



# **Expansion of Hong Kong International Airport into a Three-Runway System**

Construction Phase Quarterly EM&A Report No.3

November 2016

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Construction Phase Quarterly EM&A Report No.3

November 2016

**This Construction Phase Quarterly EM&A Report No. 3 has been  
reviewed and certified by**

**the Environmental Team Leader (ETL) in accordance with**

**Section 15.4 of the Updated EM&A Manual**

**Certified by:**

A handwritten signature in black ink, appearing to read 'Terence Kong', is positioned above a horizontal line.

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Terence Kong  
Environmental Team Leader (ETL)  
Mott MacDonald Hong Kong Limited

**Date**                      30 November 2016

\  
Our Ref : 60440482/C/JCHL161202

By Email

Airport Authority Hong Kong  
HKIA Tower, 1 Sky Plaza Road  
Hong Kong International Airport  
Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Senior Manager

2 December 2016

Dear Sir,

**Contract No. 3102**  
**3RS Independent Environmental Checker Consultancy Services**

**Submission of Revised Quarterly EM&A Report No.3 (July to September 2016)**

Reference is made to the Environmental Team's submission of Revised Quarterly EM&A Report No.3 (July to September 2016) under Condition 15.4 of the Environmental Permit No. EP-489/2014 certified by the ET Leader on 2 December 2016.

We would like to inform you that we have no adverse comment on the captioned submission. Therefore we write to verify the captioned submission.

Should you have any query, please feel free to contact our Isabella Yeung at 3922 9348 or the undersigned at 3922 9376.

Yours faithfully,  
AECOM Asia Co. Ltd.



Jackel Law  
Independent Environmental Checker



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# Executive summary

The “Expansion of Hong Kong International Airport into a Three-Runway System” (the Project) serves to meet the future air traffic demands at Hong Kong International Airport (HKIA). On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the Project was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual.

The commencement of initial reclamation works was announced on 1 August 2016. This is the 3<sup>rd</sup> Construction Phase Quarterly EM&A Report for the Project which summarizes the monitoring results and audit findings of the EM&A programme during the reporting period from 1 July 2016 to 30 September 2016.

## **Key Activities in the Reporting Period**

Key activities of the Project carried out in the reporting period were related to the following contracts:

### **Advanced works Contract:**

#### **Contract P560 (R) Aviation Fuel Pipeline Diversion Works**

- Installation of horizontal directional drilling (HDD) casing;
- Pilot hole drilling using HDD method at launching site;
- Stockpiling of excavated materials from HDD operation at stockpiling area; and
- Site preparation works and construction of containment pit at Sheung Sha Chau.

### **DCM Contracts:**

#### **Contract 3201 to 3204 Deep Cement Mixing Works**

- Mobilization and off-site plant fabrication;

### **Other Contracts:**

#### **Contract 3213 CLP Cable Diversion Enabling Works**

- Site preparation works at the western part of the airport.


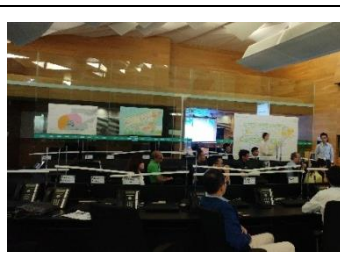

## **EM&A Activities Conducted in the Reporting Period**

The EM&A programme was undertaken in accordance with the Updated EM&A Manual of the Project. A summary of the monitoring and audit activities during this reporting period is presented as below:

Monitoring/ Audit Activities	Number of Sessions
1-hour Total Suspended Particulates (TSP) Air Quality Monitoring	99

Monitoring/ Audit Activities	Number of Sessions
Noise Monitoring	65
Water Monitoring	25
Ecological Monitoring	2
Vessel line-transect surveys for Chinese White Dolphin (CWD) monitoring	4
Land-based theodolite tracking survey effort for CWD monitoring	10

Note: No marine construction work was carried out during the reporting quarter, monitoring for water quality and CWD was conducted as scheduled.

		
Vessel Line-Transect Surveys for CWD Monitoring	Skypier Plan Briefing at Integrated Airport Centre	Construction Vessel Skipper Training

In total, 2,459 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. All the High Speed Ferries (HSFs) had travelled through the Speed Control Zone (SCZ) with prevailing speed within 15 knots, which complied with the SkyPier Plan. Fifteen ferry movements had minor deviation from the diverted route during the reporting period. Among the 15 cases, eight cases are related to public safety / emergency situations. Follow-up actions such as checking of electronic marine chart / radar graphs and refresher training have been taken for the remaining non-public safety / emergency cases.

The audit of construction and associate vessels starts in August. ET has conducted weekly audit of relevant information to ensure sufficient information has been provided by the contractors to the Marine Traffic Control Center (MTCC) and the contractors are fully complied with the requirements of the Marine Travel Routes and Management Plan for Construction and Associated Vessel (MTRMP-CAV). A total of 11 skipper training workshops have been held in August and September with concerned captains of construction vessels associated with Contract P560(R) Aviation Fuel Pipeline Diversion Works and the four DCM contracts to familiarise them with the MTRMP-CAV.

### **Review of Environmental Quality Performance Limits (Action and Limit levels)**

The water quality monitoring and CWD monitoring were completed as scheduled in August and September 2016, although no marine construction works was carried out in the reporting period.

For air quality, three exceedance cases involving Action Level of 1-hour TSP monitoring were recorded on 27 September 2016. The investigation results indicated that the exceedances were likely related to background air quality level but not project-related.

No breach of the Action or Limit Levels in relation to the construction noise and waste monitoring were recorded during the reporting period.

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

Weekly site audits were carried out during the reporting period to confirm the implementation measures undertaken by the Contractors. Environmental issues related to the construction activities, including air quality, noise, waste, ecology and landscape & visual were monitored and/or reviewed.

The recommended environmental mitigation measures, as included in the EM&A programme, were implemented properly in the reporting period. The EM&A programme effectively monitored the construction activities and ensure the proper implementation of mitigation measures.

### **Summary findings of the EM&A programme**

The following table summarizes the key findings of the EM&A programme during the reporting period:

	YesNo	Details	Analysis / Recommendation / Remedial Actions
Breaches of Limit Level <sup>^</sup>	✓	No exceedance of project-related limit level was recorded.	Nil
Breaches of Action Level <sup>^</sup>	✓	No exceedance of project-related action level was recorded.	Nil
Complaints Received	✓	No construction activities related complaints were received.	Nil
Notification of any summons and status of prosecutions	✓	Neither notifications of summons nor prosecution were received.	Nil
Changes that affect the EM&A	✓	There were no changes to the construction works that may affect the EM&A	Nil

Remarks: <sup>^</sup> only exceedance of action/ limit level related to Project works will be highlighted.

# 1 Introduction

## 1.1 Background

On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the “Expansion of Hong Kong International Airport into a Three-Runway System” (the Project) was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual (the Manual) submitted under EP Condition 3.1. The Manual is available on the Project’s dedicated website (accessible at: <http://env.threerunwaysystem.com/en/index.html>). AECOM Asia Company Limited (AECOM) was employed by AAHK as the Independent Environmental Checker (IEC) for the Project.

The Project covers the expansion of the existing airport into a three-runway system (3RS) with key project components comprising land formation of about 650 ha and all associated facilities and infrastructure including taxiways, aprons, aircraft stands, a passenger concourse, an expanded Terminal 2, all related airside and landside works and associated ancillary and supporting facilities. The existing submarine aviation fuel pipelines and submarine power cables also require diversion as part of the works.

Construction of the Project is to proceed in the general order of diversion of the submarine aviation fuel pipelines, diversion of the submarine power cables, land formation, and construction of infrastructure, followed by construction of superstructures.

The commencement of initial reclamation works was announced on 1 August 2016. The updated overall phasing programme of all construction works and the contract information are provided in Appendix A.

## 1.2 Scope of this Report

This is the 3<sup>rd</sup> Construction Phase Quarterly EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 July 2016 to 30 September 2016.

## 1.3 Project Organisation

The Project’s organisation structure and the contact details of the key personnel are provided in **Appendix B** and **Table 1.1** respectively.

**Table 1.1: Contact Information of Key Personnel**

Party	Position	Name	Telephone
Project Manager's Representative (Airport Authority Hong Kong)	Senior Manager, Environment	Lawrence Tsui	2183 2734
Environmental Team (ET) (Mott MacDonald Hong Kong Limited)	Environmental Team Leader	Terence Kong	2828 5919
	Deputy Environmental Team Leader	Heidi Yu	2828 5704
	Deputy Environmental Team Leader	Keith Chau	2972 1721
Independent Environmental Checker (IEC) (AECOM Asia Company Limited)	Independent Environmental Checker	Jackel Law	3922 9376
	Deputy Independent Environmental Checker	Joanne Tsoi	3922 9423
<b>Advanced Works Contract:</b>			
Contract P560(R) Aviation Fuel Pipeline Diversion Works (Langfang Huayuan Mechanical and Electrical Engineering Co., Ltd.)	Project Manager	Shih Wei	2117 0566
	Environmental Officer	Lyn Lau	5172 6543
<b>DCM Works Contracts:</b>			
Contract 3201 DCM (Package 1) (Penta-Ocean-China State-Dong-Ah Joint Venture)	Project Director	Mr. Tsugunari SUZUKI	9178 9689
	Environmental Officer	Mr. Kanny CHO	9019 1962
Contract 3202 DCM (Package 2) (Samsung-BuildKing Joint Venture)	Project Manager	Mr. Ilkwon Nam	9643 3117
	Environmental Officer	Mr. Dickson Mak	9525 8408
Contract 3203 DCM (Package 3) (Sambo E&C Co.,Ltd)	Project Manager	Mr. Park Seong Jae	9683 8693
	Environmental Officer	Mr. Leung Min Pong	9203 5820
Contract 3204 DCM (Package 4) (CRBC-SAMBO Joint Venture)	Project Manager	Mr. Yoo Kyung-Sik	9683 8697



Party	Position	Name	Telephone
	Environmental Officer	Mr. David Man	6421 3238
<b>Other Works contract:</b>			
Contract 3213 CLP Cable Diversion Enabling Works (Wing Hing Construction Company)	Environmental Officer	Mr. Kan Yun Tai, Michael	9206 0550
	Environmental Officer	Ms Ivy Tam	2151 2090

## 1.4 Contact information for the Project

The contact information for the Project is provided in **Table 1.2**. The public can contact us through the following channels if they have any queries and comments on the environmental monitoring data and project related information.

**Table 1.2: Contact Information of the Project**

Channels	Contact Information
Hotline	3908 0354
Email	env@3rsproject.com
Fax	3747 6050
Postal Address	Airport Authority Hong Kong HKIA Tower 1 Sky Plaza Road Hong Kong International Airport Lantau Hong Kong Attn: Environmental Team Leader Mr Terence Kong c/o Mr Lawrence Tsui (TRD)

## 1.5 Summary of Construction Works

During the reporting period, no marine construction work was carried out. Key activities of the Project were related to the Contract P560(R) Aviation Fuel Pipeline Diversion Works (Contract P560(R)) which involved installation of HDD casing and pilot hole drilling at the HDD launching site located at the west part of the airport, stockpiling of excavated materials from HDD operation at stockpiling area, site preparation works and construction of containment pit at Sheung Sha Chau. CLP cable diversion enabling work contract involved site preparation works. The four DCM contracts involved mobilization and off-site plant fabrication. There are also some site investigation works conducted during the reporting period.

The locations of the works areas are presented in **Figure 1.1** to **Figure 1.2**. Some site investigation works were carried out during the reporting period.

## 1.6 Summary of EM&A Programme Requirements

As presented in the Updated EM&A Manual, the environmental aspects of interest for the Project include air quality, noise, water quality, waste management, land contamination, terrestrial ecology, marine ecology, fisheries, landscape and visual, sewage and sewerage, and hazard to human life.

The status for all environmental aspects is presented in **Appendix A**.

**Table 1.3: Summary of Status for All Environmental Aspects under the Updated EM&A Manual**

Parameters		Status
<b>Air Quality</b>		
Baseline Monitoring	At least 14 consecutive days before commencement of construction work	The baseline air quality monitoring result has been reported in Baseline Monitoring Report (Version 1) and submitted to EPD under EP Condition 3.4.
Impact Monitoring	At least 3 times every 6 days	On-going
<b>Noise</b>		
Baseline Monitoring	Daily for a period of at least two weeks prior to the commencement of construction works	The baseline noise monitoring result has been reported in Baseline Monitoring Report (Version 1) and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
<b>Water Quality</b>		
General Baseline Water Quality Monitoring for reclamation, water jetting and field joint works	Three days per week, at mid-flood and mid-ebb tides, for at least four weeks prior to the commencement of marine works.	The baseline water quality monitoring result has been reported in Water Quality Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
General Impact Water Quality Monitoring for reclamation, water jetting and field joint works	Three days per week, at mid-flood and mid-ebb tides.	The general water quality monitoring were completed as scheduled in August and September 2016, although there were no marine construction works.
Initial Intensive Deep Cement Mixing (DCM) Water Quality Monitoring	At least four weeks	To be commenced according to the detailed plan on DCM
Regular DCM Water Quality Monitoring	Three times per week until completion of DCM works.	The early regular DCM water quality monitoring were completed as scheduled in August and September 2016, although there were no marine construction works.
<b>Waste Management</b>		
Waste Monitoring	At least weekly	On-going
<b>Land Contamination</b>		
Supplementary Contamination Assessment Plan (CAP)	At least 3 months before commencement of any soil remediation works.	To be submitted with the relevant construction works
Contamination Assessment Report (CAR) for Golf Course	CAR to be submitted for golf course first; programme for submission of supplementary CAR at the other areas to be agreed.	The CAR for Golf Course was submitted to EPD.
<b>Terrestrial Ecology</b>		
Pre-construction Egret Survey	Once per month in the breeding season between April and July, prior to the commencement of HDD drilling works.	The revised Egret Survey Plan was submitted and approved by EPD under EP Condition 2.14.
Egret Survey Plan		
Ecological Monitoring	Monthly monitoring during the HDD construction works period from August to March.	No construction work was carried out on Sheung Sha Chau Island during the ardeid's breeding season in July 2016 in accordance with the Updated EM&A Manual. Ecological monitoring was commenced in August 2016.

Parameters		Status
<b>Marine Ecology</b>		
Pre-Construction Phase Coral Dive Survey	Prior to marine construction works	The Coral Translocation Plan was submitted and approved by EPD under EP Condition 2.12.
Coral Translocation	-	On-going
<b>Chinese White Dolphins (CWD)</b>		
Baseline Monitoring	6 months of baseline surveys before the commencement of land formation related construction works at a frequency of two full surveys per month.	Baseline CWD results were reported in the CWD Baseline Monitoring Report and submitted to EPD in accordance with EP Condition 3.4.
Impact Monitoring	Vessel surveys: Two full surveys per month; Land-based theodolite tracking: One day per month at the Sha Chau station and one day per month at the Lung Kwu Chau Station; and PAM: For the whole duration for land formation related construction works.	Monitoring of CWDs were completed as scheduled in August and September 2016 although there were no marine construction works.
<b>Landscape and Visual</b>		
Baseline Monitoring	One-off survey within the Project site boundary prior to commencement of any construction works	The baseline landscape & visual monitoring result has been reported in Baseline Monitoring Report (Version 1) and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
<b>Environmental Auditing</b>		
Regular site inspection	Weekly	On-going
Skypier High Speed Ferries (HSF) implementation measures	Monitor and check	On-going
Construction and Associated Vessels Implementation measures	Monitor and check	The auditing of construction and associated vessels was commenced in August 2016.
Complaint Hotline and Email channel	Construction phase	On-going
Environmental Log Book	Construction phase	On-going

Taking into account the construction works in the reporting period, impact monitoring of air quality, noise, waste management and landscape & visual were carried out in the reporting period. Ecological monitoring, water quality monitoring and CWD monitoring were commenced in August 2016 .

The EM&A programme also involved weekly site inspections and related auditings conducted by the ET for checking the implementation of the required environmental mitigation measures recommended in the approved EIA Report.

The EM&A programme followed the recommendations presented in the approved EIA Report and the Updated EM&A Manual. A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix C**.

## 2 Environmental Monitoring and Auditing

### 2.1 Air Quality Monitoring

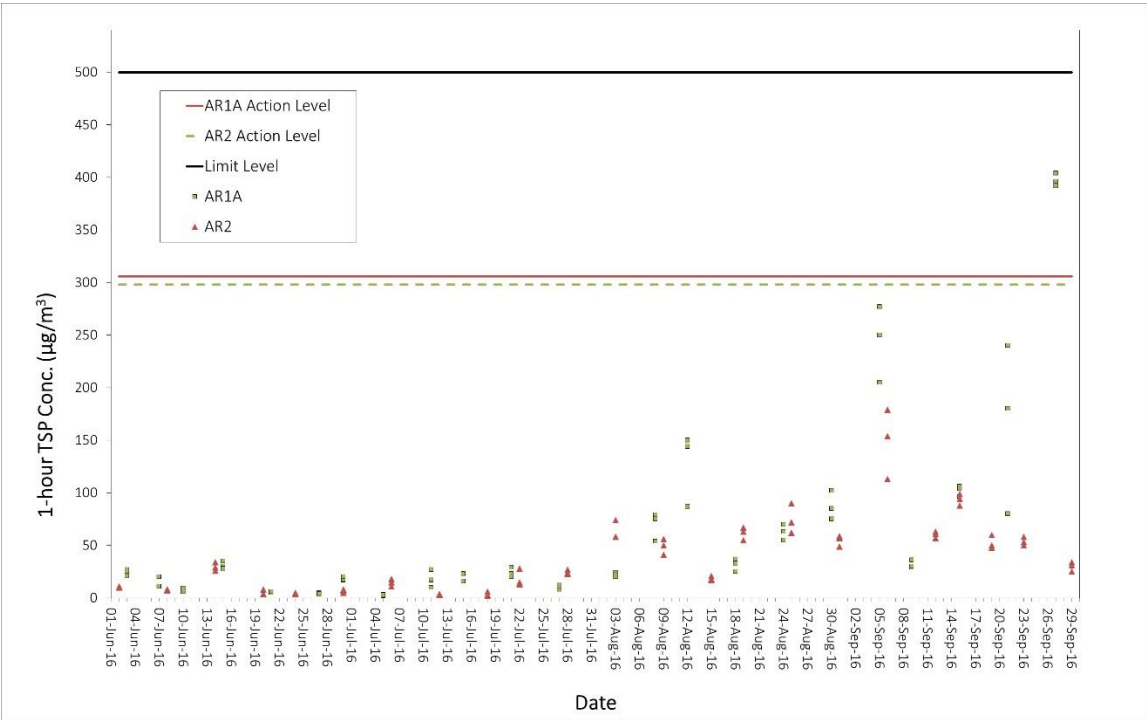
Impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted three times every 6 days at two representative monitoring stations during the reporting period. The locations of monitoring stations are described in **Table 2.1** and presented in **Figure 2.1**. The Action and Limit Levels of the air quality monitoring are also provided in **Table 2.1** for reference.

**Table 2.1: Impact Air Quality Monitoring Stations**

Monitoring Station	Location	Action Level (µg/m³)	Limit Level (µg/m³)
AR1A	Man Tung Road Park	306	500
AR2	Village House at Tin Sum	298	

The graphical plots of impact air quality monitoring results during the reporting period are presented in **Graph 1**.

**Graph 1: Graphical Plot of 1-hour TSP concentration at AR1A and AR2 during the Reporting Period**



Three exceedance cases of action level of air quality monitoring were recorded at AR1A on 27 September 2016 in the 1-hour TSP monitoring that started at 08:52am, 09:52am and 10:52am. Actions were taken accordingly based on the established Event and Action Plan as presented in the Updated EM&A Manual. IEC and AAHK were informed of the exceedances.

According to on-site observation by monitoring team, haze weather was observed during monitoring. No major construction dust emission source was observed during monitoring. Based on the information from Hong Kong Observatory, tropical cyclone Megi was approaching Taiwan, its subsidence airstream create unfavourable conditions for the dispersion of pollutants and lead to low visibility to Hong Kong. According to EPD's pollutant concentration summary at Tung Chung from 08:00 to 12:00 on 27 September 2016, relatively high PM<sub>10</sub> ranging from 104 -159 µg/m<sup>3</sup> was recorded.

Relevant contractors were informed of the exceedances. As informed by the contractors, no major dusty activities were conducted during monitoring. The major land works were related to P560(R) HDD pilot hole drill, stockpiling of excavated materials and site preparation works at Sha Chau.

The exceedances of 1-hr TSP may possibly due to the air quality impact induced by tropical cyclone Megi. As no major project-related dusty construction work was conducted during monitoring, the exceedance was considered not due to 3RS project construction works and therefore, no repeat measurement is required.

No exceedance of the Action and Limit Level was recorded at AR2 in the reporting period.

The weather was varied from fine to rainy in the reporting quarter. Wind direction was mainly northeast or northwest in the reporting quarter.

Key activities of the Project were related to the Contract P560(R) which mainly involved installation of HDD casing and pilot hole drilling at the HDD launching site, stockpiling of excavated materials from HDD operation at stockpiling area, site preparation works and construction of containment pit on Sheung Sha Chau. CLP cable diversion enabling work contract involved site preparation works. The four DCM contracts involved mobilization and off-site plant fabrication. Those works were not likely to cause adverse dust pollution. The active construction works of Contract P560(R) were around 3 km and 900 m away respectively from the nearest monitoring stations in Tung Chung and the villages in North Lantau. The major dust sources during the reporting period were observed to be local air pollution and nearby traffic emissions. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the works of the Project.

## 2.2 Noise Monitoring

Impact noise monitoring was conducted at five representative monitoring stations once per week during 0700 and 1900 during the reporting period. The locations of monitoring stations are described in **Table 2.2** and presented in **Figure 2.1**. The Action and Limit Levels of the noise monitoring are provided in **Table 2.2** for reference.

The graphical plots of impact noise quality monitoring results during the reporting period are presented in **Graph 2**.

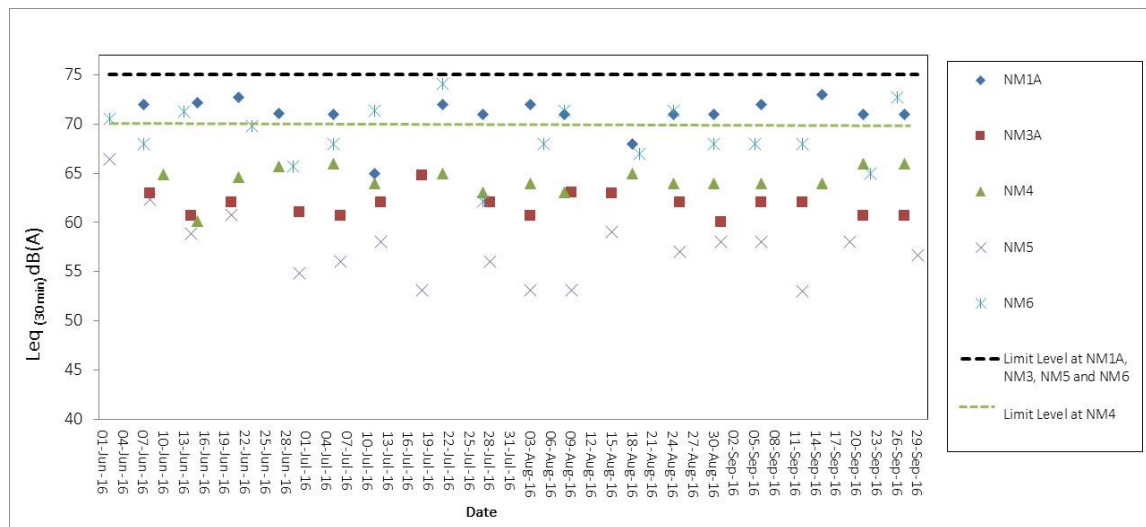
**Table 2.2: Impact Noise Quality Monitoring Stations**

Monitoring Station	Location	Action Level	Limit Level
NM1A	Man Tung Road Park		75 dB(A)
NM3A	Site Office		75 dB(A)

Monitoring Station	Location	Action Level	Limit Level
NM4 <sup>(i)</sup>	Ching Chung Hau Po Woon Primary School	When one documented complaint is received from any one of the sensitive receivers	65dB(A) / 70 dB(A)
NM5	Village House in Tin Sum		75 dB(A)
NM6	House No. 1, Sha Lo Wan		75 dB(A)

Note: <sup>(i)</sup> reduce to 70dB(A) for school and 65dB(A) during school examination periods.

**Graph 2: Graphical Plot of Leq (30min) at NM1A, NM3A, NM4, NM5 and NM6 during the Reporting Period**



No exceedance of the Action and Limit Level was recorded at all monitoring stations in the reporting period.

The key activities undertaken in the reporting period were not likely to cause adverse noise impact. The active construction works of Contract P560(R) were around 3 km and 900 m away respectively from the nearest monitoring stations in Tung Chung and the villages in North Lantau. The monitoring stations were observed during the construction noise impact monitoring dominated by aircraft noise at NM3A and NM5, aircraft noise and helicopter noise at NM6, road traffic noise at NM1A and school activities at NM4 in the background. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the works of the Project.

## 2.3 Water Quality Monitoring

Although no marine construction works was carried out, water quality monitoring was commenced as scheduled. The monitoring was conducted at a total of 22 water quality monitoring stations, comprising 12 impact stations, seven sensitive receiver stations and three control stations in the vicinity of the water quality sensitive receivers around the airport island in accordance with the Updated EM&A Manual. **Table 2.3** describes the details of the monitoring stations. **Figure 2.2** shows the locations of the monitoring stations.

**Table 2.3: Monitoring Locations and Parameters for Impact Water Quality Monitoring**

Monitoring Stations	Description	Coordinates		Parameters
		Easting	Northing	
C1	Control	804247	815620	DO, pH, Temperature, Salinity, Turbidity, SS, Total Alkalinity, Heavy Metals <sup>(2)</sup>
C2	Control	806945	825682	
C3 <sup>(3)</sup>	Control	817803	822109	
IM1	Impact	806458	818351	
IM2	Impact	806193	818852	
IM3	Impact	806019	819411	
IM4	Impact	805039	819570	
IM5	Impact	804924	820564	
IM6	Impact	805828	821060	
IM7	Impact	806835	821349	
IM8	Impact	807838	821695	
IM9	Impact	808811	822094	
IM10	Impact	809838	822240	
IM11	Impact	810545	821501	
IM12	Impact	811519	821162	
SR1 <sup>(1)</sup>	Future Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) Seawater Intake for cooling	812586	820069	DO, pH, Temperature, Salinity, Turbidity, SS
SR2 <sup>(3)</sup>	Planned marine park / hard corals at The Brothers / Tai Mo To	814166	821463	
SR3	Sha Chau and Lung Kwu Chau Marine Park / fishing and spawning grounds in North Lantau	807571	822147	
SR4A	Sha Lo Wan	807810	817189	
SR5A	San Tau Beach SSSI	810696	816593	
SR6	Tai Ho Bay, Near Tai Ho Stream SSSI	814663	817899	
SR7	Ma Wan Fish Culture Zone (FCZ)	823742	823636	
SR8	Seawater Intake for cooling at Hong Kong International Airport (East)	811593	820417	

**Notes:**

<sup>(1)</sup> the seawater intakes of SR1 for the future HKBCF are not yet in operation, the future permanent location for SR1 during impact monitoring is subject to finalisation after the HKBCF seawater is commissioned.

<sup>(2)</sup> according to the Baseline Water Quality Monitoring Report, Chromium and Nickel are the representative heavy metals for early regular DCM monitoring. DCM specific water quality monitoring parameters (total alkalinity and heavy metals) were only conducted at C1 to C3, IM1 to IM12.

<sup>(3)</sup> according to the baseline water quality monitoring report, C3 station is not adequately representative as a control station of impact/ SR stations. The control reference has been changed from C3 to SR2 from 1 September 2016 onwards.

### 2.3.1 Action and Limit Levels for Water Quality Monitoring

The Action and Limit Levels levels for general water quality monitoring and regular DCM monitoring are presented in **Table 2.4**. The control and impact stations during flood tide and ebb tide for general water quality monitoring and regular DCM monitoring are presented in **Table 2.5**.

**Table 2.4: Action and Limit Levels for General Water Quality Monitoring and Regular DCM Monitoring**

Parameters	Action Level (AL)		Limit Level (LL)	
Action and Limit Levels for general water quality monitoring and regular DCM monitoring (excluding SR1& SR8)				
DO in mg/L (Surface, Middle & Bottom)	Surface and Middle 4.8 mg/L		Surface and Middle 4.1 mg/L 5 mg/L for Fish Culture Zone (SR7) only	
	Bottom 3.1 mg/L		Bottom 2.3 mg/L	
Suspended Solids (SS) in mg/L	25	or 120% of upstream control station at the same tide of the same day, whichever is higher	36	or 130% of upstream control station at the same tide of the same day, whichever is higher
Turbidity in NTU	26.0		41.4	
Total Alkalinity in ppm	95		98	
Representative Heavy Metals for early regular DCM monitoring (Chromium)	0.2		0.2	
Representative Heavy Metals for early regular DCM monitoring (Nickel)	3.2		3.4	
Action and Limit Levels SR1				
SS (mg/l)	To be determined prior to its commissioning		To be determined prior to its commissioning	
Action and Limit Levels SR8				
SS (mg/l)	52		60	

Note:

1. For DO measurement, non-compliance occurs when monitoring result is lower than the limits.
2. For parameters other than DO, non-compliance of water quality results when monitoring results is higher than the limits.
3. Depth-averaged results are used unless specified otherwise.
4. Details of selection criteria for the two heavy metals for early regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website <http://env.threerunwaysystem.com/en/ep-submissions.html>
5. The action and limit levels for the two representative heavy metals chosen will be the same as that for the intensive DCM monitoring.

**Table 2.5: The Control and Impact Stations during Flood Tide and Ebb Tide for General Water Quality Monitoring and Regular DCM Monitoring**

Control Station	Impact Stations
<b>Flood Tide</b>	
C1	IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, SR3
SR2 <sup>^1</sup>	IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR3, SR4A, SR5A, SR6, SR8
<b>Ebb Tide</b>	
C1	SR4A, SR5A, SR6
C2	IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR2, SR3, SR7, SR8

<sup>^1</sup> As per findings of Baseline Water Quality Report, the control reference has been changed from C3 to SR2 from 1 Sep 2016 onwards.



Water quality monitoring was commenced in August 2016. No marine construction works were conducted in August and September 2016, and hence no adverse water quality impact arising from the project was observed. The general water quality monitoring was completed as scheduled. The graphical plots of water quality monitoring results during the reporting period are presented in **Appendix D**.

## 2.4 Waste Monitoring

In accordance with the Updated EM&A Manual, the waste generated from construction activities was audited once per week to determine if wastes were being managed in accordance with the Waste Management Plan (WMP) prepared for the Project, contract-specific WMP, and any statutory and contractual requirements. All aspects of waste management including waste generation, storage, transportation and disposal were assessed during the audits. The Action and Limit levels of the construction waste are provided in **Table 2.6**.

**Table 2.6: Action and Limit Levels for Construction Waste**

Monitoring Stations	Action Level	Limit Level
Construction Area	When one valid documented complaint is received	Non-compliance of the WMP, contract-specific WMPs, any statutory and contractual requirements

Weekly waste monitoring of the Project construction works to check and monitor the implementation of proper waste management practices during the construction phase during the reporting period.

Recommendation was provided for P560(R) Aviation Fuel Pipeline Diversion Works during monitoring including review of the capacity of chemical waste storage, provision of drip tray for the oil drums, proper maintenance of drip tray and removal of oil stain on ground as chemical waste on sites.

