

China Harbour Engineering Company Limited

Contract No. HY/2010/02

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

Monthly EM&A Report for August 2016

[09/2016]

| | Name | Signature |
|-----------------------------------|------------------|---|
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| | | | |
|----------|--------|-------|-------------------|
| Version: | Rev. 0 | Date: | 14 September 2016 |
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Disclaimer

This report is prepared for China Harbour Engineering Company Limited and is given for its sole benefit in relation to and pursuant to Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities-Reclamation Works and may not be disclosed to, quoted to or relied upon by any person other than China Harbour Engineering Company Limited without our prior written consent. No person (other than China Harbour Engineering Company Limited) into whose possession a copy of this report comes may rely on this report without our express written consent and China Harbour Engineering Company Limited may not rely on it for any purpose other than as described above.

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14 September 2016

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
Monthly Environmental Monitoring & Audit Report for August 2016**

Reference is made to the Environmental Team's submission of the Monthly Environmental Monitoring & Audit Report for August 2016 certified by the ET Leader (ET's ref.: "60249820/C/RMKY16091401" dated 14 September 2016) and provided to us via e-mail on 14 September 2016.

We are pleased to inform you that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 5.4 of EP-353/2009/K and Condition 4.4 of EP-354/2009/D (for TM-CLKL Southern Landfall Reclamation only).

As per Condition 1.7 of EPs, please be reminded to keep in view on the site condition, in particular on the integrity of the perimeter silt curtain and the effectiveness of perimeter drainage facilities with your on-going surveillance and monitoring and to further update/notify ENPO and EPD, from time to time and prior to each further removal of other section(s) of the perimeter silt curtains.

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) |
| | HyD | Mr. Wai-Ping Lee | (By Fax: 3188 6614) |
| | AECOM | Ms. Echo Leong | (By Fax: 2317 7609) |
| | CHEC | Mr. Lim Kim Chuan | (By Fax: 2578 0413) |

Internal: DY, YH, JC, 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 and 31 August 2016. As informed by the Contractor, major activities in the reporting period were:-

Marine-base

- Sloping Seawalls
- Rubble Mound Seawall
- Maintenance of silt curtain

Land-base

- Surcharge removal & laying
- Deep Cement Mixing
- Construction of Permanent Seawall
- 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 period is listed below:

| | |
|---|-------------|
| 24-hour Total Suspended Particulates (TSP) monitoring | 5 sessions |
| 1-hour TSP monitoring | 5 sessions |
| Noise monitoring | 4 sessions |
| Impact water quality monitoring | 13 sessions |
| Impact dolphin monitoring | 2 surveys |
| Joint Environmental site inspection | 4 sessions |

Breaches of Action and Limit Levels for Air Quality

For impact air quality monitoring, no exceedance of 1-Hour TSP or 24-Hour TSP was recorded at all monitoring stations in the reporting month.

Breaches of Action and Limit Levels for Noise

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

Breaches of Action and Limit Levels for Water Quality

For impact water quality monitoring, no exceedance was recorded at all monitoring stations in the reporting month. Due to tropical cyclone warning signal no.3 or above was hoisted during the water quality monitoring scheduled on 1 August 2016 was cancelled except the monitoring locations named CSA, CS6, SR10B(N) and SR10A during Mid-Ebb Tide.

Breaches of Action and Limit Levels for Impact Dolphin Monitoring

For dolphin monitoring, one (1) limit level exceedance is recorded. The Investigation is undergoing and investigation results will be reported in quarterly report (June– August 2016)

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Change

No reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:

- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities;
- Exposed surfaces/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Conduct regular inspection of various working machineries and vessels within works areas to avoid any dark smoke emission;
- Suppress dust generated from work processes with use of bagged cements, earth movements, excavation activities, exposed surfaces/soil stockpiles and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures for operating equipment and machinery on-site, such as erection of movable noise barriers or enclosure for noisy plants;
- Closely check and replace the sound insulation materials regularly;
- Better scheduling of construction works to minimize noise nuisance;
- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved and confined areas;
- Collection and segregation of construction waste and general refuse on land and in the sea should be carried out properly and regularly; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.
- Control night-time lighting and glare by hooding all lights.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

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 fifty fourth monthly 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 in August 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 |
|--|-------------------------------------|-----------------|-----------|-----------|
| Engineer's Representative (ER) (Ove Arup & Partners Hong Kong Limited) | Chief Resident Engineer | Paul Appleton | 3698 5889 | 2698 5999 |
| IEC / ENPO (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 |
| Contractor (China Harbour Engineering Company Limited) | Environmental Officer | Louie Chan | 3693 2254 | 2578 0413 |
| | 24-hour Hotline | Alan C.C. Yeung | 9448 0325 | -- |
| ET (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 this reporting period are listed below:-

Marine-base

- Sloping Seawalls
- Rubble Mound Seawall
- Maintenance of silt curtain

Land-base

- Surcharge removal & laying
- Deep Cement Mixing
- Construction of Permanent Seawall
- 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.

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise, water quality, marine ecology and environmental site inspections for air quality, noise, water quality, waste management, marine ecology, and landscape and visual impact. The EM&A requirements for each parameter described in the following sections include:-

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming month;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA reports; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the Contract Specific EM&A Manual, baseline 1-hour and 24-hour Total Suspended Particulates (TSP) levels at 4 air quality monitoring stations were established. Impact 1-hour 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. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at each designated monitoring station. The HVS meets all the requirements of the Contract Specific EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

| Equipment | Brand and Model |
|---|--|
| Portable direct reading dust meter (1-hour TSP) | Sibata Digital Dust Monitor (Model No. LD-3 and LD-3B) |
| High Volume Sampler (24-hour TSP) | Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Air Sampler (Model No. TE-5170) |

2.3 Monitoring Locations

2.3.1 Monitoring locations AMS2 and AMS7 were set up at the proposed locations in accordance with Contract Specific EM&A Manual. 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. 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.

2.3.2 It was observed that a tree near AMS3B may affect the wind flow around the HVS located at AMS3B. With no further comment received from IEC, the HVS at AMS3B has been relocated on 8 September 2014 to slightly more than 2 meters separation from it, measured horizontally. 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.

2.3.3 Reference is made to ET’s proposal of the omission of air monitoring station (AMS 6) dated on 1 November 2012 and EPD’s letter dated on 19 November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 is effective since 19 November 2012.

2.3.4 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 was conducted at AMS7 (Hong Kong SkyCity Marriott Hotel) since January 2016, action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel has been adopted for this air quality monitoring location.

