/B), December 2014 (EP-354/2009/C) and March 2015 (EP-354/2009/D).
- 1.1.4 The Project is a designated Project and is governed by the current permits for the Project, i.e. the amended EPs issued on 11 April 2016 (EP-353/2009/K) and 13 March 2015 (EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only).
- 1.1.5 A Contract Specific EM&A Manual, which included all Contract -relation contents from the original EM&A Manuals for the Contract, was issued in May 2012.
- 1.1.6 Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project’s reclamation works (i.e. the Engineer for the Contract).
- 1.1.7 China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Contract.
- 1.1.8 Ramboll Environ Hong Kong Limited was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.
- 1.1.9 AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Contract for carrying out the EM&A works.
- 1.1.10 The construction phase of the Project under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2017.
- 1.1.11 According to the Contract Specific EM&A Manual, there is a need of an EM&A programme including air quality, noise, water quality and dolphin monitoring and environmental site inspections. The EM&A programme of the Contract commenced on 12 March 2012.

### 1.2 Scope of Report

- 1.2.1 This is the seventeenth quarterly EM&A Report under the Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works. This report

presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Contract from 1 March 2016 to 31 May 2016.



### 1.3 Contract Organization

1.3.1 The Contract organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

**Table 1.1 Contact Information of Key Personnel**

Party	Position	Name	Telephone	Fax
<b>Engineer's Representative (ER)</b>  (Ove Arup & Partners Hong Kong Limited)	Chief Resident Engineer	Paul Appleton	3698 5889	2698 5999
<b>IEC / ENPO</b>  (Ramboll Environ Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	3465 2888	3465 2899
	Environmental Project Office Leader	Y. H. Hui	3547 2133	3465 2899
<b>Contractor</b>  (China Harbour Engineering Company Limited)	Environmental Officer	Louie Chan	36932254	2578 0413
	24-hour Hotline	Alan C.C. Yeung	9448 0325	--
<b>ET</b>  (AECOM Asia Company Limited)	ET Leader	Echo Leong	3922 9280	2317 7609

#### 1.4 Summary of Construction Works

1.4.1 The construction phase of the Project under the EP commenced on 12 March 2012.

1.4.2 As informed by the Contractor, details of the major works carried out in the reporting quarter are listed below:-

##### **Marine-base**

- Sloping Seawalls
- Rubble Mound Seawall
- Rock fill
- Maintenance of silt curtain & silt screen at sea water intake of HKIA (As informed by the Contractor, the silt curtain at NE Airport Cooling Water Intake has been removed on 10 May 2016.)

##### **Land-base**

- Surcharge removal & laying
- Deep Cement Mixing
- Installations of Precast Culverts except sloping outfalls
- Construction of Sloping Outfalls
- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2

1.4.3 The 3-month rolling construction programme of the Contract is shown in Appendix B.

1.4.4 The general layout plan of the Contract site showing the detailed works areas is shown in Figure 1.

1.4.5 The environmental mitigation measures implementation schedule are presented in Appendix C.

## 2 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

### 2.1 Monitoring Parameters

- 2.1.1 The Contract Specific EM&A Manual designated 4 air quality monitoring stations, 2 noise monitoring stations, 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations) to monitor environmental impacts on air quality, noise and water quality respectively. Pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast and Northwest Lantau survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.
- 2.1.2 For impact air quality monitoring, monitoring locations AMS2 (Tung Chung Development Pier) and AMS7 (Hong Kong SkyCity Marriott Hotel) were set up at the proposed locations in accordance with Contract Specific EM&A Manual. The conditional omission of Monitoring Station AMS6 was effective since 19 November 2012. For monitoring location AMS3 (Ho Yu College), as proposed in the Contract Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact air quality monitoring was conducted at site boundary of the site office area in Works Area WA2 (AMS3B) respectively. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location.
- 2.1.3 For impact noise monitoring, monitoring locations NMS2 (Seaview Crescent Tower 1) was set up at the proposed locations in accordance with Contract Specific EM&A Manual. However, for monitoring location NMS3 (Ho Yu College), as proposed in the Contract Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact noise monitoring was conducted at site boundary of the site office area in Works Area WA2 (NMS3B) respectively. Same baseline noise level, as derived from the baseline monitoring data recorded at Ho Yu College was adopted for this alternative noise monitoring location. Reference is made to ET's proposal of relocation of air quality monitoring station (AMS7) dated on 2 February 2015, with no further comment received from IEC on 2 February 2015 and no objection received from EPD on 5 February 2015, the impact air quality monitoring station AMS7 (Hong Kong SkyCity Marriott Hotel) has been relocated to AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) on 3 February 2015. Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel, was adopted for this alternative air quality location.
- 2.1.4 As informed by the premises owner of (AMS7A) - Chu Kong Air-Sea Union Transportation Co. LTD would not grant us the permission to install air quality monitoring equipment (High volume sampler) and conduct 1-hour TSP/24 hour TSP monitoring at the premises of Chu Kong Air-Sea Union Transportation Co. LTD after December 2015. In order to fulfil the EM&A requirement of this Contract, as permission to conduct impact air quality monitoring at the premise of Hong Kong SkyCity Marriott Hotel has been granted in December 2015, ET proposed relocation of air quality monitoring station (AMS7A) on 15 December 2015, with no further comment received from IEC on 15 December 2015 and no particular comment received from EPD on 21 December 2015, the impact air quality monitoring station AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) has been relocated to AMS7 (Hong Kong SkyCity Marriott Hotel) on 30 December 2015. The impact air quality monitoring for December 2015 was conducted before the relocation of AQM Station from AMS7A to AMS7. The impact air quality monitoring has been conducted at AMS7 (Hong Kong SkyCity Marriott Hotel) since 1 January 2016, Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel will be adopted for this air quality monitoring location.
- 2.1.5 In accordance with the Contract Specific EM&A Manual, twenty-one stations were designated for impact water quality monitoring. The nine Impact Stations (IS) were chosen on the basis of their proximity to the reclamation and thus the greatest potential for water quality impacts, the seven Sensitive Receiver Stations (SR) were chosen as they are close to the key sensitive receives and the

