

MTR Corporation Limited

**Shatin to Central Link –  
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 6

[Period from 1 to 31 October 2014]

(November 2014)

Verified by: Fredrick Leong



Position: Independent Environmental Checker

Date: 13 November 2014

MTR Corporation Limited

**Shatin to Central Link –  
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 6

[Period from 1 to 31 October 2014]

(November 2014)

Certified by: Richard Kwan 

Position: Environmental Team Leader

Date: 13 November 2014

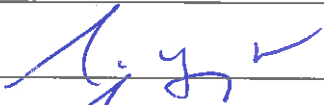

**MTR Corporation Limited**

Consultancy Agreements  
No. C11033B

**Shatin to Central Link - Hung Hom to  
Admiralty Section**

**Monthly EM&A Report No. 6**

[Period from 1 to 31 October 2014]

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Date: 13 November 2014

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Appendix C	Monthly EM&A Report for October 2014 – SCL Works Contract 11227 Advance Works for NSL Cross Harbour Tunnels



## 1 INTRODUCTION

### 1.1 Background

- 1.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai to Hung Hom via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH) and Stabling Sidings at Hung Hom Freight Yard (HHS); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).
- 1.1.2 Shatin to Central Link – Hung Hom to Admiralty Section [SCL (HUH – ADM)] (hereafter referred to as “the Project”) is part of the SCL.
- 1.1.3 The Environmental Impact Assessment (EIA) Report for SCL (HUH-ADM) (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) (EP No.: EP-436/2012) was granted on 22 March 2012 for construction and operation. Variations of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/A) was issued by Director of Environmental Protection (DEP) on 30 April 2014.

### 1.2 Project Programme

- 1.2.1 Four civil construction works contracts of the Project have been awarded since January 2014. The construction of the Project commenced in May 2014 and is expected to complete in 2020. The Project will have to interface with other infrastructure projects, including Wan Chai Development Phase II and Central-Wan Chai Bypass. **Table 1.1** summarises the information of the awarded Works Contracts.

**Table 1.1 Summary of Awarded Works Contracts**

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
1126	Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool	July 2014	Kaden Leader JV	Cinotech Consultants Ltd. (Cinotech)
1128	South Ventilation Building to Admiralty Tunnels	To be constructed (tentatively in November 2014)	Dragages Bouygues J.V.	AECOM Asia Co. Ltd.
1129	SCL – Advance Works for NSL	May 2014	Hsin Chong Construction Co. Ltd.	AECOM Asia Co. Ltd.
11227	Advance Works for NSL Cross Harbour Tunnels	August 2014	Concentric-Hong Kong River Joint Venture	Cinotech Consultants Ltd. (Cinotech)

### 1.3 Purpose of the Report

- 1.3.1 The Environmental Monitoring and Audit (EM&A) programme for the Project commenced in May 2014. This is the sixth EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs during the period from 1 to 31 October 2014.

## 2 ENVIRONMENTAL MONITORING AND AUDIT

### 2.1 EM&A Results

- 2.1.1 The EM&A Report for Works Contracts 1129, 1126 and 11227 prepared by the respective Contractor's ETs are provided in **Appendices A to C** respectively. The EM&A Reports provide details of the project information, EM&A requirements, impact monitoring and audit results for the corresponding Contracts.
- 2.1.2 A summary of the major construction activities undertaken by the respective Contractors of various Works Contracts during the reporting period are presented in **Table 2.1**.

**Table 2.1 Summary of Major Construction Activities in the Reporting Period**

Works Contract	Site	Construction Activities
1126	Wan Chai Sports Ground (WCSG)	<ul style="list-style-type: none"> <li>Pre-drill and Instrumentation installation for Piezometer and utility settlement marker; and</li> <li>Site cleaning.</li> </ul>
	Public Transport Interchange (PTI) Area	<ul style="list-style-type: none"> <li>Construction of Petrol Interception;</li> <li>Manhole construction &amp; underground utilities connection;</li> <li>Construction of Store Room;</li> <li>Construction of ducting for street lighting; and</li> <li>Construction of bus lay-by.</li> </ul>
1129	Area W1	<ul style="list-style-type: none"> <li>Removal of Batch 1 Pile by Jacking Method;</li> <li>H-piles Removal;</li> <li>Post Drilling; and</li> <li>Sheetpiling.</li> </ul>
	Area W2	<ul style="list-style-type: none"> <li>Fix Steel Plates;</li> <li>Site Reinstatement; and</li> <li>Handover to SCL Contract 1128.</li> </ul>
	Area W3	<ul style="list-style-type: none"> <li>Piles Removal; and</li> <li>Temporary Diversion of DN150 DI Fresh Water Main.</li> </ul>
11227	Shek O Casting Basin	<ul style="list-style-type: none"> <li>Seabed leveling works at channel exit; and</li> <li>Rock filling works in Casting Basin.</li> </ul>
	Victoria Harbour	<ul style="list-style-type: none"> <li>Dredging of trial trench in Victor Harbour.</li> </ul>

- 2.1.3 During the reporting month, impact monitoring for air quality, construction noise and water quality were conducted in accordance with the EM&A Manual and EP Condition 2.23.7. Continuous noise monitoring was not required in the reporting period according to the Continuous Noise Monitoring Plan (CNMP). No exceedances of the Action/Limit Levels of 24-hr TSP, construction noise and water quality parameters due to the Project construction were recorded. Results of air quality, construction noise and water quality monitoring are summarised in **Tables 2.2, 2.3** and **2.4** respectively. Details of the monitoring requirements, locations, equipment and methodology are presented in the EM&A Reports (**Appendices A to C**).

**Table 2.2 Summary of 24-Hour TSP Monitoring Results in the Reporting Period**

Monitoring Station ID	Location	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Exceedance due to the Project Construction (Yes/No)
<b>Works Contract 1126</b>					

Monitoring Station ID	Location	TSP Concentration ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )	Exceedance due to the Project Construction (Yes/No)
<b>Works Contract 1126</b>					
AM2	Wan Chai Sports Ground <sup>(1)</sup>	115.2– 143.7	160	260	No
AM3	Existing Harbour Road Sports Centre	87.0– 125.5	169	260	No
<b>Works Contract 1129 and 11227<sup>(2)</sup></b>					

Note:

- (1) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.  
(2) No TSP monitoring is required under Works Contracts 1129 and 11227.

**Table 2.3 Summary of Construction Noise Monitoring Results in the Reporting Period**

Monitoring Station ID	Location	Noise Level (L <sub>Aeq,30mins</sub> , dB(A))			Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
		Measured	Baseline	Corrected <sup>(1)</sup>		
Works Contract 1126						
NM2 <sup>(2)</sup>	Harbour Centre (7/F)	68.3 – 74.2	69.6	< Baseline – 72.4	75	No
Works Contract 1129						
NM1	Hoi Kung Court	70.0 – 71.6	71	< Baseline – 62.7	75	No
Works Contract 11227 <sup>(3)</sup>						

Note:

- (1) The measured noise levels are corrected against the corresponding baseline noise levels.  
(2) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.  
(3) No Noise monitoring is required under Works Contract 11227.

**Table 2.4 Summary of Marine Water Quality Monitoring Results in the Reporting Period<sup>(1)</sup>**

Locations		Parameters			
		Dissolved Oxygen (mg/L)		Depth- average Turbidity (NTU)	Depth- average Suspended Solids (mg/L)
		Surface & Middle	Bottom		
Shek O Casting Basin					
C3	Mean	7.2	7.1	2.8	4.8
	Range	7.0 – 7.5	6.9 – 7.5	1.4 – 4.6	3.5 – 8.2
C4	Mean	7.3	7.1	2.6	4.7
	Range	6.9 – 7.9	6.9 – 7.5	1.4 - 4.8	3.0 – 8.7
GB3	Mean	7.3	7.2	2.5	4.3
	Range	7.0 – 8.3	6.9 – 7.8	1.1 – 4.7	3.0 – 6.7
Action Level		6.8 (Dry season) 5.5 (Wet season)		5.0 (Dry season) 2.1 (Wet season)	9.3 (Dry season) 4.5 (Wet season)
Limit Level		6.5 (Dry season)		5.6 (Dry season)	9.3 (Dry season)