Under the P560(R) Contract, about 621 m<sup>3</sup> excavated material from the launching site has been delivered and temporarily stored at the stockpiling area at Chun Ming Road adjacent to Tradeport Logistic Centre on the airport island during the reporting period. The excavated material will be reused in the Project, including as backfilling material at the launching site.

In addition, metals and paper were recycled. During the reporting period, 9.3 tonnes of general refuse were disposed of to the West New Territories (WENT) Landfill and no Construction and Demolition (C&D) material was disposed off-site. No exceedances of the Action and Limit Levels of waste monitoring were recorded during the reporting period.

No waste was generated from other contracts during the reporting period.

## 2.5 CWD Monitoring

### 2.5.1 Summary of Monitoring Requirements

CWD monitoring was conducted by vessel line-transect survey at a frequency of two full survey per month, supplemented by land-based theodolite tracking for twice per month at the Sha Chau station and three times per month at the Lung Kwu Chau station as well as Passive Acoustic Monitoring. Monitoring was completed in the reporting period, although there were no marine construction works. The locations of CWD monitoring by vessel survey transect are shown in **Figure 2.3**, whilst the land-based survey stations are described in **Table 2.7** and depicted in **Figure 2.4**. Location of Passive Acoustic Monitoring is shown in **Figure 2.10**.

**Table 2.7: Land-based Survey Station Details**

Stations	Location	Geographical Coordinates	Station Height (m)	Approximate Tracking Distance (km)
D	Sha Chau (SC)	22° 20' 43.5" N 113° 53' 24.66" E	45.66	2
E	Lung Kwu Chau (LKC)	22° 22' 44.83" N 113° 53' 0.2" E	70.40	3

The Action Level (AL) and Limit Level (LL) for CWD monitoring were formulated by an action response approach using the running quarterly dolphin encounter rates (STG and ANI) derived from baseline monitoring data, as presented in the CWD Baseline Monitoring Report. The derived values of AL and LL for CWD monitoring are shown in **Table 2.8**.

**Table 2.8: Derived Values of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring**

NEL, NWL, AW, WL and SWL as a Whole	
Action Level	Running quarterly STG < 1.86 & ANI < 9.35
Limit Level	Two consecutive running quarterly (3-month) STG < 1.86 & ANI < 9.35

## 2.5.2 Summary of Monitoring Results

### Vessel Line-transect Survey

#### Survey Effort

During the reporting period, four complete sets of vessel line-transect surveys were conducted from August to September 2016 to cover all transects in NEL, NWL, AW, WL and SWL survey area twice per month.

A total of 939 km of survey effort was collected from these surveys, with around 94.5% of the total survey effort being conducted under favourable weather condition (i.e. Beaufort Sea State 3 or below with favourable visibility). Details of the survey effort data were presented in **Appendix E**.

#### Sighting Distribution

In August and September 2016, 37 groups of CWD with 142 individuals were sighted. Amongst the sightings of CWD, 31 groups with 128 individuals were made during on-effort search under favourable weather condition.

Distribution of CWD sightings recorded during August 2016 to September 2016 are illustrated in **Figure 2.5**. CWD sightings were more frequent in WL than in NWL and SWL. In NWL, sightings were mainly recorded to the northeast and to the southwest of Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP). One sighting was recorded in AW near to the existing Hong Kong International Airport, whilst no sightings of CWDs were recorded within the 3RS land-formation footprint. CWD sightings in WL were evenly distributed in both coastal and off-shore areas from Tai O to Fan Lau. In SWL waters, CWD sightings were frequently sighted along the coast from Fan Lau to Lo Kei Wan, with a few scattered sightings further off-shore. Details of the sighting data were presented in **Appendix E**.

**Figure 2.5: Sightings Distribution of Chinese White Dolphins**

[Pink circle: Sighting locations of CWD, White line: Vessel survey transects, Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP), Red polygon: 3RS land-formation footprint]



Note: Only on-effort sightings under Beaufort 3 or below were presented in the figure.

### Encounter Rate

The dolphin encounter rates for the number of dolphin sightings per 100km survey effort (STG) and for the total number of dolphins per 100km survey effort (ANI) in the whole survey area (i.e. NEL, NWL, AW, WL and SWL) for August and September 2016 are summarized in **Table 2.9**.

**Table 2.9: Summary of Monthly and Running Quarterly STG and ANI of Chinese White Dolphin for August and September 2016**

	Encounter Rate (STG)	Encounter Rate (ANI)
August 2016	3.48	14.17
Running Quarterly of August 2016	4.93	20.57
September 2016	3.50	14.65
Running Quarterly of September 2016	4.29	18.32

Note: For detailed calculations of encounter rates STG and ANI, please refer to the Monthly EM&A Reports No. 8 and No. 9.

### Group Size

In August and September 2016, the group size of CWDs ranged from 1 to 10 individuals per group. The average group size of CWDs was 4.1 individuals per group. The numbers of CWD sightings with small group size (i.e. 1-2 individuals) and medium group size (3-9 individuals) were 12 and 18 respectively. The majority of CWD groups encountered in NWL were of medium group size. In WL, medium-sized CWD groups were mainly sighted along the coast. One large CWD group with 10 individuals was sighted in WL. Sighting locations of CWD groups with different group sizes were depicted in **Figure 2.6**.

### **Figure 2.6: Sighting Locations of Chinese White Dolphins with Different Group Sizes**

[Pink circle: Sighting locations of CWD with group size from 1 to 2 individuals, Green circle: Sighting locations of CWD with group size from 3 to 9 individuals, Red circle: Sighting locations of CWD with group size of 10 or above, White line: Vessel survey transects, Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP), Red polygon: 3RS land-formation footprint]



Note: Only on-effort sightings under Beaufort 3 or below were presented in the figure.

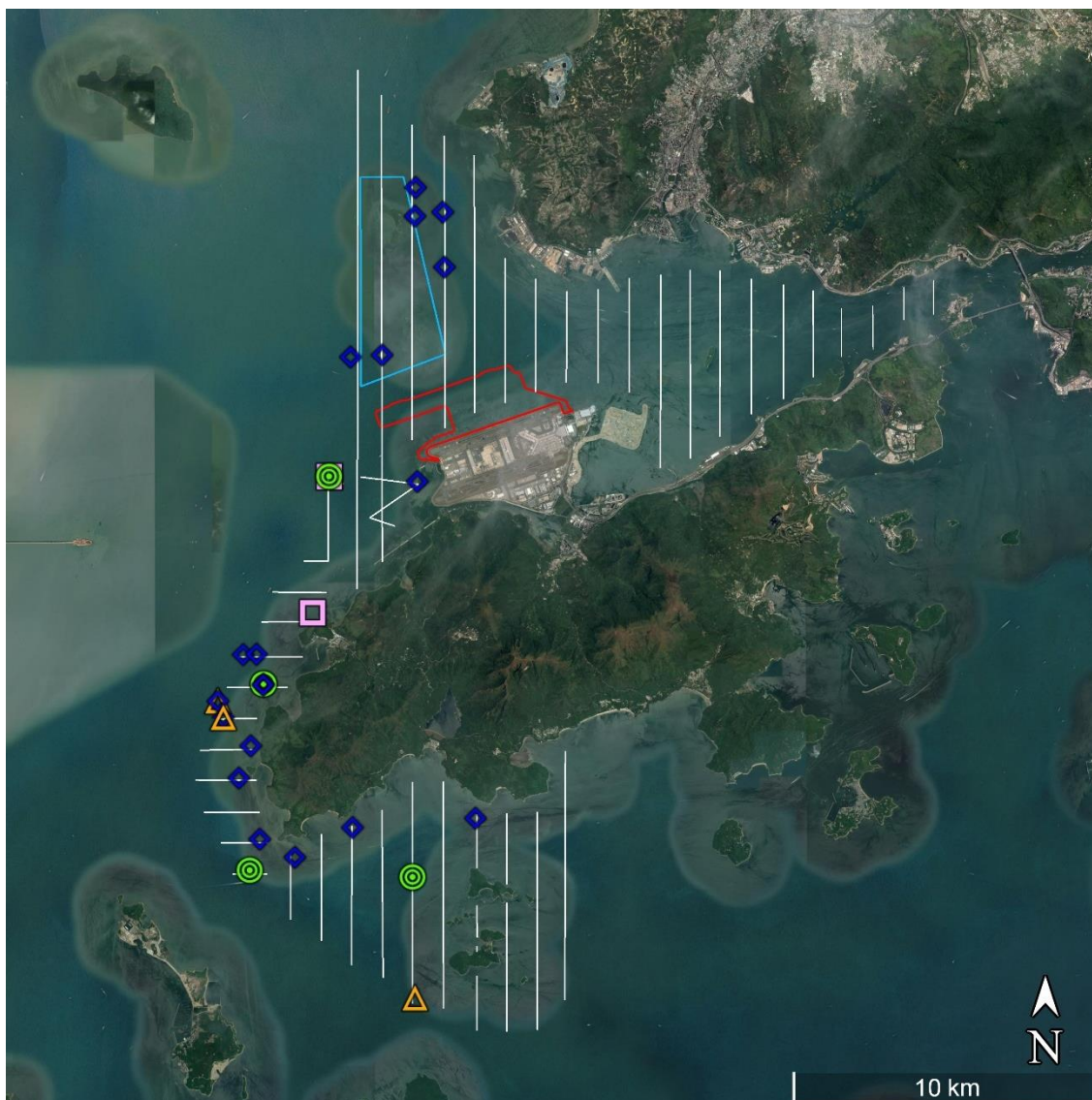


### Activities and Association with Fishing Boats

During August 2016 and September 2016, 19 groups of CWDs were sighted with feeding activities. Two groups amongst 19 were observed in association with operating purse seiners, one in WL and the other in SWL. In NWL waters, the majority of the feeding activities of CWDs were observed around SCLKCMP, while CWDs mainly fed along the coast of WL and SWL during the current reporting months. The sighting locations of CWDs engaged in different behaviours during the current reporting months were illustrated in **Figure 2.7**.

**Figure 2.7: Sighting Locations of Chinese White Dolphins Engaged in Different Behaviours**

[Indigo rhombus: Feeding, Green circle: Socializing, Pink square: Resting, Yellow triangle: Travelling, White line: Vessel survey transects, Blue polygon: SCLKCMP, Red polygon: 3RS land-form footprint]



### Mother-calf Pairs

In August 2016, two mother-calf pairs were sighted in WL and one mother-spotted juvenile pair was sighted in NWL near Lung Kwu Chau. No mother-calf or mother-spotted juvenile pairs were sighted in September 2016. The sighting locations of those mother-calf pairs were shown in **Figure 2.8**.

**Figure 2.8: Sighting Locations of Mother-calf Pairs**

[Pink circle: Sighting locations of mother-calf pairs, White line: Vessel survey transects, Blue polygon: Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP), Red polygon: 3RS land-form footprint]



### Photo Identification

During August 2016 and September 2016, a total number of 52 different CWD individuals sighted altogether 68 times were identified. Amongst these 52 identified individuals, 13 animals (i.e. NLMM002, NLMM006, NLMM010, NLMM013, NLMM028, NLMM038, SLMM002, SLMM010, SLMM011, SLMM015, WLMM027, WLMM043 and WLMM054) were sighted more than once. A summary of photo identification works is presented in **Table 2.10**. Representative photos of these individuals may refer to **Appendix E**.

Re-sighting locations of the identified CWD individuals and further detailed analysis of CWD monitoring results collected by vessel survey during construction phase would be included starting from the next Quarterly EM&A Report when there are more data and photos collected.

**Table 2.10: Summary of Photo Identification**

Individual ID	Date of sighting	Sighting Group No.	Area	Individual ID	Date of sighting	Sighting Group No.	Area
NLMM002	19/08/2016	1	NWL	SLMM017	26/09/2016	3	SWL
		2	NWL	SLMM022	19/09/2016	2	WL
	24/08/2016	1	NWL			4	WL
	22/09/2016	2	NWL	SLMM030	19/09/2016	4	WL
NLMM004	19/08/2016	2	NWL			5	WL
NLMM005	22/09/2016	1	NWL	SLMM032	19/09/2016	6	SWL
		2	NWL	SLMM034	19/09/2016	2	WL
NLMM006	24/08/2016	1	NWL	SLMM050	26/09/2016	3	SWL
	22/09/2016	2	NWL	SLMM051	26/09/2016	3	SWL
NLMM008	22/08/2016	3	WL	WLMM007	19/09/2016	5	WL
NLMM010	24/08/2016	1	NWL			7	SWL
	06/09/2016	1	NWL	WLMM013	09/08/2016	3	WL
	22/09/2016	2	NWL	WLMM015	19/09/2016	5	WL
NLMM012	08/09/2016	2	WL	WLMM020	19/09/2016	7	SWL
NLMM013	24/08/2016	1	NWL	WLMM024	19/09/2016	1	AW
	22/09/2016	2	NWL	WLMM025	19/09/2016	2	WL
NLMM017	08/09/2016	2	WL			7	SWL
NLMM019	22/08/2016	3	WL	WLMM027	08/09/2016	3	WL
NLMM021	27/09/2016	6	SWL		27/09/2016	5	SWL
NLMM027	22/09/2016	2	NWL	WLMM030	09/08/2016	1	WL
NLMM028	22/08/2016	1	WL	WLMM038	22/08/2016	2	WL
	24/08/2016	1	NWL	WLMM043	09/08/2016	1	WL
	22/09/2016	2	NWL		08/09/2016	1	WL
NLMM035	19/08/2016	1	NWL	WLMM046	09/08/2016	3	WL
		2	NWL	WLMM047	22/08/2016	2	WL
NLMM036	19/08/2016	1	NWL	WLMM048	22/08/2016	2	WL
NLMM037	19/08/2016	1	NWL	WLMM049	22/08/2016	4	WL
		2	NWL	WLMM050	08/09/2016	2	WL
NLMM038	22/08/2016	1	WL	WLMM051	08/09/2016	2	WL
	24/08/2016	1	NWL	WLMM052	08/09/2016	2	WL
SLMM002	19/09/2016	2	WL	WLMM053	08/09/2016	2	WL
		7	SWL	WLMM054	08/09/2016	3	WL
	26/09/2016	3	SWL		27/09/2016	5	SWL
SLMM010	22/08/2016	7	WL	WLMM055	19/09/2016	2	WL
	19/09/2016	7	SWL	WLMM056	19/09/2016	2	WL
SLMM011	22/08/2016	7	WL	WLMM057	19/09/2016	2	WL
	25/08/2016	1	SWL	WLMM058	19/09/2016	2	WL
SLMM015	22/08/2016	6	WL	WLMM059	19/09/2016	5	WL
		7	WL				
	27/09/2016	4	SWL				

**Land-based Theodolite Tracking**Survey Effort

During August 2016 and September 2016, a total of 10 days of land-based theodolite tracking survey effort was completed, including six days on Lung Kwu Chau and four days on Sha Chau. In total, 21 CWD groups were tracked during the surveys. Information on survey effort and CWD groups sighted during these land-based theodolite tracking surveys are presented in **Table 2.11**. Details on the survey effort and CWD groups tracked are presented in **Appendix E**. The first sighting locations of CWD groups tracked during land-based theodolite tracking surveys in August 2016 and September 2016 are shown in **Figure 2.9**.

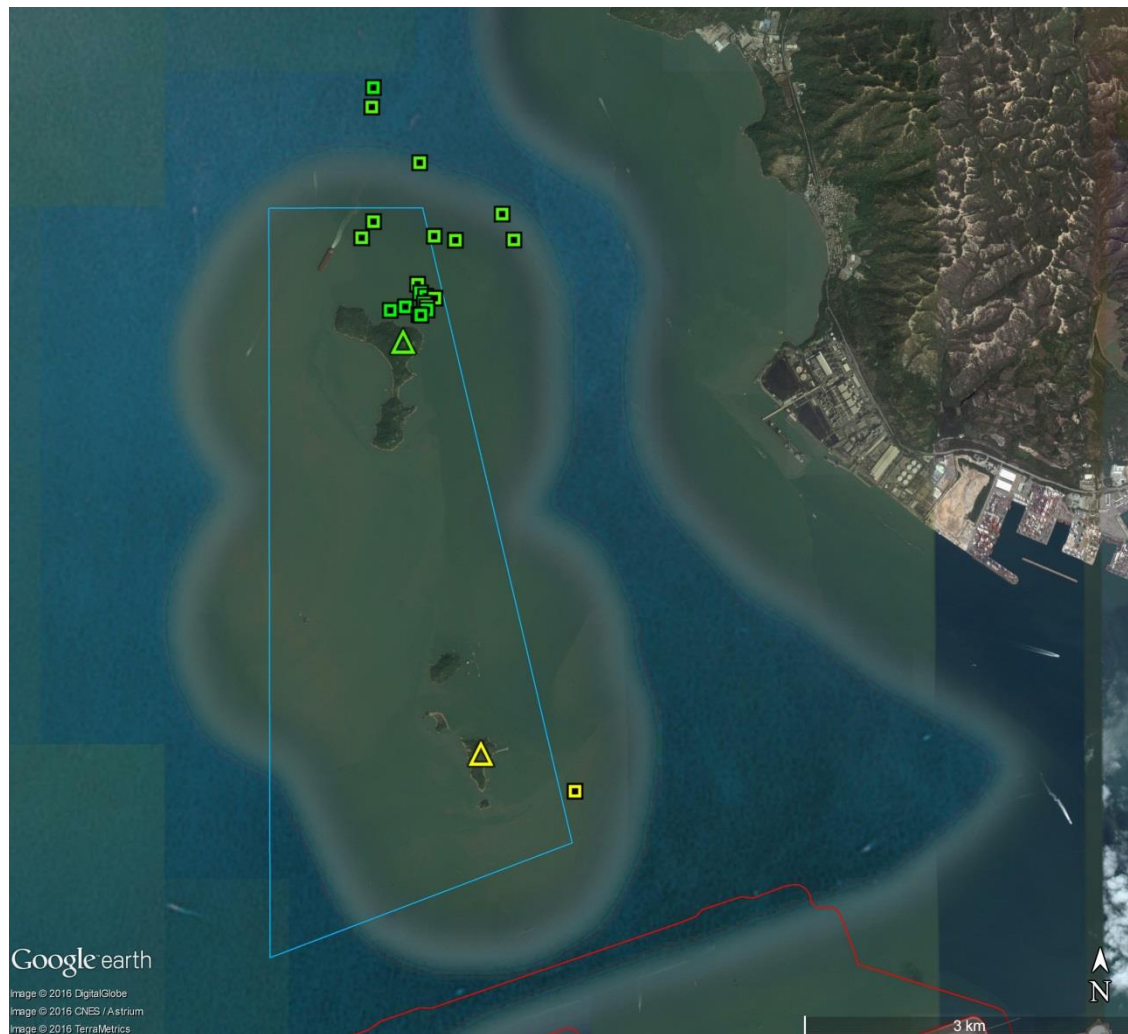


**Table 2.11: Summary of Survey Effort and CWD Group of Land-based Theodolite Tracking**

Land-based Station	# of Survey Sessions	Survey Effort (hh:mm)	# CWD Groups Sighted	CWD Group Sighting per Survey Hour
<b>August 2016</b>				
Lung Kwu Chau	3	18:11	11	0.607
Sha Chau	2	12:10	1	0.083
<b>Total</b>	<b>5</b>	<b>30:21</b>	<b>12</b>	<b>0.395</b>
<b>September 2016</b>				
Lung Kwu Chau	3	18:00	9	0.5
Sha Chau	2	12:00	0	0
<b>Total</b>	<b>5</b>	<b>30:00</b>	<b>9</b>	<b>0.3</b>

**Figure 2.9: Plots of First Sightings of All CWD Groups from Land-based Stations**

[Green triangle: LKC station; Green square: CWD group off LKC; Yellow triangle: SC station; Yellow square: CWD group off SC; Blue line: SCLKCMP boundary; Red line: 3RS land-formation footprint]





### Progress Update on Passive Acoustic Monitoring (PAM)

An Ecological Acoustic Recorder (EAR) has been deployed and positioned to the south of Sha Chau Island with 20% duty cycle (**Figure 2.10**) with data from the EAR intended primarily to supplement the data collected from the land-based theodolite station on Sha Chau. The EAR deployment generally lasts around 4-6 weeks followed by a period of data retrieval for subsequent analysis. As the data analysis takes more than two months after retrieval, PAM results are not available for reporting in this quarterly report. Data transfer / analysis of this batch of PAM data is tentatively scheduled for completion by end of November 2016.

### 2.6 Weekly Environmental Site Inspection

Site inspections of the construction works were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. Bi-weekly site inspections were also conducted by the Independent Environmental Checker (IEC). Observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from site inspection and associated recommendations were related to:

- improvement of efficiency and capacity of wastewater treatment facilities;
- proper maintenance of drip tray;
- provision of wheel washing before leaving the construction site;
- removal of oil stains on ground as chemical waste;
- review of the capacity of chemical waste storage area;
- display of Environmental Permit at site entrance;
- erection of site hoarding;
- provision of sandbags around the gully to prevent surface runoff; and
- improvement of dust mitigation measures.

In addition, CNP compliance check of the use of powered mechanical equipment for Contract P560(R) during restricted hour at the launching site was carried out by the ET on 11 July 2016. The use of powered mechanical equipment was complied with the requirements of CNP.

A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix C**.

### 2.7 Ecological Monitoring

In accordance with the Updated EM&A Manual, ecological monitoring shall be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.

Monthly ecological monitoring was carried out in August and September 2016 on Sheung Sha Chau Island. No encroachment or disturbance to the egret area at Sheung Sha Chau was recorded during ecological monitoring.

### 2.8 Audit of the SkyPier Plan

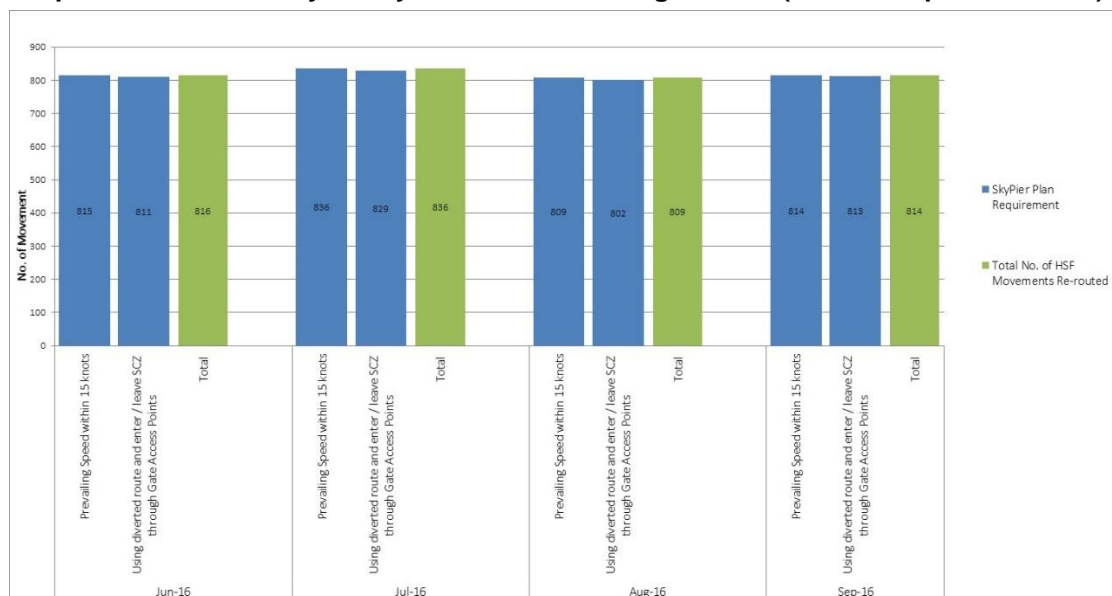
In total, 2,459 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. The daily movements of all SkyPier HSFs in the reporting period ranged between 10 and 95, which falls within the maximum daily cap number of 125. There are fewer ferry movements on 1<sup>st</sup> and 2<sup>nd</sup> August 2016 (52 and 10 movements respectively) due to typhoon.

Status of compliance with annual daily average of 99 movements will be further reviewed in the annual EM&A Report.

All the HSFs had travelled through the SCZ with prevailing speed within 15 knots (7.8 knots to 14.8 knots), which complied with the SkyPier Plan. 15 ferry movements had minor deviations from the diverted route during the reporting period. Notices were sent to the ferry operators and the cases have been investigated. In July, six cases recorded with the same ferry were not related to public safety / emergency situations. Warning letter has been issued to the concerned ferry operator to prevent reoccurrence. The ferry operator was requested to check the coordinates of SCZ plotted on the radar. Refresher training to the two concerned vessel captains was provided by experienced captain of the concerned ferry operator to ensure the captains are familiarised with the SkyPier Plan requirements. In August, one case was not related to public safety / emergency situations. Investigation found that the SCZ was plotted inaccurately in the radar graph and it was the first time the HSF used the diverted route. The ferry operator had checked and corrected the coordinates of SCZ in both the radar graph and electronic marine chart. The remaining eight cases are related to public safety / emergency situations. The summary of the SkyPier Plan monitoring result (June to September 2016) is presented in **Graph 3**.

Two HSF movements with no transmission of AIS data received were reported during the reporting period. After investigation, it was found that missing of AIS data for concerned ferries were due to interference effect of AIS signal. Vessel captains were requested to provide the radar track photos which indicated the vessel entered the SCZ though the gate access point and no speeding in the SCZ. Ferry operator's explanation has been accepted.

**Graph 3: Summary of SkyPier Plan Monitoring Results (June to September 2016)**



## 2.9 Audit of Construction and Associated Vessels

The audit of construction and associated vessels has been started in August. ET has conducted weekly audit of relevant information including AIS data, vessel tracks and other relevant records to ensure sufficient information has been provided by the contractors to the Marine Traffic Control Center (MTCC) and the contractors are complied with the requirements of the MTRMP-CAV. The contractors have been reminded to submit the endorsed vessel 3-month programme to MTCC for

the review of keeping the number of construction vessels to a practicable minimum. The IEC has also performed audit on the compliance of the requirements as part of the EM&A programme.

A total of 11 skipper training workshops have been held in August and September with concerned captains of construction vessels associated with Contract P560(R) Aviation Fuel Pipeline Diversion Works and the four DCM contracts to familiarise them with the predefined routes, general education on local cetaceans, guidelines for avoiding adverse water quality impact, the required environmental practices / measures while operating construction and associated vessels under the Project, and guidelines for operating vessels safely in the presence of CWDs. Trainings have also been held in September with the 4 DCM and P560(R) contractor senior management staff to strengthen the communication between senior management and the sub-contractor and facilitating them in familiarise with the requirements of the MTRMP-CAV. In addition, a Marine Management Liaison Group (MMLG) has been set up and provided a forum to assist and resolve any marine issues which may be encountered under 3RS project. The 2nd MMLG meeting was held on 26 September 2016.

### **2.10 Review of the Key Assumptions Adopted in the EIA Report**

With reference to Appendix E of the Updated EM&A Manual, it is noted that the key assumptions adopted in approved EIA report for the construction phase are still valid and no major changes are involved. The environmental mitigation measures recommended in the approved EIA Report remain applicable and shall be implemented in undertaking construction works for the Project.

### 3 Report on Non-compliance, Complaints, Notifications of Summons and Prosecutions

#### 3.1 Cumulative Statistics

Cumulative statistics on exceedance, non-compliance, complaints, notifications of summons and status of prosecutions are summarized in **Table 3.1** and **Table 3.2**.

**Table 3.1: Statistics for Valid Exceedances for the Environmental Monitoring**

		Total no. recorded in the reporting period	Total no. recorded since the project commenced
1-hr TSP	Action	0	0
	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Waste	Action	0	0
	Limit	0	0

Remark: Exceedances, which are not project related, are not shown in this table.

**Table 3.2: Statistics for Non-compliance, Complaints, Notifications of Summons and Prosecution**

Reporting Period	Cumulative Statistics			
	Non-compliance	Complaints	Notifications of Summons	Prosecutions
This reporting period	0	0	0	0
From 28 December 2015 to end of the reporting period	0	0	0	0

## 4 Conclusion and Recommendation

In this quarterly period from 1 July 2016 to 30 September 2016, the EM&A programme has been implemented as planned, including 99 sets of air quality measurements, 65 sets of construction noise measurements, two ecological monitoring on Sheung Sha Chau Island, as well as environmental site inspections, landscape & visual and waste monitoring for the Project's construction works.

Twenty-five sets of water quality measurements, four complete sets of vessel line-transect surveys and ten days of land-based theodolite tracking survey effort for Chinese White Dolphin (CWD) monitoring were completed as scheduled although no marine construction works was carried out during the reporting period.

Key activities of the Project carried out in the reporting period were related to Contract P560(R) which involved installation of HDD casing and drilling of HDD pilot hole at launching site, stockpiling of excavated materials from HDD operation at stockpiling area, site preparation works and construction of containment pit at Sheung Sha Chau. Works under the four DCM contracts involved mobilization and off-site plant fabrication, and CLP cable diversion enabling work involved site preparation works. Some other site investigation works were also carried out during the reporting period.

Three exceedance cases involving Action Level of 1-hour TSP monitoring were recorded during the reporting period. The investigation results indicated that the exceedances were likely related to background air quality level but not project-related.

No breach of the Action or Limit Levels in relation to the construction noise and waste monitoring were recorded in the reporting month. All site observations made by the ET were recorded in the site inspection checklists and passed to the Contractor together with the recommended follow-up actions. No encroachment or disturbance to the egret area on Sheung Sha Chau was recorded during monthly ecological monitoring.

In total, 2,459 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. All the HSFs had travelled through the SCZ with prevailing speed within 15 knots, which complied with the SkyPier Plan. Fifteen ferry movements had minor deviation from the diverted route during the reporting period. Among the 15 cases, eight cases are related to public safety / emergency situations. Follow-up actions such as checking of electronic marine chart / radar graphs and refresher training have been taken for the remaining non-public safety / emergency cases.