five Control/ Far Field Stations (CS) were chosen to facilitate comparison of the water quality of the IS stations with less influence by the Project/ ambient water quality conditions.

- 2.1.6 Due to safety concern and topographical condition of the original locations of SR4 and SR10B, alternative impact water quality monitoring stations, naming as SR4(N) and SR10B(N), were adopted, which are situated in vicinity of the original impact water quality monitoring stations (SR4 and SR10B) and could be reachable. Same baseline and Action Level for water quality, as derived from the baseline monitoring data recorded, were adopted for these alternative impact water quality monitoring stations.
- 2.1.7 The monitoring locations used during the reporting quarter are depicted in Figures 2, 3 and 4 respectively.
- 2.1.8 The Contract Specific EM&A Manual also required environmental site inspections for air quality, noise, water quality, chemical, waste management, marine ecology and landscape and visual impact.

## **2.2 Environmental Quality Performance (Action/Limit Levels)**

- 2.2.1 The environmental quality performance limits (i.e. Action and/or Limit Levels) of air and water quality monitoring were derived from the baseline air and water quality monitoring results at the respective monitoring stations, while the environmental quality performance limits of noise monitoring were defined in the EM&A Manual.
- 2.2.2 The environmental quality performance limits of air quality, noise and water monitoring are given in Appendix D.

## **2.3 Environmental Mitigation Measures**

- 2.3.1 Relevant environmental mitigation measures were stipulated in the Particular Specification and EPs (EP-353/2009/K and EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only) for the Contractor to adopt. A list of environmental mitigation measures and their implementation statuses are given in Appendix C.

### 3 MONITORING RESULTS

#### 3.1 Air Quality Monitoring

- 3.1.1 In accordance with the Contract Specific EM&A Manual, impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days at the 4 monitoring stations (AMS2, AMS3B, AMS6 and AMS7).
- 3.1.2 The monitoring locations for impact air quality monitoring are depicted in Figure 2. However, for AMS6 (Dragonair/CNAC (Group) Building), permission on setting up and carrying out impact monitoring works was sought, however, access to the premise has not been granted yet on this report issuing date.
- 3.1.3 As informed by the premises owner of (AMS7A) - Chu Kong Air-Sea Union Transportation Co. LTD would not grant us the permission to install air quality monitoring equipment (High volume sampler) and conduct 1-hour TSP/24 hour TSP monitoring at the premises of Chu Kong Air-Sea Union Transportation Co. LTD after December 2015. In order to fulfil the EM&A requirement of this Contract, as permission to conduct impact air quality monitoring at the premise of Hong Kong SkyCity Marriott Hotel has been granted in December 2015, ET proposed relocation of air quality monitoring station (AMS7A) on 15 December 2015, with no further comment received from IEC on 15 December 2015 and no particular comment received from EPD on 21 December 2015, the impact air quality monitoring station AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) has been relocated to AMS7 (Hong Kong SkyCity Marriott Hotel) on 30 December 2015. The impact air quality monitoring for December 2015 was conducted before the relocation of AQM Station from AMS7A to AMS7. The impact air quality monitoring for this report quarter were conducted at AMS7 (Hong Kong SkyCity Marriott Hotel), Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel will be adopted for this air quality monitoring location.
- 3.1.4 The weather was mostly fine and sunny, with occasional cloudy in the reporting quarter. The major dust source in the reporting quarter included construction activities from the Project, as well as nearby traffic emissions.
- 3.1.5 The number of monitoring events and exceedances recorded in each month of the reporting quarter are presented in Table 3.1 and Table 3.2 respectively.