Locations	Parameters				
	Dissolved Oxygen (mg/L)		Depth- average Turbidity (NTU)	Depth- average Suspended Solids (mg/L)	
	Surface & Middle	Bottom			
	5.3 (Wet season)		2.4 (Wet season)	4.5 (Wet season)	
Exceedance (Yes/No)	No	No	No	No	
<b>Victoria Harbour (Wet Season) <sup>(2)</sup></b>					
C1	Mean	5.0	4.6	3.7	3.9
	Range	4.2 – 6.5	3.2 – 6.0	2.4 – 5.1	3.0 – 4.7
C2	Mean	5.3	5.0	4.0	3.9
	Range	4.1 – 6.4	3.3 – 6.1	2.7 – 5.1	3.0 – 4.8
14	Mean	4.9	4.5	3.7	3.9
	Range	4.3 – 5.6	3.4 – 5.3	2.5 – 5.0	3.0 – 4.7
A	Mean	5.2	4.8	3.6	3.9
	Range	3.7 – 6.9	3.1 – 6.4	2.4 – 5.2	3.0 – 4.8
WSD9	Mean	5.3	5.0	4.0	3.9
	Range	4.1 – 6.4	3.3 – 6.1	2.7 – 5.1	3.0 – 4.8
WSD17	Mean	4.9	4.5	3.7	3.9
	Range	4.3 – 5.6	3.4 – 5.3	2.5 – 5.0	3.0 – 4.7
Action Level	<2.1		5.3	4.4	
Limit Level	<2		5.6	4.8	
Exceedance (Yes/No)	No	No	No	No	

Notes:

- (1) Marine water quality monitoring was conducted in the reporting period under Works Contract 11227.
- (2) As the construction activities in Victoria Harbour commenced on 11 September 2014, water quality monitoring in Victoria Harbour commenced on 12 September 2014. According to the Water Quality Monitoring Plan for Trial Trenching Works (WQMP) and the Baseline Water Quality Monitoring Report for Trial Trenching Works, water quality monitoring in Victoria Harbour will be carried out at two impact monitoring stations (namely A and WSD9) in dry season and four impact monitoring stations (namely A, WSD9, 14 and WSD17) in wet season.

- 2.1.4 No environmental complaints, notification of summons and successful prosecutions were received in the reporting period. Cumulative log for environmental complaints, notification of summons and successful prosecutions is provided in **Table 2.5**.

**Table 2.5 Cumulative Log for Environmental Complaints, Notification of Summons and Successful Prosecutions**

Works Contract	Environmental Complaints		Notification of Summons		Successful Prosecutions	
	Reporting Month	Cumulative Number	Reporting Month	Cumulative Number	Reporting Month	Cumulative Number
1126	0	0	0	0	0	0
1129	0	0	0	0	0	0
11227	0	0	0	0	0	0

- 2.1.5 Regular site inspections were conducted by the Contractor's ET on a weekly basis to check the implementation of environmental pollution control and mitigation measures for the Project. No non-conformance was identified in the reporting period.

### 3 IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

3.1.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Report, EM&A Manual and EP (EP-436/2012/A). The status of required submissions under the EP as of the reporting period are summarised in **Table 3.1**.

**Table 3.1 Summary of EP Submissions Status**

EP Condition (EP-436/2012/A)	Submission	Submission date
Condition 1.11	Notification of Commencement Date of Construction of the Project	19 Dec 2012
Condition 2.3	Notification of Information of Community Liaison Groups	17 Mar 2014
Condition 2.5	Management Organisation of Main Construction Companies	4 Apr 2014
Condition 2.6	Construction Programme and EP Submission Schedule	19 Dec 2012
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP)	9 Jun 2014 (1 <sup>st</sup> Submission)
Condition 2.8	Continuous Noise Monitoring Plan (CNMP)	9 Jun 2014 (1 <sup>st</sup> Submission)
Condition 2.9	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1 <sup>st</sup> Submission) 12 Sept 2012 (2 <sup>nd</sup> Submission) 15 Oct 2012 (approved)
Condition 2.10	Silt Curtain Deployment Plan for Trial Trenching in Victoria Harbour	11 Jul 2014
Condition 2.11	Silt Screen Deployment Plan	11 Jul 2014
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1 <sup>st</sup> Submission) 12 Sept 2012 (2 <sup>nd</sup> Submission) 15 Oct 2012 (approved) 3 Jul 2014 (3 <sup>rd</sup> submission)
Condition 2.14	Visual, Landscape, Tree Planting & Tree Protection Plan	14 Nov 2012 (1 <sup>st</sup> Submission) 15 Feb 2013 (2 <sup>nd</sup> Submission) 3 Dec 2013 (3 <sup>rd</sup> Submission) 21 Aug 2014 (4 <sup>th</sup> Submission)
Condition 2.23.1	Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1 <sup>st</sup> Submission) 31 Jul 2014 (approved)
Condition 2.24	Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR) Remedial Action Plan (RAP) for the above-ground diesel tanks for Wan Chai Swimming Pool	CAP: 25 Sept 2012 (1 <sup>st</sup> Submission) 12 Nov 2012 (2 <sup>nd</sup> Submission) 22 Nov 2012 (approved)  CAR: 19 Mar 2013 (1 <sup>st</sup> Submission) 16 Apr 2013 (2 <sup>nd</sup> Submission) 21 May 2013 (3 <sup>rd</sup> Submission) 7 Jun 2013 (approved)
Condition 2.31.1	Silt Curtain Deployment Plan for Temporary Marine Works at Shek O Casting Basin	30 Jun 2014
Condition 3.3	Baseline Monitoring Report (for noise and air quality)	4 Dec 2013 (1 <sup>st</sup> Submission) 5 Feb 2014 (2 <sup>nd</sup> Submission)
	Baseline Water Quality Monitoring Report	23 Sept 2014 (1 <sup>st</sup> Submission)
	Baseline Water Quality Monitoring Report for Temporary Marine Works at Shek O Casting Basin	8 Jul 2014 (1 <sup>st</sup> Submission) 11 Aug 2014 (2 <sup>nd</sup> Submission)
Condition 3.4	Monthly EM&A Reports No.1 - 4	Reported in previous Monthly EM&A Reports
	Monthly EM&A Report No.5	14 Oct 2014

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**Appendix A**

**Monthly EM&A Report for October2014 – SCL Works Contract  
1129 Advance Works for NSL**

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**Hsin Chong Construction Co. Ltd.**

**Shatin to Central Link -  
Hung Hom to Admiralty Section**

**Works Contract 1129 -  
Advance Works for NSL**

**Monthly EM&A Report for  
October 2014**

**November 2014**

	Name	Signature
Prepared & Checked:	Lemon Lam	
Reviewed, Approved & Certified:	Y T Tang (Contractor's Environmental Team Leader)	

Version: 0

Date: 12 November 2014

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## EXECUTIVE SUMMARY

Shatin to Central Link Contract 1129 – Advance Works for North South Link (NSL) (hereafter called “the Project”) covers part of the construction of the Shatin to Central Link (SCL) which aimed to comprises advance works for NSL – the extension of the existing East Rail Line (EAL) to Hong Kong Island.

The Project covers construction activities at Percival Street Footbridge, Causeway Flyover, Tunnel Approach Rest Garden (TARG) and demolition works at existing abandoned culvert near Wan Shing Street.

The EM&A programme commenced on 2 May 2014. The impact EM&A for the Project includes noise monitoring.

As informed by the Contractor, a part of works area in W2 has been handed over to other SCL contract on 25 and 27 August 2014, and the whole part of W2 has been handed over to other SCL contract on 25 October 2014.

This report documents the findings of EM&A works conducted in the period between 1 and 31 October 2014. As informed by the Contractor, major activities in the reporting period were:

### Area W1

- Removal of Batch 1 Pile by Jacking Method;
- H-piles Removal;
- Post Drilling; and
- Sheetpiling.

### Area W2

- Fix Steel Plates;
- Site Reinstatement; and
- Handover to SCL Contract 1128

### Area W3

- Piles Removal; and
- Temporary Diversion of DN150 DI Fresh Water Main.

## Breaches of Action and Limit Levels for Noise

No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.

No exceedance of Limit Level of noise was recorded in the reporting month.

## Complaint, Notification of Summons and Successful Prosecution

No environmental complaint and no notification of summons and successful prosecution were received in the reporting month.

## Reporting Changes

There was no reporting change in the reporting month.

## Future Key Issues

Key issues to be considered in the coming month included:-

### Area W1

- Removal of Batch 2 Pile by Jacking Method
- H-piles Removal;
- Construct Eastern Pile Cap;

- ELS Works; and
- Excavation.

Area W3

- Temporary Diversion of DN150 DI Fresh Water Main.

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

## **1 INTRODUCTION**

Hsin Chong Construction Co. Ltd (HC) was commissioned by MTR as the Civil Contractor for Works Contract 1129. AECOM Asia Company Limited (AECOM) was appointed by HC as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

### **1.1 Purpose of the Report**

- 1.1.1 This is the sixth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period from 1 to 31 October 2014.