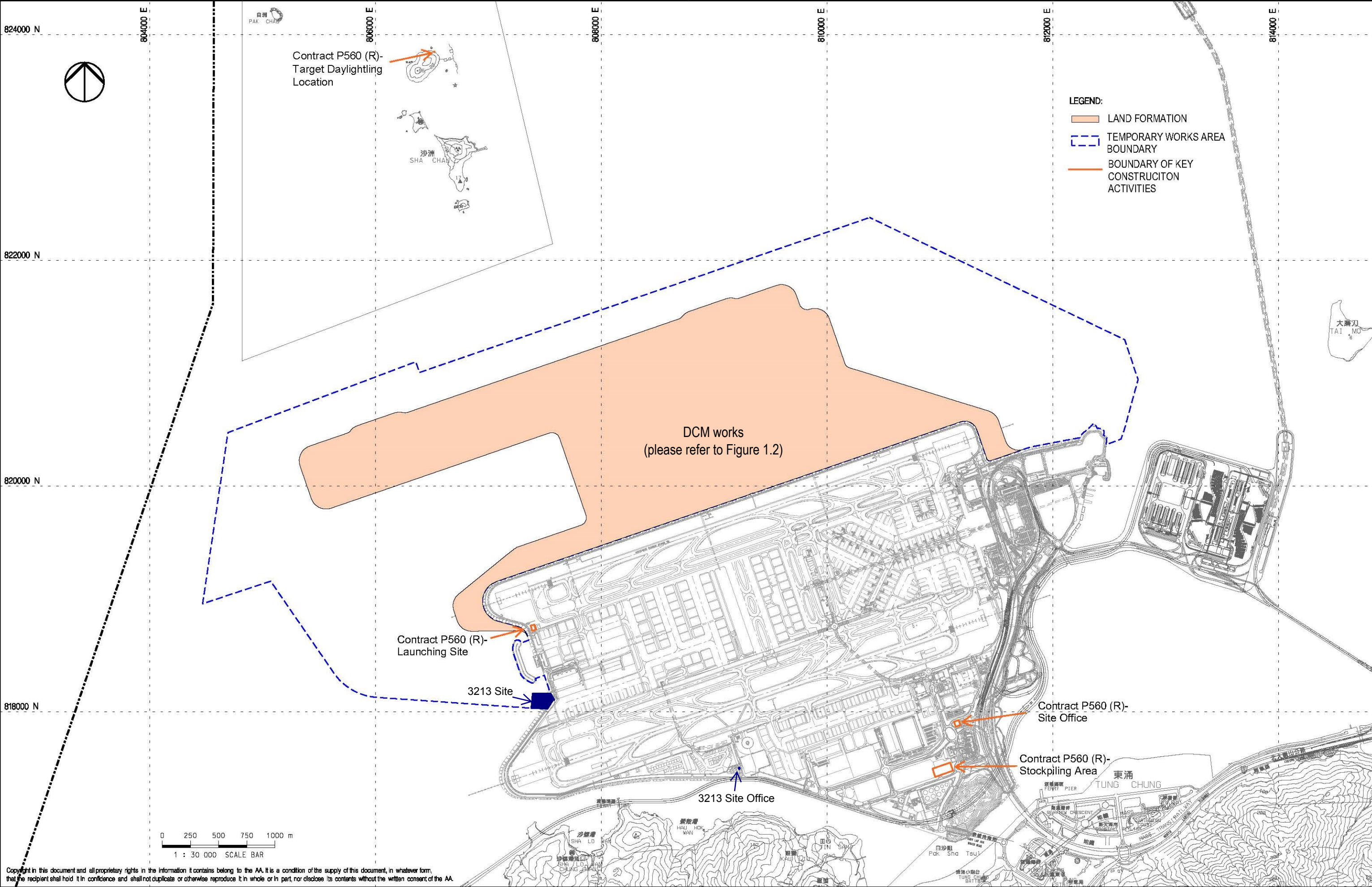
The audit of construction and associate vessels has been started in August. ET has conducted weekly audit of relevant information to ensure sufficient information has been provided by the contractors to the Marine Traffic Control Center (MTCC) and the contractors are fully complied with the requirements of the MTRMP-CAV. A total of 11 skipper training workshops have been held in August and September with concerned captains of construction vessels associated with Contract P560(R) Aviation Fuel Pipeline Diversion Works and the four DCM contracts to familiarise them with the MTRMP-CAV.

The recommended environmental mitigation measures, as included in the EM&A programme, have been effectively implemented during the reporting period. Also, the EM&A programme

implemented by the ET has effectively monitored the construction activities and ensure the proper implementation of mitigation measures.

# Figures





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Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC



LOCATIONS OF KEY CONSTRUCTION ACTIVITIES IN THIS REPORTING PERIOD

Consultant's Signatures for Approval		Date
Design	DC	31AUG15
Checkers	DC	31AUG15
Design Supervisor	EC	31AUG15
Authorised Representative	JFP	31AUG15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM		Scale at A3
Drawing No.	FIGURE 1.1	1 : 30000
Rev.	A	



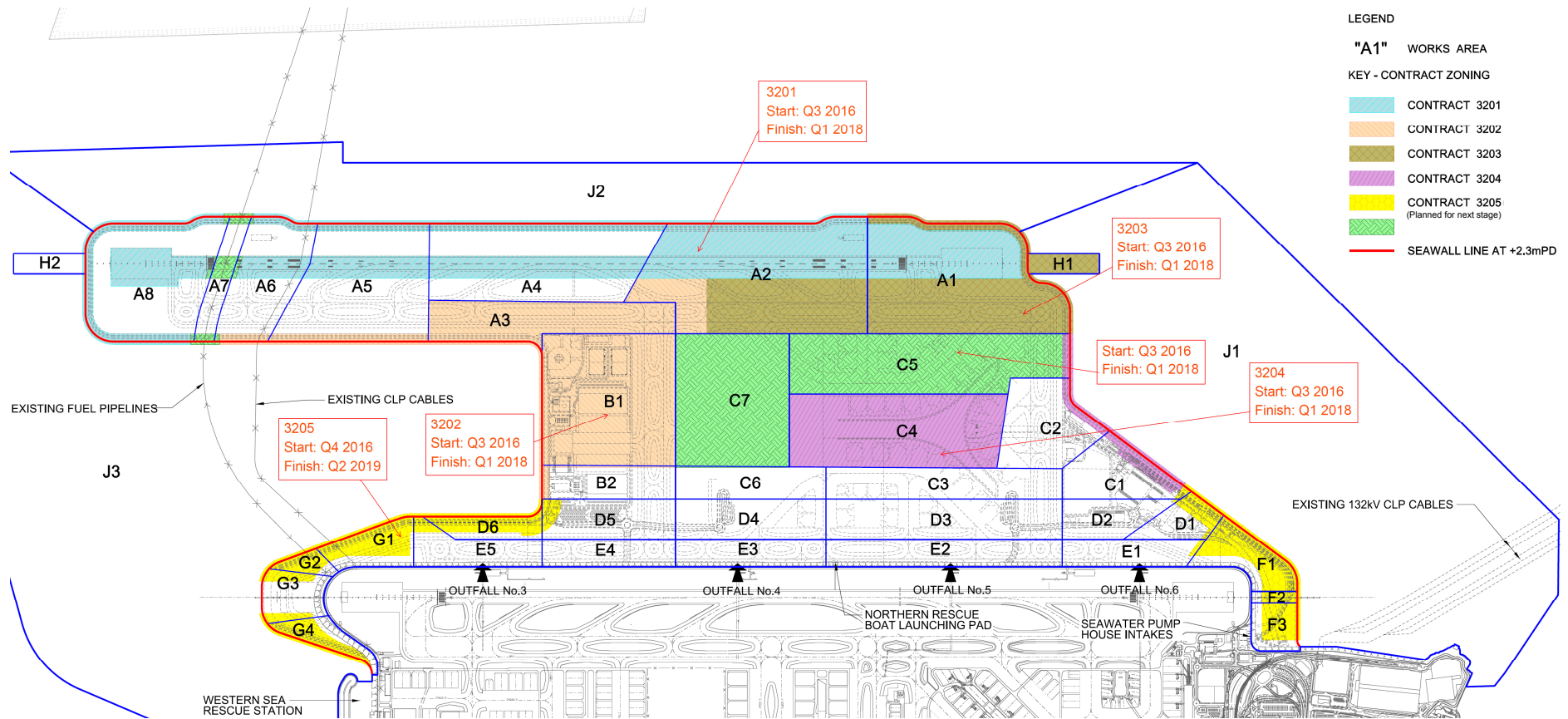
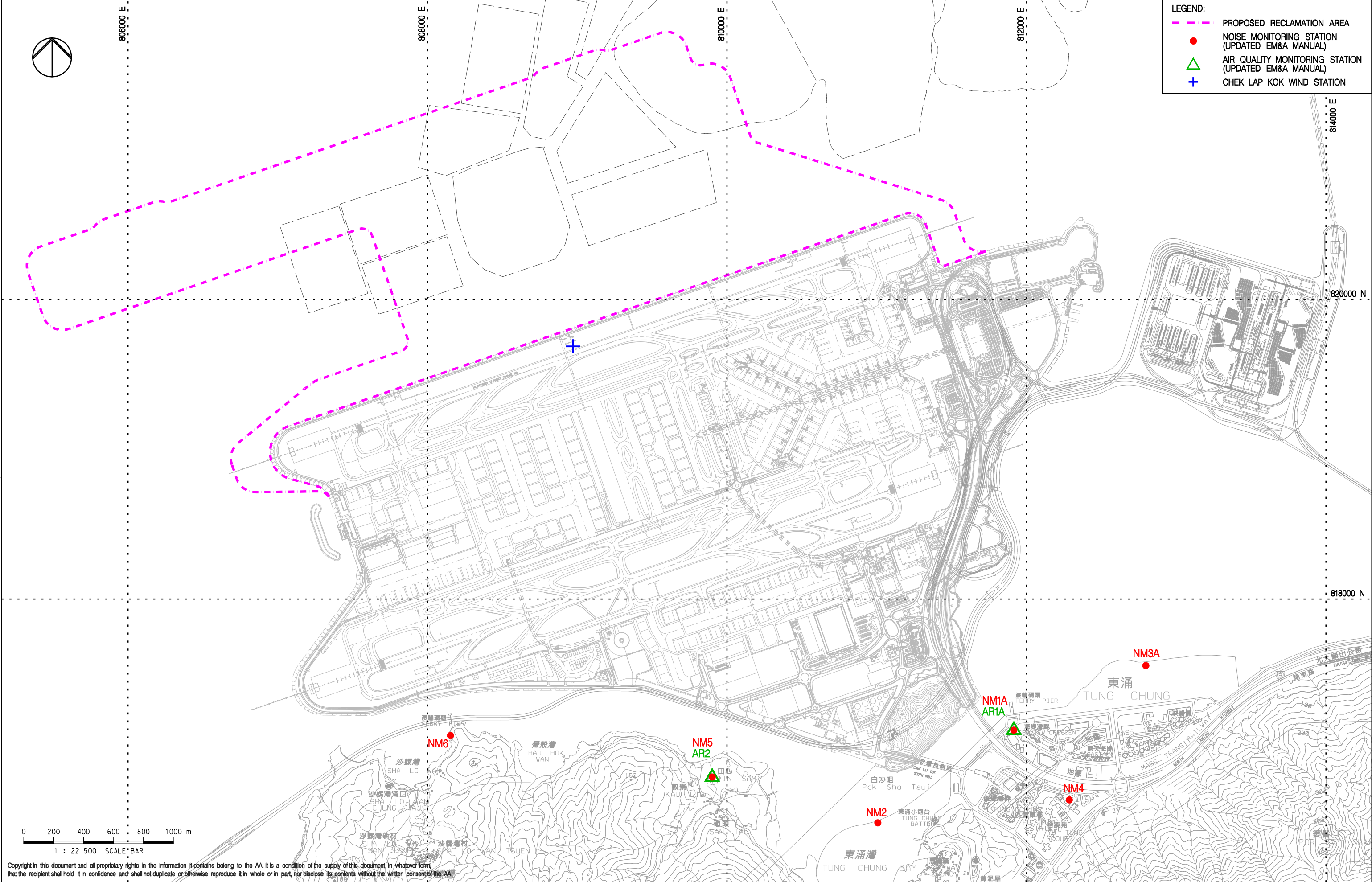


Figure 1.2 -Locations of Deep Cement Mixing Works Area



Rev.	Date	Description	Checked
A	06JAN16	FIRST ISSUE	RO
B	29JAN16	GENERAL REVISION	RO
C	11FEB16	GENERAL REVISION	RO



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Mott MacDonald

Title

LOCATIONS OF AIR AND NOISE MONITORING STATIONS AND CHEK LAP KOK WIND STATION

Consultant's Signatures for Approval	
Design	AM
Checkers	AM / TK
Approver	EC

Date
11FEB16
11FEB16
11FEB16

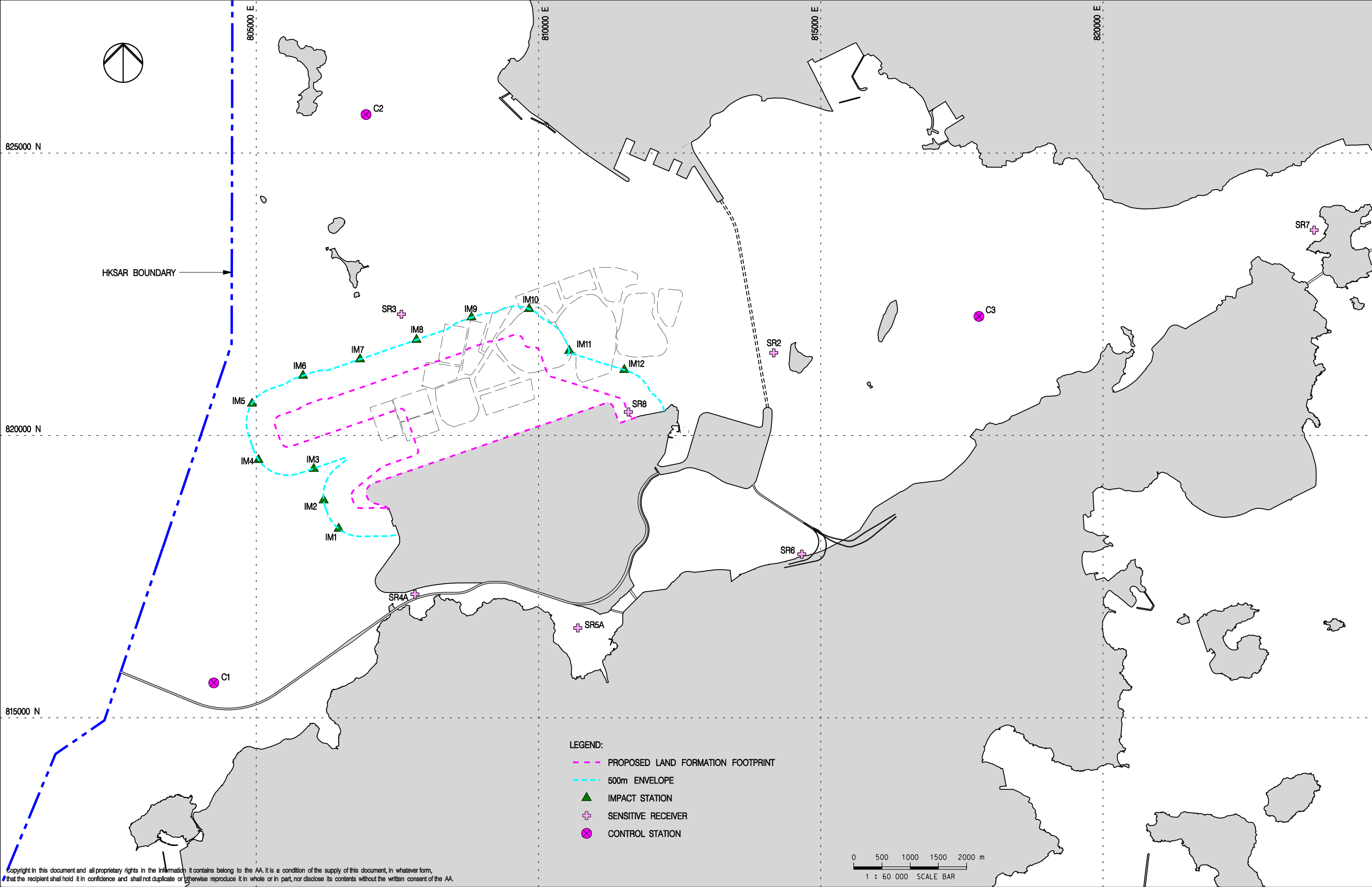
EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No.

FIGURE 2.1

Scale at A3 1 : 22500
Rev. C





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Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	DC
B	04MAY16	GENERAL REVISION	RO
C	06JUN16	GENERAL REVISION	LC

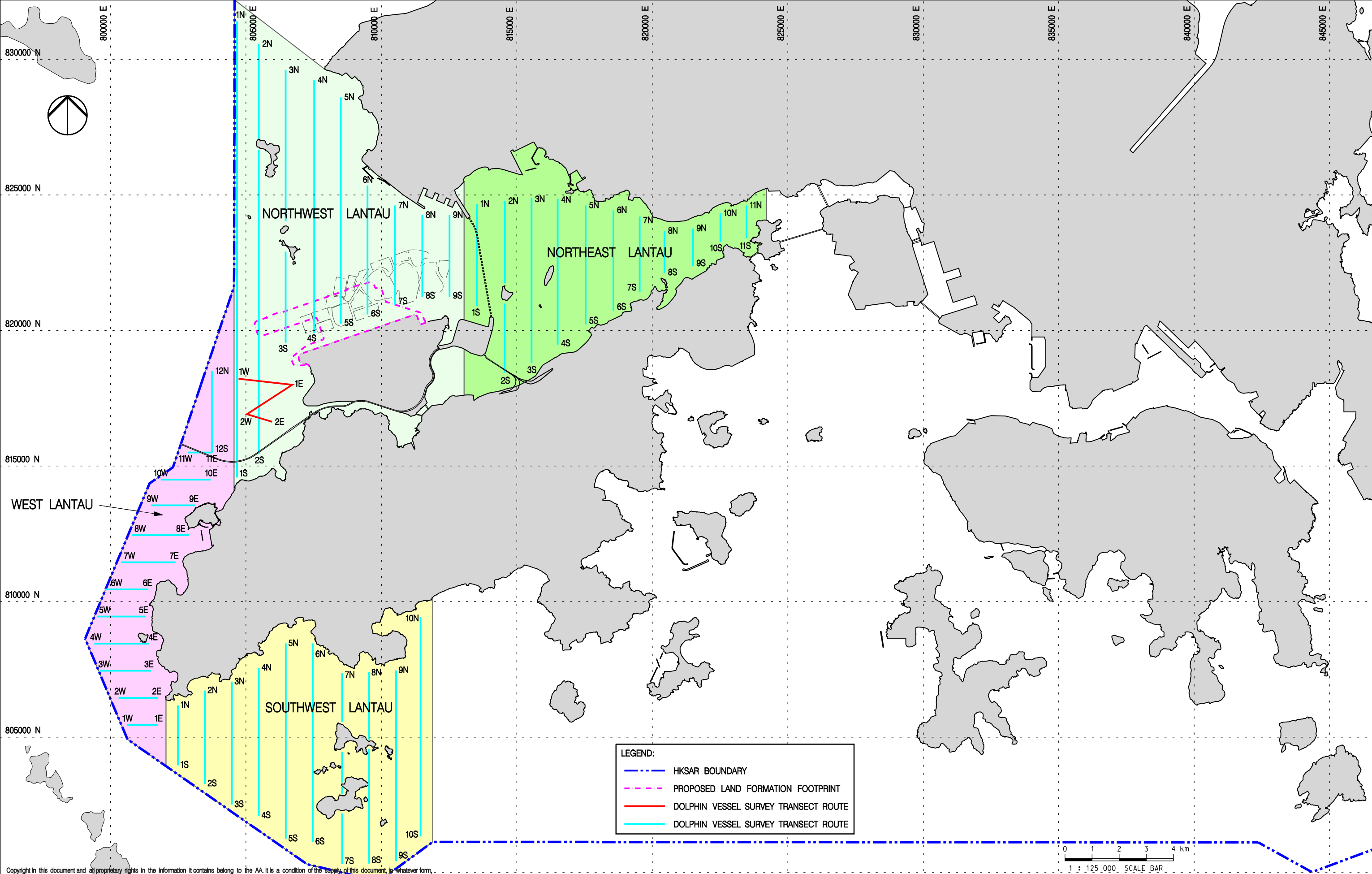


LOCATIONS OF WATER QUALITY MONITORING STATIONS

Consultant's Signatures for Approval	
Design	DC
Checkers	DC / TK
Approver	EC

Date
06JUN16
06JUN16
06JUN16

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Scale at A3
FIGURE 2.2	1 : 60000
Rev.	C



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A	02DEC15	FIRST ISSUE	JC

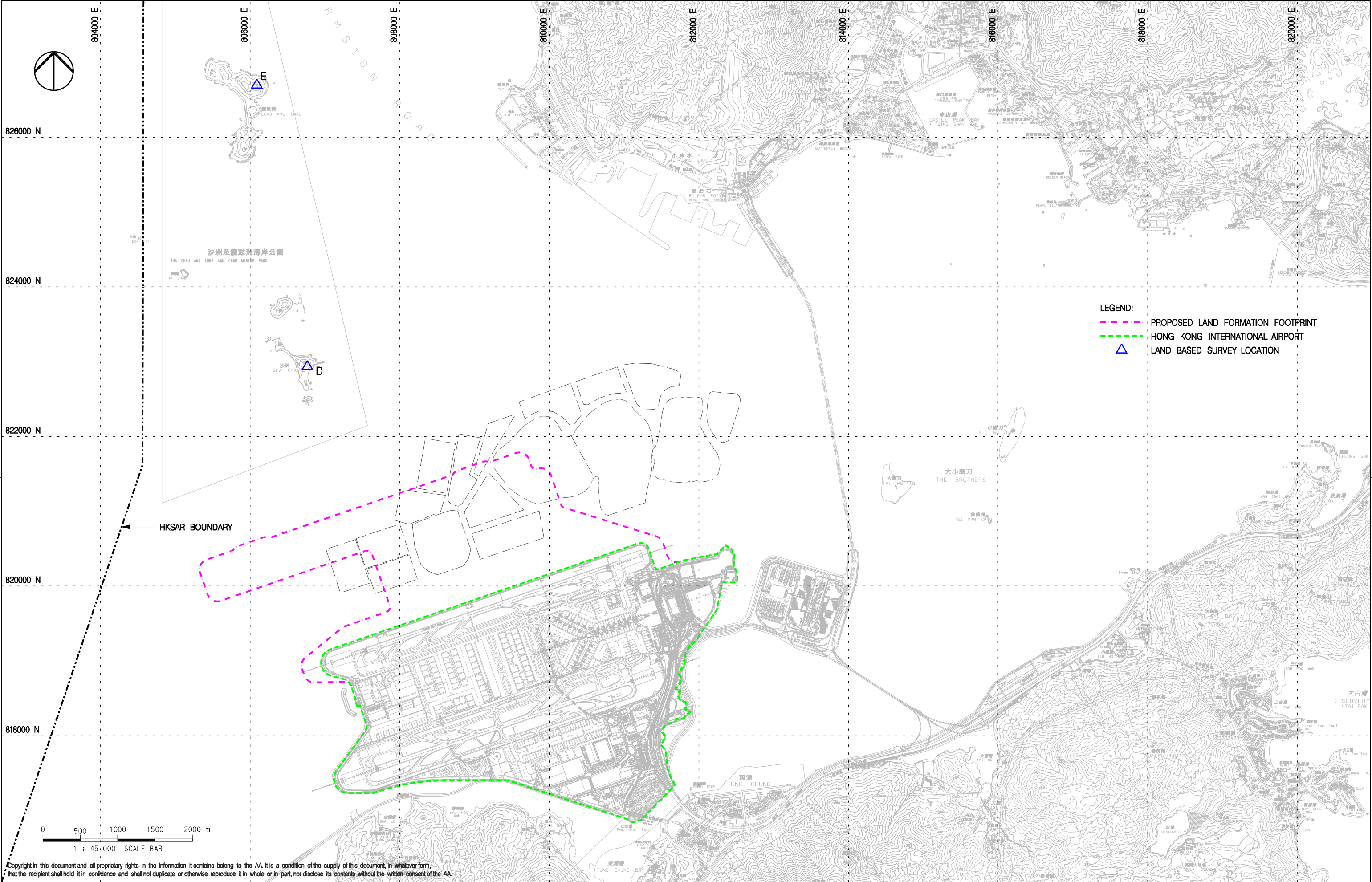


Title
VESSEL BASED DOLPHIN MONITORING TRANSECTS



Consultant's Signatures for Approval		Date
Design	JC	02DEC15
Checkers	JC / TK	02DEC15
Approver	EC	02DEC15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Scale at A3 1 : 125000
FIGURE 2.3	
Rev.	A

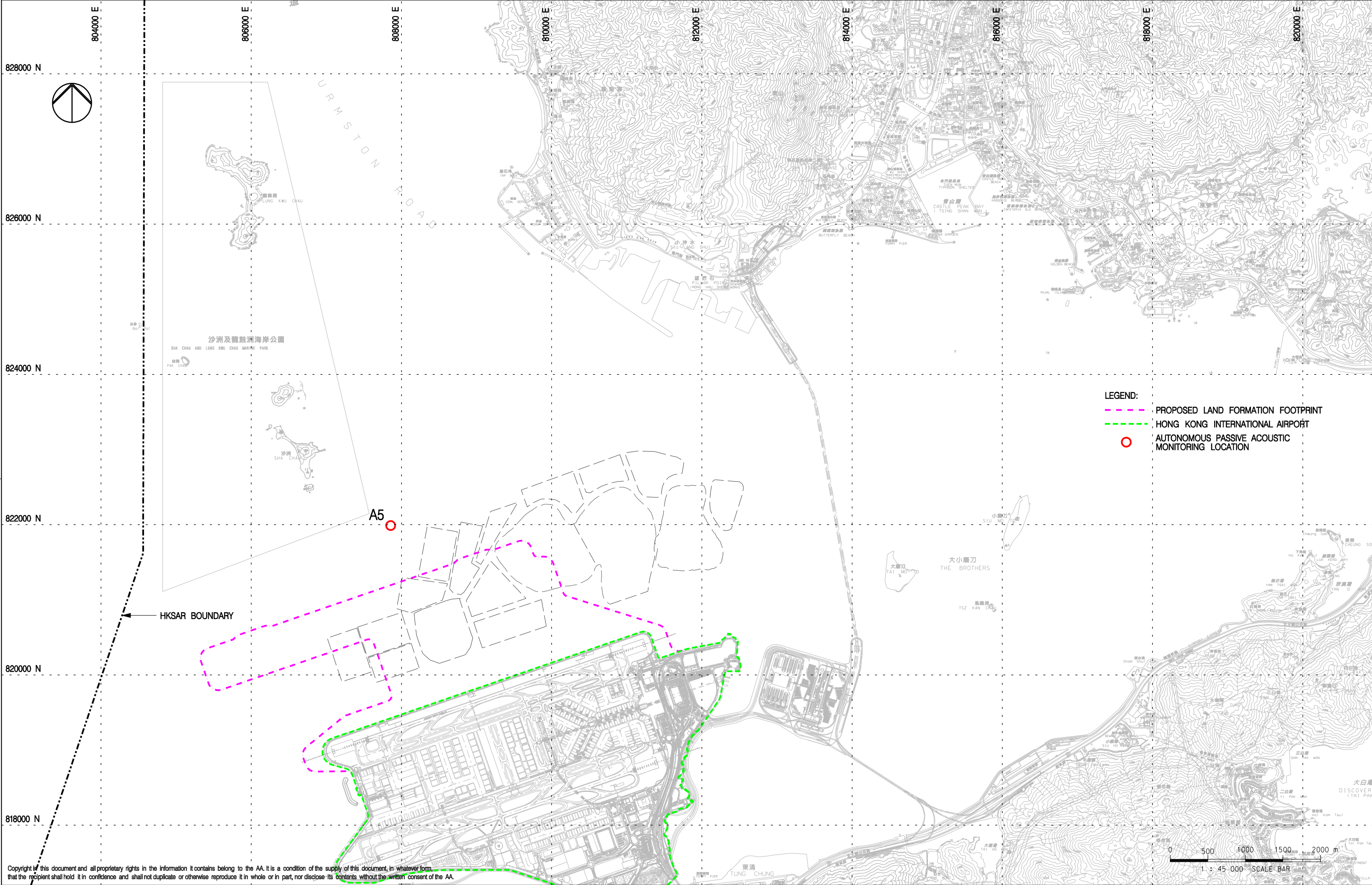




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Rev.	Date	Description	Checked	 <b>HONG KONG INTERNATIONAL AIRPORT</b> <small>Airport Authority : 190A Tower 1 Sky Plaza Road, Hong Kong International Airport, Lantau, Hong Kong Tel : (852) 2888 7711 Fax : (852) 2884 0970</small>	 <b>Mott MacDonald</b>	Title	Consultant's Signatures for Approval		Date	EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
A	02DEC15	FIRST ISSUE	JC				Design	JC	02DEC15	Drawing No.  <b>FIGURE 2.4</b>	Scale at A3 1 : 45000
							Checkers	JC / TK	02DEC15		Rev.
							Approver	EC	02DEC15		A





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Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC



Title  
LOCATIONS FOR AUTONOMOUS PASSIVE ACOUSTIC MONITORING IN BASELINE AND CONSTRUCTION PHASES

Consultant's Signatures for Approval		Date
Design	JC	02DEC15
Checkers	JC / TK	02DEC15
Approver	EC	02DEC15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Scale at A3 1 : 45000
FIGURE 2.10	
Rev.	A

## **Appendix A. Construction Programme and Contract Description**



Line	Name	2016	2017	2018	2019	2020	2021	2022	2023	2024
	<b>Advanced Works</b>									
1	Aviation Fuel Pipeline Diversion	1								
2	Power Cable Diversion		2							
3	<b>Land Formation</b>									
4	Mobilization		4							
5	Sand Blanket Laying		5							
6	Ground Improvement Works		6							
7	Construction of Seawall		7							
8	Marine Filling		8							
9	Land Filling		9							
10	Surcharge			10						
11	Works After Closure of Existing North Runway							11		
12	<b>North Runway (New)</b>				12					
13	<b>Centre Runway Modification</b>		13							
14	<b>TRC/ Apron</b>					14				
15	<b>T2 Expansion (Advance Works)</b>		15							
16	<b>T2 Expansion (Main Works)</b>				16					
17	<b>Underground Tunnel (APM/ BHS)</b>		17							
18	<b>APM System</b>			18						
19	<b>BHS</b>						19			
20	<b>Operation Trials</b>									20

Programme No.	3-AAP-EPP-0-A0
Revision/Date	A/(12-Jul-16)
Prepared	VT
Checked	PY

### 3RS Phasing Programme

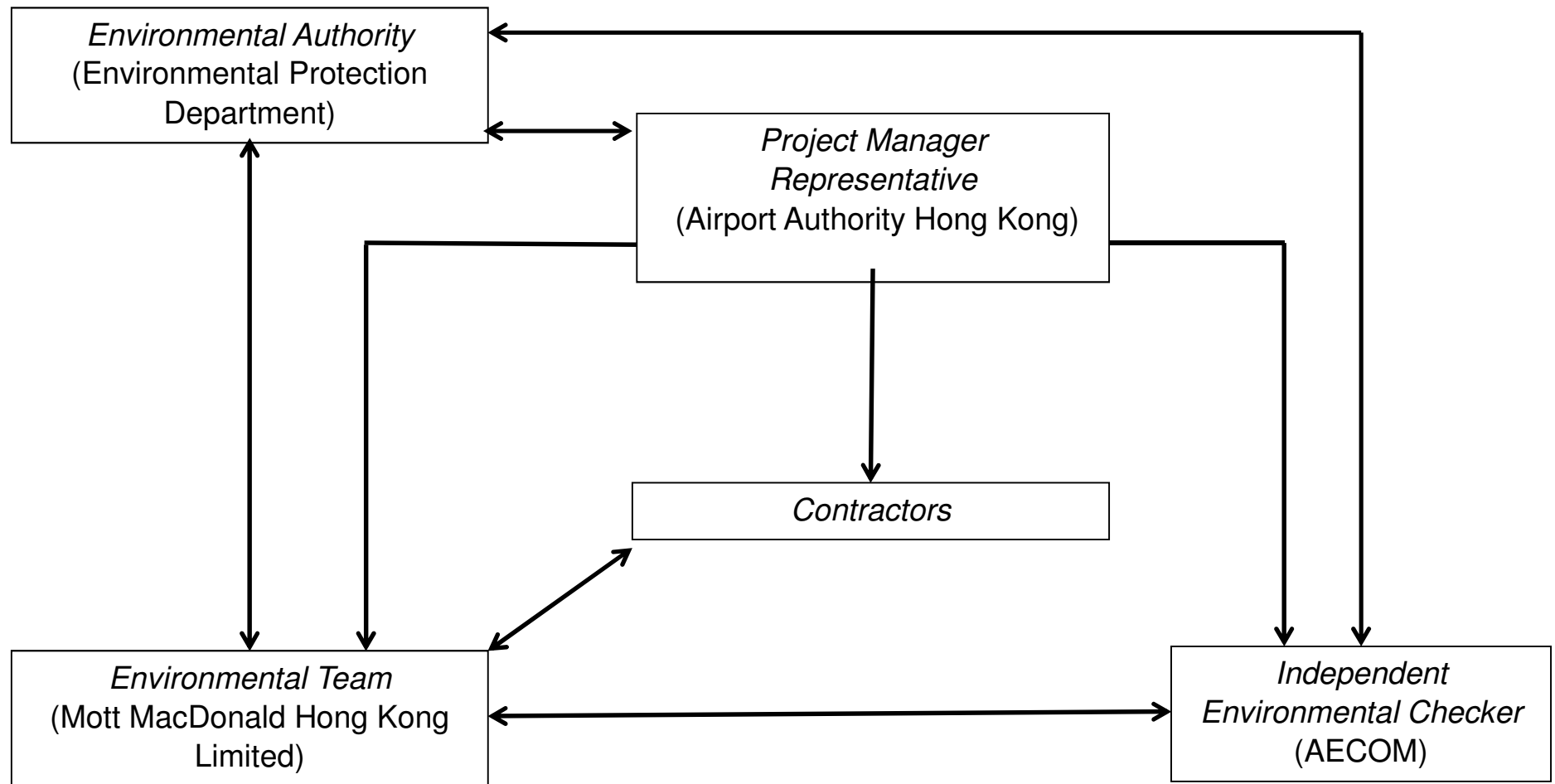
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AIRPORT