**Table 3.1 Summary of Number of Monitoring Events for 1-hr & 24-hr TSP Concentration**

Monitoring Parameter	Location	No. of monitoring events		
		March 16	April 16	May 16
1-hr TSP	AMS2	15	18	15
	AMS3B	15	18	15
	AMS7	15	18	15
24-hr TSP	AMS2	5	6	5
	AMS3B	5	6	5
	AMS7	5	6	5

**Table 3.2 Summary of Number of Exceedances for 1-hr & 24-hr TSP Monitoring**

Monitoring Parameter	Location	Level of Exceedance	Numbers of Exceedance		
			March 16	April 16	May 16
1-hr TSP	AMS2	Action	0	0	0
		Limit	0	0	0
	AMS3B	Action	0	0	0
		Limit	0	0	0
	AMS7	Action	0	0	0
		Limit	0	0	0
		<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>
24-hr TSP	AMS2	Action	0	0	0
		Limit	0	0	0

	AMS3B	Action	0	0	0
		Limit	0	0	0
	AMS7	Action	0	0	0
		Limit	0	0	0
		<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

- 3.1.6 All 24-Hour TSP and 1-Hour TSP results were below the Action and Limit Level in the reporting quarter.
- 3.1.7 The event action plan is annexed in Appendix K.
- 3.1.8 Meteorological information collected from the wind station during the monitoring periods on the monitoring dates, as shown in Figure 2, including wind speed and wind direction, is annexed in Appendix H of monthly EM&A report March 2016, April 2016 and May 2016 respectively.
- 3.1.9 Due to electricity failure, the 24-hour TSP Monitoring at Station AMS3B - Site Boundary of Site Office (WA2) was rescheduled from 23 May 2016 - 24 May 2016 to 24 May 2016 - 25 May 2016.

### 3.2 Noise Monitoring

- 3.2.1 Impact noise monitoring was conducted at the 2 monitoring stations (NMS2 and NMS3B) for at least once per week during 07:00 – 19:00 in the reporting quarter.
- 3.2.2 The monitoring locations used during the reporting quarter are depicted in Figure 2.
- 3.2.3 No Action or Limit Level Exceedance of construction noise was recorded in the reporting quarter.
- 3.2.4 Major noise sources during the noise monitoring included construction activities of the Project and nearby traffic noise.
- 3.2.5 The number of impact noise monitoring events and exceedances are summarized in Table 3.3 and Table 3.4 respectively.

**Table 3.3 Summary of Number of Monitoring Events for Impact Noise**

Monitoring Parameter	Location	No. of monitoring events		
		March 16	April 16	May 16
	NMS2	4	4	5
	NMS3B	4	4	5

**Table 3.4 Summary of Number of Monitoring Exceedances for Impact Noise**

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance		
			March 16	April 16	May 16
	NMS2	Action	0	0	0
		Limit	0	0	0
	NMS3B	Action	0	0	0
		Limit	0	0	0
		<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

- 3.2.6 The graphical plots of the trends of the monitoring results are provided in Appendix F. No specific trend of the monitoring results or existence of persistent pollution source was noted.
- 3.2.7 The event action plan is annexed in Appendix K.



### 3.3 Water Quality Monitoring

3.3.1 The monitoring locations used during the reporting quarter are depicted in Figure 3.

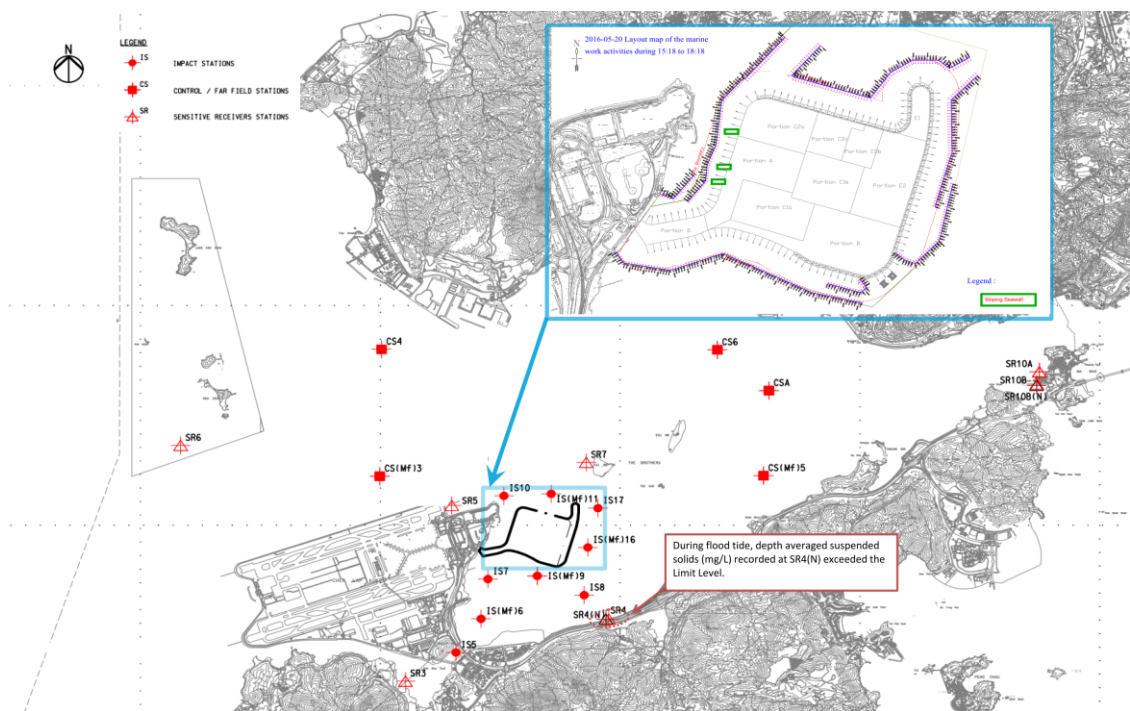
**Table 3.5 Summary of Water Quality Exceedances in March 2016 – May 2016**