### **1.2 Report Structure**

- 1.2.1 This monthly EM&A Report is organised as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

## 2 PROJECT INFORMATION

### 2.1 Background

- 2.1.1 The Shatin to Central Link (SCL) is a 17km extension of the existing Ma On Shan Line (MOL) and East Rail Line (EAL) comprising (i) The East-West Corridor which extends the MOL from Tai Wai via East Kowloon to connect with the West Rail Line (WRL) at Hung Hom Station (HUH); and (ii) The North-South Corridor which is an extension of the East Rail Line (EAL) at Hung Hom across the harbour to Admiralty Station (ADM).
- 2.1.2 The Environmental Impact Assessment (EIA) Reports for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 22 March 2012, which covers SCL (HUH-ADM) EP No.: EP-436/2012), for the construction and operation. Variation of EP (VEP) (VEP-433/2014) was applied on 2 April 2014 and the latest EP (EP No. EP-436/2012/A) was issued by the Director of Environmental Protection (DEP) on 30 April 2014.
- 2.1.3 The construction of the SCL is divided into different civil construction works contracts and the Project covers construction activities at Percival Street Footbridge, Causeway Flyover, TARG and demolition works at existing abandoned culvert near Wan Shing Street under the EP.
- 2.1.4 As informed by the Contractor, a part of works area in W2 has been handed over to other SCL contract on 25 and 27 August 2014. The works areas and site location of the Project is shown in **Figure 1.1**. The whole part of W2 has been handed over to other SCL contract on 25 October 2014.

### 2.2 Site Description

- 2.2.1 The major construction activities under Works Contract 1129 include:
- (a) Removal of 10 nos. of abandoned steel H-piles, provision of temporary staircase and diversion of pedestrians at Percival Street Footbridge; (Works Area W1)
  - (b) Underpinning of Pier A5 of Causeway Flyover including installation of 6 nos. 600mm diameter concrete bored piles and construction of pile cap; (Works Area W1)
  - (c) Site clearance, temporary take-up, storage and handover of feature stone at existing TARG, tree removal and utility diversions. Construction of temporary box culvert (in dry/wet season) without breakthrough of existing culvert at TARG; (Area W2) and
  - (d) Diversion and temporary support of utilities to facilitate pile extraction works at existing abandoned culvert near Wan Shing Street. Demolition on part of the abandoned culvert and removal of 6 nos. of 18" concrete square driven piles. Construction of minor slip road to facilitate road diversion. (Works Area W3)

### 2.3 Construction Programme and Activities

- 2.3.1 The major construction activities undertaken in the reporting month are summarised below:

#### Area W1

- Removal of Batch 1 Pile by Jacking Method;
- H-piles Removal;
- Post Drilling; and
- Sheetpiling.

#### Area W2

- Fix Steel Plates;
- Site Reinstatement; and

- Handover to SCL Contract 1128

Area W3

- Piles Removal; and
- Temporary Diversion of DN150 DI Fresh Water Main.

2.3.2 The construction programme is presented in **Appendix A**.

## 2.4 Project Organisation

2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1**.

**Table 2.1 Contact Information of Key Personnel**

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. T.C. Lam	3143 9129	3127 6424
		SCL Project Environmental Team Leader	Mr. Richard Kwan	2688 1283	2993 7577
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Mr. Fredrick Leong	2859 1739	2540 1580
HC	Contractor	Senior Project Manager	Mr. Nelson Cheng	2602 0918/ 9302 5927	2774 9322
		Assistant Environmental Manager	Mr. Andy Leung	9489 0035	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y T Tang	3922 9393	2317 7609

## 2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 2.2**.

**Table 2.2 Status of Environmental Licenses, Notifications and Permits**

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
EP-436/2012	22 Mar 2012	-	Superseded by EP-436/2012/A on 30 Apr 2014	-
EP-436/2012/A	30 Apr 2014	-	Valid	-
Construction Noise Permit				
GW-RS1024-14	24 Sep 2014	20 Mar 2015	Valid	Applied for plant mobilization
GW-RS0859-14	19 Aug 2014	18 Feb 2015	Valid	Applied for water pump at W1B (2300-0700)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RS1042-14	29 Sep 2014	28 Mar 2015	Valid	Applied for work at W1 (1900-2300)
GW-RS0975-14	15 Sep 2014	14 Mar 2015	Valid	Applied for UMP installation at Wan Shing Street (2100-0600)
<b>Wastewater Discharge License</b>				
WT00018771-2014	4 Apr 2014	30 Apr 2019	Valid	-
<b>Chemical Waste Producer Registration</b>				
WPN5213-135-H35 63-01	26 Feb 2014	End of Contract	Valid	For Hung Hing Flyover & Percival Street (Area W1)
WPN5213-135-H35 64-01	26 Feb 2014	End of Contract	Valid (Until 25 Oct 2014)	For Canal Road Flyover & Tunnel Approach Rest Garden (Area W2)
WPN5213-134-H35 65-01	26 Feb 2014	End of Contract	Valid	For Tunnel Approach Road & Wan Shing Footbridge (Area W3)
<b>Billing Account for Construction Waste Disposal</b>				
7019335	13 Feb 2014	End of Contract	Valid	-
<b>Notification Under Air Pollution Control (Construction Dust) Regulation</b>				
370021	28 Jan 2014	End of Contract	Valid	-

### 3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### 3.1 Construction Noise Monitoring

##### *Monitoring Requirements*

- 3.1.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.1** summarises the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit level of the noise monitoring is provided in **Appendix D**.

**Table 3.1 Noise Monitoring Parameters, Frequency and Duration**

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. Leq, L <sub>10</sub> and L <sub>90</sub> would be recorded.	At least once per week

##### *Monitoring Equipment*

- 3.1.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.2**.

**Table 3.2 Noise Monitoring Equipment for Regular Noise Monitoring**

Equipment	Brand and Model
Integrated Sound Level Meter	Rion (Model No. NL-31 (S/N: 00320528)) and B&K (Model No. 2238 (S/N: 2800927 & 2800930))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223))

##### *Monitoring Locations*

- 3.1.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manuals for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.3** and shown in **Figure 3.1**.

**Table 3.3 Noise Monitoring Stations during Construction Phase**

Identification No.	Noise Sensitive Receiver (NSR) ID in EIA Report	Noise Monitoring Station
NM1	CH2	Hoi Kung Court



**Monitoring Methodology****3.1.4 Monitoring Procedure**

- (a) Façade measurement was made at NM1.
- (b) The battery condition was checked to ensure the correct functioning of the meter.
- (c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - (i) frequency weighting: A
  - (ii) time weighting: Fast
  - (iii) time measurement:  $L_{eq(30\text{-minutes})}$  during non-restricted hours i.e. 0700 – 1900 on normal weekdays.
- (d) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (e) During the monitoring period, the  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (f) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- (g) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

**3.1.5 Maintenance and Calibration**

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

**Monitoring Schedule for the Reporting Month**

- 3.1.6 The schedule for environmental monitoring in October 2014 is provided in **Appendix F**.

**3.2 Landscape and Visual**

- 3.2.1 As per the EM&A Manuals, the landscape and visual mitigation measures shall be implemented and site inspections should be undertaken once every two weeks during the construction period. A summary of the implementation status is presented in **Section 6**.

**4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES**

- 4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in Appendix C. Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

**Table 4.1 Status of Required Submission under Environmental Permit**

EP Condition	Submission	Submission Date
Condition 3.4 (EP-436/2012/A)	Monthly EM&A Report for September 2014	14 October 2014

## 5 MONITORING RESULTS

### 5.1 Construction Noise Monitoring

- 5.1.1 The monitoring results for noise are summarized in **Table 5.1** and the monitoring data is provided in **Appendix G**.

**Table 5.1 Summary of Construction Noise Monitoring Results in the Reporting Period**

ID	Range, dB(A), $L_{eq}$ (30 mins)	Limit Level, dB(A), $L_{eq}$ (30 mins)
NM1 (*)	<Baseline – 62.7	75

(\*) Baseline correction will be made to the measured  $L_{eq}$  when the measured noise level exceeded the corresponding baseline noise level and presented in the table.

- 5.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 5.1.3 No Limit Level exceedance of noise was recorded at all monitoring stations in the reporting month.
- 5.1.4 The event and action plan is annexed in **Appendix H**.
- 5.1.5 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

### 5.2 Waste Management

- 5.2.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.
- 5.2.2 As advised by the Contractor, 569m<sup>3</sup> of inert C&D material was generated (545m<sup>3</sup> was disposed as public fills at CWPFBP and 25m<sup>3</sup> was disposed as fill bank at TKO137) in the reporting month. 8m<sup>3</sup> of general refuse was generated in the reporting month. No metals, no paper/cardboard packaging material and no plastic was collected by recycling contractor in the reporting month. No inert C&D materials were reused on site. No chemical waste was collected by licensed contractor in the reporting period. The waste flow table is annexed in **Appendix J**.
- 5.2.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 5.2.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

### 5.3 Landscape and Visual

- 5.3.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted on 2, 16 and 30 October 2014. A summary of the site inspection is provided in **Appendix C**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

**6 ENVIRONMENTAL SITE INSPECTION AND AUDIT**

- 6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.
- 6.1.2 In the reporting month, 5 site inspections were carried out on 3, 9, 16, 24 and 30 October 2014. The one held on 9 October 2014 was a joint inspection with the IEC, ER, the Contractor and the ET. No site inspection was conducted by EPD during the reporting month. No non-compliance was recorded during the site inspections. Details of observations recorded during the site inspections are presented in **Table 6.1**.