2.3.5 Figure 2 shows the locations of monitoring stations. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Impact Air Quality Monitoring Stations

| Monitoring Station | Location | Description |
|--------------------|---|--------------------------------------|
| AMS2 | Tung Chung Development Pier | Rooftop of the premise |
| AMS3B | Site Boundary of Site Office Area at Works Area WA2 | On ground at the area boundary |
| AMS6* | Dragonair/CNAC (Group) Building | On ground at boundary of the premise |
| AMS7 | Hong Kong SkyCity Marriott Hotel | On ground at boundary of the premise |

*Remarks: Reference is made to EPD conditional approval of the omission of air monitoring station (AMS 6) for the Contract. The omission will be effective on 19 November 2012.

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

| Parameter | Frequency and Duration |
|-------------|---|
| 1-hour TSP | Three times every 6 days while the highest dust impact was expected |
| 24-hour TSP | Once every 6 days |

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

- (a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.
 - (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
 - (ii) No two samplers should be placed less than 2 meters apart.
 - (iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
 - (iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
 - (v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
 - (vi) No furnace or incinerator flues nearby.
 - (vii) Airflow around the sampler was unrestricted.
 - (viii) Permission was obtained to set up the samplers and access to the monitoring stations.
 - (ix) A secured supply of electricity was obtained to operate the samplers.
 - (x) The sampler was located more than 20 meters from any dripline.
 - (xi) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
 - (xii) Flow control accuracy was kept within $\pm 2.5\%$ deviation over 24-hour sampling period.

- (b) Preparation of Filter Papers
 - (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
 - (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.

- (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.
- (c) Field Monitoring
- (i) The power supply was checked to ensure the HVS works properly.
 - (ii) The filter holder and the area surrounding the filter were cleaned.
 - (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
 - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
 - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
 - (vi) Then the shelter lid was closed and was secured with the aluminum strip.
 - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
 - (viii) A new flow rate record sheet was set into the flow recorder.
 - (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.1 m³/min, and complied with the range specified in the updated EM&A Manual (i.e. 0.6-1.7 m³/min).
 - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
 - (xi) The initial elapsed time was recorded.
 - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
 - (xiii) The final elapsed time was recorded.
 - (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
 - (xv) It was then placed in a clean plastic envelope and sealed.
 - (xvi) All monitoring information was recorded on a standard data sheet.
 - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
 - (ii) 5-point calibration of the HVS was conducted using TE-5025A Calibration Kit prior to the commencement of baseline monitoring. Bi-monthly 5-point calibration of the HVS will be carried out during impact monitoring.
 - (iii) Calibration certificate of the HVSs are provided in Appendix E.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter were in accordance with the Manufacturer's Instruction Manual as follows:-

- (i) Turn the power on.
- (ii) Close the air collecting opening cover.
- (iii) Push the "TIME SETTING" switch to [BG].
- (iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
- (v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
- (vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- (vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- (viii) Pull out the knob and return it to MEASURE position.
- (ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
- (x) Lower down the air collection opening cover.
- (xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

- (i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix E.
- (ii) 1-hour validation checking of the TSP meter against HVS is carried out on half-year basis at the air quality monitoring locations.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for air quality monitoring in August 2016 is provided in Appendix F.

2.6.2 24-hour TSP monitoring at Station AMS2 - Tung Chung Development Pier was rescheduled from 4 Aug 2016 to 5 Aug 2016 due to electricity failure.

2.7 Results and Observations

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed impact air quality monitoring results are presented in Appendix G.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

| | Average ($\mu\text{g}/\text{m}^3$) | Range ($\mu\text{g}/\text{m}^3$) | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|--------------|--------------------------------------|------------------------------------|---|--|
| AMS2 | 71 | 65-75 | 374 | 500 |
| AMS3B | 70 | 67-76 | 368 | 500 |
| AMS7 | 71 | 64-76 | 370 | 500 |

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

| | Average ($\mu\text{g}/\text{m}^3$) | Range ($\mu\text{g}/\text{m}^3$) | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|--------------|--------------------------------------|------------------------------------|---|--|
| AMS2 | 28 | 19-39 | 176 | 260 |
| AMS3B | 17 | 10-31 | 167 | 260 |
| AMS7 | 33 | 21-47 | 183 | 260 |

2.7.2 The event action plan is annexed in Appendix L.

2.7.3 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.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the Contract Specific EM&A Manual, impact noise monitoring was conducted for at least once per week during the construction phase of the Contract. The Action and Limit level of the noise monitoring is provided in Appendix D.

3.2 Monitoring Equipment

3.2.1 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply 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 meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

| Equipment | Brand and Model |
|------------------------------|-----------------------|
| Integrated Sound Level Meter | Rion NL-31 & B&K2238 |
| Acoustic Calibrator | Rion NC-73 & B&K 4231 |

3.3 Monitoring Locations

3.3.1 Monitoring locations NMS2 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) and Limit Level were adopted for this alternative noise monitoring location.

3.3.2 Figure 2 shows the locations of the monitoring stations. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Stations

| Monitoring Station | Location | Description |
|--------------------|---|--|
| NMS2 | Seaview Crescent Tower 1 | Free-field on the rooftop of the premise |
| NMS3B | Site Boundary of Site Office Area at Works Area WA2 | Free-field on ground at the area boundary. |

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

| Parameter | Frequency and Duration |
|---|------------------------|
| 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 per week |

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

- (a) The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at NMS2. A correction of +3 dB(A) shall be made to the free field measurements.
- (b) All measurement at NMS3B were free field measurements in the reporting month at NMS3B. A correction of +3 dB(A) shall be made to the free field measurements.
- (c) The battery condition was checked to ensure the correct functioning of the meter.
- (d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:-
 - (i) frequency weighting: A
 - (ii) time weighting: Fast
 - (iii) time measurement: $L_{eq(30-minutes)}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays.
- (e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (f) During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- (h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

3.5.2 Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- (c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix E.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for construction noise monitoring in August 2016 is provided in Appendix F.

3.7 Monitoring Results

3.7.1 The monitoring results for construction noise are summarized in Table 3.4 and the monitoring data is provided in Appendix I.

Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period

| | Average, dB(A), L_{eq} (30 mins) | Range, dB(A), L_{eq} (30 mins) | Limit Level, dB(A), L_{eq} (30 mins) |
|-------|---------------------------------------|-------------------------------------|---|
| NMS2 | 67 | 65-68* | 75 |
| NMS3B | 66 | 62-68* | 70/65^ |

*+3dB(A) Façade correction included

^ Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

3.7.2 No Action or Limit Level Exceedance of construction noise was recorded in the reporting month.

3.7.3 Other major noise sources during the noise monitoring included construction activities of the Contract, construction activities by other contracts and nearby traffic noise. Nonetheless, the Contractor of Contract No.HY/2010/02 was reminded to continue to properly implement all noise mitigation measures.

