

Your Ref:  
Our Ref: 60249820/C/RMKY13042601

**By Fax (2578 0413) and E-mail**

China Harbour Engineering Company Limited  
19/F., China Harbour Building,  
370-374 King's Road,  
North Point,  
Hong Kong.

Attn: Mr. LIM Kim-chuan

26 April 2013,

Dear Sir,

**Contract No. HY/2010/02**  
**Hong Kong-Zhuhai-Macao Bridge**  
**Hong Kong Boundary Crossing Facilities – Reclamation Works**

**Proposal for Consolidating the Event and Action Plan for Chinese White Dolphin Monitoring**

Reference is made to Section 9.6.2 of the Environmental Monitoring and Audit Manual (EM&A Manual) for the Environmental Permits No. EP-353/2009/F. It states that “significance” level which will trigger the action plan shall be proposed by the ET as part of the post-construction monitoring programme design to be agreed with AFCD and EPD prior to the monitoring being undertaken. This document would propose methodology in calculating the “significance” levels which will trigger the action plan. This document would propose 1) “significance” level for triggering Action and Limit Levels for dolphin monitoring and 2) In addition, a consolidated EAP for dolphin monitoring is also included in this proposal for enhancing the overall event and action plan (EAP) of Chinese White Dolphin (CWD) monitoring.

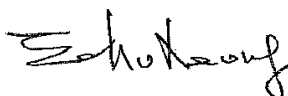
We are pleased to submit herewith a copy of the Proposal for Consolidating the Event and Action Plan for Chinese White Dolphin Monitoring.

By copy of this letter, would IEC review and approve the proposal attached to this letter?

Should you require further information, please do not hesitate to contact our Ms. Roy Man at 3922 9365.

Yours faithfully,

For and on behalf of  
AECOM Asia Co. Ltd.



Echo Leong  
Environmental Team Leader

cc. IEC (Environ)  
ER (Arup)

Mr. Raymond Dai  
Mr. Roger Marechal


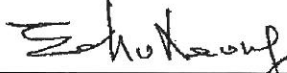
By E-mail and Fax (3548 6988)  
By E-mail and Fax (3698 5999)

**China Harbour Engineering Company Limited**

Contract No. HY/2010/02

**Hong Kong – Zhuhai – Macao Bridge  
Hong Kong Boundary Crossing  
Facilities –  
Reclamation Works****Proposal for Consolidating Event and Action  
Plan for Chinese White Dolphin Monitoring**

[04/2013]

	Name	Signature
Prepared & Checked:	Roy K.Y. Man	
Reviewed, Approved and Certified:	Echo Leong (ETL)	

Version:	Rev. 0	Date:	26 April 2013
<b>Disclaimer</b> <p>This proposal is prepared for China Harbour Engineering Company Limited and is given for its sole benefit in relation to and pursuant to Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities-Reclamation Works and may not be disclosed to, quoted to or relied upon by any person other than China Harbour Engineering Company Limited without our prior written consent. No person (other than China Harbour Engineering Company Limited) into whose possession a copy of this proposal comes may rely on this proposal without our express written consent and China Harbour Engineering Company Limited may not rely on it for any purpose other than as described above.</p>			

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## 1 Introduction

### 1.1 Background Information

The EIA report of the Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF hereafter) has been approved by the Environmental Protection Department (EPD) with conditions on 23 Oct 2009 and the Environmental Permit (EP) EP-353/2009 (EP hereafter) has been granted to construct and operate the HKBCF Project. As a requirement stated in section 9.6.2 of the Project Specific Environmental Monitoring and Audit Manual (EM&A Manual hereafter), the “significance” level which will trigger the action plan shall be proposed by the ET as part of the post-construction monitoring programme design to be agreed with AFCD and EPD prior to the monitoring being undertaken. This document would propose methodology in calculating the “significance” levels which will trigger the action plan. This document would propose 1) “significance” level for triggering Action and Limit Levels for dolphin monitoring and 2) In addition, a consolidated EAP for dolphin monitoring is also included in this proposal for enhancing the overall event and action plan (EAP) of Chinese White Dolphin (CWD) monitoring.

### 1.2 Purpose

To propose “significance” level for triggering Action and Limit Levels for dolphin monitoring of this contract and a consolidated EAP to be agreed with AFCD and EPD.

## 2 Methodology

The percentage reduction of Chinese White Dolphin encounter rates for number of sighting (STG) and number of dolphins (ANI) from 2011 baseline survey were adopted as the parameters for the revised Action Level (AL) and Limit Level (LL). The formulas for calculating STG and ANI encounter rate are listed below:

### 2.1 Calculation Method for STG and ANI Encounter Rates of Chinese White Dolphin

1. Quarterly encounter rate of number of dolphin sightings (STG)

$$STG = \frac{\text{Total No. of On-effort Sightings}}{\text{Total Amount of Survey Effort (km)}} \times 100$$

(Note: Only data collected under Beaufort 3 or below condition should be used; For the purpose of the Event Action Plan, only data from and effort of the primary survey line should be used.)