## Contract Description

Contract No.	Contract Title	Contractor	Key Construction Activities
P560 (R)	Aviation Fuel Pipeline Diversion Works	Langfang Huayuan Mechanical and Electrical Engineering Co., Ltd.	Diversion of the existing submarine aviation fuel pipelines will use a horizontal directional drilling (HDD) method forming two rock drill holes by drilling through bedrock from a launching site located at the west of the airport island to a daylighting point adjacent to the offshore receiving platform at Sha Chau. Two new pipelines will be installed through the drilled tunnels. The total length is approximately 5 km. Drilling works will proceed from the HDD launching site at the airport island.
3201	Deep Cement Mixing (Package 1)	Penta-Ocean-China State-Dong-Ah Joint Venture	<p>The works covered by the Contract 3201, 3202, 3203 and 3204 comprise ground improvement of seabed using Deep Cement Mixing (DCM) method, the major construction activities including without limitation the following</p> <ul style="list-style-type: none"> <li>• Geophysical surveys;</li> <li>• Supply and placing of geotextile and sand blanket under seawalls;</li> <li>• Supply, maintenance, installation and removal of silt curtain systems;</li> <li>• Preliminary construction trails;</li> <li>• Supply and installation of DCM clusters within the works areas; and</li> <li>• Coring, sampling and testing of DCM treated soils and reporting works.</li> </ul>
3202	Deep Cement Mixing (Package 2)	Samsung-BuildKing Joint Venture	
3203	Deep Cement Mixing (Package 3)	Sambo E&C Co.,Ltd	
3204	Deep Cement Mixing (Package 4)	CRBC-SAMBO Joint Venture	
3213	CLP Cable Diversion Enabling Works	Wing Hing Construction Company	<p>CLP cable diversion enabling works of Sha Chau South, Sheung Sha Chau and Lung Kwu Chau at Hong Kong International Airport Landside. The major construction activities including without limitation the following:</p> <ul style="list-style-type: none"> <li>• Geotechnical instrumentation and monitoring of the Works;</li> <li>• Temporary removal of armour rock and underlayers of existing seawall and subsequent reinstatement to its original condition;</li> <li>• Construction of the concrete cable trough embedded at about 3m below the surface of the existing seawall; and</li> <li>• Supply, installation, maintenance, and subsequent removal of temporary generator sets for temporary power supply with associated fuel supply and pump system located at Sheung Sha Chau, Sha Chau South and Lung Kwu Chau Islands.</li> </ul>

# Appendix B.     Project Organization Chart



## **Appendix C. Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase**

## Appendix C Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
<b>Air Quality Impact – Construction Phase</b>					
5.2.6.2	2.1	-	<b>Dust Control Measures</b> <ul style="list-style-type: none"> <li>Water spraying for 12 times a day or once every two hours for 24-hour working at all active works area.</li> </ul>	Within construction site / Duration of the construction phase	I
5.2.6.3	2.1	-	<ul style="list-style-type: none"> <li>Covering of at least 80% of the stockpiling area by impervious sheets. Water spraying of all dusty materials immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling.</li> </ul>	Within construction site / Duration of the construction phase	I
5.2.6.4	2.1	-	<p>Dust control practices as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted. These practices include:</p> <p>Good Site Management</p> <ul style="list-style-type: none"> <li>Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning.</li> </ul> <p>Disturbed Parts of the Roads</p> <ul style="list-style-type: none"> <li>Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or</li> <li>Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li> </ul> <p>Exposed Earth</p> <ul style="list-style-type: none"> <li>Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.</li> </ul> <p>-</p> <p>Loading, Unloading or Transfer of Dusty Materials</p> <ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.</li> </ul> <p>Debris Handling</p>	Within construction site / Duration of the construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides; and</li> <li>Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.</li> </ul> <p>Transport of Dusty Materials</p> <ul style="list-style-type: none"> <li>Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.</li> </ul> <p>Wheel washing</p> <ul style="list-style-type: none"> <li>Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> </ul> <p>Use of vehicles</p> <ul style="list-style-type: none"> <li>The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site;</li> <li>Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels; and</li> <li>Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.</li> </ul> <p>Site hoarding</p> <ul style="list-style-type: none"> <li>Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.</li> </ul>		
5.2.6.5	2.1	-	<p><b>Best Practices for Concrete Batching Plant</b></p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2 as well as in the future Specified Process licence should be adopted. The best practices are recommended to be applied to both the land based and floating concrete batching plants. Best practices include:</p> <p>Cement and other dusty materials</p> <ul style="list-style-type: none"> <li>The loading, unloading, handling, transfer or storage of cement, pulverised fuel ash (PFA) and/or other equally dusty materials shall be carried in a totally enclosed system acceptable to EPD. All dust-laden air or waste gas generated by the process operations shall be properly extracted and vented to fabric filtering system to meet the required emission limit;</li> <li>Cement, PFA and/or other equally dusty materials shall be stored in storage silo fitted with audible high level alarms to warn of over-filling. The high-level alarm indicators shall be interlocked with the material filling line such that in the event of the silo approaching an overfilling condition, an audible alarm will</li> </ul>	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<p>operate, and after 1 minute or less the material filling line will be closed;</p> <ul style="list-style-type: none"> <li>▪ Vents of all silos shall be fitted with fabric filtering system to meet the required emission limit;</li> <li>▪ Vents of cement/PFA weighing scale shall be fitted with fabric filtering system to meet the required emission limit; and</li> <li>▪ Seating of pressure relief valves of all silos shall be checked, and the valves re-seated if necessary, before each delivery.</li> </ul> <p>Other raw materials</p> <ul style="list-style-type: none"> <li>▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rock, sand, stone aggregate, shall be carried out in such a manner to prevent or minimize dust emissions;</li> <li>▪ The materials shall be adequately wetted prior to and during the loading, unloading and handling operations. Manual or automatic water spraying system shall be provided at all unloading areas, stock piles and material discharge points;</li> <li>▪ All receiving hoppers for unloading relevant materials shall be enclosed on three sides up to 3 m above the unloading point. In no case shall these hoppers be used as the material storage devices;</li> <li>▪ The belt conveyor for handling materials shall be enclosed on top and two sides with a metal board at the bottom to eliminate any dust emission due to wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can achieve same performance;</li> <li>▪ All conveyor transfer points shall be totally enclosed. Openings for the passage of conveyors shall be fitted with adequate flexible seals;</li> <li>▪ Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface;</li> <li>▪ Conveyors discharged to stockpiles of relevant materials shall be arranged to minimize free fall as far as practicable. All free falling transfer points from conveyors to stockpiles shall be enclosed with chute(s) and water sprayed;</li> <li>▪ Aggregates with a nominal size less than or equal to 5 mm should be stored in totally enclosed structure such as storage bin and should not be handled in open area. Where there is sufficient buffer area surrounding the concrete batching plant, ground stockpiling may be used;</li> <li>▪ The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side;</li> <li>▪ Aggregates with a nominal size greater than 5 mm should preferably be stored in a totally enclosed structure. If open stockpiling is used, the stockpile shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; and</li> <li>▪ The opening between the storage bin and weighing scale of the materials shall be fully enclosed.</li> </ul> <p>Loading of materials for batching</p>		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ?^
			<ul style="list-style-type: none"> <li>Concrete truck shall be loaded in such a way as to minimise airborne dust emissions. The following control measures shall be implemented:               <ul style="list-style-type: none"> <li>(a) Pre-mixing the materials in a totally enclosed concrete mixer before loading the materials into the concrete truck is recommended. All dust-laden air generated by the pre-mixing process as well as the loading process shall be totally vented to fabric filtering system to meet the required emission limit; and</li> <li>(b) If truck mixing batching or other types of batching method is used, effective dust control measures acceptable to EPD shall be adopted. The dust control measures must have been demonstrated to EPD that they are capable to collect and vent all dust-laden air generated by the material loading/mixing to dust arrestment plant to meet the required emission limit.</li> </ul> </li> <li>The loading bay shall be totally enclosed during the loading process.</li> </ul> <p>Vehicles</p> <ul style="list-style-type: none"> <li>All practicable measures shall be taken to prevent or minimize the dust emission caused by vehicle movement; and</li> <li>All access and route roads within the premises shall be paved and adequately wetted.</li> </ul> <p>Housekeeping</p> <ul style="list-style-type: none"> <li>A high standard of housekeeping shall be maintained. All spillages or deposits of materials on ground, support structures or roofs shall be cleaned up promptly by a cleaning method acceptable to EPD. Any dumping of materials at open area shall be prohibited.</li> </ul>		
5.2.6.6	2.1	-	<p><b>Best Practices for Asphaltic Concrete Plant</b></p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Tar and Bitumen Works (Asphaltic Concrete Plant) BPM 15 (94) as well as in the future Specified Process licence should be adopted. These include:</p> <p>Design of Chimney</p> <ul style="list-style-type: none"> <li>The chimney shall not be less than 3 metres plus the building height or 8 metres above ground level, whichever is the greater;</li> <li>The efflux velocity of gases from the main chimney shall not be less than 12 m/s at full load condition;</li> <li>The flue gas exit temperature shall not be less than the acid dew point; and</li> <li>Release of the chimney shall be directed vertically upwards and not be restricted or deflected.</li> </ul> <p>Cold feed side</p> <ul style="list-style-type: none"> <li>The aggregates with a nominal size less than or equal to 5 mm shall be stored in totally enclosed structure such as storage bin and shall not be handled in open area;</li> <li>Where there is sufficient buffer area surrounding the plant, ground stockpiling may be used. The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side. If</li> </ul>	Within Concrete Batching Plant / Duration of the construction phase	N/A



EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ?^
		-	<p>these aggregates are stored above the feeding hopper, they shall be enclosed at least on top and three sides and be wetted on the surface to prevent wind-whipping;</p> <ul style="list-style-type: none"> <li>▪ The aggregates with a nominal size greater than 5 mm should preferably be stored in totally enclosed structure. Aggregates stockpile that is above the feeding hopper shall be enclosed at least on top and three sides. If open stockpiling is used, the stockpiles shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping;</li> <li>▪ Belt conveyors shall be enclosed on top and two sides and provided with a metal board at the bottom to eliminate any dust emission due to the wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can be achieve the same performance;</li> <li>▪ Scrapers shall be provided at the turning points of all belt conveyors inside the chute of the transfer points to remove dust adhered to the belt surface;</li> <li>▪ All conveyor transfer points shall be totally enclosed. Openings for the passages of conveyors shall be fitted with adequate flexible seals; and</li> <li>▪ All materials returned from dust collection system shall be transferred in enclosed system and shall be stored inside bins or enclosures.</li> </ul> <p>Hot feed side</p> <ul style="list-style-type: none"> <li>▪ The inlet and outlet of the rotary dryer shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter. The particulate and gaseous concentration at the exhaust outlet of the dust collector shall not exceed the required limiting values;</li> <li>▪ The bucket elevator shall be totally enclosed and the air be extracted and ducted to a dust collection system to meet the required particulates limiting value;</li> <li>▪ All vibratory screens shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings;</li> <li>▪ Chutes for carrying hot material shall be rigid and preferably fitted with abrasion resistant plate inside. They shall be inspected daily for leakages;</li> <li>▪ All hot bins shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings. The air shall be extracted and ducted to a dust collection system to meet the required particulates limiting value; and</li> <li>▪ Appropriate control measures shall be adopted in order to meet the required bitumen emission limit as well as the ambient odour level (2 odour units).</li> </ul> <p>Material transportation</p> <ul style="list-style-type: none"> <li>▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rocks, sands, stone aggregates, reject fines, shall be carried out in such a manner as to minimize dust emissions;</li> <li>▪ Roadways from the entrance of the plant to the product loading points and/or any other working areas</li> </ul>		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<p>where there are regular movements of vehicles shall be paved or hard surfaced; and</p> <ul style="list-style-type: none"> <li>▪ Haul roads inside the Works shall be adequately wetted with water and/or chemical suppressants by water trucks or water sprayers.</li> </ul> <p>Control of emissions from bitumen decanting</p> <ul style="list-style-type: none"> <li>▪ The heating temperature of the particular bitumen type and grade shall not exceed the corresponding temperature limit of the same type listed in Appendix 1 of the Guidance Note;</li> <li>▪ Tamper-free high temperature cut-off device shall be provided to shut off the fuel supply or electricity in case the upper limit for bitumen temperature is reached;</li> <li>▪ Proper chimney for the discharge of bitumen fumes shall be provided at high level;</li> <li>▪ The emission of bitumen fumes shall not exceed the required emission limit; and</li> <li>▪ The air-to-fuel ratio shall be properly controlled to allow complete combustion of the fuel. The fuel burners, if any, shall be maintained properly and free from carbon deposits in the burner nozzles.</li> </ul> <p>Liquid fuel</p> <ul style="list-style-type: none"> <li>▪ The receipt, handling and storage of liquid fuel shall be carried out so as to prevent the release of emissions of organic vapours and/or other noxious and offensive emissions to the air.</li> </ul> <p>Housekeeping</p> <ul style="list-style-type: none"> <li>▪ A high standard of housekeeping shall be maintained. Waste material, spillage and scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared frequently. The minimum clearing frequency is on a weekly basis.</li> </ul>		
5.2.6.7	2.1	-	<p><b>Best Practices for Rock Crushing Plants</b></p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plant) BPM 11/1 (95) as well as in the future Specified Process licence should be adopted. These include:</p> <p>Crushers</p> <ul style="list-style-type: none"> <li>▪ The outlet of all primary crushers, and both inlet and outlet of all secondary and tertiary crushers, if not installed inside a reasonably dust tight housing, shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter;</li> <li>▪ The inlet hopper of the primary crushers shall be enclosed on top and 3 sides to contain the emissions during dumping of rocks from trucks. The rock while still on the trucks shall be wetted before dumping;</li> <li>▪ Water sprayers shall be installed and operated in strategic locations at the feeding inlet of crushers; and</li> <li>▪ Crusher enclosures shall be rigid and be fitted with self-closing doors and close-fitting entrances and exits. Where conveyors pass through the crusher enclosures, flexible covers shall be installed at entries and exits of the conveyors to the enclosure.</li> </ul> <p>Vibratory screens and grizzlies</p>	Within Crushing Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>▪ All vibratory screens shall be totally enclosed in a housing. Screenhouses shall be rigid and reasonably dust tight with self-closing doors or close-fitted entrances and exits for access. Where conveyors pass through the screenhouse, flexible covers shall be installed at entries and exits of the conveyors to the housing. Where containment of dust within the screenhouse structure is not successful then a dust extraction and collection system shall be provided; and</li> <li>▪ All grizzlies shall be enclosed on top and 3 sides and sufficient water sprayers shall be installed at their feeding and outlet areas.</li> </ul> <p>Belt conveyors</p> <ul style="list-style-type: none"> <li>▪ Except for those conveyors which are placed within a totally enclosed structure such as a screenhouse or those erected at the ground level, all conveyors shall be totally enclosed with windshield on top and 2 sides;</li> <li>▪ Effective belt scraper such as the pre-cleaner blades made by hard wearing materials and provided with pneumatic tensioner, or equivalent device, shall be installed at the head pulley of designated conveyor as required to dislodge fine dust particles that may adhere to the belt surface and to reduce carry-back of fine materials on the return belt. Bottom plates shall also be provided for the conveyor unless it has been demonstrated that the corresponding belt scraper is effective and well maintained to prevent falling material from the return belt; and</li> <li>▪ Except for those transfer points which are placed within a totally enclosed structure such as a screenhouse, all transfer points to and from conveyors shall be enclosed. Where containment of dust within the enclosure is not successful, then water sprayers shall be provided. Openings for any enclosed structure for the passage of conveyors shall be fitted with flexible seals.</li> </ul> <p>-</p> <p>Storage piles and bins</p> <ul style="list-style-type: none"> <li>▪ Where practicable, free falling transfer points from conveyors to stockpiles shall be fitted with flexible curtains or be enclosed with chutes designed to minimize the drop height. Water sprays shall also be used where required.</li> <li>▪ The surface of all surge piles and stockpiles of blasted rocks or aggregates shall be kept sufficiently wet by water spraying wherever practicable;</li> <li>▪ All open stockpiles for aggregates of size in excess of 5 mm shall be kept sufficiently wet by water spraying where practicable; or</li> <li>▪ The stockpiles of aggregates 5 mm in size or less shall be enclosed on 3 sides or suitably located to minimize wind-whipping. Save for fluctuations in stock or production, the average stockpile shall stay within the enclosure walls and in no case the height of the stockpile shall exceed twice the height of the enclosure walls.</li> <li>▪ Scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared regularly.</li> </ul> <p>Rock drilling equipment</p> <ul style="list-style-type: none"> <li>• Appropriate dust control equipment such as a dust extraction and collection system shall be used during</li> </ul>		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			rock drilling activities.		
<b>Hazard to Human Life – Construction Phase</b>					
Table 6.40	3.2	-	<ul style="list-style-type: none"> <li>Precautionary measures should be established to request barges to move away during typhoons.</li> </ul>	Construction Site / Construction Period	N/A
Table 6.40	3.2	-	<ul style="list-style-type: none"> <li>An appropriate marine traffic management system should be established to minimize risk of ship collision.</li> </ul>	Construction Site / Construction Period	N/A
Table 6.40	3.2	-	<ul style="list-style-type: none"> <li>Location of all existing hydrant networks should be clearly identified prior to any construction works.</li> </ul>	Construction Site / Construction Period	N/A
<b>Noise Impact – Construction Phase</b>					
7.5.6	4.3	-	<b>Good Site Practice</b> Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: <ul style="list-style-type: none"> <li>only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works;</li> <li>machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum;</li> <li>plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;</li> <li>mobile plant should be sited as far away from NSRs as possible; and</li> <li>material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul>	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	<b>Adoption of QPME</b> <ul style="list-style-type: none"> <li>QPME should be adopted as far as applicable.</li> </ul>	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	<b>Use of Movable Noise Barriers</b> <ul style="list-style-type: none"> <li>Movable noise barriers should be placed along the active works area and mobile plants to block the direct line of sight between PME and the NSRs.</li> </ul>	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	<b>Use of Noise Enclosure/ Acoustic Shed</b> <ul style="list-style-type: none"> <li>Noise enclosure or acoustic shed should be used to cover stationary PME such as air compressor and generator.</li> </ul>	Within the Project site / During construction phase / Prior to	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures commencement of operation	Mitigation Measures Implemented ?^
<b>Water Quality Impact – Construction Phase</b>					
8.8.1.2 and 8.8.1.3	5.1	2.26	<b>Marine Construction Activities</b> <u>General Measures to be Applied to All Works Areas</u> <ul style="list-style-type: none"> <li>▪ Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation;</li> <li>▪ Use of Lean Material Overboard (LMOB) systems shall be prohibited;</li> <li>▪ Excess materials shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessels are moved;</li> <li>▪ Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly;</li> <li>▪ Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;</li> <li>▪ All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</li> <li>▪ The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site; and</li> <li>▪ For ground improvement activities including DCM, the wash water from cleaning of the drilling shaft should be appropriately treated before discharge. The Contractor should ensure the waste water meets the WPCO/TM requirements before discharge. No direct discharge of contaminated water is permitted.</li> </ul> <u>Specific Measures to be Applied to All Works Areas</u> <ul style="list-style-type: none"> <li>▪ The daily maximum production rates shall not exceed those assumed in the water quality assessment in the EIA report;</li> <li>▪ A maximum of 10 % fines content to be adopted for sand blanket and 20 % fines content for marine filling below +2.5 mPD prior to substantial completion of seawall (until end of Year 2017) shall be specified in the works contract document;</li> <li>▪ An advance seawall of at least 200m to be constructed (comprising either rows of contiguous permanent steel cells completed above high tide mark or partially completed seawalls with rock core to high tide mark and filter layer on the inner side) prior to commencement of marine filling activities;</li> <li>▪ Closed grab dredger shall be used to excavate marine sediment;</li> <li>▪ Silt curtains surrounding the closed grab dredger shall be deployed in accordance with the Silt Curtain Deployment Plan; and</li> <li>▪ The Silt Curtain Deployment Plan shall be implemented.</li> </ul>	Within construction site / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
<p><u>Specific Measures to be Applied to Land Formation Activities prior to Commencement of Marine Filling Works</u></p> <ul style="list-style-type: none"> <li>Double layer 'Type III' silt curtains to be applied around the active eastern works areas prior to commencement of sand blanket laying activities. The silt curtains shall be configured to minimise SS release during ebb tides. A silt curtain efficiency test shall be conducted to validate the performance of the silt curtains;</li> <li>Double layer silt curtains to enclose WSRs C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of construction; and</li> <li>The silt curtains and silt screens should be regularly checked and maintained.</li> </ul> <p><u>Specific Measures to be Applied to Land Formation Activities during Marine Filling Works</u></p> <ul style="list-style-type: none"> <li>Double layer 'Type II' or 'Type III' silt curtains to be applied around the eastern openings between partially completed seawalls prior to commencement of marine filling activities. The silt curtains shall be configured to minimise SS release during ebb tides;</li> <li>Double layer silt curtains to be applied at the south-western opening prior to commencement of marine filling activities;</li> <li>Double layer silt curtain to enclose WSR C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of marine filling activities; and</li> <li>The silt curtains and silt screens should be regularly checked and maintained.</li> </ul> <p><u>Specific Measures to be Applied to the Field Joint Excavation Works for the Submarine Cable Diversion</u></p> <ul style="list-style-type: none"> <li>Only closed grabs designed and maintained to avoid spillage shall be used and should seal tightly when operated. Excavated materials shall be disposed at designated marine disposal area in accordance with the Dumping and Sea Ordinance (DASO) permit conditions; and</li> <li>Silt curtains surrounding the closed grab dredger to be deployed as a precautionary measure.</li> </ul>					
8.8.1.4	5.1	-	<p><b>Modification of the Existing Seawall</b></p> <ul style="list-style-type: none"> <li>Silt curtains shall be deployed around the seawall modification activities to completely enclose the active works areas, and care should be taken to avoid splashing of rockfill / rock armour into the surrounding marine environment. For the connecting sections with the existing outfalls, works for these connection areas should be undertaken during the dry season in order that individual drainage culvert cells may be isolated for interconnection works.</li> </ul>	At the existing northern seawall / Duration of the construction phase	N/A
8.8.1.5	5.1	-	<p><b>Construction of New Stormwater Outfalls and Modifications to Existing Outfalls</b></p> <ul style="list-style-type: none"> <li>During operation of the temporary drainage channel, runoff control measures such as bunding or silt fence shall be provided on both sides of the channel to prevent accumulation and release of SS via the temporary channel. Measures should also be taken to minimise the ingress of site drainage into the culvert excavations.</li> </ul>	Within construction site / Duration of the construction phase	N/A



EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
8.8.1.6 8.8.1.7	5.1	2.27	<p><b>Piling Activities for Construction of New Runway Approach Lights and HKIAAA Marker Beacons</b></p> <p>Silt curtains shall be deployed around the piling activities to completely enclose the piling works and care should be taken to avoid spillage of excavated materials into the surrounding marine environment.</p> <p><u>For construction of the eastern approach lights at the CMPs</u></p> <ul style="list-style-type: none"> <li>Ground improvement via DCM using a close-spaced layout shall be completed prior to commencement of piling works;</li> <li>Steel casings shall be installed to enclose the excavation area prior to commencement of excavation;</li> <li>The excavated materials shall be removed using a closed grab within the steel casings;</li> <li>No discharge of the cement mixed materials into the marine environment will be allowed; and</li> <li>Excavated materials shall be treated and reused on-site.</li> </ul>	Within construction site / Duration of the construction phase	N/A
8.8.1.8	5.1	-	<p><b>Construction Site Runoff and Drainage</b></p> <p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended:</p> <ul style="list-style-type: none"> <li>Install perimeter cut-off drains to direct off-site water around the site and implement internal drainage, erosion and sedimentation control facilities. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractors prior to the commencement of construction (for works areas located on the existing Airport island) or as soon as the new land is completed (for works areas located on the new landform);</li> <li>Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM-DSS standards under the WPCO. The design of efficient silt removal facilities should make reference to the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractors prior to the commencement of construction;</li> <li>All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly;</li> <li>Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities;</li> <li>In the event that contaminated groundwater is identified at excavation areas, this should be treated on-site using a suitable wastewater treatment process. The effluent should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge to foul sewers or collected for</li> </ul>	Within construction site / Duration of the construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<p>proper disposal off-site. No direct discharge of contaminated groundwater is permitted;</p> <ul style="list-style-type: none"> <li>All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exits. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. All washwater should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge;</li> </ul>		
		-	<ul style="list-style-type: none"> <li>Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the construction materials, soil, silt or debris from washing away into the drainage system;</li> <li>Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and to prevent stormwater runoff being directed into foul sewers; and</li> <li>Precautionary measures should be taken at any time of the year when rainstorms are likely. Actions to be taken when a rainstorm is imminent or forecasted are summarized in Appendix A2 of ProPECC Note PN 1/94. This includes actions to be taken during and/or after rainstorms. Particular attention should be paid to the control of silty surface runoff during storm events.</li> </ul>		
8.8.1.9	5.1	-	<p><b>Sewage Effluent from Construction Workforce</b></p> <ul style="list-style-type: none"> <li>Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.</li> </ul>	Within construction site / During construction phase	I
8.8.1.10 8.8.1.11	5.1		<p><b>General Construction Activities</b></p> <ul style="list-style-type: none"> <li>Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used; and</li> <li>Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.</li> </ul>	Within construction site / During construction phase	I
8.8.1.12 8.8.1.13	5.1	2.28	<p><b>Drilling Activities for the Submarine Aviation Fuel Pipelines</b></p> <p>To prevent potential water quality impacts at Sha Chau, the following measures shall be applied:</p> <ul style="list-style-type: none"> <li>A 'zero-discharge' policy shall be applied for all activities to be conducted at Sha Chau;</li> <li>No bulk storage of chemicals shall be permitted; and</li> </ul>	Within construction site / During construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>A containment pit shall be constructed around the drill holes. This containment pit shall be lined with impermeable lining and bunded on the outside to prevent inflow from off-site areas.</li> </ul> <p>At the airport island side of the drilling works, the following measures shall be applied for treatment of wastewater:</p> <ul style="list-style-type: none"> <li>During pipe cleaning, appropriate desilting or sedimentation device should be provided on site for treatment before discharge. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge; and</li> <li>Drilling fluid used in drilling activities should be reconditioned and reused as far as possible. Temporary enclosed storage locations should be provided on-site for any unused chemicals that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.</li> </ul>		
<b>Waste Management Implication – Construction Phase</b>					
10.5.1.1	7.1	-	<p>Opportunities to minimise waste generation and maximise the reuse of waste materials generated by the project have been incorporated where possible into the planning, design and construction stages, and the following measures have been recommended:</p> <ul style="list-style-type: none"> <li>The relevant construction methods (particularly for the tunnel works) and construction programme have been carefully planned and developed to minimise the extent of excavation and to maximise the on-site reuse of inert C&amp;D materials generated by the project as far as practicable. Temporary stockpiling areas will also be provided to facilitate on-site reuse of inert C&amp;D materials;</li> <li>Priority should be given to collect and reuse suitable inert C&amp;D materials generated from other concurrent projects and the Government's PFRF as fill materials for the proposed land formation works;</li> <li>Only non-dredged ground improvement methods should be adopted in order to completely avoid the need for dredging and disposal of marine sediment for the proposed land formation work;</li> <li>Excavation work for constructing the APM tunnels, BHS tunnels and airside tunnels will not be down to the CMPs beneath the fill materials in order to avoid excavating any sediments; and</li> <li>For the marine sediments expected to be excavated from the piling works of TRC, APM &amp; BHS tunnels, airside tunnels and other facilities on the proposed land formation area, piling work of marine sections of the approach lights and HKIAAA beacons, basement works for some of T2 expansion area and excavation works for the proposed APM depot should be treated and reused on-site as backfilling materials, although required treatment level / detail and the specific re-use mode are under development.</li> </ul>	Project Site Area / During design and construction phase	I
10.5.1.1	7.1	-	<p>The following good site practices should be performed during the construction activities include:</p> <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;</li> <li>Training of site personnel in proper waste management and chemical waste handling procedures;</li> </ul>	Project Site Area / Construction Phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>Provision of sufficient waste disposal points and regular collection for disposal;</li> <li>Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks by tarpaulin/ similar material or by transporting wastes in enclosed containers. The cover should be extended over the edges of the sides and tailboards;</li> <li>Stockpiles of C&amp;D materials should be kept wet or covered by impervious sheets to avoid wind-blown dust;</li> <li>All dusty materials including C&amp;D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the barging points/ stockpile areas;</li> <li>C&amp;D materials to be delivered to and from the project site by barges or by trucks should be kept wet or covered to avoid wind-blown dust;</li> <li>The speed of the trucks including dump trucks carrying C&amp;D or waste materials within the site should be controlled to about 10 km/hour in order to reduce the adverse dust impact and secure the safe movement around the site; and</li> <li>To avoid or minimise dust emission during transport of C&amp;D or waste materials within the site, each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials. Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li> </ul>		
10.5.1.3	7.1	-	<p>The following practices should be performed to achieve waste reduction include:</p> <ul style="list-style-type: none"> <li>Use of steel or aluminium formworks and falseworks for temporary works as far as practicable;</li> <li>Adoption of repetitive design to allow reuse of formworks as far as practicable;</li> <li>Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;</li> <li>Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force;</li> <li>Any unused chemicals or those with remaining functional capacity should be collected for reused as far as practicable;</li> <li>Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and</li> <li>Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> </ul>	Project Site Area / Construction Phase	I
10.5.1.5	7.1		<ul style="list-style-type: none"> <li>Inert and non-inert C&amp;D materials should be handled and stored separately to avoid mixing the two types of materials.</li> </ul>	Project Site Area / Construction Phase	I
10.5.1.5	7.1	-	<ul style="list-style-type: none"> <li>Any recyclable materials should be segregated from the non-inert C&amp;D materials for collection by</li> </ul>	Project Site Area /	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			reputable licensed recyclers whereas the non-recyclable waste materials should be disposed of at the designated landfill site by a reputable licensed waste collector.	Construction Phase	
10.5.1.6	7.1	-	<ul style="list-style-type: none"> <li>A trip-ticket system promulgated shall be developed in order to monitor the off-site delivery of surplus inert C&amp;D materials that could not be reused on-site for the proposed land formation work at the PFRF and to control fly tipping.</li> </ul>	Project Site Area / Construction Phase	I
10.5.1.6	7.1	2.32	<ul style="list-style-type: none"> <li>The Contractor should prepare and implement a Waste Management Plan detailing various waste arising and waste management practices.</li> </ul>	Construction Phase	I
10.5.1.16	7.1	-	<p>The following mitigation measures are recommended during excavation and treatment of the sediments:</p> <ul style="list-style-type: none"> <li>On-site remediation should be carried out in an enclosed area in order to minimise odour/dust emissions;</li> <li>The loading, unloading, handling, transfer or storage of treated and untreated sediment should be carried out in such a manner to prevent or minimise dust emissions;</li> <li>All practical measures, including but not limited to speed control for vehicles, should be taken to minimise dust emission;</li> <li>Good housekeeping should be maintained at all times at the sediment treatment facility and storage area;</li> <li>Treated and untreated sediment should be clearly separated and stored separately; and</li> <li>Surface runoff from the enclosed area should be properly collected and stored separately, and then properly treated to levels in compliance with the relevant effluent standards as required by the Water Pollution Control Ordinance before final discharge.</li> </ul>	Project Site Area / Construction Phase	N/A
10.5.1.18	7.1	-	<p>The marine sediments to be removed from the cable field joint area would be disposed of at the designated disposal sites to be allocated by the MFC. The following mitigation measures should be strictly followed to minimise potential impacts on water quality during transportation of the sediments requiring Type 1 disposal:</p> <ul style="list-style-type: none"> <li>Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material;</li> <li>Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by EPD; and</li> <li>Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation.</li> </ul>	Project Site Area / Construction Phase	N/A
10.5.1.19	7.1	-	<p>Contractor should register with the EPD as a chemical waste producer and to follow the relevant guidelines. The following measures should be implemented:</p> <ul style="list-style-type: none"> <li>Good quality containers compatible with the chemical wastes should be used;</li> <li>Incompatible chemicals should be stored separately;</li> <li>Appropriate labels must be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc; and</li> </ul>	Project Site Area / Construction Phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>The contractor will use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</li> </ul>		
10.5.1.20	7.1	-	<ul style="list-style-type: none"> <li>General refuse should be stored in enclosed bins or compaction units separated from inert C&amp;D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site for disposal at designated landfill sites. An enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</li> </ul>	Project Site Area / Construction Phase	I
10.5.1.21	7.1	-	<ul style="list-style-type: none"> <li>The construction contractors will be required to regularly check and clean any refuse trapped or accumulated along the newly constructed seawall. Such refuse will then be stored and disposed of together with the general refuse.</li> </ul>	Project Site Area / Construction Phase	N/A
<b>Land Contamination – Construction Phase</b>					
11.10.1.2 to 11.10.1.3	8.1	2.32	<p>For areas inaccessible during site reconnaissance survey</p> <ul style="list-style-type: none"> <li>Further site reconnaissance would be conducted once the areas are accessible in order to identify any land contamination concern for the areas.</li> <li>Subject to further site reconnaissance findings, a supplementary Contamination Assessment Plan (CAP) for additional site investigation (SI) (if necessary) may be prepared and submitted to EPD for endorsement prior to the commencement of SI at these areas.</li> <li>After completion of SI, the Contamination Assessment Report (CAR) will be prepared and submitted to EPD for approval prior to start of the proposed construction works at the golf course, the underground and above-ground fuel storage tank areas, emergency power generation units, airside petrol filling station and fuel tank room.</li> <li>Should remediation be required, Remediation Action Plan (RAP) and Remediation Report (RR) will be prepared for EPD's approval prior to commencement of the proposed remediation and any construction works respectively.</li> </ul>	Project Site Area inaccessible during site reconnaissance / Prior to Construction Phase	N/A
11.8.1.2	8.1	-	<p>If contaminated soil is identified, the following mitigation measures are for the excavation and transportation of contaminated materials (if any):</p> <ul style="list-style-type: none"> <li>To minimize the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment should be employed;</li> <li>Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when working directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site;</li> <li>Stockpiling of contaminated excavated materials on site should be avoided as far as possible;</li> <li>The use of any contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out;</li> <li>Vehicles containing any excavated materials should be suitably covered to reduce dust emissions and/or</li> </ul>	Project Site Area / Construction Phase	N/A



EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			release of contaminated wastewater; <ul style="list-style-type: none"> <li>Truck bodies and tailgates should be sealed to prevent any discharge;</li> <li>Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping;</li> <li>Speed control for trucks carrying contaminated materials should be exercised. 8km/h is the recommended speed limit;</li> <li>Strictly observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and</li> <li>Maintain records of waste generation and disposal quantities and disposal arrangements.</li> </ul>		
<b>Terrestrial Ecological Impact – Construction Phase</b>					
12.10.1.1	9.2	2.14	<b>Pre-construction Egretty Survey</b> <ul style="list-style-type: none"> <li>Conduct ecological survey for Sha Chau egretty to update the latest boundary of the egretty.</li> </ul>	Breeding season (April - July) prior to commencement of HDD drilling works at HKIA	I
12.7.2.3 and 12.7.2.6	9.1	2.30	<b>Avoidance and Minimisation of Direct Impact to Egretty</b> <ul style="list-style-type: none"> <li>The daylighting location will avoid direct encroachment to the Sheung Sha Chau egretty. The daylighting location and mooring of flat top barge, if required, will be kept away from the egretty;</li> <li>In any event, controls such as demarcation of construction site boundary and confining the lighting within the site will be practised to minimise disturbance to off-site habitat at Sheung Sha Chau Island; and</li> <li>The containment pit at the daylighting location shall be covered or camouflaged.</li> </ul>	During construction phase at Sheung Sha Chau Island	I
12.7.2.5	9.1	2.30	<b>Preservation of Nesting Vegetation</b> <ul style="list-style-type: none"> <li>The proposed daylighting location and the arrangement of connecting pipeline will avoid the need of tree cutting, therefore the trees that are used by ardeids for nesting will be preserved.</li> </ul>	During construction phase at Sheung Sha Chau Island	I
12.7.2.4 and 12.7.2.6	9.1	2.30	<b>Timing the Pipe Connection Works outside Ardeid's Breeding Season</b> <ul style="list-style-type: none"> <li>All HDD and related construction works on Sheung Sha Chau Island will be scheduled outside the ardeids' breeding season (between April and July). No night-time construction work will be allowed on Sheung Sha Chau Island during all seasons.</li> </ul>	During construction phase at Sheung Sha Chau Island	I
12.10.1.1	9.3	-	<b>Ecological Monitoring</b> <ul style="list-style-type: none"> <li>During the HDD construction works period from August to March, ecological monitoring will be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.</li> </ul>	at Sheung Sha Chau Island	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
<b>Marine Ecological Impact – Pre-construction Phase</b>					
13.11.4.1	10.2.2	-	<ul style="list-style-type: none"> <li>Pre-construction phase Coral Dive Survey.</li> </ul>	HKIAAA artificial seawall	I
<b>Marine Ecological Impact – Construction Phase</b>					
13.11.1.3 to 13.11.1.6	-	-	<b>Minimisation of Land Formation Area</b> <ul style="list-style-type: none"> <li>Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population.</li> </ul>	Land formation footprint / during detailed design phase to completion of construction	N/A
13.11.1.7 to 13.11.1.10	-	2.31	<b>Use of Construction Methods with Minimal Risk/Disturbance</b> <ul style="list-style-type: none"> <li>Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF;</li> <li>Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on CWDs, fisheries and the marine environment;</li> <li>Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway;</li> <li>Avoid bored piling during CWD peak calving season (Mar to Jun);</li> <li>Prohibition of underwater percussive piling; and</li> <li>Use of horizontal directional drilling (HDD) method and water jetting methods for placement of submarine cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources.</li> </ul>	During construction phase at marine works area	N/A
13.11.2.1 to 13.11.2.7	-	-	<b>Mitigation for Indirect Disturbance due to Deterioration of Water Quality</b> <ul style="list-style-type: none"> <li>Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices;</li> <li>Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains);</li> <li>Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and</li> <li>Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources.</li> </ul>	All works area during the construction phase	N/A
13.11.1.12	-	-	<b>Strict Enforcement of No-Dumping Policy</b> <ul style="list-style-type: none"> <li>A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would</li> </ul>	All works area during the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<p>potentially be harmful to dolphins and/or their habitat in the work area;</p> <ul style="list-style-type: none"> <li>▪ Mandatory educational programme of the no-dumping policy be made available to all construction site personnel for all project-related works;</li> <li>▪ Fines for infractions should be implemented; and</li> <li>▪ Unscheduled, on-site audits shall be implemented.</li> </ul>		
13.11.1.13	-	-	<p><b>Good Construction Site Practices</b></p> <ul style="list-style-type: none"> <li>▪ Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines;</li> <li>▪ Keep the number of working or stationary vessels present on-site to the minimum anytime; and</li> <li>▪ Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators.</li> </ul>	All works area during the construction phase	N/A
13.11.5.4 to 13.11.5.13	10.3.1	-	<p><b>SkyPier High Speed Ferries' Speed Restrictions and Route Diversions</b></p> <ul style="list-style-type: none"> <li>▪ SkyPier HSFs operating to / from Zhuhai and Macau would divert north of SCLKC Marine Park with a 15 knot speed limit to apply for the part-journeys that cross high CWD abundance grid squares as indicatively shown in <b>Drawing No. MCL/P132/EIA/13-023</b> of the EIA Report. Both the alignment of the northerly route and the portion of routings to be subject to the speed limit of 15 knots shall be finalised prior to commencement of construction based on the future review of up-to-date CWD abundance and EM&amp;A data and taking reference to changes in total SkyPier HSF numbers; and</li> <li>▪ A maximum of 10 knots will be enforced through the designated SCLKC Marine Park area at all times.</li> </ul> <p><b>Other mitigation measures</b></p> <ul style="list-style-type: none"> <li>▪ The ET will audit various parameters including actual daily numbers of HSFs, compliance with the 15-knot speed limit in the speed control zone and diversion compliance for SkyPier HSFs operating to / from Zhuhai and Macau; and</li> <li>▪ The effectiveness of the CWD mitigation measures after implementation of initial six month SkyPier HSF diversion and speed restriction will be reviewed.</li> </ul>	Area between the footprint and SCLKC Marine Park during construction phase	I
13.11.5.14 to 13.11.5.18	10.3.1	2.31	<p><b>Dolphin Exclusion Zone</b></p> <ul style="list-style-type: none"> <li>▪ Establishment of a 24 hr Dolphin Exclusion Zone (DEZ) with a 250 m radius around the land formation works areas;</li> <li>▪ A DEZ would also be implemented during ground improvement works (e.g. DCM), water jetting works for submarine cables diversion, open trench dredging at the field joint locations and seawall construction; and</li> <li>▪ A DEZ would also be implemented during bored piling work but as a precautionary measure only.</li> </ul>	Marine waters around land formation works area during construction phase	N/A
13.11.5.19	10.4	2.31	<p><b>Acoustic Decoupling of Construction Equipment</b></p> <ul style="list-style-type: none"> <li>▪ Air compressors and other noisy equipment that must be mounted on steel barges should be acoustically-decoupled to the greatest extent feasible, for instance by using rubber or air-filled tyres; and</li> </ul>	Around coastal works area during construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>Specific acoustic decoupling measures shall be specified during the detailed design of the project for use during the land formation works.</li> </ul>		
13.11.5.20	10.6.1	2.29	<b>Spill Response Plan</b> <ul style="list-style-type: none"> <li>An oil and hazardous chemical spill response plan is proposed to be established during the construction phase as a precautionary measure so that appropriate actions to prevent or reduce risks to CWDs can be undertaken in the event of an accidental spillage.</li> </ul>	Construction phase	I
13.11.5.21 to 13.11.5.23	10.6.1	-	<b>Construction Vessel Speed Limits and Skipper Training</b> <ul style="list-style-type: none"> <li>A speed limit of 10 knots should be strictly observed for construction vessels at areas with the highest CWD densities; and</li> <li>Vessels traversing through the work areas should be required to use predefined and regular routes (which would presumably become known to resident dolphins) to reduce disturbance to cetaceans due to vessel movements. Specific marine routes shall be specified by the Contractor prior to construction commencing.</li> </ul>	All areas north and west of Lantau Island during construction phase	I
<b>Fisheries Impact – Construction Phase</b>					
14.9.1.2 to 14.9.1.5	-	-	<b>Minimisation of Land Formation Area</b> <ul style="list-style-type: none"> <li>Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for fisheries resources.</li> </ul>	Land formation footprint / during detailed design phase to completion of construction	N/A
14.9.1.6	-	-	<b>Use of Construction Methods with Minimal Risk/Disturbance</b> <ul style="list-style-type: none"> <li>Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF;</li> <li>Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on fisheries and the marine environment;</li> <li>Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and</li> <li>Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources.</li> </ul>	During construction phase at marine works area	N/A
14.9.1.11	-		<b>Strict Enforcement of No-Dumping Policy</b> <ul style="list-style-type: none"> <li>A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area;</li> <li>Mandatory educational programme of the no-dumping policy be made available to all construction site personnel for all project-related works;</li> </ul>	All works area during the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
			<ul style="list-style-type: none"> <li>Fines for infractions should be implemented; and</li> <li>Unscheduled, on-site audits shall be implemented.</li> </ul>		
14.9.1.12	-		<b>Good Construction Site Practices</b> <ul style="list-style-type: none"> <li>Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines;</li> <li>Keep the number of working or stationary vessels present on-site to the minimum anytime; and</li> <li>Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators.</li> </ul>	All works area during the construction phase	N/A
14.9.1.13 to 14.9.1.18	-		<b>Mitigation for Indirect Disturbance due to Deterioration of Water Quality</b> <ul style="list-style-type: none"> <li>Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices;</li> <li>Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains);</li> <li>Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and</li> <li>Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources.</li> </ul>	All works area during the construction phase	N/A
<b>Landscape and Visual Impact – Construction Phase</b>					
Table 15.6	12.3	-	<b>CM1</b> - The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	<b>CM2</b> - Reduction of construction period to practical minimum.	All works areas for duration of works; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	<b>CM3</b> - Phasing of the construction stage to reduce visual impacts during the construction phase.	All works areas for duration of works; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	<b>CM4</b> - Construction traffic (land and sea) including construction plants, construction vessels and barges should be kept to a practical minimum.	All works areas for duration of works; Upon handover and	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
				completion of works.	
Table 15.6	12.3	-	<b>CM5</b> - Erection of decorative mesh screens or construction hoardings around works areas in visually unobtrusive colours.	All works areas for duration of works; Upon handover and completion of works. – may be disassembled in phases	N/A
Table 15.6	12.3	-	<b>CM6</b> - Avoidance of excessive height and bulk of site buildings and structures.	New passenger concourse, terminal 2 expansion and other proposed airport related buildings and structures under the project; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	<b>CM7</b> - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	All works areas for duration of works; Upon handover and completion of works. – may be disassembled in phases	N/A
Table 15.6	12.3	-	<b>CM8</b> - All existing trees shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas.	All existing trees to be retained; Upon handover and completion of works.	I
Table 15.6	12.3	-	<b>CM9</b> - Trees unavoidably affected by the works shall be transplanted where practical. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.	All existing trees to be affected by the works; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	<b>CM10</b> - Land formation works shall be followed with advanced hydroseeding around taxiways and runways as soon as practical.	All affected existing grass areas around runways and verges/Duration of works;	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented ? <sup>^</sup>
				Upon handover and completion of works.	
			<b>Cultural Heritage Impact – Construction Phase</b>		
	-		Not applicable.		
			<b>Health Impact – Aircraft Emissions</b>		
	-		Not applicable.		
			<b>Health Impact – Aircraft Noise</b>		
	-		Not applicable.		

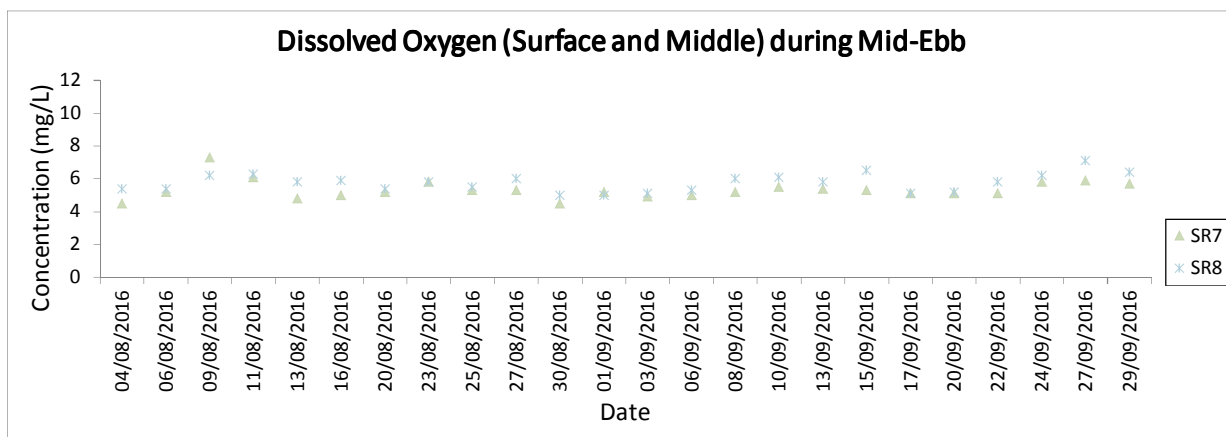
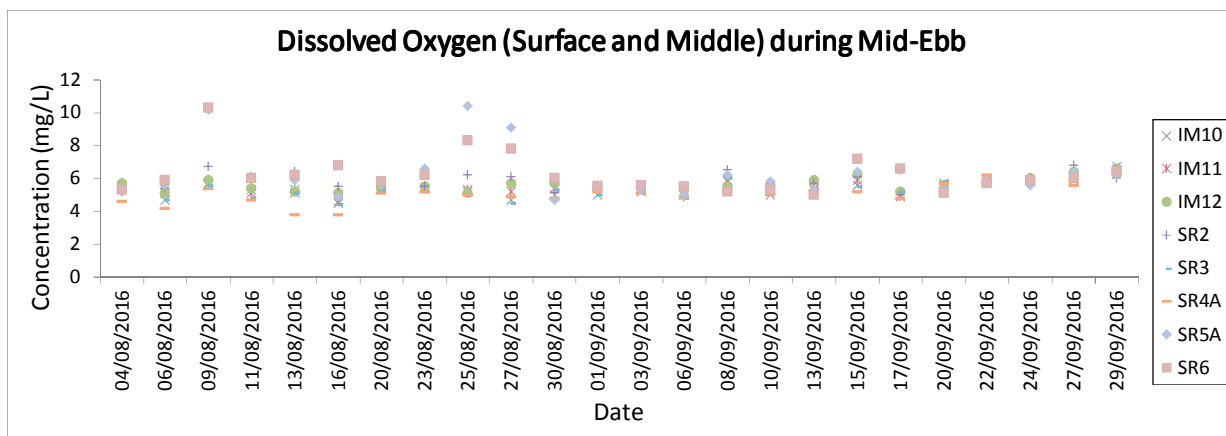
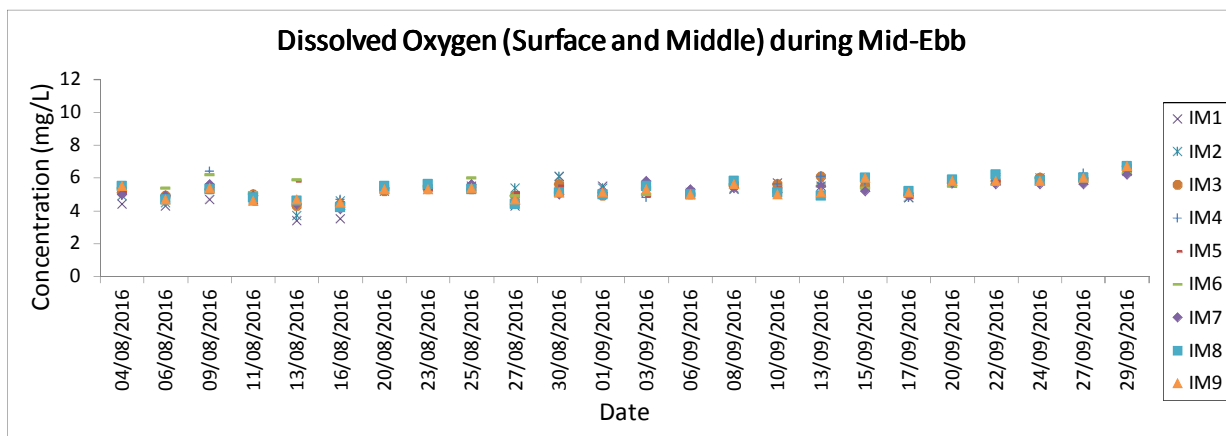
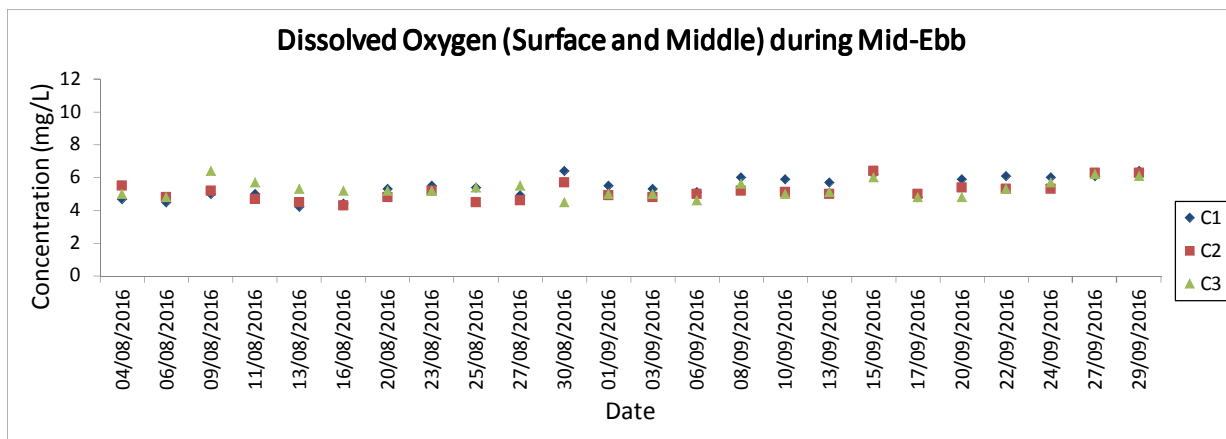
Notes:

I= implemented where applicable; N/A= not applicable to the construction works implemented during the reporting month.

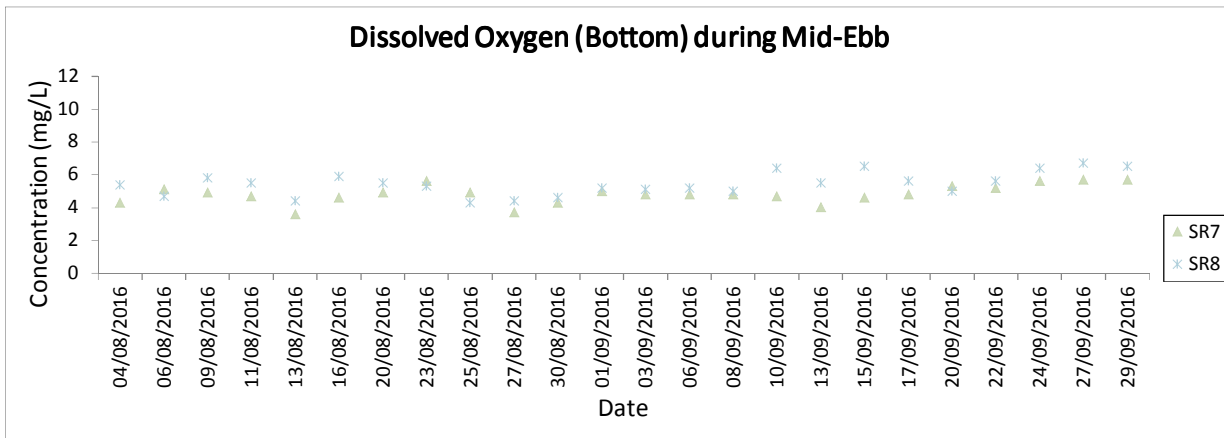
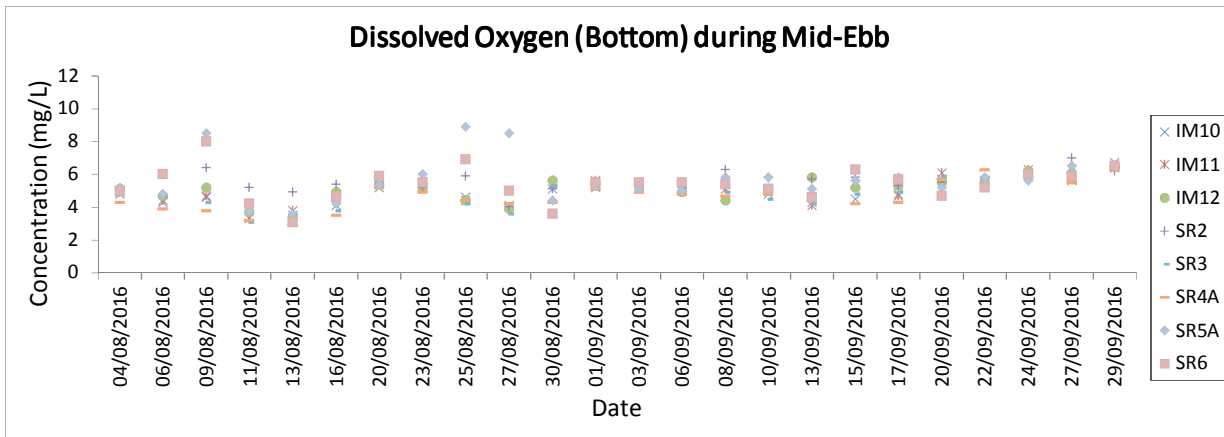
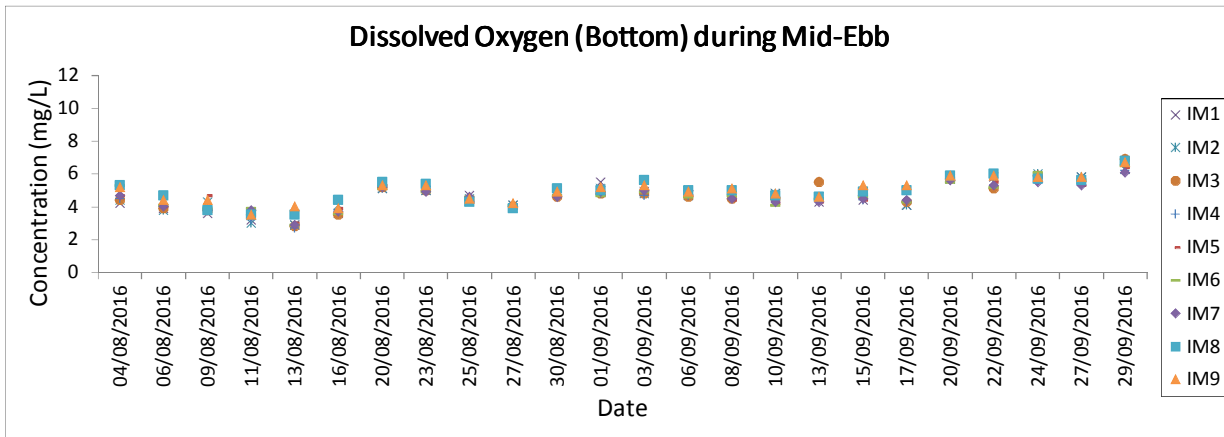
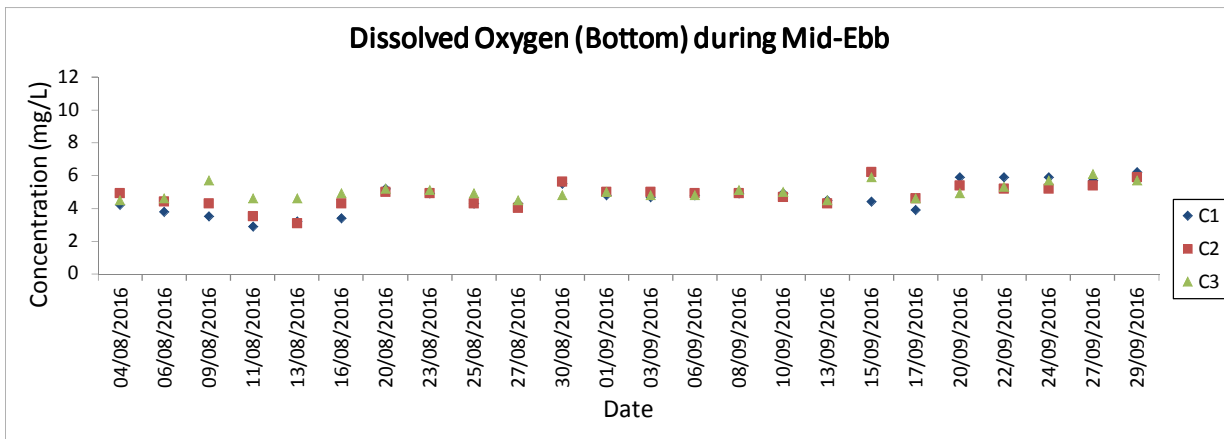
<sup>^</sup> Checked by ET during site inspection