3.7.4 The event action plan is annexed in Appendix L.

4 WATER QUALITY MONITORING

4.1 Monitoring Requirements

4.1.1 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. For impact water quality monitoring, measurements were taken in accordance with the Contract Specific EM&A Manual. Appendix D shows the established Action/Limit Levels for the environmental monitoring works.

4.2 Monitoring Equipment

4.2.1 Table 4.1 summarises the equipment used in the impact water quality monitoring programme.

Table 4.1 Water Quality Monitoring Equipment

| Equipment | Brand and Model |
|---|--|
| Dissolved Oxygen (DO) and Temperature Meter, Salinity Meter and Turbidity Meter | YSI Model 6820 |
| pH Meter | YSI Model 6820 or Thermo Orion 230A+ |
| Positioning Equipment | JRC DGPS 224 Model JLR-4341 with J-NAV 500 Model NWZ4551 |
| Water Depth Detector | Eagle Cuda-168 and Lowrance x-4 |
| Water Sampler | Kahlsio Water Sampler (Vertical) 2.2 L with messenger |

4.3 Monitoring Parameters, Frequency and Duration

4.3.1 Table 4.2 summarises the monitoring parameters, frequency and monitoring depths of impact water quality monitoring as required in the Contract Specific EM&A Manual.

Table 4.2 Impact Water Quality Monitoring Parameters and Frequency

| Monitoring Stations | Parameter, unit | Frequency | No. of depth |
|--|--|---|--|
| <p><i>Impact Stations:</i> IS5, IS(Mf)6, IS7, IS8, IS(Mf)9, IS10, IS(Mf)11, IS(Mf)16, IS17</p> <p><i>Control/Far Field Stations:</i> CS(Mf)3, CS(Mf)5, CS4, CS6, CSA</p> <p><i>Sensitive Receiver Stations:</i> SR3-SR7, SR10A&SR10B</p> | <ul style="list-style-type: none"> • Depth, m • Temperature, °C • Salinity, ppt • Dissolved Oxygen (DO), mg/L • DO Saturation, % • Turbidity, NTU • pH • Suspended Solids (SS), mg/L | <p>Three times per week during mid-ebb and mid-flood tides (within ± 1.75 hour of the predicted time)</p> | <p>3 (1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth is less than 6 m, in which case the mid-depth station may be omitted. Should the water depth be less than 3 m, only the mid-depth station will be monitored).</p> |

4.4 Monitoring Locations

- 4.4.1 In accordance with the Contract Specific EM&A Manual, twenty-one stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field 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.
- 4.4.2 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.
- 4.4.3 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.
- 4.4.4 With respect to the latest available information about the temporary works boundary associated with the Expansion of Hong Kong International Airport into a Three-Runway System project (3RS project), it is noted that a few impact water quality monitoring stations of this Contract will be enclosed by temporary works boundary of 3RS project, as such alternation on the water quality monitoring stations of this Contract will tentatively be proposed in next reporting month.
- 4.4.5 The locations of these monitoring stations are summarized in Table 4.3 and depicted in Figure 3.

Table 4.3 Impact Water Quality Monitoring Stations

| Station | Description | East | North |
|----------|--|--------|--------|
| IS5 | Impact Station (Close to HKBCF construction site) | 811579 | 817106 |
| IS(Mf)6 | Impact Station (Close to HKBCF construction site) | 812101 | 817873 |
| IS7 | Impact Station (Close to HKBCF construction site) | 812244 | 818777 |
| IS8 | Impact Station (Close to HKBCF construction site) | 814251 | 818412 |
| IS(Mf)9 | Impact Station (Close to HKBCF construction site) | 813273 | 818850 |
| IS10 | Impact Station (Close to HKBCF construction site) | 812577 | 820670 |
| IS(Mf)11 | Impact Station (Close to HKBCF construction site) | 813562 | 820716 |
| IS(Mf)16 | Impact Station (Close to HKBCF construction site) | 814328 | 819497 |
| IS17 | Impact Station (Close to HKBCF construction site) | 814539 | 820391 |
| SR3 | Sensitive receivers (San Tau SSSI) | 810525 | 816456 |
| SR4(N) | Sensitive receivers (Tai Ho) | 814705 | 817859 |
| SR5 | Sensitive receivers (Artificial Reef in NE Airport) | 811489 | 820455 |
| SR6 | Sensitive receivers (Sha Chau and Lung Kwu Chau Marine Park) | 805837 | 821818 |
| SR7 | Sensitive receivers (Tai Mo Do) | 814293 | 821431 |
| SR10A | Sensitive receivers (Ma Wan FCZ)1 | 823741 | 823495 |
| SR10B(N) | Sensitive receivers (Ma Wan FCZ)2 | 823683 | 823187 |
| CS(Mf)3 | Control Station | 809989 | 821117 |
| CS(Mf)5 | Control Station | 817990 | 821129 |
| CS4 | Control Station | 810025 | 824004 |
| CS6 | Control Station | 817028 | 823992 |

| Station | Description | East | North |
|---------|-----------------|--------|--------|
| CSA | Control Station | 818103 | 823064 |

4.5 Monitoring Methodology

4.5.1 Instrumentation

- (a) The in-situ water quality parameters, viz. dissolved oxygen, temperature, salinity, turbidity and pH, were measured by multi-parameter meters (i.e. Model YSI 6820 CE-C-M-Y) and pH meter (i.e. Thermo Orion 230A+) respectively.

4.5.2 Operating/Analytical Procedures

- (a) Digital Differential Global Positioning Systems (DGPS) were used to ensure that the correct location was selected prior to sample collection.
- (b) Portable, battery-operated echo sounders were used for the determination of water depth at each designated monitoring station.
- (c) All in-situ measurements were taken at 3 water depths, 1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth was less than 6 m, in which case the mid-depth station was omitted. Should the water depth be less than 3 m, only the mid-depth station was monitored.
- (d) At each measurement/sampling depth, two consecutive in-situ monitoring (DO concentration and saturation, temperature, turbidity, pH, salinity) and water sample for SS. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of DO or turbidity parameters was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.
- (e) Duplicate samples from each independent sampling event were collected for SS measurement. Water samples were collected using the water samplers and the samples were stored in high-density polythene bottles. Water samples collected were well-mixed in the water sampler prior to pre-rinsing and transferring to sample bottles. Sample bottles were pre-rinsed with the same water samples. The sample bottles were then be packed in cool-boxes (cooled at 4°C without being frozen), and delivered to ALS Technichem (HK) Pty Ltd. for the analysis of suspended solids concentrations. The laboratory determination work would be started within 24 hours after collection of the water samples. ALS Technichem (HK) Pty Ltd. is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples was analyzed.
- (f) The analysis method and reporting and detection limit for SS is shown in Table 4.4.