2. Quarterly encounter rate of total number of dolphins (ANI)

$$ANI = \frac{\text{Total No. of Dolphins from All On-effort Sightings}}{\text{Total Amount of Survey Effort (km)}} \times 100$$

(Note: Only data collected under Beaufort 3 or below condition should be used; For the purpose of the Event Action Plan, only data from and effort of the primary survey line should be used.)

In order to define the Action Level (AL) and Limit Level (LL) in comparison with the baseline dolphin encounter rate, the seasonal fluctuation of dolphin encounter rate in NWL and NEL should be considered by comparing dolphin encounter rates across the four seasons in order to take the natural fluctuation of dolphin occurrence into account. Notably, the natural fluctuation among different seasons

can differ by as much as 30%, and in a few extreme cases up to 40-60% upon review of dolphin historical data in North Lantau waters. Therefore, the approach of 30% and 60% percentage reduction to define the AL and LL respectively is reasonable to determine whether the construction activities of HKBCF02 project have caused real significant impact on dolphin occurrence, instead of triggering false alarms prematurely. Although the exact percentages (30%/60%) for the AL and LL are set somewhat arbitrarily, this is based on careful consideration of the natural fluctuation of dolphin occurrences among different seasons as explained above. The criteria for triggering the action level and limit level of dolphin monitoring is listed in Table 1 and 2.

Table 1. Approach to Define Action Level (AL) and Limit Level (LL):

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 70% of baseline) & (ANI < 70% of baseline)	(STG < 70% of baseline) & (ANI < 70% of baseline)
Limit Level	[(STG < 40% of baseline) & (ANI < 40% of baseline)] AND [(STG < 40% of baseline) & (ANI < 40% of baseline)]	

For North Lantau Social Cluster, action level will be trigger if either NEL or NWL fall below the criteria; limit level will be triggered if both NEL and NWL fall below the criteria.

Table 2 Derived Value of Action Level (AL) and Limit Level (LL):

	North Lantau Social Cluster	
	NEL	NWL
Action Level	(STG < 4.2) & (ANI < 15.5)	(STG < 6.9) & (ANI < 31.3)
Limit Level	[(STG < 2.4) & (ANI < 8.9)] AND [(STG < 3.9) & (ANI < 17.9)]	

### 3 Event and Action Plan

#### 3.1 Consolidated Event and Action Plan

The actions under the EAP were reviewed and consolidated taking into consideration of the action lists already stated in the EAP of the current project specific EM&A Manuals. The actions under current EAP were be spitted into two tiers, that is, one for the AL exceedance and one for the LL exceedance.

Table 3 Event and Action Plan for Dolphin Monitoring:

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Repeat statistical data analysis to confirm findings;</li> <li>2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET and Contractor;</li> <li>2. Discuss monitoring results and finding with the ET and the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss monitoring with the IEC and any other measures proposed by the ET;</li> <li>2. If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER/SOR and confirm notification of the non-compliance in writing;</li> <li>2. Discuss with the ET and the IEC and propose measures to the IEC and the ER/SOR;</li> <li>3. Implement the agreed measures.</li> </ol>

	<p>variation or previously observed seasonal differences;</p> <p>3. Identify source(s) of impact;</p> <p>4. Inform the IEC, ER/SOR and Contractor;</p> <p>5. Check monitoring data.</p> <p>6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</p>			
Limit Level	<p>1. Repeat statistical data analysis to confirm findings;</p> <p>2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&amp;A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;</p> <p>3. Identify source(s) of impact;</p> <p>4. Inform the IEC, ER/SOR and Contractor of findings;</p> <p>5. Check monitoring data;</p> <p>6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.</p>	<p>1. Check monitoring data submitted by ET and Contractor;</p> <p>2. Discuss monitoring results and findings with the ET and the Contractor;</p> <p>3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures.</p> <p>4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise ER/SOR of the results and findings accordingly.</p> <p>5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise</p>	<p>1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures.</p> <p>2. If ER/SOR is satisfied with the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures.</p> <p>3. Supervise the implementation of additional monitoring and/or any other mitigation measures.</p>	<p>1. Inform the ER/SOR and confirm notification of the non-compliance in writing;</p> <p>2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures.</p> <p>3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary.</p> <p>4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.</p>

	<p>7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.</p>	<p>ER/SOR the results and findings accordingly.</p>		
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