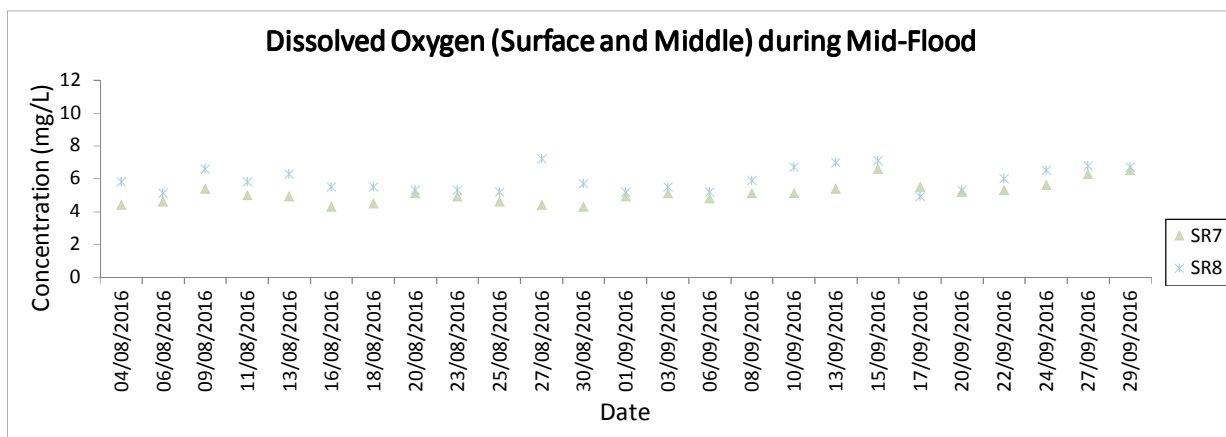
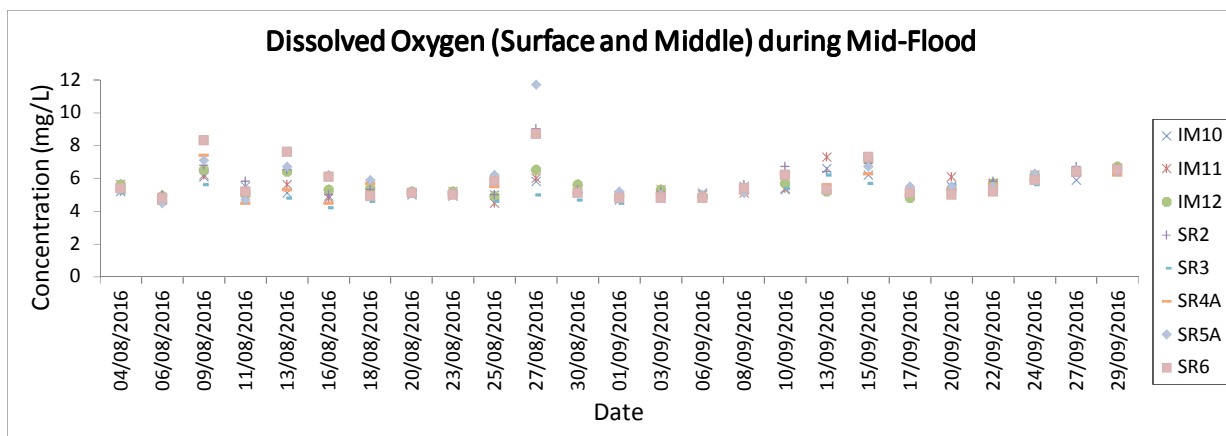
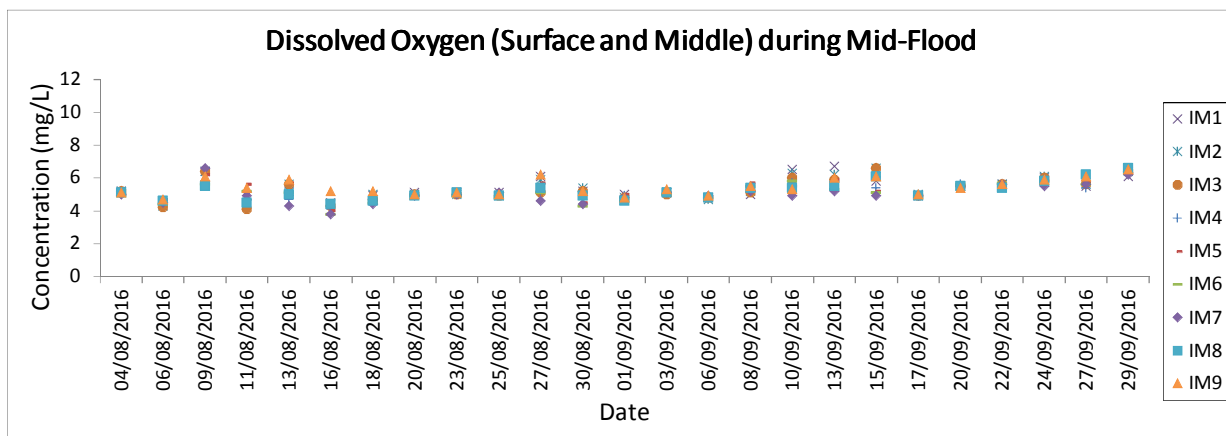
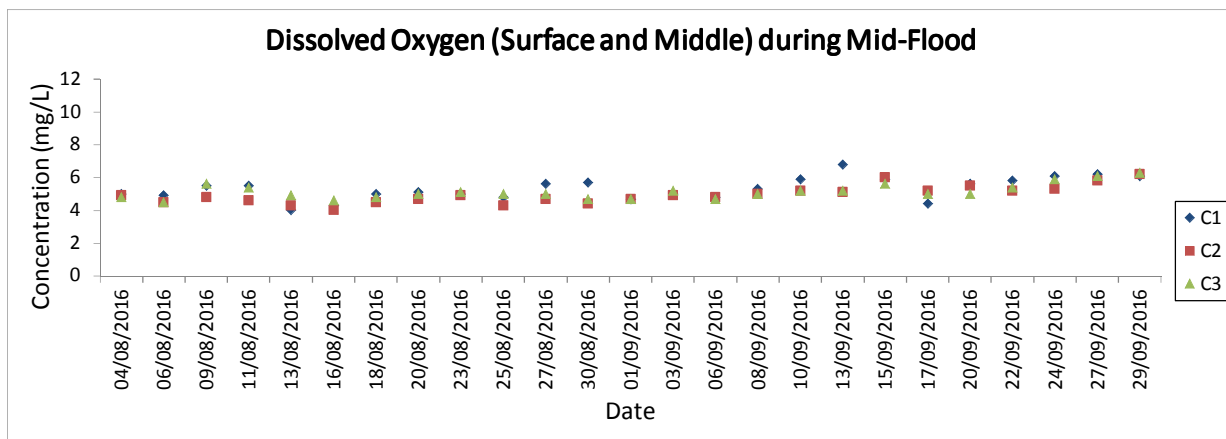
## **Appendix D. Graphical Plots of Water Quality Monitoring Result**



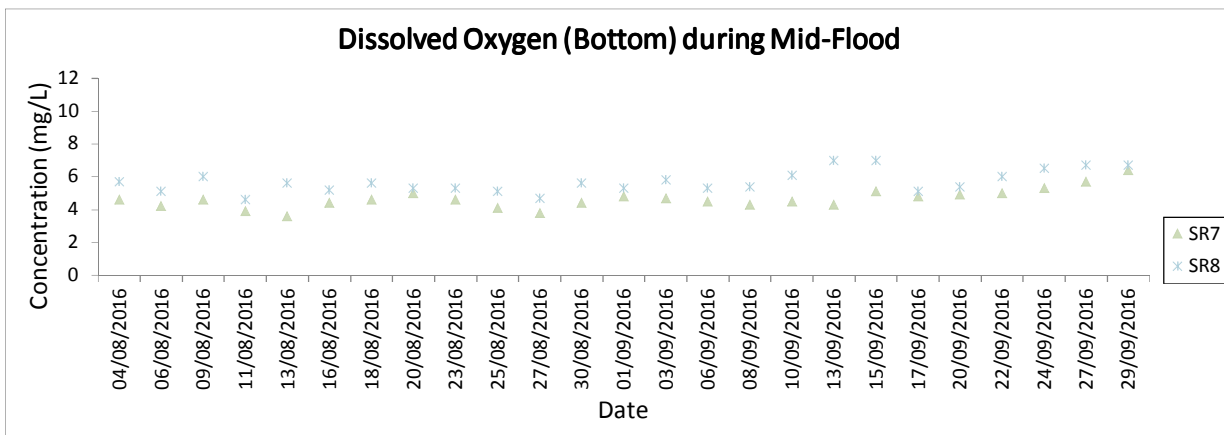
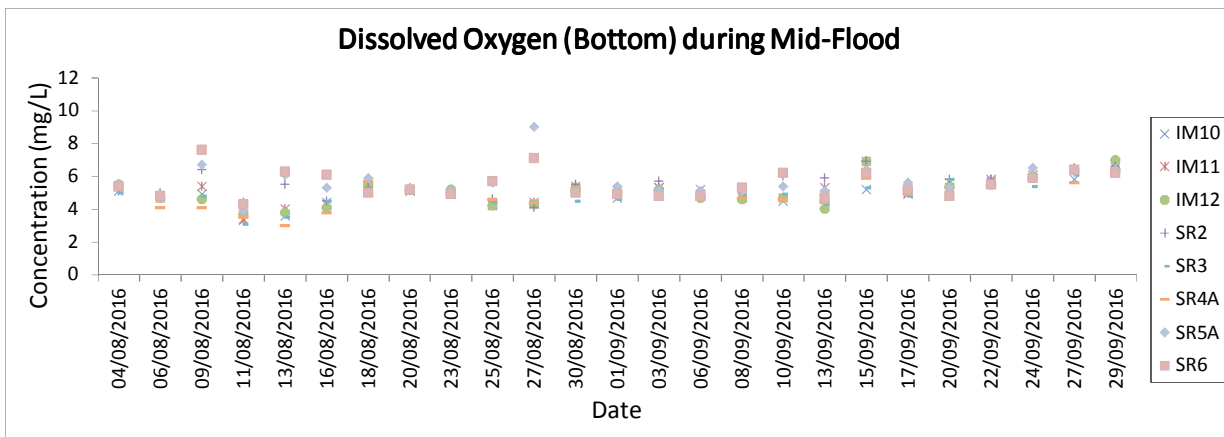
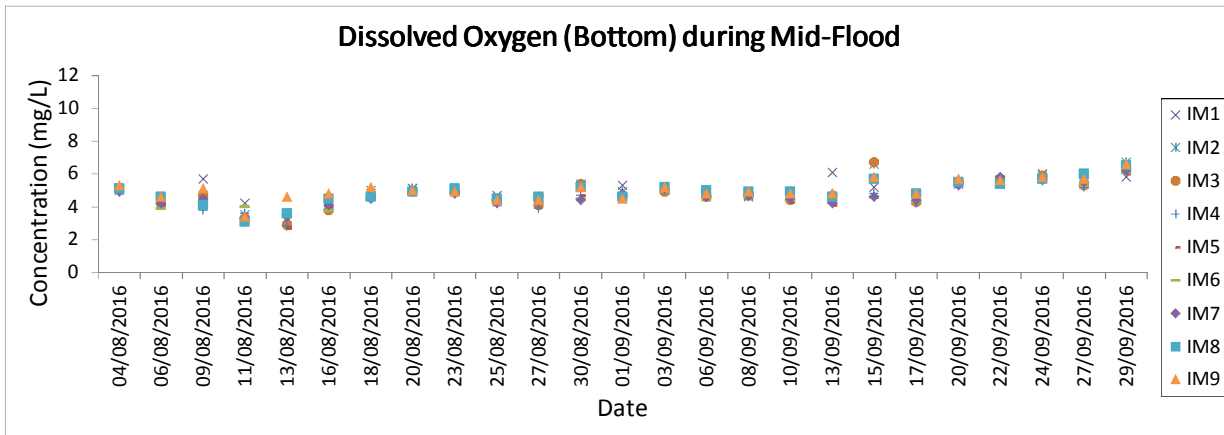
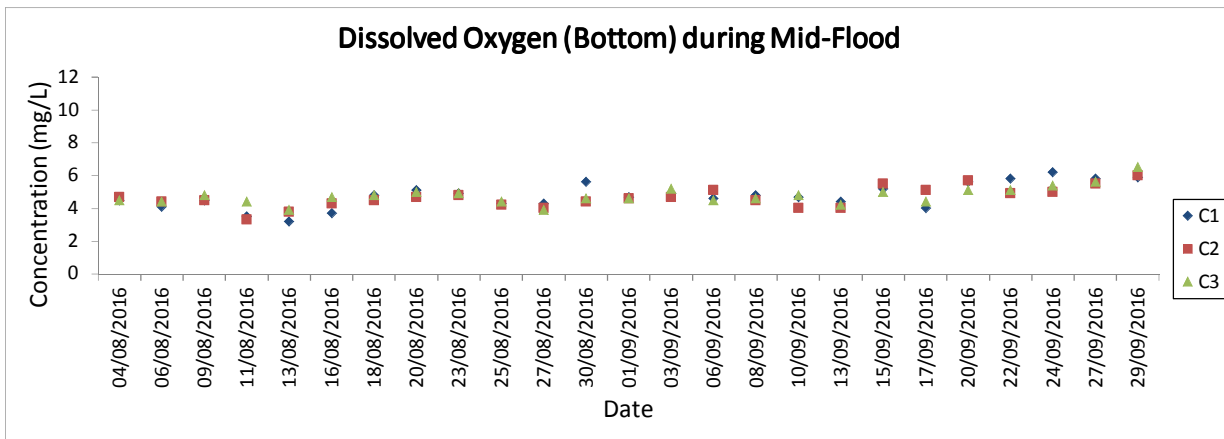
Note: The action and limit level of DO can be referred to Table 2.4 of the quarterly EM&A report.  
The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.



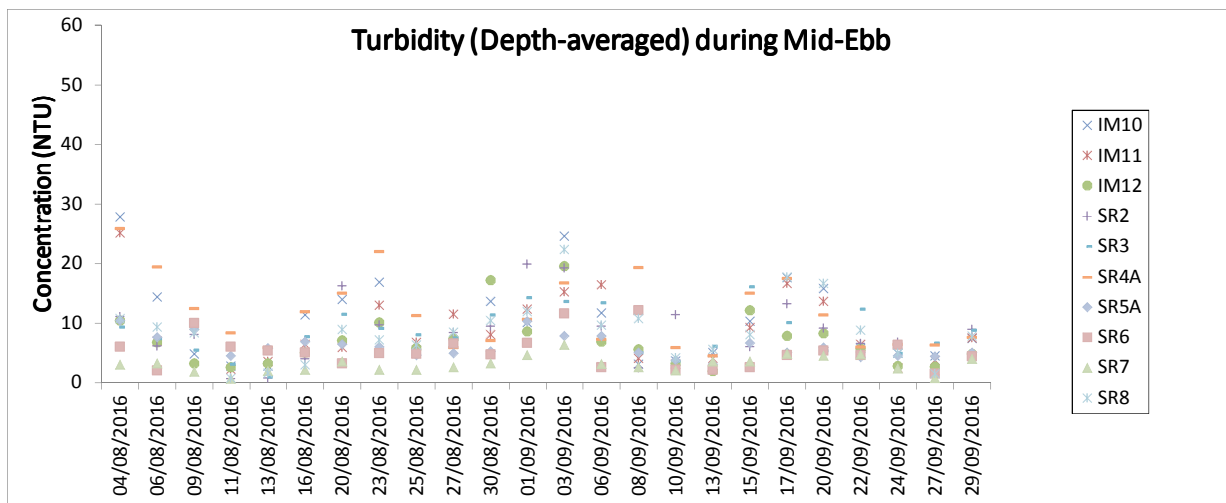
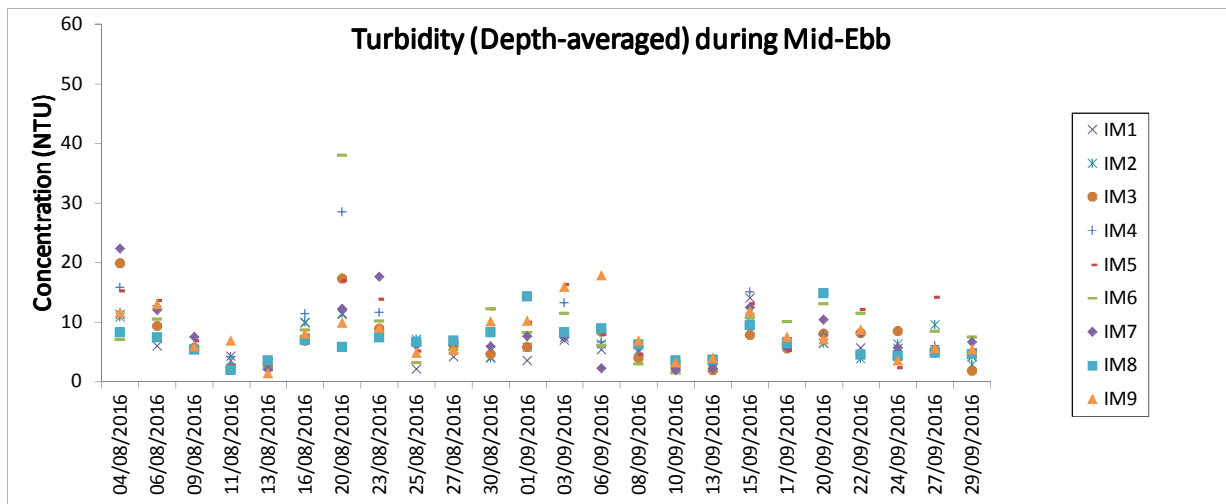
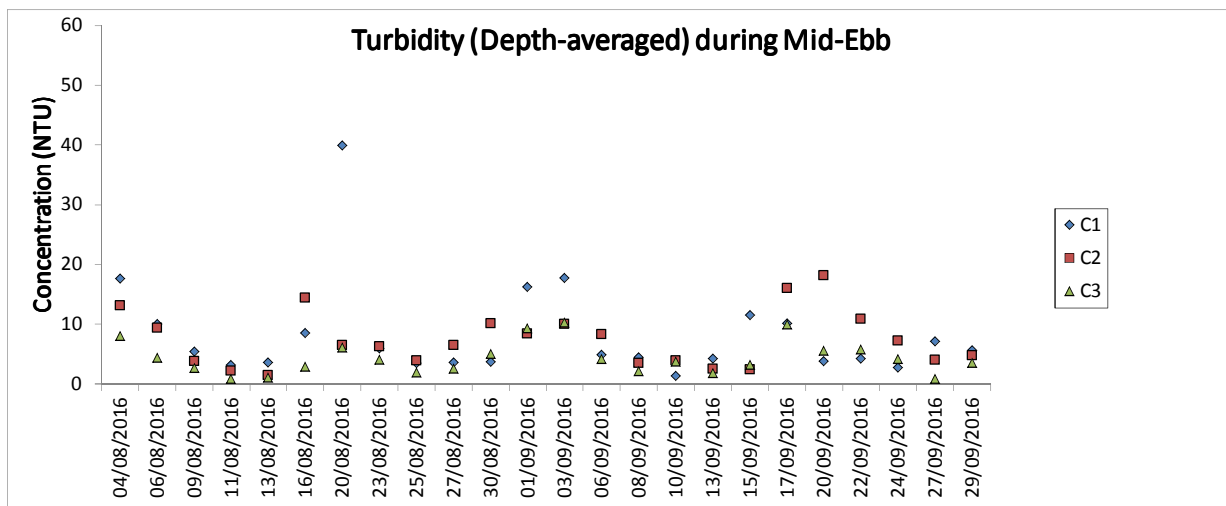
Note: The action and limit level of DO can be referred to Table 2.4 of the quarterly EM&A report.  
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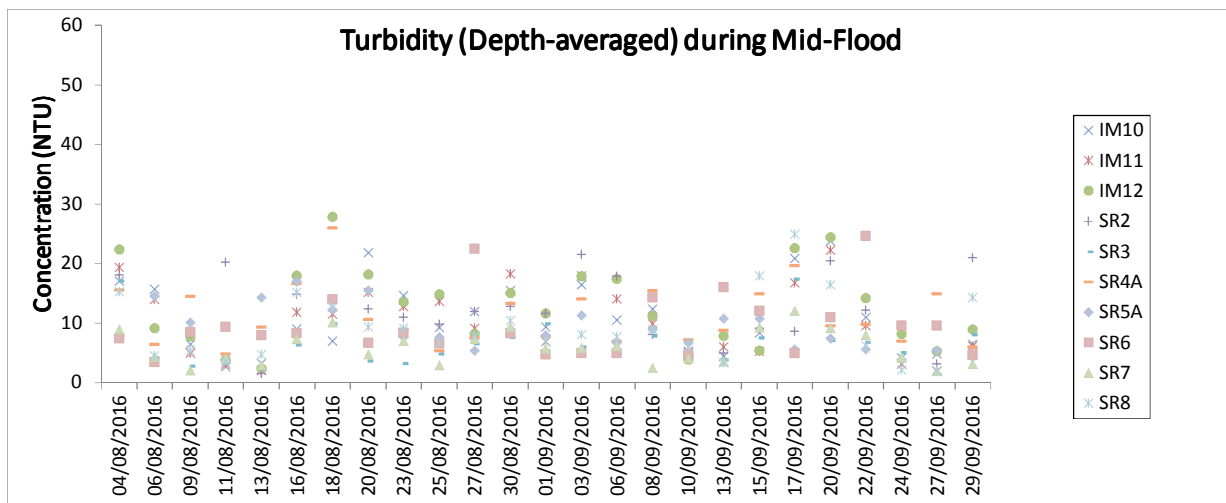
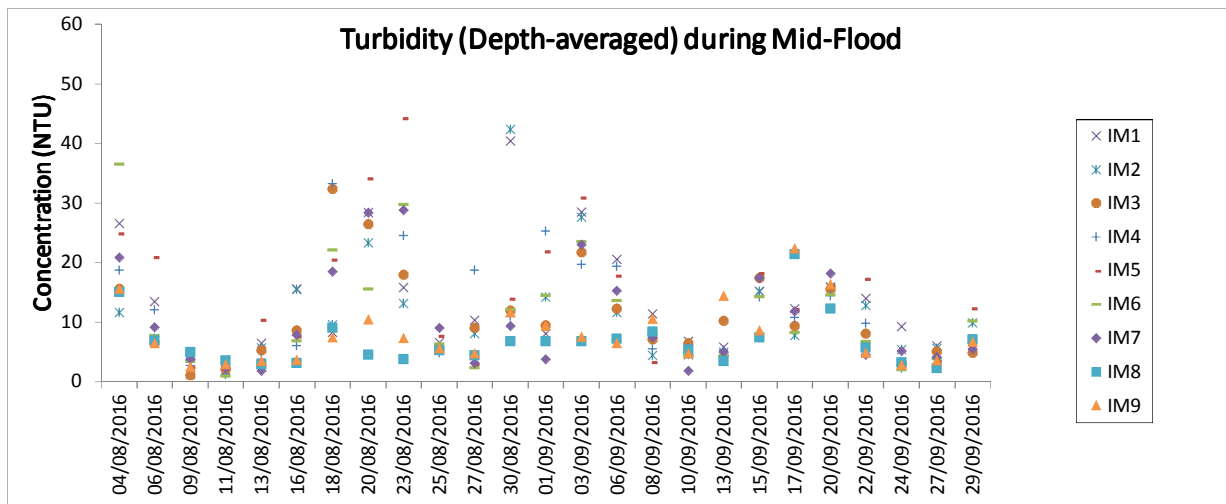
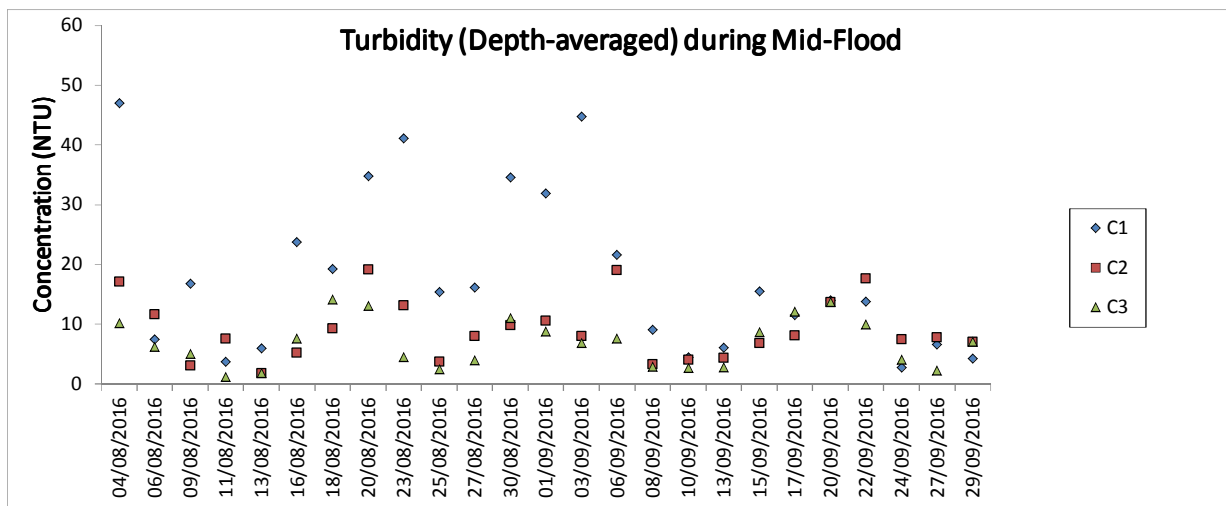
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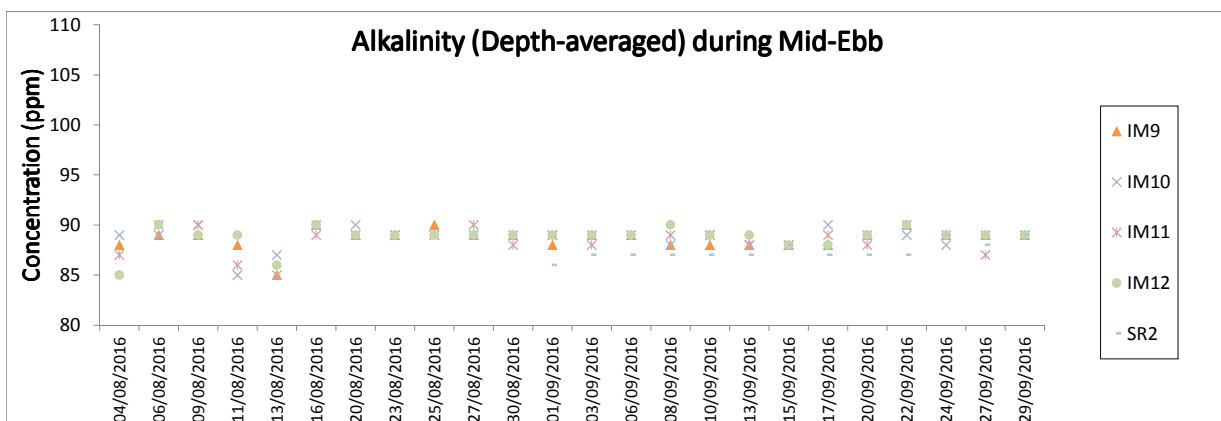
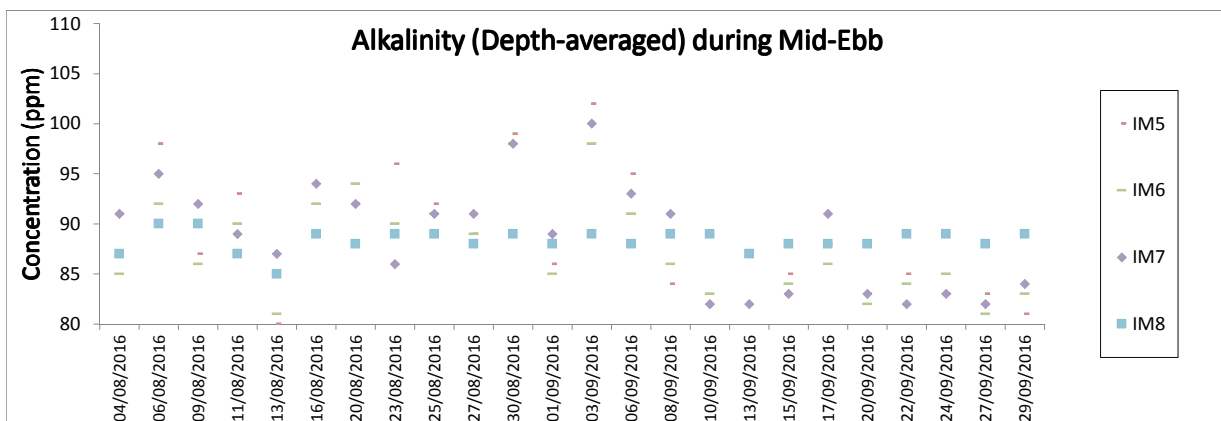
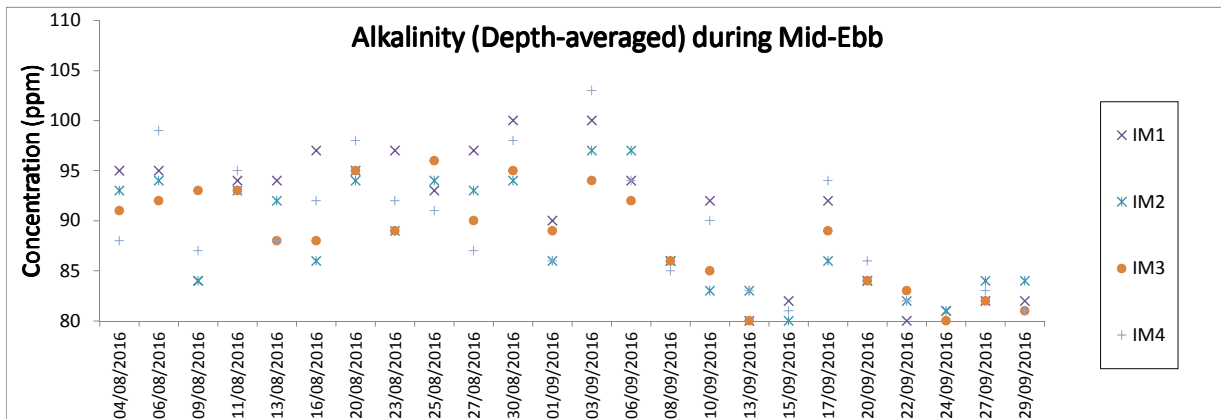
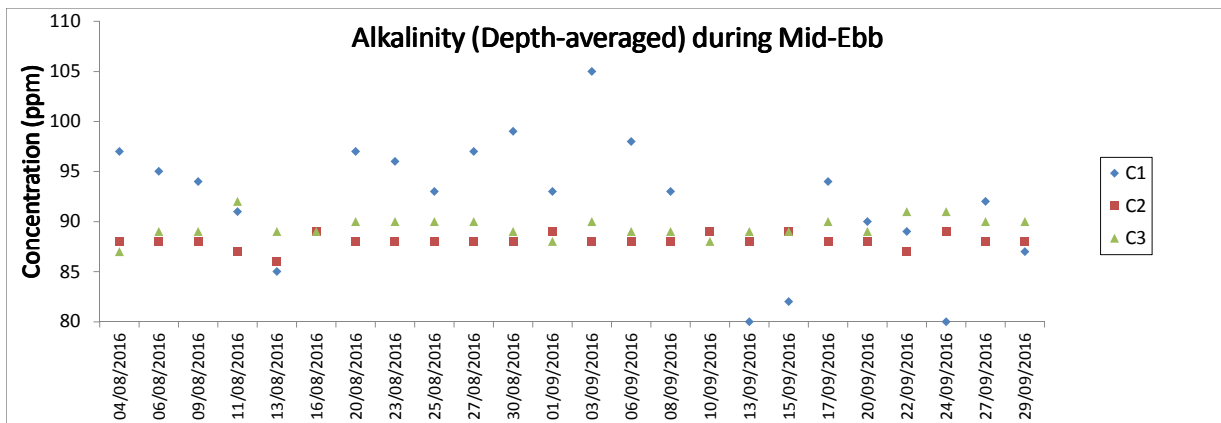


Note: The action and limit level of turbidity can be referred to Table 2.4 of the quarterly EM&A report.  
The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.