**Table 6.1 Observations and Recommendations of Site Audit**

Parameters	Date	Observations and Recommendations	Follow-up
<b>Air Quality</b>	16 October 2014	<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to cover the stockpile at W3 with tarpaulin sheet or similar fabric if the stockpile would stay overnight.</li> </ul>	The item was rectified by the Contractor on 17 October 2014.
<b>Noise</b>	N/A	N/A	N/A
<b>Water Quality</b>	9 October 2014	<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to implement sufficient mitigation measures to avoid muddy runoff from works area at W2 entering the box culvert diversion channel.</li> </ul>	The item was rectified by the Contractor on 10 October 2014.
		<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to implement proper measures to prevent wheels of vehicles carrying debris/ mud from the works area at W3 to public road.</li> </ul>	The item was rectified by the Contractor on 9 October 2014.
<b>Waste/ Chemical Management</b>	3 October 2014	<ul style="list-style-type: none"> <li>Improper storage of oil container without provision of drip tray was observed in W1. The Contractor was reminded to provide drip tray for oil storage container to prevent oil leakage.</li> </ul>	The item was rectified by the Contractor on 6 October 2014.
<b>Landscape &amp; Visual</b>	N/A	N/A	N/A
<b>Permits/ Licenses</b>	N/A	N/A	N/A

- 6.1.3 All the follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed into the following weekly site inspection conducted during the reporting period.

**7 ENVIRONMENTAL NON-CONFORMANCE****7.1 Summary of Monitoring Exceedances**

- 7.1.1 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 7.1.2 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

**7.2 Summary of Environmental Non-Compliance**

- 7.2.1 No environmental non-compliance was recorded in the reporting month.

**7.3 Summary of Environmental Complaints**

- 7.3.1 No environmental related complaint was received in the reporting month. Cumulative statistics on environmental complaints is provided in **Appendix I**.

**7.4 Summary of Environmental Summon and Successful Prosecutions**

- 7.4.1 No environmental related prosecution or notification of summons was received in the reporting month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix I**.

## **8 FUTURE KEY ISSUES**

### **8.1 Construction Programme for the Next Two Month**

8.1.1 The major construction works in November and December 2014 will be:

#### Area W1

- Removal of Batch 2 Pile by Jacking Method;
- Post-drilling;
- H-piles Removal;
- Construct Pile Cap;
- Excavation;
- ELS Works;
- Hoarding Erection for W1C; and
- Backfilling.

#### Area W3

- Temporary Diversion of DN150 DI Fresh Water Main;
- Ramp Formation and Breaking-up Carriageway for Pile Removal Works;
- Strengthen Abandoned Box Culvert.

### **8.2 Key Issues for the Coming Month**

8.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

### **8.3 Monitoring Schedule for the Next Month**

8.3.1 The tentative schedule for environmental monitoring in November 2014 is provided in **Appendix F**.

## **9 CONCLUSIONS AND RECOMMENDATIONS**

### **9.1 Conclusions**

- 9.1.1 Noise monitoring was carried out in the reporting month.
- 9.1.2 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 9.1.3 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.4 5 nos. of environmental site inspections were carried out in October 2014. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.5 Referring to the Contractor's information, no environmental complaint, notification of summons and successful prosecution was received in the reporting month.

### **9.2 Recommendations**

- 9.2.1 According to the environmental site inspections performed in the reporting month, the following recommendations were provided:-

#### Air Quality Impact

- Implement effective measures to avoid dust impact.

#### Construction Noise Impact

- No specific observation was identified in the reporting month.

#### Water Quality Impact

- Implement effective measures to avoid surface runoff into the drainage system.
- Implement proper measures to prevent wheels of vehicles carrying debris/ mud from the works.

#### Chemical and Waste Management

- Provide proper chemical and construction waste management.

#### Permits/licenses

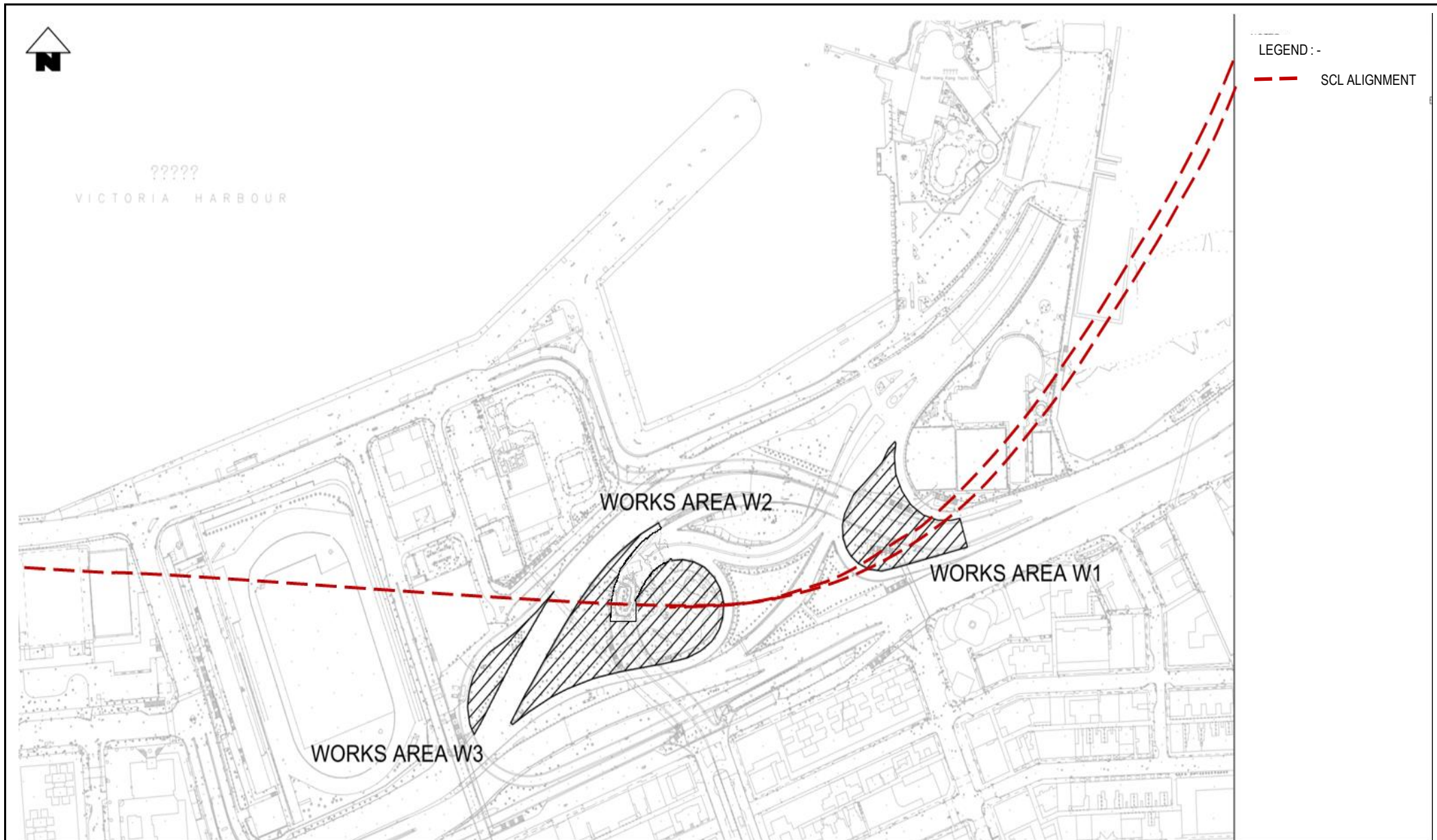
- No specific observation was identified in the reporting month.