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)6	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS8	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)9	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS10	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)11	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)16	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS17	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR3	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR4(N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	1 20 May 16	0	1 20 May 16
SR5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR6	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR10A	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR10B (N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>Action</b>	0	0	0	0	0	0	0	0	0	
	<b>Limit</b>	0	0	0	0	0	0	0	1 20 May 16	1 20 May 16	

Note: S: Surface;  
 M: Mid-depth;

3.3.2 For the limit Level Exceedance of Suspended Solids at water quality monitoring station SR4(N) was measured on 20 May 2016 during flood tide. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

3.3.2.1 Below layout map shows that marine based construction works such as box culverts and seawall construction was carried out at Portion D and Portion A of HKBCF Reclamation Works.

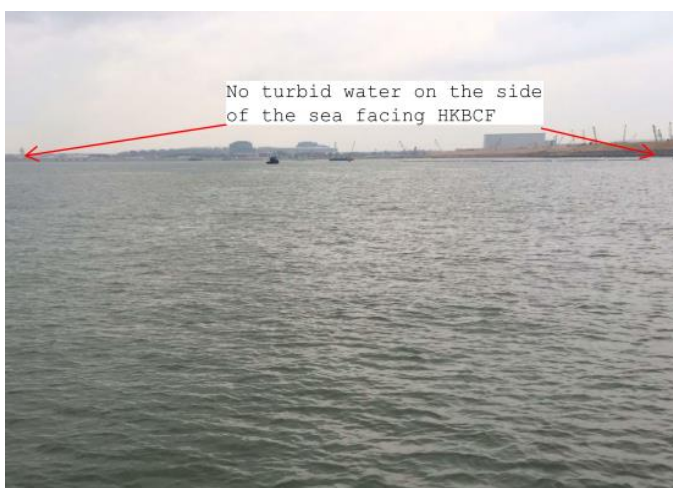


3.3.2.2 Exceedances recorded at SR4(N) during mid-flood tide are unlikely due to marine based construction activities of the Contract because:

3.3.2.3 With reference to the silt curtain checking record, no defect was observed at southern and southeastern parts of the perimeter silt curtain which are facing SR4(N).

3.3.2.4 With referred to the attached layout map, marine based construction works such as seawall construction were conducted at Portion A and Portion C2A, however no silt plume was observed to flow from the inside of the perimeter silt curtain to the outside of the perimeter silt curtain when monitoring was conducted during flood tide. (Also see attached Photo record 1 for sea condition observed on 20 May 2016 during flood tide.)

3.3.2.5 Photo record 1 which shows the sea condition at southern and southeastern part of the HKBCF reclamation works during flood tide on 20 May 2016. No turbid water was observed.



- 3.3.2.6 Also, turbidity and suspended solids levels recorded at IS7, IS8, IS(Mf)9 and IS(Mf)16 were below the action and limit level. This indicates that the turbidity and suspended solids levels recorded at monitoring stations closer to the active works, were not adversely affected. As such, the exceedances recorded at SR4(N) were unlikely attribute to the active works of this Contract.
- 3.3.2.7 With referred to the photo record 2 taken at monitoring station SR4(N) on 20 May 2016 (also see attached photo record) turbid water was observed at this area. However, with referred to the photo record 1 taken at southern and southeastern part of the HKBCF reclamation works during flood tide on 20 May 2016, turbid water was not noted. Photo record 2 shows that vessel activities was observed when monitoring was conducted at monitoring location SR4(N), as confirmed with the Contractor of HY/2010/02, this Contract did not have any construction vessels working outside the site boundary of Contract HY/2010/02 on 20 May 2016 (also refer to the above layout map).
- 3.3.2.8 Photo record 2 which shows the sea condition taken on 20 May 2016 at near monitoring location SR4(N) and facing monitoring station SR4(N), turbid water was observed at this area.