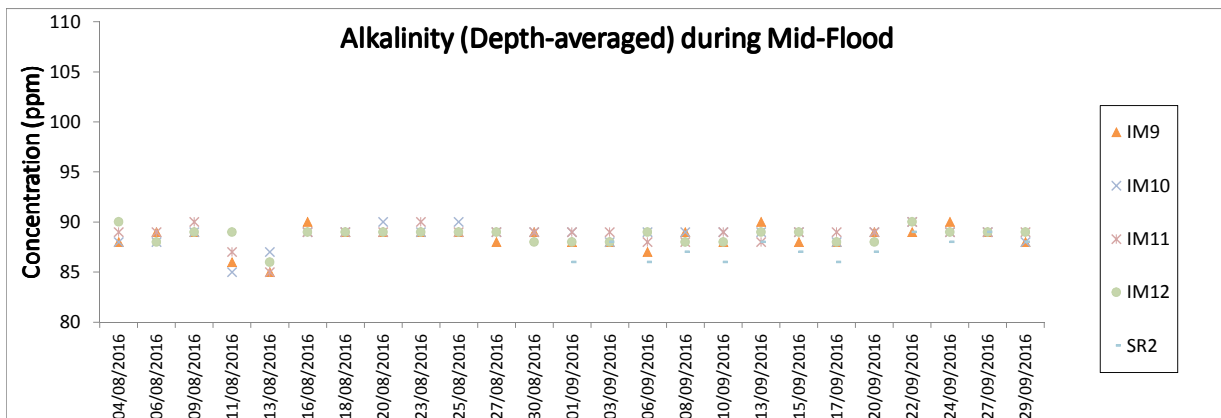
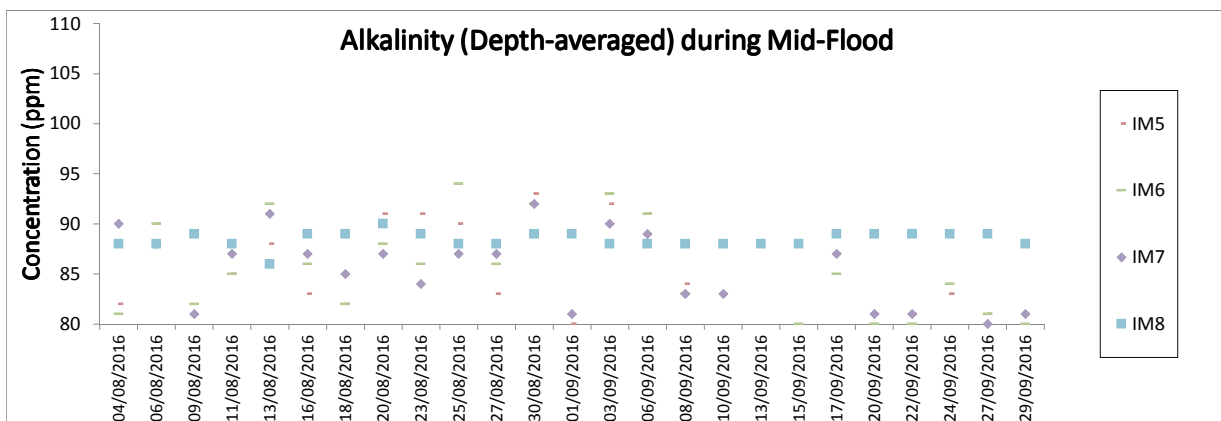
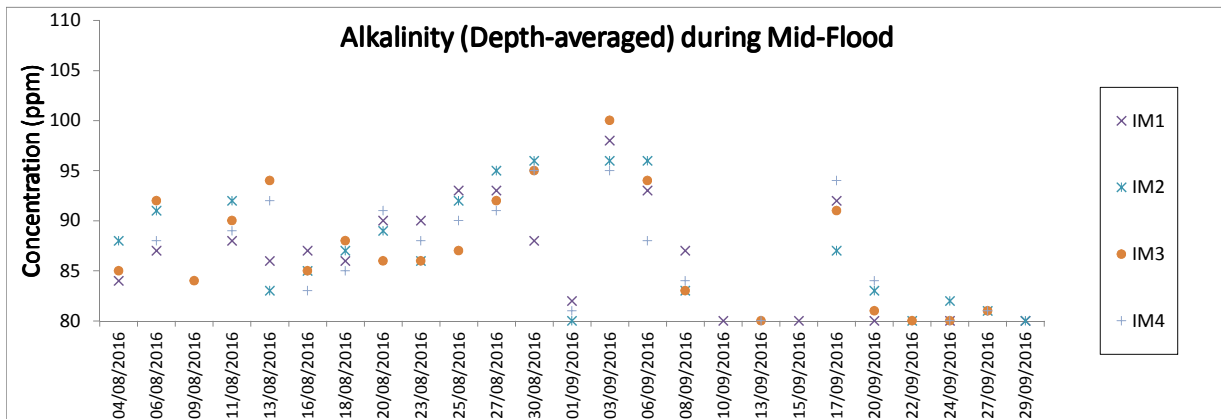
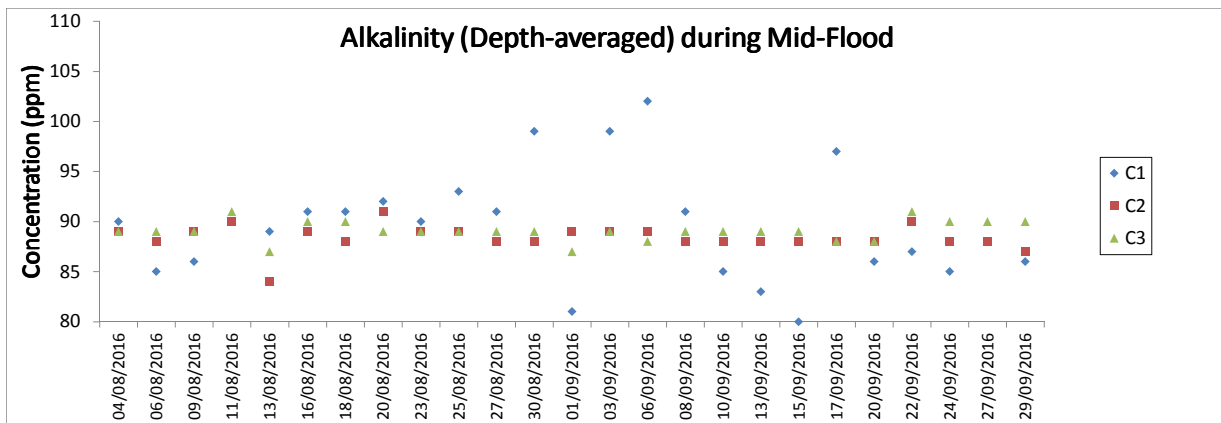


Note: The action and limit level of turbidity can be referred to Table 2.4 of the quarterly EM&A report.  
 The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.



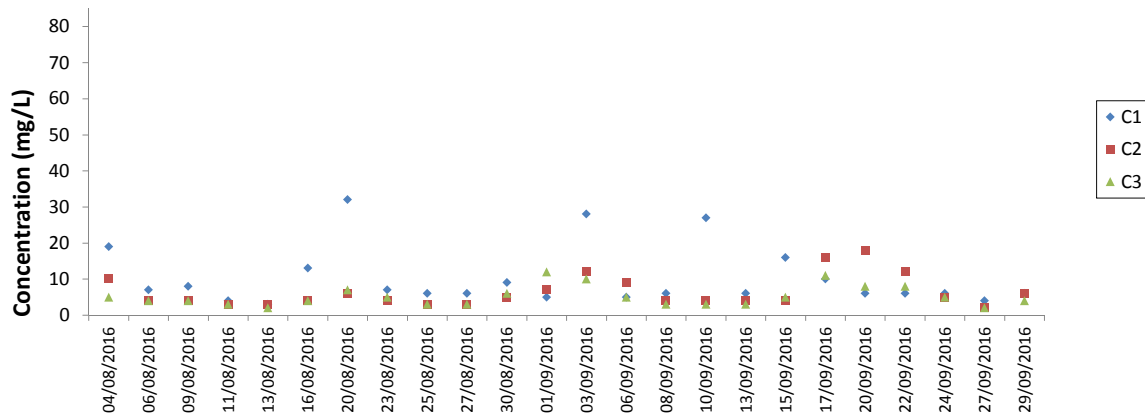


Note: The action and limit level of alkalinity can be referred to Table 2.4 of the quarterly EM&A report.  
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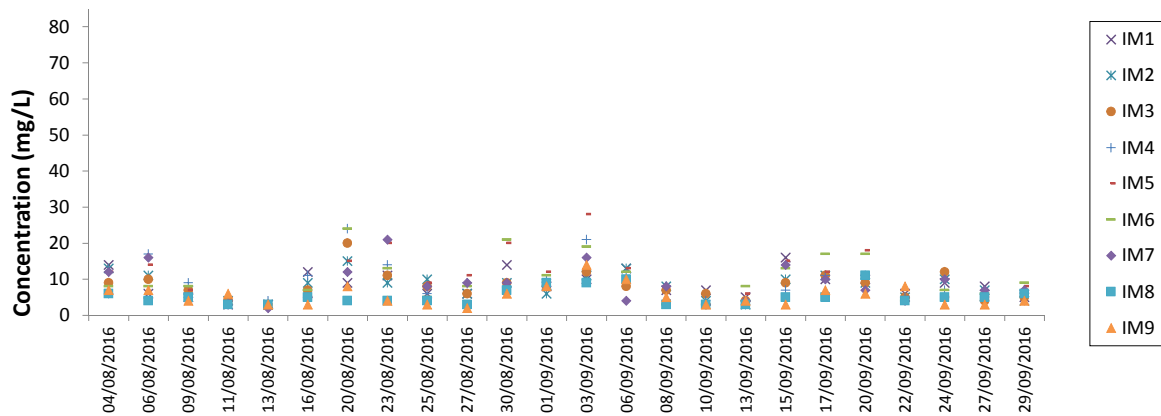


Note: The action and limit level of alkalinity can be referred to Table 2.4 of the quarterly EM&A report.  
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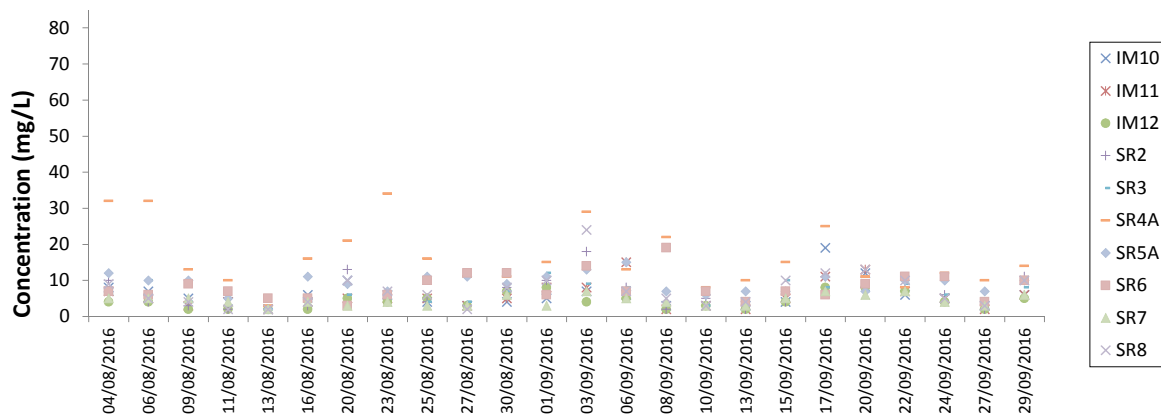
### Suspended Solids (Depth-averaged) during Mid-Ebb



### Suspended Solids (Depth-averaged) during Mid-Ebb

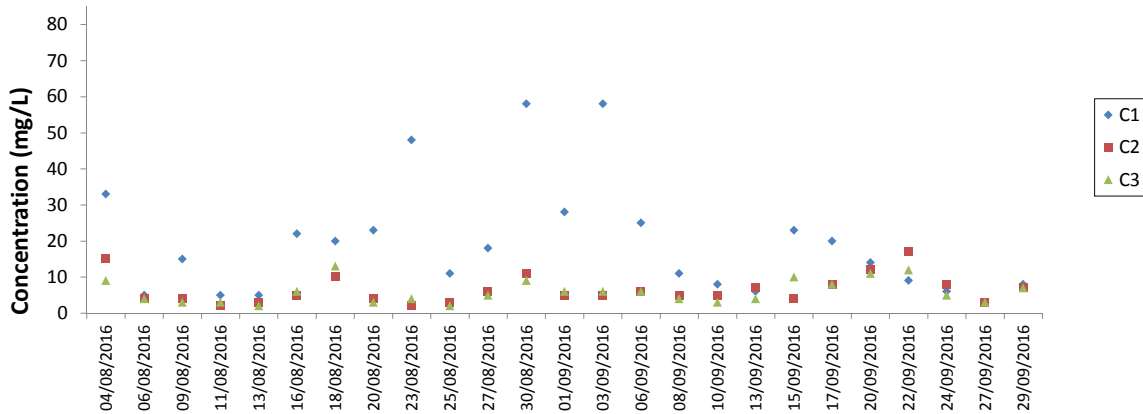


### Suspended Solids (Depth-averaged) during Mid-Ebb

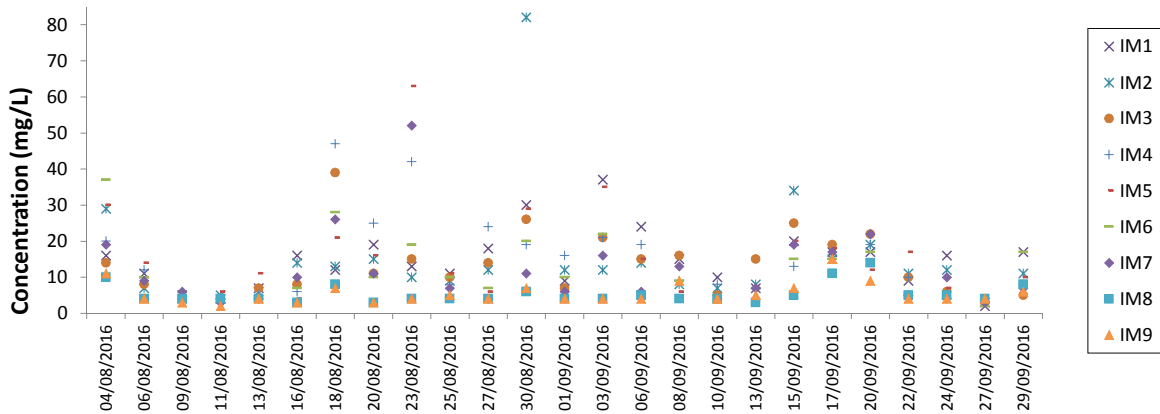


Note: The action and limit level of SS can be referred to Table 2.4 of the quarterly EM&A report.  
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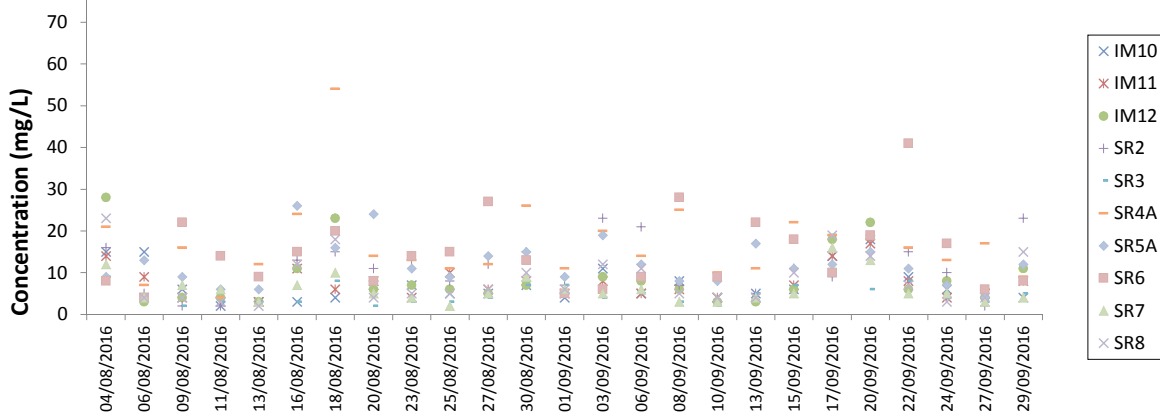
### Suspended Solids (Depth-averaged) during Mid-Flood



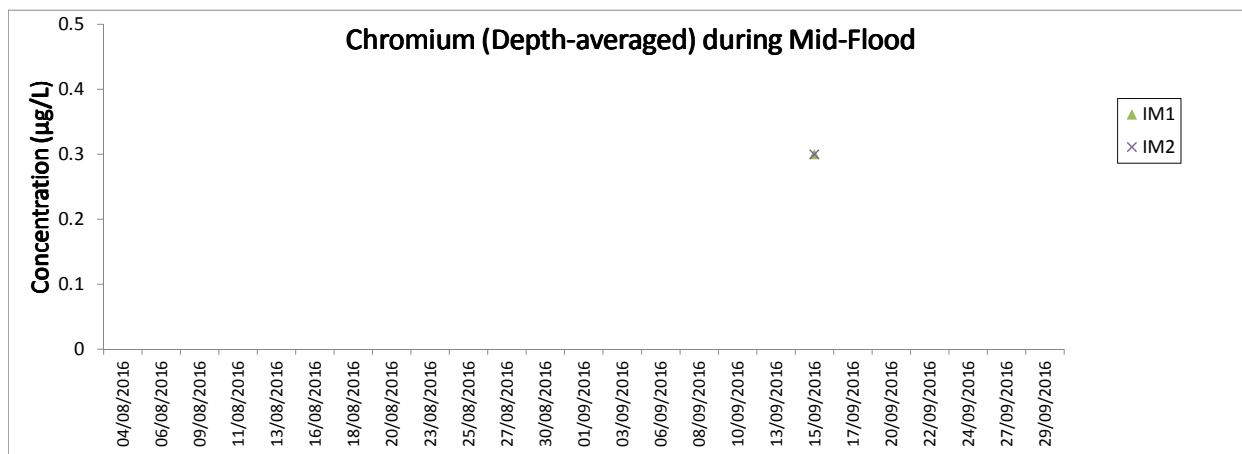
### Suspended Solids (Depth-averaged) during Mid-Flood



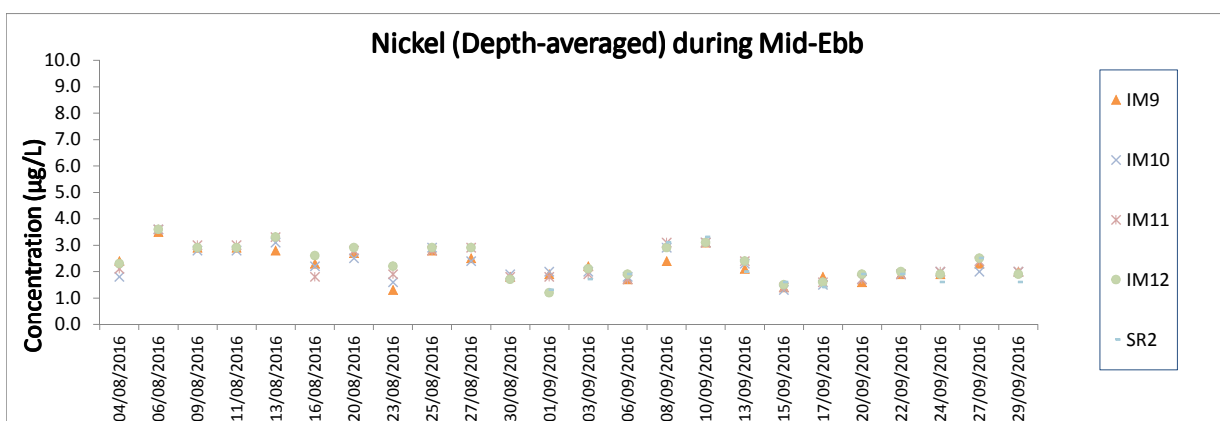
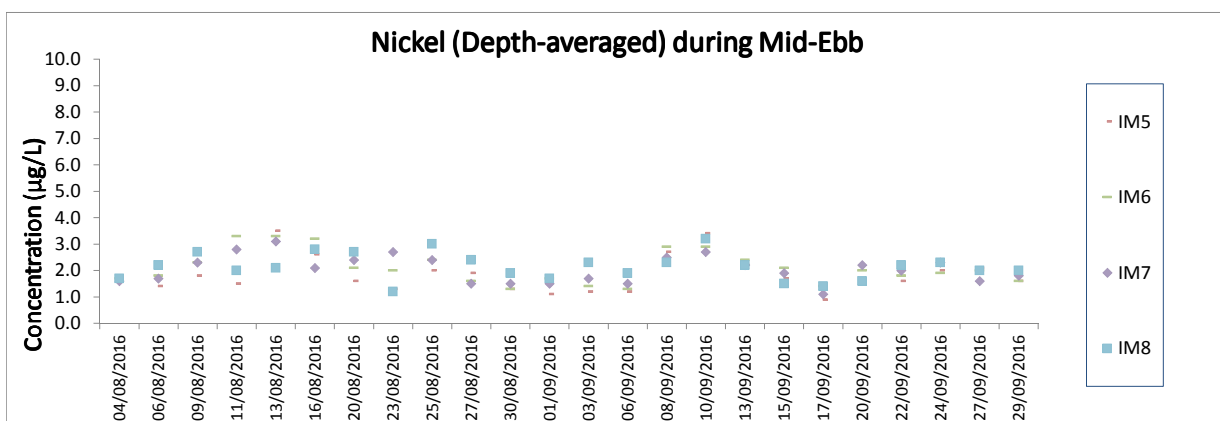
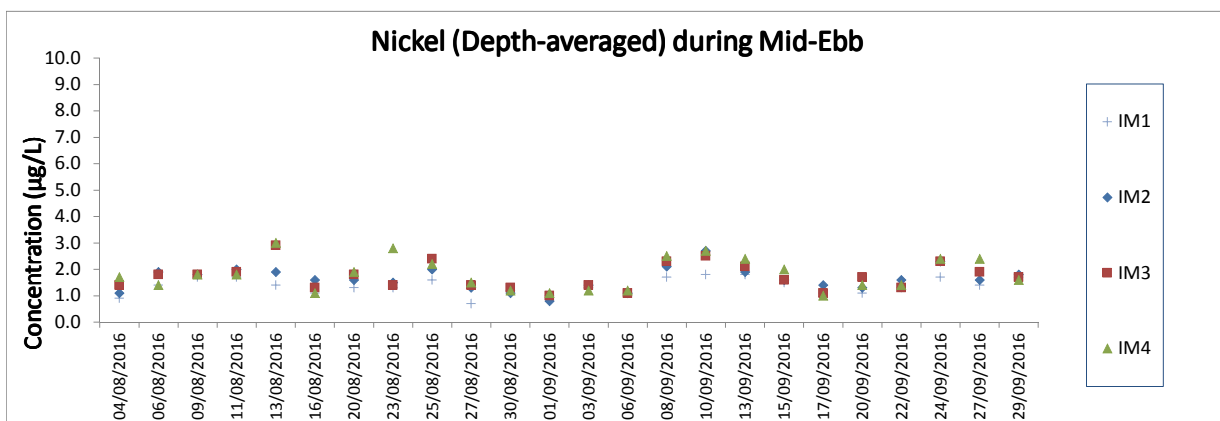
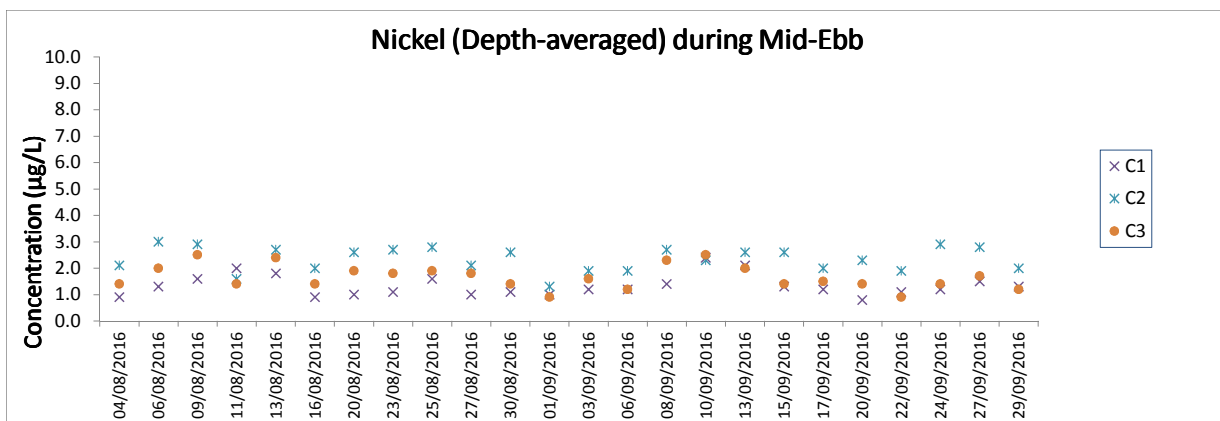
### Suspended Solids (Depth-averaged) during Mid-Flood



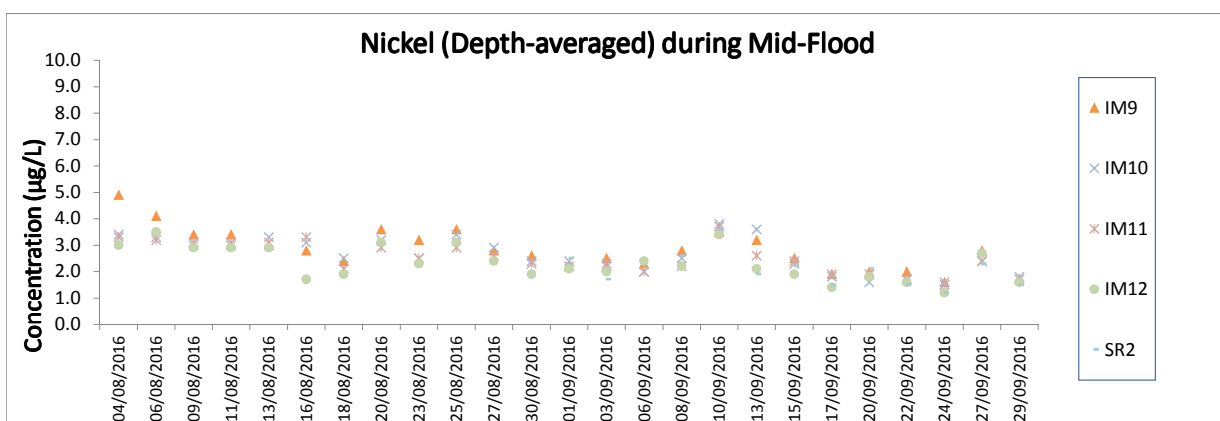
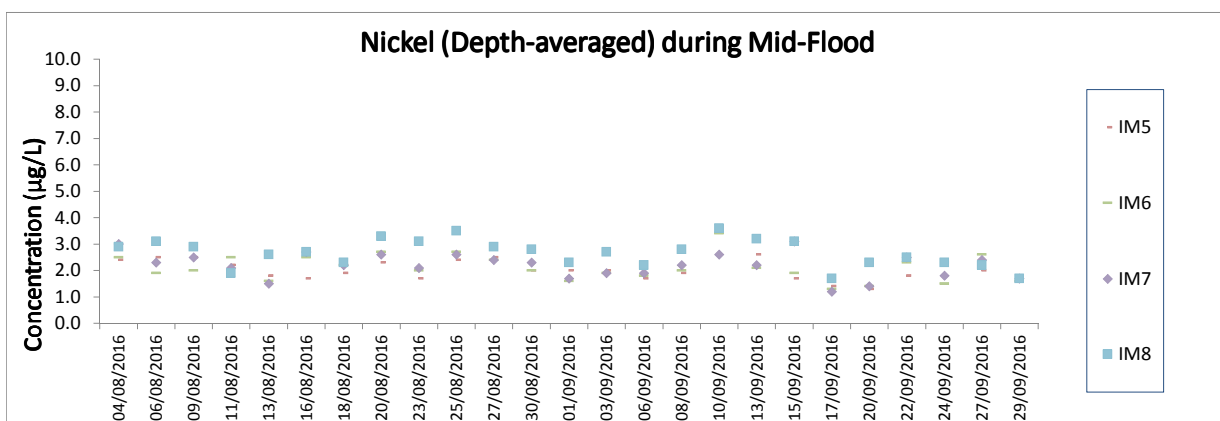
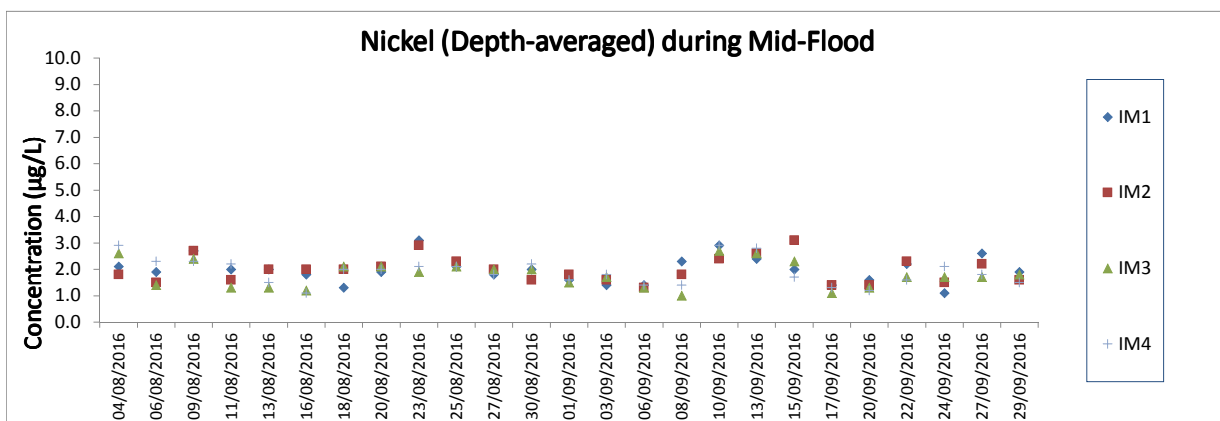
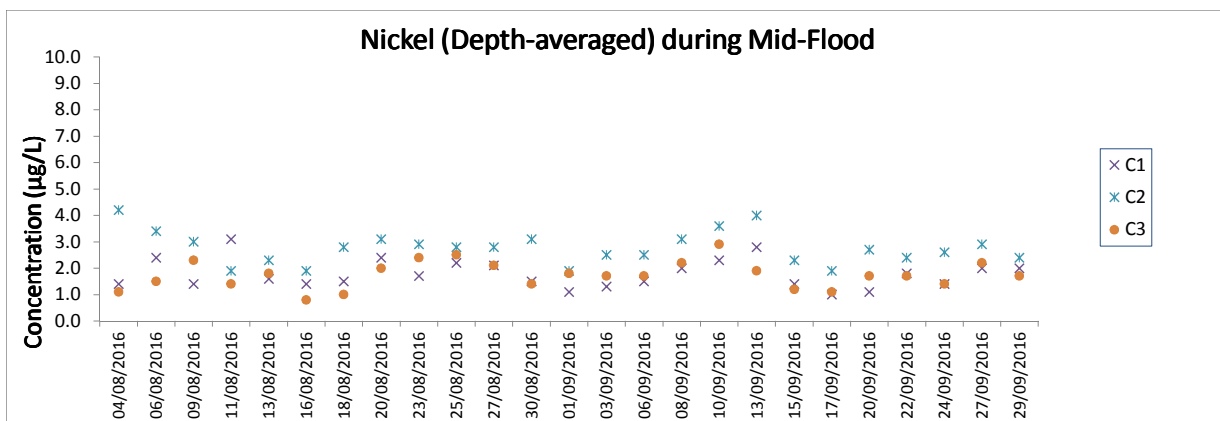
Note: The action and limit level of SS can be referred to Table 2.4 of the quarterly EM&A report.  
The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.



Note: The action and limit level of Chromium can be referred to Table 2.4 of the quarterly EM&A report.  
The monitoring results of Chromium at all other monitoring stations during mid-flood and mid-ebb tides were below the reporting limit <0.2 µg/L  
The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.



Note: The action and limit level of Nickel can be referred to Table 2.4 of the quarterly EM&A report.  
 The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.



Note: The action and limit level of Nickel can be referred to Table 2.4 of the quarterly EM&A report.  
 The scheduled water quality monitoring on 2 August 2016 during ebb and flood tides and 18 August 2016 during ebb tide were cancelled due to adverse weather conditions.