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## FIGURES

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**CONTRACT 1129**  
**ADVANCED WORKS FOR NSL**

### WORKS AREA AND SITE LOCATION OF SCL1129

Project No.: -

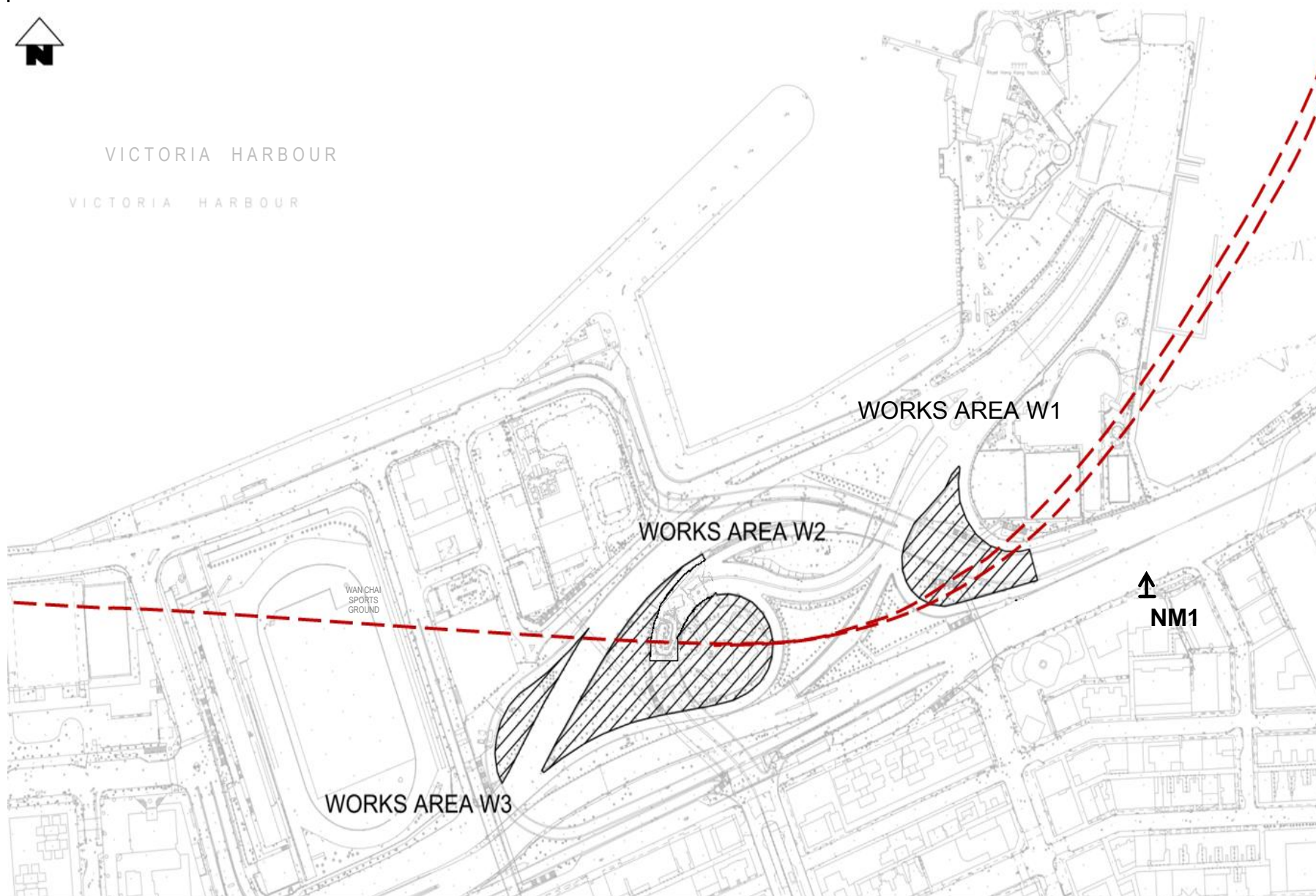
Date: September 2014

Figure 1.1



VICTORIA HARBOUR

VICTORIA HARBOUR



LEGEND :-

--- SCL ALIGNMENT

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**CONTRACT 1129**

**ADVANCED WORKS FOR NSL**

### LOCATION OF AIR-BORNE NOISE SENSITIVE RECEIVER NM1

Project No.: -

Date: September 2014

Figure 3.1

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**APPENDIX A**

**Construction Programme**

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Activity ID	Activity Name	Duration	BL Project Start	BL Project Finish	Start	Finish	TF	Variance- BL Project Finish Date	Oct	Nov	Dec	Jan	
MTRC-1129 - Advance Work for NSL (Working Programme) 3MRP Oct													
Schedule of Completion Obligations									▼ Schedule of Completion Obligations				
Section of the Works									▼ Section of the Works				
01129.CD002C	Complete all works of box culvert at Tunnel Approach Rest Garden (Wk43/14)	0.00d		26-Oct-14		24-Oct-14 A		2.00d	◆ Complete all works of box culvert at Tunnel Approach Rest Garden (Wk43/14)				
Vacation Dates for Works Areas									▼ Vacation Dates for Works Areas				
01129.VD1080	Works Area 1129.W2A	0.00d		26-Oct-14		24-Oct-14 A		2.00d	◆ Works Area 1129.W2A				
Schedule of Milestones									▼ Summary				
Cost Centre A - Preliminaries									▼ Cost Centre A - Preliminaries				
01129.MSA01-1	Approval of Contractor's submissions and all Permanent Works Material Control Schedules (Wk 15/14) S/S	0.00d		30-Sep-14		31-Oct-14*	200.00	-31.00d	◆ Approval of Contractor's submissions and all Permanent Works Material Control Schedules (Wk 15/14) S/S				
01129.MSA03	Engineer's confirmation of satisfactory implementation of PMS, QHSE management requirements (Wk39/14)	0.00d		30-Sep-14		31-Oct-14*	-32.00c	-31.00d	◆ Engineer's confirmation of satisfactory implementation of PMS, QHSE management requirements (Wk39/14)				
Cost Centre B - Percival Street Footbridge									▼ Cost Centre B - Percival Street Footbridge				
01129.MSB01	MS for Steel pile removal and temp staircase approval and Scheme for Util. Protection agreed (Wk35/14-31-Aug-14) Rev	0.00d		30-Sep-14		31-Oct-14*	60.00c	-31.00d	◆ MS for Steel pile removal and temp staircase approval and Scheme for Util. Protection agreed (Wk35/14-31-Aug-14) Rev				
01129.MSB02-1	70% steel pile removal works in number completed (Wk43/14) S/S	0.00d		26-Oct-14		31-Oct-14*	-4.00d	-4.00d	◆ 70% steel pile removal works in number completed (Wk43/14) S/S				
01129.MSB02	70% steel pile removal works in number completed (Wk45/14: 09-Nov-14)	0.00d		09-Nov-14		09-Nov-14*	0.00d	0.00d	◆ 70% steel pile removal works in number completed (Wk45/14: 09-Nov-14)				
Cost Centre C - Causeway Flyover & Hung Hing Flyover									▼ Cost Centre C - Causeway Flyover & Hung Hing Flyover				
01129.MSC01-1	Method Statement for new foundation works and underpinning approved (Wk21/14) S/S	0.00d		30-Sep-14		31-Oct-14*	158.00	-31.00d	◆ Method Statement for new foundation works and underpinning approved (Wk21/14) S/S				
01129.MSC02-1	All piling works for Pier A5 completed and all relevant tests accepted. (Wk39/14) S/S	0.00d		30-Sep-14		31-Oct-14*	-32.00c	-31.00d	◆ All piling works for Pier A5 completed and all relevant tests accepted. (Wk39/14) S/S				
01129.MSC02	All piling works for Pier A5 completed and all relevant tests accepted. ( 16-Nov-14 Wk46/14) - Revised	0.00d		16-Nov-14		16-Nov-14*	0.00d	0.00d	◆ All piling works for Pier A5 completed and all relevant tests accepted. ( 16-Nov-14 Wk46/14) - Revised				
01129.MSC03-1	Complete all works within Cost Centre C. (Wk52/14) S/S	0.00d		28-Dec-14		28-Dec-14*	0.00d	0.00d	◆ Complete all works within Cost Centre C. (Wk52/14) S/S				
01129.MSC03	Complete all works within Cost Centre C. (Wk04/15: 25-Jan-15))	0.00d		25-Jan-15		26-Jan-15*	-1.00d	-1.00d	◆ Complete all works within Cost Centre C. (Wk04/15: 25-Jan-15))				
Cost Centre D - Box Culvert at Tunnel Approach Rest Garden									▼ Cost Centre D - Box Culvert at Tunnel Approach Rest Garden				
01129.MSD03	Complete all works within Cost Centre D (Wk39/14)	0.00d		10-Oct-14		24-Oct-14 A		-13.00d	◆ Complete all works within Cost Centre D (Wk39/14)				
Cost Centre E - Abandoned Box Culvert Underneath Gloucester Road									▼ Cost Centre E - Abandoned Box Culvert Underneath Gloucester Road				
01129.MSE02	Gloucester Rd traff. divertn approaching Cross Harbour Tunnel implemented & MS for SI works approved (Wk35/14) Rev	0.00d		30-Sep-14		24-Oct-14 A		-24.00d	◆ Gloucester Rd traff. divertn approaching Cross Harbour Tunnel implemented & MS for SI works approved (Wk35/14) Rev				
01129.MSE01-1	TTMS for Gloucester rd, Works w/in WA W2c & west side of Canal Road Flyover tree felling completed (Wk17/14)S/S	0.00d		30-Sep-14		31-Oct-14*	186.00	-31.00d	◆ TTMS for Gloucester rd, Works w/in WA W2c & west side of Canal Road Flyover tree felling completed (Wk17/14)S/S				