- 3.3.2.9 The exceedances were likely due to local effects in the vicinity of SR4(N).
- 3.3.2.10 After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.
- 3.3.2.11 Action taken under the action plan:
1. Not applicable as SS was not measured in situ;
  2. After considering the above mentioned investigation results, it appears that it was unlikely that the suspended solids exceedance was attributed to active construction activities of this Contract;
  3. IEC, Contractor, ER and EPD were informed via email;
  4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
  5. Since it is considered that the suspended solids exceedance is unlikely to be contract related, as such, actions 5-7 under the EAP are not considered applicable.

- 3.3.2.12 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains and to carry out maintenance work once defects were found.
- 3.3.2.13 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except Sunday and public holiday.
- 3.3.2.14 The Contractor was reminded to adhere to the environmental permit requirement and undertake the necessary mitigation measures after the realignment of the perimeter silt curtain near southeastern corner of HKBCF Reclamation Works, as necessary.
- 3.3.2.15 No exceedance was recorded at all other monitoring stations in the reporting period.
- 3.3.3 The Impact Water Quality Monitoring originally scheduled on 27 May 2016 was cancelled due to Tropical Cyclone Warning Signal No.3 was hoisted.
- 3.3.4 The event action plan is annexed in Appendix K.

### 3.4 Dolphin Monitoring

- 3.4.1 In accordance with the Contract Specific EM&A Manual, pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast Lantau (NEL) and Northwest Lantau (NWL) survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.
- 3.4.2 The impact dolphin monitoring conducted is vessel-based and combines line-transect and photo-ID methodology, which have adopted similar survey methodologies as that adopted during baseline monitoring to facilitate comparisons between datasets.
- 3.4.3 The layout map of impact dolphin monitoring have been provided by AFCD and is shown in Figure 4.
- 3.4.4 The effort summary and sighting details during the reporting quarter are shown in the Appendix H. A summary of key findings of the dolphin surveys completed during the reporting quarter is shown below:

**Table 3.6 Summary of Key Dolphin Survey Findings in March 2016 – May 2016**

Number of Impact Surveys Completed <sup>^</sup>	6
Survey Distance Travelled under Favourable On- Effort Condition	633.6km
Number of Sightings	15 sightings (6 sightings are "on effort" (which are all under favourable condition), 9 sightings are "opportunistic")
Number of dolphin individual sighted	59 individuals (the best estimated group size)
Dolphin Encounter Rate#	NEL: 0 NWL: 1.4
Dolphin Group Size	Average of NEL: 0 Average of NWL: 3.8 Varied from 1-8 individuals
Most Often frequent dolphin sighting area	Northern Sha Chau and Lung Kwu Chau Marine Park, the western limit of NWL and Tai O area.

Remarks:

<sup>^</sup> Completion of line transect survey of NEL and NWL survey area once was counted as one complete survey.  
<sup>#</sup> Dolphin Encounter Rate = (Sum of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> month's total sighting/ Sum of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> month's total effort)\*100km (encounter rates are calculated using on effort sightings made under favourable conditions only.)

- 3.4.5 One (1) Limit Level exceedance of dolphin monitoring was recorded in the reporting quarter. After investigation, it was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified nor separate from the other stress factors. Event Action Plan for Impact Dolphin Monitoring was triggered. For detail of investigation, please refer to appendix L.

**Table 3.7 Summary of STG and ANI encounter rates in March 2016 – May 2016**

	NEL	NWL	Level Exceeded
STG*	0	1.4	Limit
ANI**	0	4.6	

\*Quarterly Average Encounter Rate of Number of Dolphin Sightings (STG) presents averaged encounter rates of the three monitored months in terms of groups per 100km per survey event.

STG Encounter rate = (Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 1st month+ Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 2nd month + Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 3rd month)/3\*100km

\*\*Quarterly Average Encounter Rate of Total Number of Dolphins (ANI) presents averaged encounter rates of the three monitored months in terms of individuals per 100km per survey event.

ANI Encounter rate = (Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 1st month+ Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 2nd month + Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 3rd month +)/3\*100km

- 3.4.6 Details of the comparison and analysis methodology and their findings and discussions are annexed in Appendix H.

### **3.5 Environmental Site Inspection and Audit**

- 3.5.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting quarter, 13 site inspections were carried out. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

- 3.5.2 Particular observations during the site inspections are described below:

#### ***Air Quality***

- 3.5.3 Breaker was observed without dust suppression measures at TKO sorting facility, the Contractor was reminded to provide dust suppression measure such as watering during the operation of breaker. The Contractor subsequently provided watering during operation of breaker. (Closed)
- 3.5.4 The Contractor was reminded to affix a proper exception/approval label to the power pack at Portion E2 under NRMM regulation. The Contractor subsequently rectified the situation. (Closed)

#### ***Noise***

- 3.5.5 No relevant adverse impact was observed in the reporting quarter.