Table 4.4 Laboratory Analysis for Suspended Solids

| Parameters | Instrumentation | Analytical Method | Reporting Limit | Detection Limit |
|----------------------|-----------------|-------------------|-----------------|-----------------|
| Suspended Solid (SS) | Weighting | APHA 2540-D | 0.5mg/L | 0.5mg/L |

- (g) Other relevant data were recorded, including monitoring location / position, time, water depth, tidal stages, weather conditions and any special phenomena or work underway at the construction site in the field log sheet for information.

4.5.3 Maintenance and Calibration

- (a) All in situ monitoring instruments would be calibrated and calibrated by ALS Technichem (HK) Pty Ltd. before use and at 3-monthly intervals throughout all stages of the water quality monitoring programme. Calibration details are provided in Appendix E.
- (b) The dissolved oxygen probe of YSI 6820 was calibrated by wet bulb method. Before the calibration routine, the sensor for dissolved oxygen was thermally equilibrated in water-saturated air. Calibration cup is served as a calibration chamber and it was loosened from airtight condition before it is used for the calibration. Calibration at ALS Technichem (HK) Pty Ltd. was carried out once every three months in a water sample with a known concentration of dissolved oxygen. The sensor was immersed in the water and after thermal equilibration, the known mg/L value was keyed in and the calibration was carried out automatically.
- (c) The turbidity probe of YSI 6820 is calibrated two times a month. A zero check in distilled water was performed with the turbidity probe of YSI 6820 once per monitoring day. The probe will be calibrated with a solution of known NTU at ALS Technichem (HK) Pty Ltd. once every three months.

4.6 Monitoring Schedule for the Reporting Month

4.6.1 The schedule for impact water quality monitoring in August 2016 is provided in Appendix F.

4.6.2 Due to tropical cyclone warning signal no.3 or above was hoisted during the water quality monitoring scheduled on 1 August 2016 was cancelled except the monitoring locations named CSA, CS6, SR10B(N) and SR10A during Mid-Ebb Tide.

4.7 Results and Observations

4.7.1 Impact water quality monitoring results and graphical presentations are provided in Appendix J.

Table 4.5 Summary of Water Quality Exceedances

| 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 | 0 | 0 | 0 |
| 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 |

| Station | Exceedance Level | DO (S&M) | | DO (Bottom) | | Turbidity | | SS | | Total | |
|--------------|------------------|----------|-------|-------------|-------|-----------|-------|-----|-------|-------|-------|
| | | Ebb | Flood | Ebb | Flood | Ebb | Flood | Ebb | Flood | Ebb | Flood |
| 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 |
| Total | Action | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Limit | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

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

4.7.2 No exceedance was recorded at all monitoring stations in the reporting month.

4.7.3 The event action plan is annexed in Appendix L.

5 DOLPHIN MONITORING

5.1 Monitoring Requirements

- 5.1.1 Vessel based surveys for the Chinese White Dolphin (CWD), *Sousa chinensis*, are to be conducted by a dedicated team comprising a qualified marine mammal ecologist and experienced marine mammal observers (MMOs). The purpose of the surveys are to evaluate the impact of the HKCBF reclamation and, if deemed detrimental, to take appropriate action as per the EM&A manual.
- 5.1.2 This 'Impact Monitoring' follows several months of 'Baseline Monitoring' so similar survey methodologies have been adopted to facilitate comparisons between datasets. Further, the data collected are compatible with, and are available for, incorporation into the data set managed by the Agriculture, Fisheries and Conservation Department (AFCD) as part of Hong Kong's long term Marine Mammal Monitoring Programme.

5.2 Monitoring Equipment

Table 5.1 summarises the equipment used for the impact dolphin monitoring.

Table 5.1 Dolphin Monitoring Equipment

| Equipment | Model |
|--------------------------------------|--|
| Commercially licensed motor vessel | 15m in length with a 4.5m viewing platform |
| Global Positioning System (GPS) x2 | Integrated into T7000 Garmin GPS Map 76C |
| Computers (T7000 Tablet, Intel Atom) | Windows 7/MSO 13 Logger |
| Camera | Nikon D7100 300m 2.8D fixed focus Nikon D90 80-400mm zoom lens |
| Laser Rangefinder | Range Finder Bushnell 1000m |
| Marine Binocular x3 | Nexus 7 x 50 marine binocular with compass and reticules Fujinon 7 x 50 marine binocular with compass and reticules |

5.3 Monitoring Frequency and Conditions

- 5.3.1 Dolphin monitoring is conducted twice per month in each survey area.
- 5.3.2 Dolphin monitoring is conducted only when visibility is good (e.g., over 1km) and the sea condition is at a Beaufort Sea State of 4 or better.
- 5.3.3 When thunder storm, black rain or typhoon warnings are in force, all survey effort is stopped.

5.4 Monitoring Methodology and Location

- 5.4.1 The impact dolphin monitoring is vessel-based and combines line-transect and photo-ID methodology. The survey follows pre-set and fixed transect lines in the two areas defined by AFCD as:
- 5.4.2 Northeast Lantau survey area; and
- 5.4.3 Northwest Lantau survey area.
- 5.4.4 With respect to the latest available information about the temporary works boundary associated with the Expansion of Hong Kong International Airport into a Three-Runway System project (3RS project), it is noted that transect lines of this Contract will be enclosed by temporary works boundary of 3RS project, as such alternation of the transect lines of this Contract will tentatively be proposed in next reporting month.

5.4.5 The co-ordinates for the transect lines and layout map have been provided by AFCD and are shown in Table 5.2 and Figure 4.