01129.MSE02-1	Gloucester Rd traff. divertn approaching Cross Harbour Tunnel implemented & MS for SI works approved (Wk30/14) S/S	0.00d				31-Oct-14*	-95.00c		◆ Gloucester Rd traff. divertn approaching Cross Harbour Tunnel implemented & MS for SI works approved (Wk30/14) S/S				
01129.MSE03	Existing Pile location acceptance by Engr & Utility diversion & protection complete to commence piling removal (Wk52/14)	0.00d		28-Dec-14		28-Dec-14*	0.00d	0.00d	◆ Existing Pile location acceptance by Engr & Utility diversion & protection complete to commence piling removal (Wk52/14)				
Cost Centre F - Associated Works									▼ Cost Centre F - Associated Works				
01129.MSF01	Installation of geotechnical instrumentations within Works Areas (WA 1, 2 & 3) completed. (31-Aug-14 Wk35/14) Revised	0.00d		30-Sep-14		31-Oct-14*	-60.00c	-31.00d	◆ Installation of geotechnical instrumentations within Works Areas (WA 1, 2 & 3) completed. (31-Aug-14 Wk35/14) Revised				
01129.MSF02A	50%tree compensation works at various areas in Wan Chai district completed (WK39/14)	0.00d		06-Nov-14		13-Nov-14*	-46.00c	-7.00d	◆ 50%tree compensation works at various areas in Wan Chai district completed (WK39/14)				
Preliminaries and General Requirements									▼ Submissions				
Submissions									▼ Method Statement / Other Submission				
Method Statement / Other Submission									▼ Submission of Geotechnical Instrumentation and Monitoring Plan				
01129.PG1610	Submission of Geotechnical Instrumentation and Monitoring Plan	56.00d	20-Mar-14	06-Oct-14	20-Mar-14 A	06-Nov-14	-61.00c	-31.00d	◆ Submission of Geotechnical Instrumentation and Monitoring Plan				
01129.PG1620	Approval of Geotechnical Instrumentation and Monitoring Plan	28.00d	28-Mar-14	13-Oct-14	28-Mar-14 A	13-Nov-14	-54.00c	-31.00d	◆ Approval of Geotechnical Instrumentation and Monitoring Plan				
01129.PG1370	Submission of Proposal for Training of Workers	72.00d	16-Jun-14	06-Oct-14	16-Jun-14 A	06-Nov-14*	203.00	-31.00d	◆ Submission of Proposal for Training of Workers				
01129.PG1380	Approval of Proposal for Training of Workers	28.00d	29-Aug-14	13-Oct-14	29-Aug-14 A	13-Nov-14*	182.00	-31.00d	◆ Approval of Proposal for Training of Workers				
Implementation									▼ Implementation of SA and Risk Mngt and Design for Safety and Constructibility				
Implementation of SA and Risk Mngt and Design for Safety and Constructibility									▼ Audit of System Assurance and Risk Management and Design for Safety and Constructability Risk Register				
01129.PG1260	Audit of System Assurance and Risk Management and Design for Safety and Constructability Risk Register	1.00d	30-Sep-14	30-Sep-14	31-Oct-14	31-Oct-14	154.00	-31.00d	◆ Audit of System Assurance and Risk Management and Design for Safety and Constructability Risk Register				
01129.PG1210	Engineer's Confirmation of Satisfactory Implementation	28.00d	01-Oct-14	28-Oct-14	01-Nov-14	28-Nov-14*	154.00	-31.00d	◆ Engineer's Confirmation of Satisfactory Implementation				
Implementation of Programme Mngt System									▼ Implementation of Programme Management System (1st)				
01129.PG1220	Implementation of Programme Management System (1st)	46.00d	16-Jul-14	05-Oct-14	16-Jul-14 A	05-Nov-14	-96.00c	-31.00d	◆ Implementation of Programme Management System (1st)				
01129.PG1230	Engineer's Confirmation of Satisfactory Implementation (1st) (26-Sep-14)	56.00d	06-Oct-14	30-Nov-14	06-Nov-14	31-Dec-14*	-96.00c	-31.00d	◆ Engineer's Confirmation of Satisfactory Implementation (1st) (26-Sep-14)				
Implementation of Quality, Health and Safety and Env't Mngt									▼ Implementation of Quality, Health and Safety and Environmental Management Requirements				
01129.PG1240	Implementation of Quality, Health and Safety and Environmental Management Requirements	66.00d	21-May-14	28-Oct-14	21-May-14 A	28-Nov-14	-92.00c	-31.00d	◆ Implementation of Quality, Health and Safety and Environmental Management Requirements				
01129.PG1280	Audit of Quality, Health and Safety and Environmental Management	1.00d	29-Oct-14	29-Oct-14	29-Nov-14	29-Nov-14	-92.00c	-31.00d	◆ Audit of Quality, Health and Safety and Environmental Management				
01129.PG1250	Engineer's Confirmation of Satisfactory Implementation (27-Sep-15)	28.00d	30-Oct-14	26-Nov-14	30-Nov-14	27-Dec-14*	-92.00c	-31.00d	◆ Engineer's Confirmation of Satisfactory Implementation (27-Sep-15)				
Implementation of Approved Specified Plans									▼ Implementation of Approved Specified Plans				
01129.PG1180	Implementation of Approved Specified Plans	66.00d	22-Dec-14	25-Feb-15	22-Dec-14	25-Feb-15	0.00d	0.00d	◆ Implementation of Approved Specified Plans				
Construction Works									▼ Submissions and Approvals				
Contract Work 1 - H-Pile Removal & Percival Street Footbridge Modification									▼ Submissions and Approvals				
Submissions and Approvals									▼ Method Statement for Temporary Staircase Erection Submission				
01129.CW11170B	Method Statement for Temporary Staircase Erection Submission	14.00d	19-Aug-14	09-Oct-14	19-Aug-14 A	07-Nov-14	-38.00c	-25.00d	◆ Method Statement for Temporary Staircase Erection Submission				

Actual Level of Effort

Primary Baseline

Actual Work

Remaining Work

Critical Remaining Work

◆

◆ Milestone

▼

Summary

Project ID: 3MRP(2014-10)

3-MONTH-ROLLING PROGRAMME (OCTOBER 2014)