#### ***Water Quality***

- 3.5.6 Turbid water was observed at Portion D, it is noted that the source of turbid water was originated from the wheel washing facility at Portion D managed by another Contract. The Contractor of Contract HY/2010/02 was advised to liaise with another Contract so that recurrence of the situation could be prevented. (Reminder)
- 3.5.7 It was observed that the overlapping of the perimeter silt curtain maybe insufficient at the northeast access. The Contractor was advised to provide sufficient length of overlapping at the northeast marine access. The Contractor subsequently extended to overlapping at the northeast marine access. (Closed)

#### ***Chemical and Waste Management***

- 3.5.8 Water and oil mixture was observed accumulated inside drip tray at TKO sorting facility, the Contractor was reminded to properly clear the water accumulated inside drip tray. The Contract subsequently cleared the water accumulated inside drip tray. (Closed)
- 3.5.9 Water was observed accumulated inside a bunded area on barge FTB19. The Contractor was reminded to regularly clear the water inside bunding to prevent potential oil spillage/runoff. The Contractor subsequently rectified the situation by clearing the water accumulated inside bunding. (Closed)
- 3.5.10 Oil was observed stored without measure to prevent oil leakage or spillage on barge Tung Fu 18, the Contractor was reminded to provide measures to prevent oil leakage or spillage. The Contractor subsequently provided measure barge Tung Fu 18 to prevent oil leakage or spillage. (Closed)
- 3.5.11 The Contractor was reminded to keep the site tidy at Portion D. Sorting was subsequently observed onsite, the Contractor was reminded to continue to keep the site tidy at Portion D. (Closed)
- 3.5.12 General refuse was observed, near box culvert area at Portion D, at the edge of the land area when inspection was conducted on barge FTP24, at other area of Portion D, the Contractor was reminded to regularly remove the general refuse on site to keep the site clean and tidy. The Contractor subsequently removed the general refuse and kept the site clean and tidy. (Closed)

- 3.5.13 Chemical waste container was observed without drip tray, the Contractor was reminded to place the chemical waste container onto the drip tray. The Contractor subsequently place the chemical waste container onto drip tray. (Closed)
- 3.5.14 The Contractor was reminded to dispose of general refuse regularly at Portion E2 properly. The Contractor subsequently cleared the generation refuse at Portion E2. (Closed)
- 3.5.15 The Contractor was reminded to provide drip tray for the moveable light generator at Portion E2. The Contractor subsequently provided drip tray to the moveable light generator. (Closed)
- 3.5.16 Oil drum was observed without drip tray. The Contractor was reminded to provide drip tray to oil drum. The Contractor subsequently removed from oil drum. (Closed)

***Landscape and Visual Impact***

- 3.5.17 No relevant adverse impact was observed in the reporting quarter.

***Others***

- 3.5.18 Rectifications of remaining identified items are undergoing by the Contractor. Follow-up inspections on the status on provision of mitigation measures will be conducted to ensure all identified items are mitigated properly.



## **4 ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS**

### **4.1 Summary of Solid and Liquid Waste Management**

- 4.1.1 The Contractor registered as a chemical waste producer for this project. Sufficient numbers of receptacles were available for general refuse collection and sorting.
- 4.1.2 As advised by the Contractor, 128239.5 m<sup>3</sup> of inert C&D Materials generated and reused in other Projects; 97381m<sup>3</sup> of surplus surcharge exported to Macau; 102329m<sup>3</sup> of Imported fill; 532kg paper/cardboard packaging, 489.7 m<sup>3</sup> other C&D waste such as general refuse were generated and disposed of in the reporting period. Monthly summary of waste flow table is detailed in Appendix I.
- 4.1.3 The Contractor is advised to properly maintain on site C&D materials and wastes 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 is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 4.1.4 The Contractor is reminded that chemical waste containers should be properly treated and stored 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.
- 4.1.5 The treated marine sediment and/or treated excavated filling material specified by Contract no. HY/2013/01 has been received as public fill for Contract no. HY/2010/02's reclamation filling works since January 2015. As informed by the Contractor in the last reporting quarter, such site arrangement has been discontinued since 24 February 2016.
- 4.1.6 After checking with the Contractor, surcharge material was removed off site to Macau from 27 April 2016 and it is continued in the reporting quarter. Surplus surcharge was exported to Macau during the reporting quarter. The Contractor was reminded to ensure consistency in quantities in case of any C&D material disposed off-site and/or no surcharge material removed off site.