Table 5.2 Impact Dolphin Monitoring Line Transect Co-ordinates (Provided by AFCD)

| ID | HK Grid System | | Long Lat in WGS84 | |
|-----|----------------|--------|-------------------|-----------|
| | X | Y | Long | Lat |
| 1 | 804671 | 815456 | 113.870287 | 22.277678 |
| 1 | 804671 | 831404 | 113.869975 | 22.421696 |
| 2 | 805475 | 815913 | 113.878079 | 22.281820 |
| 2 | 805477 | 826654 | 113.877896 | 22.378814 |
| 3 | 806464 | 819435 | 113.887615 | 22.313643 |
| 3 | 806464 | 822911 | 113.887550 | 22.345030 |
| 4 | 807518 | 819771 | 113.897833 | 22.316697 |
| 4 | 807518 | 829230 | 113.897663 | 22.402113 |
| 5 | 808504 | 820220 | 113.907397 | 22.320761 |
| 5 | 808504 | 828602 | 113.907252 | 22.396462 |
| 6 | 809490 | 820466 | 113.916965 | 22.323003 |
| 6 | 809490 | 825352 | 113.916884 | 22.367128 |
| 7 | 810499 | 820880 | 113.926749 | 22.326757 |
| 7 | 810499 | 824613 | 113.926688 | 22.360464 |
| 8 | 811508 | 821123 | 113.936539 | 22.328966 |
| 8 | 811508 | 824254 | 113.936486 | 22.357241 |
| 9 | 812516 | 821303 | 113.946320 | 22.330606 |
| 9 | 812516 | 824254 | 113.946279 | 22.357255 |
| 10* | 813525 | 820827 | 113.956112 | 22.326321 |
| 10* | 813525 | 824657 | 113.956066 | 22.360908 |
| 11 | 814556 | 818853 | 113.966155 | 22.304858 |
| 11 | 814556 | 820992 | 113.966125 | 22.327820 |
| 12 | 815542 | 818807 | 113.975726 | 22.308109 |
| 12 | 815542 | 824882 | 113.975647 | 22.362962 |
| 13 | 816506 | 819480 | 113.985072 | 22.314192 |
| 13 | 816506 | 824859 | 113.985005 | 22.362771 |
| 14 | 817537 | 820220 | 113.995070 | 22.320883 |
| 14 | 817537 | 824613 | 113.995018 | 22.360556 |
| 15 | 818568 | 820735 | 114.005071 | 22.325550 |
| 15 | 818568 | 824433 | 114.005030 | 22.358947 |
| 16 | 819532 | 821420 | 114.014420 | 22.331747 |
| 16 | 819532 | 824209 | 114.014390 | 22.356933 |
| 17 | 820451 | 822125 | 114.023333 | 22.338117 |
| 17 | 820451 | 823671 | 114.023317 | 22.352084 |
| 18 | 821504 | 822371 | 114.033556 | 22.340353 |
| 18 | 821504 | 823761 | 114.033544 | 22.352903 |
| 19 | 822513 | 823268 | 114.043340 | 22.348458 |
| 19 | 822513 | 824321 | 114.043331 | 22.357971 |
| 20 | 823477 | 823402 | 114.052695 | 22.349680 |
| 20 | 823477 | 824613 | 114.052686 | 22.360610 |
| 21 | 805476 | 827081 | 113.877878 | 22.382668 |
| 21 | 805476 | 830562 | 113.877811 | 22.414103 |
| 22 | 806464 | 824033 | 113.887520 | 22.355164 |
| 22 | 806464 | 829598 | 113.887416 | 22.405423 |
| 23 | 814559 | 821739 | 113.966142 | 22.334574 |
| 23 | 814559 | 824768 | 113.966101 | 22.361920 |

Remarks:

(a) *Due to the presence of deployed silt curtain systems at the site boundaries of the Contract, some of the transect lines shown in Figure 5 could not be fully surveyed during the regular survey. Transect 10 is reduced from 6.4km to approximately 3.6km in length due to the HKBCF construction site. Therefore the total transect length for both NEL and NWL combined is reduced to approximately 108km.

(b) Coordinates for transect lines 1, 2, 7, 8, 9 and 11 have been updated in respect to the Proposal for Alteration of Transect Line for Dolphin Monitoring approved by EPD on 19 August 2015.

5.5 Monitoring Procedures

- 5.5.1 The study area incorporates 23 transects which are to be surveyed twice per month. Each survey day lasts approximately 9 hours.
- 5.5.2 The survey vessel departs from Tung Chung Development Pier, Tsing Yi Public Pier or the nearest safe and convenient pier.
- 5.5.3 When the vessel reaches the start of a transect line, “on effort” survey begins. Areas between transect lines and traveling to and from the study area are defined as “off effort”.
- 5.5.4 The transect line is surveyed at a speed of 6-8 knots (11-14 km/hr). For the sake of safety, the speed was sometimes a bit slower to avoid collision with other vessels. During some periods, tide and current flow in the survey areas exceeds 7 knots which can affect survey speed. There are a minimum of four marine mammal observers (MMOs) present on each survey, rotating through four positions, observers (2), data recorder (1) and ‘rest’ (1). Rotations occur every 30 minutes or at the end of dolphin encounters. The data recorder records effort, weather and sightings data directly onto the programme Logger and is not part of the observer team. The observers search with naked eye and binoculars between 90° and 270° abeam (bow being 0°).
- 5.5.5 When a group of dolphins is sighted, position, bearing and distance data are recorded immediately onto the computer and, after a short observation, an estimate made of group size. These parameters are linked to the time-GPS-ships data which are automatically stored in the programme Logger throughout the survey period. In this manner, information on heading, position, speed, weather, effort and sightings are stored in a format suitable for use with DISTANCE software for subsequent line transect analyses.
- 5.5.6 Once the vessel leaves the transect line, it is deemed to be “off effort”. The dolphins are approached with the purpose of taking high resolution pictures for proper photo-identification of individual CWD. Attempts to photograph all dolphins in the group are made. Both the left and right hand sides of the dorsal fin area of each dolphin in the group are photographed, if possible. On finishing photographing, the vessel will return to the transect line at the point of departure and “on effort” survey is resumed.
- 5.5.7 Sightings which are made while on the transect line are referred to as “on effort sightings”, while not on the actual transect line are referred to as an “opportunistic sightings” (e.g. another group of dolphins is sighted while travelling back to the transect line). Only “on effort sightings” can be used in analyses which require effort or rate quantification, e.g., encounter rate per 100km searched. This is also how “on effort sightings” are treated in the baseline report. “Opportunistic sightings” provide additional information on individual habitat use and population distribution and they are noted accordingly.
- 5.5.8 As time and GPS data are automatically logged throughout the survey and are linked to sightings data input, start and end times of encounters and deviation from the transect lines are recorded and can be subsequently reviewed.

5.6 Monitoring Schedule for the Reporting Month

- 5.6.1 The schedule for dolphin monitoring in August 2016 is provided in Appendix F.
- 5.6.2 Two surveys covering both study areas were completed.