Page 1 of 3

Date	Revision	Checked	Approved
31-Oct-14 00:00	Rev.-	AB	NC

Activity ID	Activity Name	Duration	BL Project Start	BL Project Finish	Start	Finish	TF	Variance- BL Project Finish Date	Qtr 4, 2014				Qtr 1, 2015	
									Oct	Nov	Dec	Jan		
01129.CW11180B	Method Statement Approval for Temporary Staircase Erection (Wk35/14: 31 Aug 2014)	28.00d	10-Sep-14	13-Oct-14	10-Sep-14 A	13-Nov-14	60.00d	-31.00d		Method Statement Approval for Temporary Staircase Erection				
01129.CW11210B20	Approval of Staircase Shop Drawings	35.00d	10-Sep-14	13-Oct-14	10-Sep-14 A	08-Oct-14 A		6.00d		Approval of Staircase Shop Drawings				
Site Construction														
01129.CW11161B1	Works Area Handover Preparation	0.00d		30-Sep-14		31-Oct-14	92.00d	-25.00d		Works Area Handover Preparation				
Works Area W1C														
Western Pile Cap														
01129.CW1a1091B70	Friction Release Holes to Batch 1 Piles (P1, P5, P6, P10)	12.00d	20-Sep-14	06-Oct-14	06-Sep-14 A	06-Oct-14 A		0.00d		Friction Release Holes to Batch 1 Piles (P1, P5, P6, P10)				
01129.CW1a1091B80	Extension of Batch 1 Piles (P1, P5, P6, P10)	2.00d	06-Sep-14	07-Oct-14	06-Sep-14 A	13-Oct-14 A		-4.00d		Extension of Batch 1 Piles (P1, P5, P6, P10)				
01129.CW1a1091B130	Extension of Batch 2 Piles (P3, P4, P7, P8)	2.00d	12-Sep-14	03-Nov-14	12-Sep-14 A	11-Nov-14	10.00d	-7.00d		Extension of Batch 2 Piles (P3, P4, P7, P8)				
01129.CW1a1091B100	Removal of Batch 1 Piles (P1, P5, P6, P10) by Jacking Method	10.00d	08-Oct-14	18-Oct-14	07-Oct-14 A	14-Oct-14 A		5.00d		Removal of Batch 1 Piles (P1, P5, P6, P10) by Jacking Method				
01129.CW1a1091B110	Removal Verification by Drilling Holes (4 nos.) (incl. grouting) Batch 1	8.00d	20-Oct-14	28-Oct-14	15-Oct-14 A	27-Oct-14 A		2.00d		Removal Verification by Drilling Holes (4 nos.) (incl. grouting) Batch 1				
01129.CW1a1091B120	Friction Release Holes to Batch 2 Piles (P3, P4, P7, P8)	12.00d	29-Oct-14	11-Nov-14	21-Oct-14 A	03-Nov-14	7.00d	7.00d		Friction Release Holes to Batch 2 Piles (P3, P4, P7, P8)				
01129.CW1a1091B150	Removal of Batch 2 Piles (P3, P4, P7, P8) by Jacking Method	10.00d	12-Nov-14	22-Nov-14	04-Nov-14	14-Nov-14	7.00d	7.00d		Removal of Batch 2 Piles (P3, P4, P7, P8) by Jacking Method				
01129.CW1a1091B170	70% steel pile removal works in number completed (Wk43/14 : 26 Oct 2014)	4.00d	13-Nov-14	17-Nov-14	05-Nov-14	08-Nov-14	33.00d	7.00d		70% steel pile removal works in number completed (Wk43/14 : 26 Oct 2014)				
01129.CW1a1091B160	Removal Verification by Drilling Holes (4 nos.) (incl. grouting) Batch 2	8.00d	24-Nov-14	02-Dec-14	15-Nov-14	24-Nov-14	7.00d	7.00d		Removal Verification by Drilling Holes (4 nos.) (incl. grouting) Batch 2				
01129.CW11141B	Post Drilling (5 nos.)	13.00d	03-Dec-14	17-Dec-14	25-Nov-14	09-Dec-14	7.00d	7.00d		Post Drilling (5 nos.)				
01129.CW11141C	Ground Improvement Works (3 nos. pressure grout)	12.00d	18-Dec-14	03-Jan-15	10-Dec-14	23-Dec-14	7.00d	7.00d		Ground Improvement Works (3 nos. pressure grout)				
01129.CW11160B	Construct Western Pile Cap	10.00d	05-Jan-15	15-Jan-15	24-Dec-14	07-Jan-15	7.00d	7.00d		Construct Western Pile Cap				
Eastern Pile Cap														
01129.CW11120B50	Set-Up Plant and Installation of Reaction Pile including Rebar Installation and Grouting (4 nos. Reaction Piles)	6.00d	20-Sep-14	03-Oct-14	20-Sep-14 A	03-Oct-14 A		0.00d		Set-Up Plant and Installation of Reaction Pile including Rebar Installation and Grouting (4 nos. Reaction Piles)				
01129.CW11146B	28 days to Achieve Concrete Strength	22.00d	04-Oct-14	29-Oct-14	03-Oct-14 A	25-Oct-14 A		4.00d		28 days to Achieve Concrete Strength				
01129.CW11146B10	Set-up for Load Test	4.00d	25-Oct-14	29-Oct-14	18-Oct-14 A	25-Oct-14 A		4.00d		Set-up for Load Test				
01129.CW11146B20	Load Testing	4.00d	30-Oct-14	03-Nov-14	27-Oct-14 A	30-Oct-14 A		3.00d		Load Testing				
01129.CW11142B	Construct Eastern Pile Cap	18.00d	06-Nov-14	26-Nov-14	31-Oct-14	20-Nov-14	43.00d	5.00d		Construct Eastern Pile Cap				
Temporary Staircase														
01129.CW11210B	Staircase Off-site Fabrication and Delivery	40.00d	14-Oct-14	28-Nov-14	25-Oct-14 A	04-Dec-14	31.00d	-5.00d		Staircase Off-site Fabrication and Delivery				
01129.CW11161B40	Erect Eastern Pile Cap Temporary Staircase, Painting and E&M Installation	29.00d	29-Nov-14	05-Jan-15	05-Dec-14	10-Jan-15	31.00d	-5.00d		Erect Eastern Pile Cap Temporary Staircase, Painting and E&M Installation				
01129.CW11161B60	Notification to HyD for Opening of Staircase	0.00d		14-Jan-15		06-Jan-15	13.00d	7.00d		Notification to HyD for Opening of Staircase				
01129.CW11161B50	Erect Western Pile Cap Temporary Staircase, Painting and E&M Installation	21.00d	16-Jan-15	09-Feb-15	08-Jan-15	31-Jan-15	7.00d	7.00d		Erect Western Pile Cap Temporary Staircase, Painting and E&M Installation				
Contract Work 2 - Causeway Flyover Underpinning														
01129.CW21150C10	As-Built Records Submission to HyD	8.00d	16-Jan-15	06-Feb-15	27-Jan-15	04-Feb-15	-9.00d	2.00d		As-Built Records Submission to HyD				
01129.CW21160C	Complete all works of Causeway Flyover and Hung Hing Flyover and ready for handover (Wk4/15 : 25 Jan 2015)	0.00d		25-Jan-15		30-Jan-15*	-5.00d	-5.00d		Complete all works of Causeway Flyover and Hung Hing Flyover and ready for handover (Wk4/15 : 25 Jan 2015)				
Submissions and Approvals														
01129.CW11002B50	Design Submission for ELS	28.00d	25-Apr-14	17-Oct-14	25-Apr-14 A	15-Nov-14	-9.00d	-25.00d		Design Submission for ELS				
01129.CW11002B70	Method Statement for Construction of Pile Cap and Load Transfer Submission	28.00d	04-Jul-14	09-Oct-14	04-Jul-14 A	07-Nov-14	6.00d	-25.00d		Method Statement for Construction of Pile Cap and Load Transfer Submission				
01129.CW11002B60	Design Approval for ELS	28.00d	15-Jul-14	17-Oct-14	15-Jul-14 A	15-Nov-14	-9.00d	-25.00d		Design Approval for ELS				
01129.CW11002B80	Method Statement for Construction of Pile Cap and Load Transfer Approval	28.00d	25-Jul-14	17-Oct-14	25-Jul-14 A	15-Nov-14	63.00d	-25.00d		Method Statement for Construction of Pile Cap and Load Transfer Approval				
01129.CW11002B30	Method Statement for Pile Load Test Submission	12.00d	15-Sep-14	15-Oct-14	15-Sep-14 A	13-Nov-14	5.00d	-25.00d		Method Statement for Pile Load Test Submission				
01129.CW11002B40	Method Statement for Pile Load Test Approval	21.00d	16-Oct-14	08-Nov-14	14-Nov-14	08-Dec-14	5.00d	-25.00d		Method Statement for Pile Load Test Approval				
Site Construction														
01129.CW21161B	Works Area Handover Preparation	0.00d		20-Oct-14		31-Oct-14	-5.00d	-9.00d		Works Area Handover Preparation				
Works Area W1B (Underpinning at Pier A5)														
01129.CW21051Cd20	Determine Post Drill Location	5.00d	27-Sep-14	30-Sep-14	27-Sep-14 A	30-Sep-14 A		0.00d		Determine Post Drill Location				
01129.CWa21070	Post Drilling (2 nos.)	8.00d	30-Sep-14	15-Oct-14	30-Sep-14 A	10-Oct-14 A		5.00d		Post Drilling (2 nos.)				
01129.CW21120B80	Pile Load Test Location Selection	6.00d	04-Oct-14	10-Oct-14	10-Oct-14 A	11-Oct-14 A		-1.00d		Pile Load Test Location Selection				
01129.CW21060C10	Set-Up Plant and Installation of Reaction Piles (4 nos. Minipiles) on Low Headroom	7.00d	16-Oct-14	23-Oct-14	16-Oct-14 A	24-Oct-14 A		-1.00d		Set-Up Plant and Installation of Reaction Piles (4 nos. Minipiles) on Low Headroom				
01129.CW21051Cd10	Submission of Drilling Records	6.00d	30-Sep-14	08-Oct-14	20-Oct-14 A	21-Oct-14 A		-10.00d		Submission of Drilling Records				
01129.CW21051Cb10	Submission of Piling Records	2.00d	30-Sep-14	03-Oct-14	21-Oct-14 A	22-Oct-14 A		-16.00d		Submission of Piling Records				
01129.CW21060C20	Reaction Piles Re-bar Installation and Grouting	4.00d	24-Oct-14	28-Oct-14	25-Oct-14 A	27-Oct-14 A		2.00d		Reaction Piles Re-bar Installation and Grouting				
01129.CW21110C10	Develop Concrete Strength	12.00d	29-Oct-14	11-Nov-14	28-Oct-14 A	10-Nov-14	4.00d	1.00d		Develop Concrete Strength				
01129.CW21070C50	Set-up for Load Test	6.00d	08-Nov-14	14-Nov-14	04-Nov-14	10-Nov-14	4.00d	4.00d		Set-up for Load Test				
01129.CW21070C20	Sheetpiling	18.00d	18-Oct-14	07-Nov-14	10-Nov-14	29-Nov-14	-9.00d	-19.00d		Sheetpiling				
01129.CW21060C	Pile Load Test (Wk46/14: 16 Nov 2014)	4.00d	15-Nov-14	19-Nov-14	11-Nov-14	14-Nov-14	4.00d	4.00d		Pile Load Test (Wk46/14: 16 Nov 2014)				
01129.CW21070C70	Demobilization of Loading Test Equipment	2.00d	20-Nov-14	21-Nov-14	15-Nov-14	17-Nov-14	16.00d	4.00d		Demobilization of Loading Test Equipment				
01129.CW21070C30	ELS Works and Excavation	14.00d	20-Nov-14	05-Dec-14	01-Dec-14	16-Dec-14	-9.00d	-9.00d		ELS Works and Excavation				
01129.CW21110C	Preparation Work and Pile Cap Construction	20.00d	27-Nov-14	19-Dec-14	08-Dec-14	02-Jan-15	-9.00d	-9.00d		Preparation Work and Pile Cap Construction				
01129.CW11161B30	Hoarding Erection for W1C	12.00d	08-Dec-14	20-Dec-14	13-Dec-14	29-Dec-14	41.00d	-5.00d		Hoarding Erection for W1C				
01129.CW21140C	Jack up Pile Cap (including 28-d concrete strength) (Assume Early Strength Achieved Earlier)	20.00d	20-Dec-14	15-Jan-15	03-Jan-15	26-Jan-15	-9.00d	-9.00d		Jack up Pile Cap (including 28-d concrete strength) (Assume Early Strength Achieved Earlier)				
01129.CW21070C80	Removal of Pile Cap Formwork	2.00d	20-Dec-14	22-Dec-14	03-Jan-15	05-Jan-15	8.00d	-9.00d		Removal of Pile Cap Formwork				
Legend														
Actual Level of Effort  Remaining Work  Summary									Project ID: 3MRP(2014-10)					
Primary Baseline  Critical Remaining Work									3-MONTH-ROLLING PROGRAMME (OCTOBER 2014)					
Actual Work  Milestone									Page 2 of 3					
									Date					
									31-Oct-14 00:00					
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									Checked					
									AB					
									Approved					
									NC					