## 5 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

### 5.1 Implementation Status of Environmental Mitigation Measures

- 5.1.1 In response to the site audit findings, the Contractors carried out corrective actions.
- 5.1.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Most of the recommended mitigation measures are being upheld. Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.
- 5.1.3 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly.
- 5.1.4 Regarding the implementation of dolphin monitoring and protection measures (i.e. implementation of Dolphin Watching Plan, Dolphin Exclusion Zone and Silt Curtain integrity Check), regular checks were conducted by experienced MMOs within the works area to ensure that no dolphins were trapped by the silt curtain area. There were no dolphins spotted within the silt curtain during this quarter. The relevant procedures were followed and all measures were well implemented. The silt curtains were also inspected in accordance to the submitted plan.
- 5.1.5 Acoustic decoupling measures on noisy plants on construction vessels were checked regularly and the Contractor was reminded to ensure provision of ongoing maintenance to noisy plants and to carry out improvement work once insufficient acoustic decoupling measures were found.
- 5.1.6 Frequency of watering per day on exposed soil was checked; with reference to the record provided by the Contract, watering was conducted at least 8 times per day on reclaimed land. The frequency of watering is the mainly refer to water truck. Sprinklers are only served to strengthen dust control measure for busy traffic at the entrance of Portion D. As informed by the Contractor, during the malfunction period of sprinkler, water truck will enhance watering at such area. The Contractor was reminded to ensure provision of watering of at least 8 times per day on all exposed soil within the reporting period.
- 5.1.7 As informed by the Contractor, the perimeter silt curtain near Portion B of HKBCF has been arranged on 3 February 2016. A notification on the concerned site arrangement of the perimeter silt curtain of Contract HY/2010/02 was sent to IEC/ENPO by the ET for their review on 8 March 2016, IEC/ENPO issued comments on 10 March 2016 and the notification of realignment of perimeter silt curtain is under ET's further review in the reporting quarter. The concerned notification on the concerned site arrangement of the perimeter silt curtain of Contract HY/2010/02 will be sent to the Authority once the review is completed.
- 5.1.8 As informed by the Contractor on 16 February 2016, a MMWG meeting was held among the representatives of Airport Authority (AA), Arup (RSS of Contract HY/2010/02) and CHEC (the Contractor of Contract HY/2010/02) on 15 February 2016. In the meeting, it was mentioned that in order to facilitate the site investigation (SI) works of the AA's contractor in the vicinity of the concerned location, removal of the concerned silt curtain at the NE Cooling Water Intake of Hong Kong International Airport was discussed. The environmental aspect of the proposed removal of the silt curtain at NE Airport Cooling Water Intake (WSR25) was reviewed by the ET and no adverse comment was received from IEC/ENPO on 21 March 2016. As informed by the Contractor, the silt curtain at NE Airport Cooling Water Intake has been removed on 10 May 2016.
- 5.1.9 Further to our letter (ET's letter's ref.: 60249820/rmky16033001) dated 20 March 2016 regarding the notification of silt curtain removal programme and arrangement, as informed by RSS on 18 May 2016, the Contractor provided an updated programme on 17 May 2016 to indicate the current site situation. According to CHEC's latest removal programme, stage 1 (southern section of Portion B) removal work is scheduled to be carried out in mid-June 2016 while the associated section of the seawall should have been substantially completed. Tentative completion dates for the subsequent stages have also been updated, while the overall phasing arrangement has not changed. A notification letter was being prepared in the reporting quarter and should be sent to IEC/ENPO in the

next reporting quarter to inform them that the removal of perimeter silt curtain of Stages 1, 2, 3 and 4 has been rescheduled and removal works will be commenced tentatively on 15 June 2016, 18 August 2016, 7 November 2016 and 1 December 2016 respectively subject to the site progress. The arrangement is currently under ET's review in the reporting quarter.

- 5.1.10 IEC/ENPO observed that one Floating Concrete Batching Plant and two Floating Grout Production Facilities anchored at Portion C2b and Portion E2 respectively at around 9:13 am on 25 April 2016. IEC/ENPO opined that a review should be conducted by ET to assess if Condition 3.26A of EP-353/2009/K for HZMB HKBCF Project is complied, after investigation, two number of FGP barges DL-4 and DL-5 were under BCF contract. The FGP barges were servicing Contract No.HY/2010/02, but the observed FGP barges were berthing at the concerned location for upcoming works but were not operated on 25 April 2016. In addition, after further review, no floating grout production was in operation at any time in March and April 2016 for Contract No.HY/2010/02; 1 floating grout production was in operation at any time in May 2016 for Contract No.HY/2010/02. Condition 3.26A of EP-353/2009/K for Contract No.HY/2010/02 is complied with during the reporting quarter.