5.7 Results and Observations

- 5.7.1 Dolphin surveys were conducted on 8, 9, 29 and 30 of August 2016. A total of 219.5 km of transect line was conducted, all was during Beaufort Sea State 3 or better (favourable water conditions).

The effort summary and sightings data are shown in Tables 5.3 and 5.4, respectively. The survey efforts conducted in August 2016 are plotted in Figure 5a-b. For Table 5.3, only on-effort information is included. Transects conducted in all Beaufort Sea State are included. Compared to previous monthly reports, the whole number Beaufort Sea State scale is used so as to ease comparison with other dolphin monitoring reports.

Table 5.3 Impact Dolphin Monitoring Survey Effort Summary, Effort by Area and Beaufort Sea State

| Survey | Date | Area | Beaufort | Effort (km) | Total Distance Travelled (km) |
|-----------------------------|------------|------|----------|-------------|-------------------------------|
| 1 | 08/08/2016 | NWL | 1 | 33.3 | 110.5 |
| | 08/08/2016 | NWL | 2 | 9.5 | |
| | 08/08/2016 | NWL | 3 | 7.1 | |
| | 08/09/2016 | NWL | 1 | 14.2 | |
| | 08/09/2016 | NWL | 2 | 9.1 | |
| | 08/09/2016 | NEL | 1 | 30.1 | |
| | 08/09/2016 | NEL | 2 | 7.2 | |
| 2 | 08/29/2016 | NWL | 1 | 16.9 | 109 |
| | 08/29/2016 | NWL | 2 | 6.5 | |
| | 08/29/2016 | NEL | 1 | 27.5 | |
| | 08/29/2016 | NEL | 2 | 8.9 | |
| | 08/30/2016 | NWL | 1 | 33.6 | |
| | 08/30/2016 | NWL | 2 | 15.6 | |
| TOTAL in August 2016 | | | | | 219.5 |

*Remark: Surveys conduct under Beaufort Sea State 3 or below are considered as under favourable condition.

Table 5.4 Impact Dolphin Monitoring Survey Details August 2016

| Date | Location | No. Sightings “on effort” | No. Sightings “opportunistic” |
|-----------------------------|----------|---------------------------|-------------------------------|
| 08/08/2016 | NWL/WL | 3 | 1* |
| | NEL | 0 | 0 |
| 09/08/2016 | NWL | 1 | 0 |
| | NEL | 0 | 0 |
| 29/08/2016 | NEL | 0 | 0 |
| | NEL | 0 | 0 |
| 30/08/2016 | NWL | 2 | 0 |
| | NEL | 0 | 0 |
| TOTAL in August 2016 | | 6 | 1 |

* Group of dolphin was sighted at WL area while vessel based dolphin monitoring was conducted in NWL

Table 5.5 The Encounter Rate of Number of Dolphin Sightings & Total Number of Dolphins per Area^

| Encounter Rate of Number of Dolphin Sightings (STG)* | | | | | | |
|--|----------------|----------------|---------------|---------------|--------------------|--------------------|
| Date | NEL Track (km) | NWL Track (km) | NEL Sightings | NWL Sightings | NEL Encounter Rate | NWL Encounter Rate |

| | | | | | | |
|---|-----------------------|-----------------------|---------------------|---------------------|---------------------------|---------------------------|
| 8 & 9 August 2016 | 37.3 | 73.2 | 0 | 4 | 0.0 | 5.5 |
| 29 & 30 August 2016 | 36.4 | 72.6 | 0 | 2 | 0.0 | 2.8 |
| Encounter Rate of Total Number of Dolphins (ANI)** | | | | | | |
| Date | NEL Track (km) | NWL Track (km) | NEL Dolphins | NWL Dolphins | NEL Encounter Rate | NWL Encounter Rate |
| 8 & 9 August 2016 | 37.3 | 73.2 | 0 | 8 | 0.0 | 10.9 |
| 29 & 30 August 2016 | 36.4 | 72.6 | 0 | 12 | 0.0 | 16.5 |

* Encounter Rate of Number of Dolphin Sightings (STG) presents encounter rates in terms of groups per 100km.

** Encounter Rate of Total Number of Dolphins (ANI) presents encounter rates in terms of individuals per 100km. And the encounter rate is not corrected for individuals, calculation may represent double counting.

^The table is made only for reference – to the quarterly STG & ANI, which were adopted for the Event & Action Plan.

- 5.7.2 A total of 7 sightings were made, six “on effort” and one “opportunistic”. Four sightings were recorded on the 8 August 2016, one was on 9 August 2016 and two were on 30 August 2016. On 8 August 2016, the two largest groups, comprising six and four individuals, were engaged in multiple behaviours including feeding and socialising. The two other groups of two and one were both travelling. The group sighted on 9 August 2016 contained one individual who was feeding and milling. On the 30 August 2016, two groups were sighted, the group of eight was feeding and travelling and the group of four was feeding. No calves were sighted in August 2016. Sighting details are summarised and plotted in Appendix K and Figure 5c, respectively. The locations of sighting with different behaviour are mapped in Figure 5d.
- 5.7.3 Two resightings were noted in July 2016. HZMB 001 was first sighted in March 2012, the first month of dolphin impact monitoring, and was seen throughout 2013, once in 2014 and then sighted again in May 2016. HZMB 121 has been sighted once previously, in July 2014. Please also refer to resightings table (Appendix K).
- 5.7.4 For dolphin monitoring, one (1) limit level exceedance is recorded. The Investigation is undergoing and investigation results will be reported in quarterly report (June– August 2016)
- 5.7.5 Noteworthy Observation¹:
- 5.7.5.1 When impact monitoring was conducted at the southern parts of transect lines 1 & 2, the view of the area was partially blocked by the working vessels and fixed structures which do not belong to HKBCF Reclamation Works. The number of fixed structures has increased however the number of working vessels appears to have decreased, thus making it possible to travel between some of the structures. It is considered that the working barges will temporarily affect survey protocol, survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour, whereas the fixed structures will continuously affect survey protocol, survey data collection, dolphin movement, dolphin habitat use and dolphin behaviour.
- 5.7.5.2 The HKBCF and adjoining “Southern Landfall” Projects effected lines 11, 12 and 13. The view of the area was partially blocked by the working vessels and in water structures. As the working vessels will move as construction progresses, they will cause temporary effects to survey protocol and survey data collection. In time, the fixed structures will affect all survey protocols and dolphin ecology in the long term. As construction is ongoing, it is not yet known if these fixed structures will affect the transect lines passage. It is noted that fewer vessels occupy this area compared to previous months
- 5.7.5.3 Fishing Vessels were noted anchored on several occasions at line 1. Previously, dolphins have been known to be attracted to fishing vessels, both active and anchored, and as such the anchored vessels may have temporarily affected the dolphins distribution.