## **Appendix E. Summary of Chinese White Dolphin Monitoring Results**

## CWD Small Vessel Line-transect Survey

## Survey Effort Data

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
4-Jul-16	NEL	2	3.40	SUMMER	32166	3RS ET
4-Jul-16	NEL	3	23.21	SUMMER	32166	3RS ET
4-Jul-16	NEL	4	19.39	SUMMER	32166	3RS ET
6-Jul-16	NEL	1	13.60	SUMMER	32166	3RS ET
6-Jul-16	NEL	2	14.68	SUMMER	32166	3RS ET
6-Jul-16	NEL	3	18.72	SUMMER	32166	3RS ET
7-Jul-16	AW	3	5.13	SUMMER	32166	3RS ET
7-Jul-16	WL	2	11.09	SUMMER	32166	3RS ET
7-Jul-16	WL	3	17.57	SUMMER	32166	3RS ET
7-Jul-16	SWL	2	5.16	SUMMER	32166	3RS ET
13-Jul-16	NWL	1	12.00	SUMMER	32166	3RS ET
13-Jul-16	NWL	2	66.80	SUMMER	32166	3RS ET
13-Jul-16	NWL	3	5.10	SUMMER	32166	3RS ET
14-Jul-16	AW	2	4.96	SUMMER	32166	3RS ET
14-Jul-16	WL	1	2.60	SUMMER	32166	3RS ET
14-Jul-16	WL	2	2.92	SUMMER	32166	3RS ET
14-Jul-16	WL	3	21.30	SUMMER	32166	3RS ET
14-Jul-16	WL	4	6.38	SUMMER	32166	3RS ET
14-Jul-16	SWL	3	7.09	SUMMER	32166	3RS ET
18-Jul-16	SWL	2	10.21	SUMMER	32166	3RS ET
18-Jul-16	SWL	3	38.54	SUMMER	32166	3RS ET
18-Jul-16	SWL	4	7.57	SUMMER	32166	3RS ET
18-Jul-16	SWL	5	2.02	SUMMER	32166	3RS ET
22-Jul-16	NWL	1	6.55	SUMMER	32166	3RS ET
22-Jul-16	NWL	2	11.58	SUMMER	32166	3RS ET
22-Jul-16	NWL	3	45.96	SUMMER	32166	3RS ET
22-Jul-16	NWL	4	13.28	SUMMER	32166	3RS ET
25-Jul-16	SWL	1	31.32	SUMMER	32166	3RS ET
25-Jul-16	SWL	2	15.35	SUMMER	32166	3RS ET
5-Aug-16	NEL	2	44.36	SUMMER	32166	3RS ET
5-Aug-16	NEL	3	2.64	SUMMER	32166	3RS ET
9-Aug-16	AW	2	4.76	SUMMER	32166	3RS ET
9-Aug-16	WL	1	8.07	SUMMER	32166	3RS ET
9-Aug-16	WL	2	16.14	SUMMER	32166	3RS ET
9-Aug-16	WL	3	3.70	SUMMER	32166	3RS ET
9-Aug-16	WL	4	1.80	SUMMER	32166	3RS ET
9-Aug-16	SWL	3	1.41	SUMMER	32166	3RS ET
9-Aug-16	SWL	4	0.77	SUMMER	32166	3RS ET
9-Aug-16	SWL	5	4.79	SUMMER	32166	3RS ET
10-Aug-16	SWL	1	14.30	SUMMER	32166	3RS ET
10-Aug-16	SWL	2	37.70	SUMMER	32166	3RS ET
10-Aug-16	SWL	3	11.10	SUMMER	32166	3RS ET
15-Aug-16	NEL	1	21.10	SUMMER	32166	3RS ET
15-Aug-16	NEL	2	26.00	SUMMER	32166	3RS ET
19-Aug-16	NWL	3	68.90	SUMMER	32166	3RS ET
19-Aug-16	NWL	4	12.60	SUMMER	32166	3RS ET
19-Aug-16	NWL	5	0.40	SUMMER	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
22-Aug-16	AW	2	1.58	SUMMER	32166	3RS ET
22-Aug-16	AW	3	3.20	SUMMER	32166	3RS ET
22-Aug-16	WL	2	11.83	SUMMER	32166	3RS ET
22-Aug-16	WL	3	6.71	SUMMER	32166	3RS ET
22-Aug-16	WL	4	11.94	SUMMER	32166	3RS ET
22-Aug-16	SWL	3	0.83	SUMMER	32166	3RS ET
22-Aug-16	SWL	4	6.17	SUMMER	32166	3RS ET
24-Aug-16	NWL	1	34.84	SUMMER	32166	3RS ET
24-Aug-16	NWL	2	48.06	SUMMER	32166	3RS ET
25-Aug-16	SWL	1	11.89	SUMMER	32166	3RS ET
25-Aug-16	SWL	2	38.89	SUMMER	32166	3RS ET
25-Aug-16	SWL	3	12.60	SUMMER	32166	3RS ET
05-Sep-16	NEL	2	41.6	AUTUMN	32166	3RS ET
05-Sep-16	NEL	3	5.4	AUTUMN	32166	3RS ET
06-Sep-16	NWL	1	8.62	AUTUMN	32166	3RS ET
06-Sep-16	NWL	2	47.1	AUTUMN	32166	3RS ET
06-Sep-16	NWL	3	27.38	AUTUMN	32166	3RS ET
08-Sep-16	AW	2	2.65	AUTUMN	32166	3RS ET
08-Sep-16	AW	3	2.43	AUTUMN	32166	3RS ET
08-Sep-16	WL	1	5.25	AUTUMN	32166	3RS ET
08-Sep-16	WL	2	23.16	AUTUMN	32166	3RS ET
08-Sep-16	WL	3	2.67	AUTUMN	32166	3RS ET
08-Sep-16	SWL	1	2.15	AUTUMN	32166	3RS ET
08-Sep-16	SWL	2	10.15	AUTUMN	32166	3RS ET
19-Sep-16	AW	3	4.81	AUTUMN	32166	3RS ET
19-Sep-16	WL	2	5.1	AUTUMN	32166	3RS ET
19-Sep-16	WL	3	25.61	AUTUMN	32166	3RS ET
19-Sep-16	SWL	2	6.81	AUTUMN	32166	3RS ET
20-Sep-16	NEL	1	1.1	AUTUMN	32166	3RS ET
20-Sep-16	NEL	2	45.7	AUTUMN	32166	3RS ET
22-Sep-16	NWL	2	33.84	AUTUMN	32166	3RS ET
22-Sep-16	NWL	3	43.92	AUTUMN	32166	3RS ET
22-Sep-16	NWL	4	3.4	AUTUMN	32166	3RS ET
26-Sep-16	SWL	1	5.61	AUTUMN	32166	3RS ET
26-Sep-16	SWL	2	18.67	AUTUMN	32166	3RS ET
26-Sep-16	SWL	3	35.9	AUTUMN	32166	3RS ET
26-Sep-16	SWL	4	1.64	AUTUMN	32166	3RS ET
27-Sep-16	SWL	2	15.86	AUTUMN	32166	3RS ET
27-Sep-16	SWL	3	35.83	AUTUMN	32166	3RS ET
27-Sep-16	SWL	4	7.73	AUTUMN	32166	3RS ET

Notes:

CWD baseline monitoring surveys were conducted in July 2016 with two sets of transect surveys for all monitoring areas. The data collected was used to derive the running quarterly STG and ANI. These baseline survey data are presented for reference only.

## CWD Small Vessel Line-transect Survey

## Sighting Data

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
07-Jul-16	1	1052	CWD	1	WL	2	957	ON	3RS ET	22.2504	113.8411	SUMMER	NONE
07-Jul-16	2	1113	CWD	5	WL	3	181	ON	3RS ET	22.2415	113.8463	SUMMER	NONE
07-Jul-16	3	1144	CWD	1	WL	3	91	ON	3RS ET	22.2412	113.8364	SUMMER	NONE
07-Jul-16	4	1202	CWD	4	WL	3	318	ON	3RS ET	22.2336	113.8237	SUMMER	NONE
07-Jul-16	5	1230	CWD	3	WL	2	161	ON	3RS ET	22.2324	113.8364	SUMMER	NONE
07-Jul-16	6	1311	CWD	1	WL	2	95	ON	3RS ET	22.2140	113.8301	SUMMER	NONE
07-Jul-16	7	1318	CWD	5	WL	2	19	ON	3RS ET	22.2144	113.8330	SUMMER	NONE
07-Jul-16	8	1341	CWD	4	WL	2	55	ON	3RS ET	22.2079	113.8398	SUMMER	NONE
07-Jul-16	9	1358	CWD	1	WL	2	100	ON	3RS ET	22.2053	113.8350	SUMMER	NONE
07-Jul-16	10	1423	CWD	1	WL	3	57	ON	3RS ET	22.1962	113.8314	SUMMER	NONE
07-Jul-16	11	1438	CWD	7	WL	3	265	ON	3RS ET	22.1959	113.8426	SUMMER	NONE
07-Jul-16	12	1535	CWD	1	SWL	2	555	ON	3RS ET	22.1825	113.8498	SUMMER	NONE
07-Jul-16	13	1601	CWD	4	SWL	2	151	ON	3RS ET	22.1909	113.8590	SUMMER	PURSE SEINE
14-Jul-16	1	1101	CWD	2	WL	4	N/A	OFF	3RS ET	22.2413	113.8425	SUMMER	NONE
14-Jul-16	2	1235	CWD	3	WL	4	186	ON	3RS ET	22.1873	113.8306	SUMMER	NONE
14-Jul-16	3	1316	CWD	1	SWL	3	N/A	OFF	3RS ET	22.1812	113.8589	SUMMER	NONE
18-Jul-16	1	1145	CWD	8	SWL	2	269	ON	3RS ET	22.1974	113.9184	SUMMER	NONE
18-Jul-16	2	1312	CWD	2	SWL	3	77	ON	3RS ET	22.1657	113.9027	SUMMER	NONE
18-Jul-16	3	1355	CWD	14	SWL	2	N/A	OFF	3RS ET	22.1988	113.8971	SUMMER	PURSE SEINE
18-Jul-16	4	1425	CWD	6	SWL	3	572	ON	3RS ET	22.1894	113.8982	SUMMER	NONE
18-Jul-16	5	1528	CWD	2	SWL	3	653	ON	3RS ET	22.2018	113.8877	SUMMER	NONE
22-Jul-16	1	0959	CWD	3	NWL	1	118	ON	3RS ET	22.3686	113.8683	SUMMER	NONE
22-Jul-16	2	1053	CWD	3	NWL	1	47	ON	3RS ET	22.3086	113.8689	SUMMER	NONE
22-Jul-16	3	1142	CWD	5	NWL	3	151	ON	3RS ET	22.2722	113.8725	SUMMER	NONE
22-Jul-16	4	1244	CWD	2	NWL	3	65	ON	3RS ET	22.3378	113.8782	SUMMER	NONE
22-Jul-16	5	1342	CWD	7	NWL	4	15	ON	3RS ET	22.3939	113.8726	SUMMER	NONE
25-Jul-16	1	1057	FP	6	SWL	1	73	ON	3RS ET	22.1659	113.9363	SUMMER	NONE
25-Jul-16	2	1109	FP	3	SWL	1	19	ON	3RS ET	22.1597	113.9357	SUMMER	NONE
25-Jul-16	3	1128	FP	1	SWL	1	72	ON	3RS ET	22.1460	113.9272	SUMMER	NONE
25-Jul-16	4	1137	FP	3	SWL	1	132	ON	3RS ET	22.1540	113.9273	SUMMER	NONE
25-Jul-16	5	1149	FP	3	SWL	1	255	ON	3RS ET	22.1686	113.9274	SUMMER	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
25-Jul-16	6	1347	CWD	8	SWL	2	644	ON	3RS ET	22.1845	113.8977	SUMMER	NONE
25-Jul-16	7	1441	CWD	6	SWL	1	1247	ON	3RS ET	22.2029	113.8783	SUMMER	NONE
25-Jul-16	8	1531	CWD	24	SWL	2	908	ON	3RS ET	22.1605	113.8705	SUMMER	NONE
09-Aug-16	1	1037	CWD	2	WL	1	8	ON	3RS ET	22.2625	113.8563	SUMMER	NONE
09-Aug-16	2	1047	CWD	1	WL	2	85	ON	3RS ET	22.2609	113.8515	SUMMER	NONE
09-Aug-16	3	1114	CWD	5	WL	2	98	ON	3RS ET	22.2504	113.8413	SUMMER	NONE
09-Aug-16	4	1146	CWD	3	WL	2	5	ON	3RS ET	22.2394	113.8278	SUMMER	NONE
09-Aug-16	5	1325	CWD	1	SWL	4	N/A	OFF	3RS ET	22.1936	113.8473	SUMMER	NONE
10-Aug-16	1	1059	FP	1	SWL	2	130	ON	3RS ET	22.1715	113.9353	SUMMER	NONE
10-Aug-16	2	1107	FP	6	SWL	2	396	ON	3RS ET	22.1624	113.9359	SUMMER	NONE
10-Aug-16	3	1116	FP	5	SWL	2	256	ON	3RS ET	22.1524	113.9356	SUMMER	NONE
19-Aug-16	1	1201	CWD	5	NWL	3	56	ON	3RS ET	22.3869	113.8890	SUMMER	NONE
19-Aug-16	2	1358	CWD	7	NWL	3	59	ON	3RS ET	22.3749	113.9066	SUMMER	NONE
22-Aug-16	1	0950	CWD	2	WL	2	N/A	OFF	3RS ET	22.3003	113.8665	SUMMER	NONE
22-Aug-16	2	1001	CWD	5	WL	3	197	ON	3RS ET	22.3023	113.8616	SUMMER	NONE
22-Aug-16	3	1046	CWD	5	WL	2	47	ON	3RS ET	22.2661	113.8592	SUMMER	NONE
22-Aug-16	4	1116	CWD	1	WL	2	213	ON	3RS ET	22.2503	113.8345	SUMMER	NONE
22-Aug-16	5	1145	CWD	1	WL	2	390	ON	3RS ET	22.2414	113.8408	SUMMER	NONE
22-Aug-16	6	1209	CWD	5	WL	2	183	ON	3RS ET	22.2367	113.8265	SUMMER	NONE
22-Aug-16	7	1237	CWD	7	WL	2	124	ON	3RS ET	22.2236	113.8369	SUMMER	NONE
22-Aug-16	8	1318	CWD	4	WL	4	245	ON	3RS ET	22.2143	113.8209	SUMMER	NONE
24-Aug-16	1	1216	CWD	6	NWL	1	32	ON	3RS ET	22.3785	113.8888	SUMMER	NONE
24-Aug-16	2	1336	CWD	1	NWL	2	27	ON	3RS ET	22.3797	113.8976	SUMMER	NONE
25-Aug-16	1	1013	CWD	1	SWL	2	N/A	OFF	3RS ET	22.1997	113.8684	SUMMER	NONE
25-Aug-16	2	1142	CWD	7	SWL	1	1303	ON	3RS ET	22.1498	113.8887	SUMMER	NONE
06-Sep-16	1	1127	CWD	3	NWL	3	48	ON	3RS ET	22.3379	113.8784	AUTUMN	NONE
08-Sep-16	1	1020	CWD	4	WL	1	221	ON	3RS ET	22.2504	113.8387	AUTUMN	PURSE SEINE
08-Sep-16	2	1044	CWD	9	WL	1	36	ON	3RS ET	22.2416	113.8409	AUTUMN	NONE
08-Sep-16	3	1233	CWD	2	WL	2	100	ON	3RS ET	22.1871	113.8365	AUTUMN	NONE
19-Sep-16	1	945	CWD	2	AW	3	13	ON	3RS ET	22.3009	113.8895	AUTUMN	NONE
19-Sep-16	2	1147	CWD	10	WL	3	27	ON	3RS ET	22.2319	113.8282	AUTUMN	NONE
19-Sep-16	3	1230	CWD	1	WL	3	135	ON	3RS ET	22.2138	113.8202	AUTUMN	NONE
19-Sep-16	4	1244	CWD	8	WL	3	25	ON	3RS ET	22.2142	113.8331	AUTUMN	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
19-Sep-16	5	1334	CWD	5	WL	3	149	ON	3RS ET	22.1963	113.8397	AUTUMN	NONE
19-Sep-16	6	1411	CWD	1	SWL	2	124	ON	3RS ET	22.191	113.8508	AUTUMN	NONE
19-Sep-16	7	1427	CWD	5	SWL	2	N/A	OFF	3RS ET	22.1838	113.8499	AUTUMN	NONE
19-Sep-16	8	1506	CWD	1	SWL	2	N/A	OFF	3RS ET	22.1942	113.8543	AUTUMN	PURSE SEINE
22-Sep-16	1	1007	CWD	6	NWL	2	238	ON	3RS ET	22.3373	113.8684	AUTUMN	NONE
22-Sep-16	2	1315	CWD	7	NWL	3	153	ON	3RS ET	22.3636	113.8981	AUTUMN	NONE
26-Sep-16	1	1109	FP	5	SWL	2	347	ON	3RS ET	22.1688	113.928	AUTUMN	NONE
26-Sep-16	2	1157	FP	2	SWL	3	308	ON	3RS ET	22.1728	113.9195	AUTUMN	NONE
26-Sep-16	3	1456	CWD	5	SWL	2	15	ON	3RS ET	22.1997	113.869	AUTUMN	NONE
27-Sep-16	1	1100	FP	2	SWL	3	48	ON	3RS ET	22.1627	113.936	AUTUMN	NONE
27-Sep-16	2	1130	FP	1	SWL	3	34	ON	3RS ET	22.1723	113.928	AUTUMN	NONE
27-Sep-16	3	1214	FP	4	SWL	3	62	ON	3RS ET	22.1601	113.9179	AUTUMN	NONE
27-Sep-16	4	1309	CWD	1	SWL	2	204	ON	3RS ET	22.2024	113.9078	AUTUMN	NONE
27-Sep-16	5	1412	CWD	2	SWL	2	182	ON	3RS ET	22.1851	113.8879	AUTUMN	NONE
27-Sep-16	6	1434	CWD	1	SWL	3	64	ON	3RS ET	22.2062	113.8874	AUTUMN	NONE







Abbreviations: STG# = Sighting Number; GP SZ = Dolphin Group Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance (in metres); N/A = Not Applicable; DEC LAT = Latitude (WGS84 in Decimal), DEC LON = Longitude (WGS84 in Decimal); BOAT ASSOC. = Fishing Boat Association

Notes:









CWD baseline monitoring surveys were conducted in July 2016 with two sets of transect surveys for all monitoring areas. The data collected was used to derive the running quarterly STG and ANI. These baseline survey data are presented for reference only.

## CWD Small Vessel Line-transect Survey

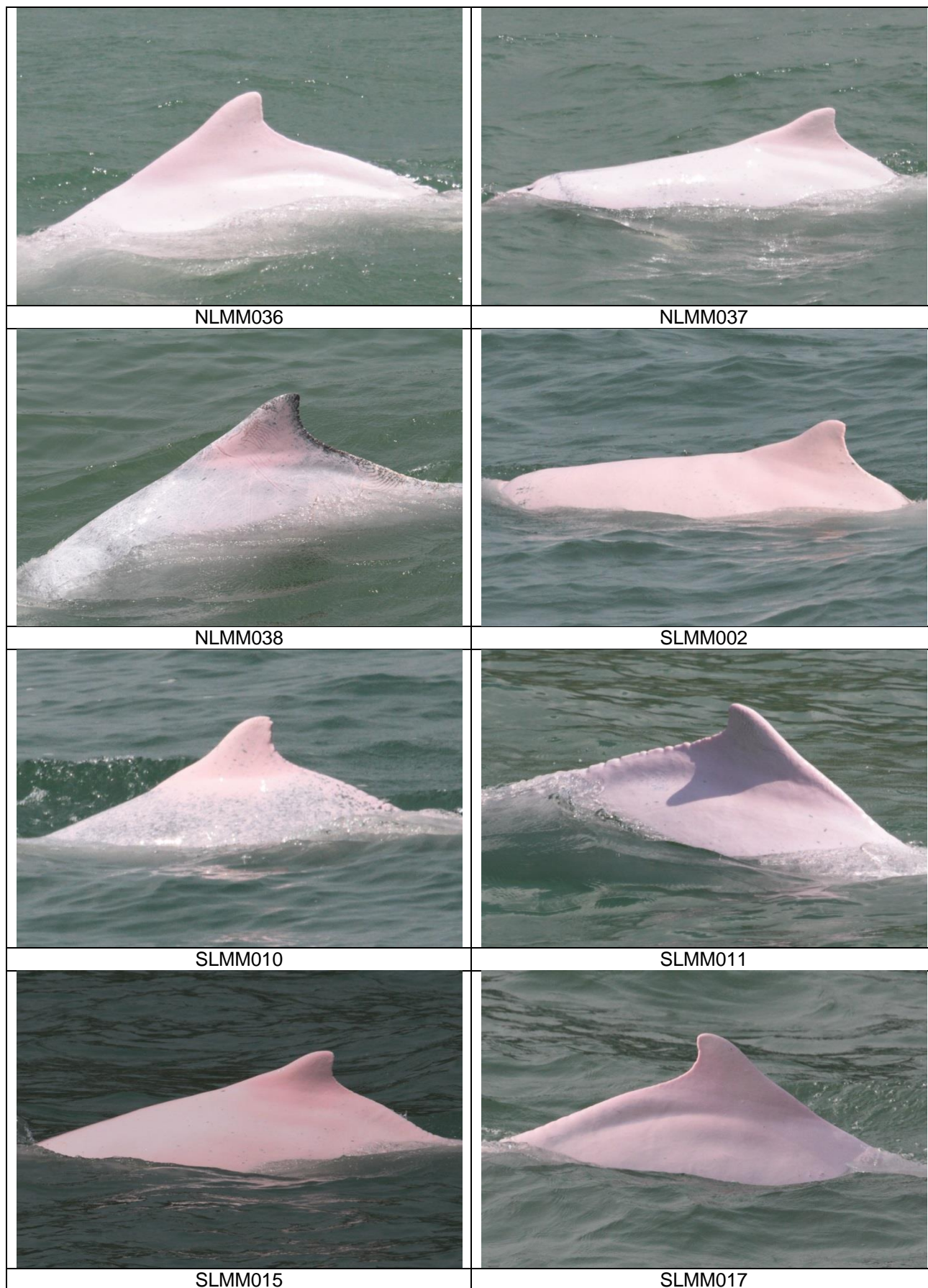
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NLMM002	NLMM004
	
NLMM005	NLMM006
	
NLMM008	NLMM010

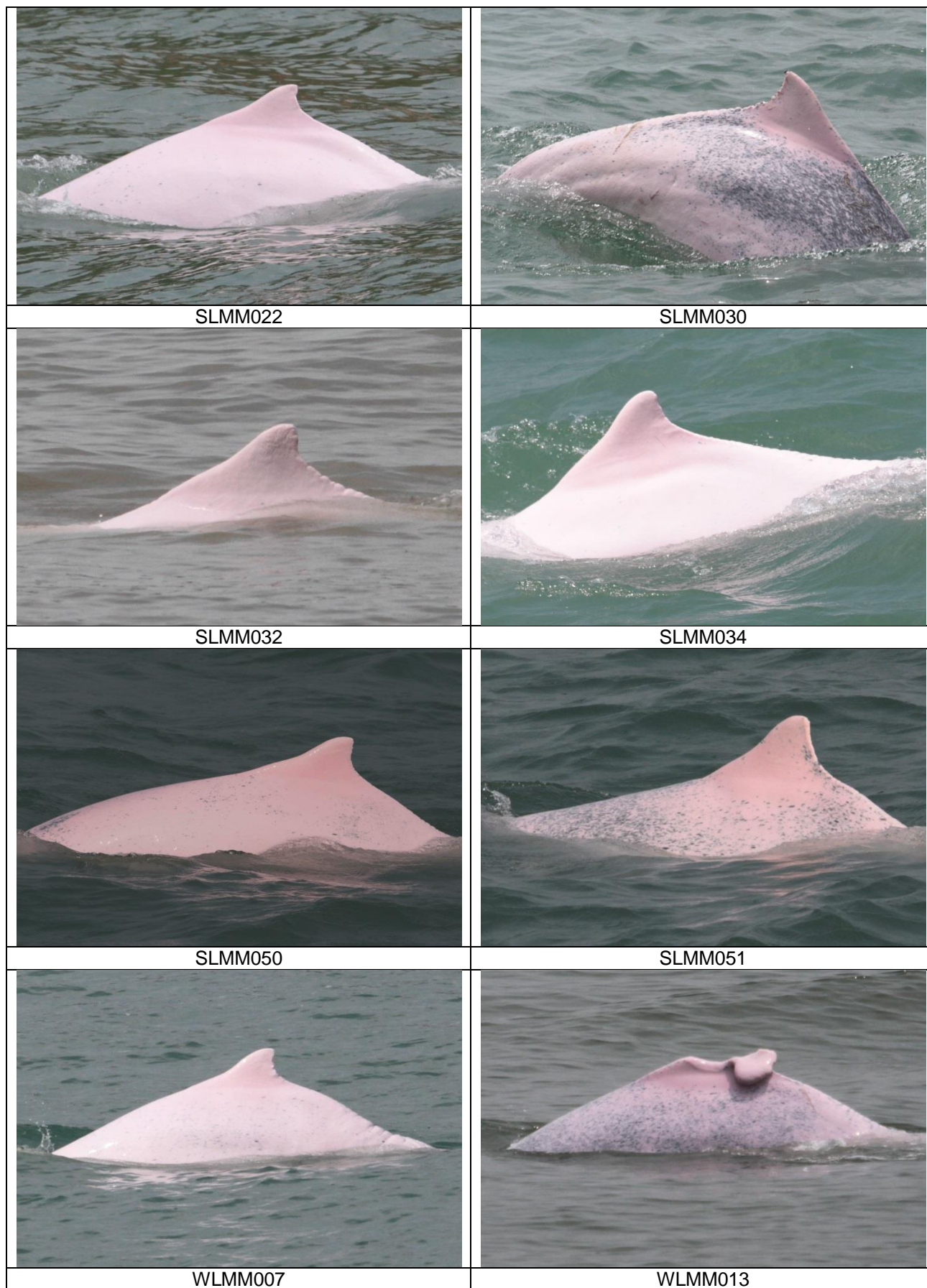


	
<p>NLMM012</p>	<p>NLMM013</p>
	
<p>NLMM017</p>	<p>NLMM019</p>
	
<p>NLMM021</p>	<p>NLMM027</p>
	
<p>NLMM028</p>	<p>NLMM035</p>













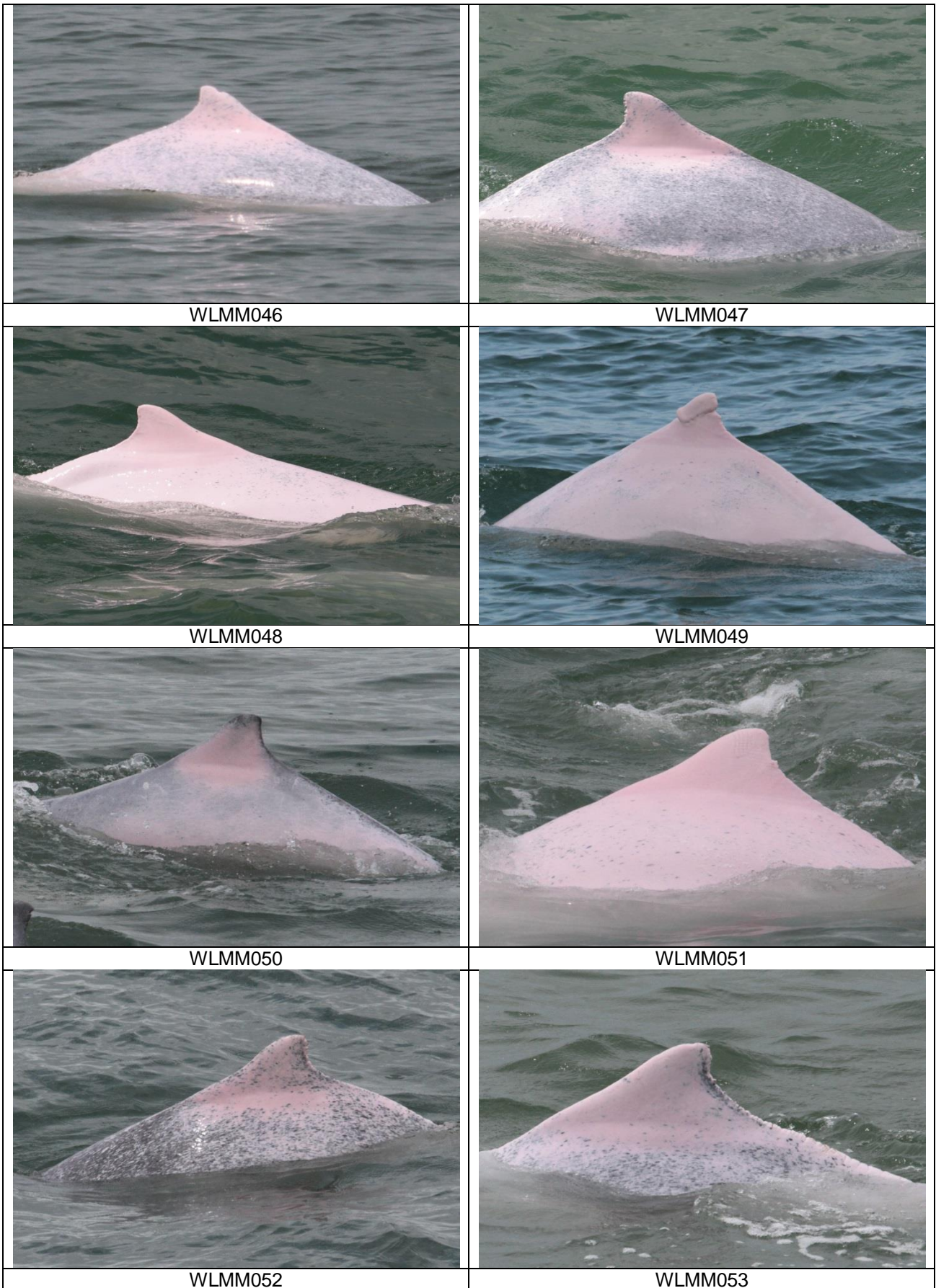






	
WLMM015	WLMM020
	
WLMM024	WLMM025
	
WLMM027	WLMM030
	
WLMM038	WLMM043







WLMM054



WLMM055



WLMM056



WLMM057



WLMM058



WLMM059

**CWD Land-based Theodolite Tracking****CWD Groups by Survey Date**

<b>Date</b>	<b>Station</b>	<b>Start Time</b>	<b>End Time</b>	<b>Duration</b>	<b>Beaufort Range</b>	<b>Visibility</b>	<b>No. of Focal Follow Dolphin Groups Tracked</b>	<b>Dolphin Group Size Range</b>
1-Aug-16	Sha Chau	8:29	13:09	4:40	1	3-4	0	N/A
5-Aug-16	Lung Kwu Chau	8:35	14:45	6:10	2	3	8	2-6
9-Aug-16	Sha Chau	8:30	16:00	7:30	1-4	2-3	1	1
11-Aug-16	Lung Kwu Chau	8:49	14:50	6:01	2-3	2-4	3	2-3
23-Aug-16	Lung Kwu Chau	8:37	14:37	6:00	1	2-3	0	N/A
1-Sep-16	Lung Kwu Chau	9:42	14:52	5:10	1-2	2-3	1	4
7-Sep-16	Lung Kwu Chau	9:19	15:09	5:50	1-3	2-3	7	2-4
13-Sep-16	Sha Chau	8:43	14:43	6:00	2	2	0	N/A
23-Sep-16	Sha Chau	8:40	14:40	6:00	2-3	2	0	N/A
26-Sep-16	Lung Kwu Chau	9:02	16:02	7:00	2-3	3	1	2

Visibility: 1=Excellent, 2=Good, 3=Fair, 4=Poor