## **6 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT**

### **6.1 Summary of Exceedances of the Environmental Quality Performance Limit**

- 6.1.1 All 1-Hour TSP and 24-Hour TSP results were below the Action and Limit Level in the reporting quarter.
- 6.1.2 For construction noise, no exceedance was recorded at all monitoring stations in the reporting quarter.
- 6.1.3 For water quality monitoring, one (1) Limit level impact water quality monitoring exceedance at monitoring station SR(4)N has been recorded on 20 May 2016 during flood tide. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.
- 6.1.4 One (1) Limit Level exceedance of dolphin monitoring was recorded in the reporting quarter. After investigation, it was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified nor separate from the other stress factors. Event Action Plan for Impact Dolphin Monitoring was triggered. For detail of investigation, please refer to appendix L.
- 6.1.5 No environmental complaint, notification of summons or prosecution was received in the reporting period
- 6.1.6 Cumulative statistics on exceedances is provided in Appendix J.

## **7 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

### **7.1 Summary of Environmental Complaints, Notification of Summons and Successful Prosecutions**

- 7.1.1 The Environmental Complaint Handling Procedure is annexed in Figure 5.
- 7.1.2 No environmental complaint, notification of summons or prosecution was received in the reporting quarter.
- 7.1.3 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix N.

## 8 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

### 8.1 Comments on mitigation measures

8.1.1 According to the environmental site inspections performed in the reporting quarter, the following recommendations were provided:

#### ***Air Quality Impact***

- All working plants and vessels on site should be regularly inspected and properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained and reviewed to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement debagging, batching and mixing operations.
- Water spraying should be provided to suppress fugitive dust for any dusty construction activity.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

#### ***Construction Noise Impact***

- Quieter powered mechanical equipment should be used as far as possible.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Proper and effective noise control measures for operating equipment and machinery on-site should be provided, such as erection of movable noise barriers or enclosure for noisy plants. Closely check and replace the sound insulation materials regularly
- Vessels and equipment operating should be checked regularly and properly maintained.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Acoustic decoupling measures should be properly implemented for all existing and incoming construction vessels with continuous and regularly checking to ensure effective implementation of acoustic decoupling measures.

#### ***Water Quality Impact***

- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities in order to make sure they are functioning effectively.
- Construction of seawall should be completed as early as possible.
- Regular inspect and review the loading process from barges to avoid splashing of material.
- Silt, debris and leaves accumulated at public drains, wheel washing bays and perimeter u-channels and desilting facilities should be cleaned up regularly.
- Silty effluent should be treated/ desilted before discharged. Untreated effluent should be prevented from entering public drain channel.

- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas.
- Exposed slopes and stockpiles should be covered up properly during rainstorm.

#### ***Chemical and Waste Management***

- All types of wastes, both on land and floating in the sea, should be collected and sorted properly and disposed of timely and properly. They should be properly stored in designated areas within works areas temporarily.
- All chemical containers and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- All kinds of maintenance works should be carried out within roofed, paved and confined areas.
- All drain holes of the drip trays utilized within works areas should be properly plugged to avoid any oil and chemical waste leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.
- Regular review should be conducted for working barges and patrol boats to ensure sufficient measures and spill control kits were provided on working barges and patrol boats to avoid any spreading of leaked oil/chemicals.

#### ***Landscape and Visual Impact***

- All existing, retained/transplanted trees at the works areas should be properly fenced off and regularly inspected.
- Control night-time lighting and glare by hooding all lights.

### **8.2 Recommendations on EM&A Programme**

- 8.2.1 The impact monitoring programme for air quality, noise, water quality and dolphin ensured that any deterioration in environmental condition was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental impacts of the Project. With implementation of recommended effective environmental mitigation measures, the Project's environmental impacts were considered as environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.
- 8.2.2 The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Project. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

### 8.3 Conclusions

- 8.3.1 The construction phase and EM&A programme of the Project commenced on 12 March 2012.
- 8.3.2 All 1-Hour TSP and 24-Hour TSP results were below the Action and Limit Level in the reporting quarter.
- 8.3.3 For construction noise, no exceedance was recorded at all monitoring stations in the reporting quarter.
- 8.3.4 For water quality monitoring, one (1) Limit level impact water quality monitoring exceedance at monitoring station SR(4)N has been recorded on 20 May 2016 during flood tide. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.
- 8.3.5 One (1) Limit Level exceedance of dolphin monitoring was recorded in the reporting quarter. After investigation, it was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified nor separate from the other stress factors. Event Action Plan for Impact Dolphin Monitoring was triggered. For detail of investigation, please refer to appendix L.
- 8.3.6 Environmental site inspection was carried out 13 times in the reporting quarter. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.
- 8.3.7 No environmental complaint notification of summons or prosecution was received in the reporting quarter.
- 8.3.8 Apart from the above mentioned monitoring, most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting quarter.
- 8.3.9 The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Contract. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.
- 8.3.10 Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.