¹ A noteworthy observation is to show that either the conduct of the surveys themselves is affected, i.e., the noted vessel or works impedes the progress or view of the survey platform. In addition, the vessel or construction works may be different or additional to that observed previously and further, are of such a nature that they are a likely to create an impact on the movement or behaviour of the subject of the impact survey, in this case, the dolphins.

- 5.7.5.4 Travel to the northern end of line 10 and line 23 was slightly impeded by anchorages. After checking with the Contractor, there are no trans-boundary vessels that are required to anchor at northern ends of lines 10 during this reporting period, as such they are unlikely to be related to this Contract. As there are variable numbers of ships in this anchorage through time, it is considered that this could temporarily affect survey protocol, survey data collection and dolphin habitat use.
- 5.7.5.5 Several single anchored vessels were noted on lines 13, 17, 18 and 21 which caused the monitoring vessel to divert slightly from the trackline or blocked the transect area view. It is unknown who these vessels belong to or even if they were Project related. After checking with the Contractor, there are no transboundary vessels that are required to anchor on lines 13, 17, 18 and 21 during this reporting period, as such they are unlikely to be related to this Contract. As there are variable numbers of ships in anchor on these lines through time, it is considered that this could temporarily affect survey protocol, survey data collection and dolphin habitat use.
- 5.7.5.6 New projects which do not belongs to contract HY/2010/02 were noted on lines 2, 3 and 6 which blocked the transect area view. It is unknown what activities occur under this project or how long it may occur for and, as such, it is considered that this new project may affect survey protocol, survey data collection and dolphin habitat use.
- 5.7.5.7 The survey effort log notes the areas in which the visibility is limited or the survey is affected so that these can be accounted for in any subsequent analyses. Some of these obstructions will become permanent and some will be temporary as the HZMB is built and other projects progress. It is advised that the impact monitoring surveys should be completed as close to the predefined lines as possible (as per Figure 4 of this report).
- 5.7.5.8 The above noteworthy observations are largely a result of multiple and on-going infrastructure projects within the Lantau area. No amendment to EM&A protocols can negate the effects of these projects, e.g., it is a highly dynamic environment and viewing conditions may alter every survey (sometimes within surveys) and most of the survey area is affected, to some degree, by marine construction works. Instead, survey data analyses should incorporate any noteworthy observations which may affect either data collection or dolphin distribution and behavioural changes. The above mentioned activities recorded during boat survey will not affect implementation of the EM&A Programme provided appropriate data analyses are conducted.
- 5.7.6 The event action plan is annexed in Appendix L.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

6.1 Site Inspection

6.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Contract. In the reporting month, 4 site inspections were carried out on 4, 11, 18 and 25 August 2016.

6.1.2 Particular observations during the site inspections are described below:

Air Quality

6.1.3 Fugitive dust was observed during handling of rock. The Contractor was reminded to provide dust suppression measures such as watering to during the handling of rock. (Follow up)

6.1.4 An excavator was observed without NRMM label. The Contractor was advised to affix NRMM label properly onto the excavator. The Contractor subsequently affix NRMM label to the excavator. (Closed)

Noise

6.1.5 No relevant adverse impact was observed in the reporting month.

Water Quality

6.1.6 Silt curtain was observed temporarily disconnected near Portion D. The Contractor was reminded to ensure mitigation measures such as the silt curtain is properly maintained and implemented. The Contractor subsequently rectified the disconnected part of the silt curtain. (Closed)

Chemical and Waste Management

6.1.7 Damaged drip tray was observed at Portion D. The Contractor should repair and replace the drip tray to avoid potential leakage. The contractor subsequently repaired the drip tray. (Closed)

6.1.8 Chemical container placed on ground was observed at portion D. The Contractor should store the chemical containers with drip tray properly. The chemical container was subsequently removed by the Contractor from Portion D. (Closed)

6.1.9 General refuse was observed on southern edge of lands area near Portion B. The Contractor was reminded to keep the site clean and tidy. The Contractor subsequently collected the general refuse on southern edge of lands area near Portion B. (Closed)

6.1.10 Floating refuse was observed at Portion D, the Contractor was reminded to collect them and dispose them of properly. The Contractor subsequently collected the general refuse on sea. (Closed)

Landscape and Visual Impact

6.1.11 No relevant adverse impact was observed in the reporting month.

Others

6.1.12 No relevant adverse impact was observed in the reporting month.

6.2 Advice on the Solid and Liquid Waste Management Status

- 6.2.1 The Contractor had registered as a chemical waste producer for this Project. Receptacles were available for general refuse collection and sorting.
- 6.2.2 As advised by the Contractor, 30,000m³ of inert C&D material was reused in other projects. 18,958.7m³ of fill material were imported for the Contract use in the reporting period. 45.5m³ of general refuse were generated and disposed of in the reporting period. Monthly summary of waste flow table is detailed in Appendix M.
- 6.2.3 The Contractor is advised to properly maintain on site C&D materials and wastes storage, 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.
- 6.2.4 The Contractor is reminded that chemical waste 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, Labeling and Storage of Chemical Wastes.
- 6.2.5 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 reporting month, such site arrangement has been discontinued since 24 February 2016.
- 6.2.6 After checking with the Contractor, surcharge material was removed off site to Macau from 27 April 2016 and it is continued in the reporting month. Surplus surcharge was exported to Macau during the reporting month. 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.
- 6.2.7 As advised by the Contractor, approximately 170,000m³ of surplus surcharge was exported to Macau during the reporting month.

6.3 Environmental Licenses and Permits

6.3.1 The environmental licenses and permits for the Contract and valid in the reporting month is summarized in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

| Statutory Reference | License/ Permit | License or Permit No. | Valid Period | | License/ Permit Holder | Remarks |
|---------------------|--|-----------------------|--------------|------------|------------------------|--|
| | | | From | To | | |
| EIAO | Environmental Permit | EP-353/2009/K | 11/04/2016 | N/A | HyD | Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities |
| | | EP-354/2009/D | 13/03/2015 | N/A | | Tuen Mun – Chek Lap Kok Link (TMCLKL Southern Landfall Reclamation only) |
| APCO | NA notification | -- | 30/12/2011 | -- | CHEC | Works Area WA2 and WA3 |
| APCO | NA notification | -- | 25/07/2014 | -- | CHEC | Works Area WA1 |
| WDO | Chemical Waste Producer Registration | 5213-951-C1186-30 | 28/10/2015 | N/A | CHEC | Chemical waste produced in Contract HY/2010/02 (WA1) |
| WDO | Chemical Waste Producer Registration | 5213-951-C1186-21 | 30/3/2012 | N/A | CHEC | Chemical waste produced in Contract HY/2010/02 (WA2) |
| WDO | Chemical Waste Producer Registration | 5213-839-C3750-02 | 13/09/2012 | -- | CHEC | Registration as Chemical Waste Producer at TKO 137(FB) |
| WDO | Billing Account for Disposal of Construction Waste | 7014181 | 05/12/2011 | N/A | CHEC | Waste disposal in Contract HY/2010/02 |
| NCO | Construction Noise Permit | GW-RE0385-16 | 19/04/2016 | 14/10/2016 | CHEC | Section of TKO Fill Bank under Contract HY/2010/02 |
| NCO | Construction Noise Permit | GW-RS0747-16 | 22/07/2016 | 21/01/2017 | CHEC | Reclamation Works in Contract HY/2010/02 |

6.4 Implementation Status of Environmental Mitigation Measures

- 6.4.1 In response to the site audit findings, the Contractors carried out corrective actions.
- 6.4.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Most of the necessary mitigation measures were implemented properly.
- 6.4.3 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly.
- 6.4.4 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 checking were conducted by the experienced MMOs within the works area to ensure no dolphin was trapped by the enclosed silt curtain systems. Any dolphin spotted within the enclosed silt curtain systems was reported and recorded. Relevant procedures were followed and measures were well implemented. Silt curtain systems were also inspected timely in accordance to the submitted plan. All inspection records were kept properly.
- 6.4.5 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.
- 6.4.6 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 Contract site and associated works areas throughout the construction phase.
- 6.4.7 After review, 1 floating grout production was in operation at any time in August 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 month.
- 6.4.8 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 in the reporting month. 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.
- 6.4.9 Further to our letter (ET's letter's ref.: 60249820/rmky16033001) dated 30/3/2016 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 during the reporting month, stage 1 (southern section of Portion B) removal work was rescheduled and therefore not carried out in June 2016. Tentative completion for stage 1 removal work and dates for the subsequent stages have also been updated in the reporting month, while the overall phasing arrangement has not changed. A notification letter was prepared in the reporting month and sent to IEC/ENPO on 1 June 2016 via email to inform them that the removal of perimeter silt curtain of Stages 1, 2, 3 and 4 has been rescheduled. IEC/ENPO expressed on 7 June 2016 that the update on the proposal is mainly on time schedule and as such, they have no objection in principle. However prior to IEC/ENPO's reply to confirm ET's updated proposal, ET was requested to provide site photos to show ET's checking of the current site condition with respect to the reminders given in their previous letter (Our Ref.: HYDZMBEEM00_0_4102L.16 dated 22 April 2016). After checking, it is noted that seawall and reclamation filling at the concerned section were completed and as informed by the Contractor, Stages 1 removal of the perimeter silt curtain has been completed on 20 August 2016.

6.5 Summary of Exceedances of the Environmental Quality Performance Limit

- 6.5.1 For impact air quality monitoring, no exceedance was recorded at all monitoring stations in the reporting month.
- 6.5.2 For construction noise, no exceedance was recorded at all monitoring stations in the reporting month.
- 6.5.3 For impact water quality monitoring, no exceedance was recorded at all monitoring stations in the reporting month.
- 6.5.4 For dolphin monitoring, one (1) limit level exceedance is recorded. The Investigation is undergoing and investigation results will be reported in quarterly report (June– August 2016)
- 6.5.5 Environmental site inspection was carried out 4 times in August 2016. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.
- 6.5.6 Cumulative statistics on exceedance is provided in Appendix N.

6.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

- 6.6.1 The Environmental Complaint Handling Procedure is annexed in Figure 6.
- 6.6.2 No complaint, notification of summons or prosecution was received in the reporting period.
- 6.6.3 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix N.

7 FUTURE KEY ISSUES

7.1 Construction Programme for the Coming Months

7.1.1 As informed by the Contractor, the major works for the Contract in September and October 2016 will be*:-

Marine-base

- Sloping Seawalls
- Rubble Mound Seawall
- Maintenance of silt curtain

Land-base

- Surcharge removal & laying
- Deep Cement Mixing
- Construction of Permanent Seawall
- 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

*Construction activities in September and October 2016 will be changed subject to works progress.

7.2 Key Issues for the Coming Month

7.2.1 Key issues to be considered in the coming months:-

- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities;
- Exposed surfaces/soil stockpiles should be properly treated to avoid generation of silty surface runoff during rainstorm;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Conduct regular inspection of various working machineries and vessels within works areas to avoid any dark smoke emission;
- Suppress dust generated from work processes with use of bagged cements, earth movements, excavation activities, exposed surfaces/soil stockpiles and haul road traffic;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures for operating equipment and machinery on-site, such as erection of movable noise barriers or enclosure for noisy plants;
- Closely check and replace the sound insulation materials regularly;
- Better scheduling of construction works to minimize noise nuisance;
- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved and confined areas;
- Collection and segregation of construction waste and general refuse on land and in the sea should be carried out properly and regularly; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.
- Control night-time lighting and glare by hooding all lights.
- Regular review and provide maintenance to dust control measures such as sprinkler system.

7.3 Monitoring Schedule for the Coming Month

- 7.3.1 The tentative schedule for environmental monitoring of September 2016 is provided in Appendix F.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

- 8.1.1 For impact air quality monitoring, no exceedance was recorded at all monitoring stations in the reporting month.
- 8.1.2 For construction noise, no exceedance was recorded at all monitoring stations in the reporting month.
- 8.1.3 For impact water quality monitoring, no exceedance was recorded at all monitoring stations in the reporting month.
- 8.1.4 For dolphin monitoring, one (1) limit level exceedance is recorded. The Investigation is undergoing and investigation results will be reported in quarterly report (June– August 2016)
- 8.1.5 No complaint, notification of summons or prosecution was received in the reporting period.
- 8.1.6 Environmental site inspection was carried out 4 times in August 2016. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

8.2 Recommendations

8.2.1 According to the environmental site inspections performed in the reporting month, 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, enclosure for noisy plants or enhancement works to provide sufficient acoustic decoupling measure(s). 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, batteries and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage. Proper measures, like drip trays and/or bundings, should be provided for retaining leaked oil/chemical from plants.
- 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, accumulated oil mixture 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.