Activity ID	Activity Name	Duration	BL Project Start	BL Project Finish	Start	Finish	TF	Variance- BL Project Finish Date	Qtr 4, 2014			Qtr 1, 2015
									Oct	Nov	Dec	Jan
01129.CW21070C90	Backfilling to +1.5mPD	5.00d	23-Dec-14	30-Dec-14	06-Jan-15	10-Jan-15	8.00d	-9.00d				Backfilling to +1.5mPD
01129.CW21070C100	Backfilling to +4 mPD	4.00d	16-Jan-15	20-Jan-15	27-Jan-15	30-Jan-15	-5.00d	-9.00d				
01129.CW21150C	Site Reinstatement (Wk4/15 : 25 Jan 2015)	2.00d	19-Jan-15	20-Jan-15	29-Jan-15	30-Jan-15	-5.00d	-9.00d				
Contract Work 3 - Box Culvert Diversion									Contract Work 3 - Box Culvert Diversion			
01129.CD002C10D	Complete all works of box culvert at Tunnel Approach Rest Garden (Wk43/14: 26 Oct 2014)	0.00d		26-Oct-14		24-Oct-14 A		3.00d	Complete all works of box culvert at Tunnel Approach Rest Garden (Wk43/14: 26 Oct 2014)			
Site Construction									Site Construction			
01129.CW31190D	Fix Steel Plates (130 nos.)	10.00d	25-Aug-14	03-Oct-14	25-Aug-14 A	10-Oct-14 A		-5.00d	Fix Steel Plates (130 nos.)			
01129.CW31200D	Site Reinstatement	10.00d	30-Sep-14	13-Oct-14	29-Sep-14 A	23-Oct-14 A		-8.00d	Site Reinstatement			
Contract Work 4 - Pile Removal at Tunnel Approach Road												
Submissions and Approvals									Submissions and Approvals			Submissions and Approvals
Method Statements									Method Statements			Method Statements
01129.CW41121E	Method Statement for Site Investigation Works to ascertain the locations of existing piles and utilities	28.00d	12-Jun-14	17-Oct-14	12-Jun-14 A	15-Nov-14	61.00d	-25.00d	Method Statement for Site Investigation Works to ascertain the locations of existing piles and utilities			
01129.CW41122E	MS Approval for Site Investigation Works to Ascertain Locations of Existing Piles and Utilities (Wk30/14: 27 Jul 14)	28.00d	30-Jun-14	20-Oct-14	30-Jun-14 A	20-Nov-14	95.00d	-31.00d	MS Approval for Site Investigation Works to Ascertain Locations of Existing Piles and Utilities (Wk30/14: 27 Jul 14)			
01129.CW41003B10	Bridge Condition Survey Report Submission	28.00d	30-Sep-14	03-Nov-14	31-Oct-14	02-Dec-14	94.00d	-25.00d	Bridge Condition Survey Report Submission			
01129.CW41002Ba	Contingency Plan for Works Adjacent to EBS Submission	28.00d	30-Sep-14	03-Nov-14	31-Oct-14	02-Dec-14	90.00d	-25.00d	Contingency Plan for Works Adjacent to EBS Submission			
01129.CW41003Ba	Contingency Plan for Works Adjacent to EBS Approval	28.00d	04-Nov-14	01-Dec-14	03-Dec-14	30-Dec-14	52.00d	-29.00d	Contingency Plan for Works Adjacent to EBS Approval			
01129.CW41003B20	Bridge Condition Survey Report Approval	28.00d	04-Nov-14	01-Dec-14	03-Dec-14	30-Dec-14	17.00d	-29.00d	Bridge Condition Survey Report Approval			
Site Construction												
Works Area W3B												
Stage 1												
01129.CW4a1161	Liaison with Utilities Undertakers	33.00d	25-Jul-14	17-Oct-14	25-Jul-14 A	11-Nov-14	20.00d	-21.00d	Liaison with Utilities Undertakers			
01129.CW41180E	Site/Ramp Formation and Breaking-Up Carriageway for Pile Removal Works	20.00d	02-Dec-14	24-Dec-14	06-Oct-14 A	15-Nov-14	20.00d	33.00d	Site/Ramp Formation and Breaking-Up Carriageway for Pile Removal Works			
01129.CW41230E	Temp. Diversion of DN150 DI Fresh Water Main to Southern Sheet Pile	32.00d	18-Oct-14	24-Nov-14	06-Oct-14 A	11-Nov-14	20.00d	11.00d	Temp. Diversion of DN150 DI Fresh Water Main to Southern Sheet Pile			
01129.CW41181E20	Utility Diversion and Protection Completed. (52/14: 28 Dec 14)*	6.00d	25-Nov-14	01-Dec-14	12-Nov-14	18-Nov-14	32.00d	11.00d	Utility Diversion and Protection Completed. (52/14: 28 Dec 14)*			
01129.CW4a1211	Proposal for Ground Improvement Works (Optional. In case Soil Profile Changes after Pile Removal)	42.00d	25-Oct-14	12-Dec-14	12-Nov-14	02-Jan-15	68.00d	-15.00d	Proposal for Ground Improvement Works (Optional. In case Soil Profile Changes after Pile Removal)			
01129.CW41181E	Strengthen Abandoned Box Culvert	22.00d	27-Dec-14	22-Jan-15	17-Nov-14	11-Dec-14	20.00d	33.00d	Strengthen Abandoned Box Culvert			
01129.CW41181E10	Existing Pile Location Confirmed/Accepted by Engineer (52/14: 28 Dec 14)	14.00d	30-Sep-14	17-Oct-14	17-Nov-14	02-Dec-14	20.00d	-39.00d	Existing Pile Location Confirmed/Accepted by Engineer (52/14: 28 Dec 14)			
01129.CW41200E	Remove 3 nos. Concrete Piles (Wk 17/15: 26 Apr 15)	44.00d	23-Jan-15	18-Mar-15	12-Dec-14	04-Feb-15	42.00d	33.00d	Remove 3 nos. Concrete Piles (Wk 17/15: 26 Apr 15)			
Geotechnical Instrumentation									Geotechnical Instrumentation			
01129.CW41151E30	Utility Monitoring Point Installation (16 nos.)	20.00d	07-Jul-14	17-Oct-14	07-Jul-14 A	15-Nov-14	30.00d	-25.00d	Utility Monitoring Point Installation (16 nos.)			
Associated Works												
01129.AW1011F40	Submission of Plant Sample Photos for Approval	6.00d	24-Jul-14	08-Oct-14	24-Jul-14 A	06-Nov-14	26.00d	-25.00d	Submission of Plant Sample Photos for Approval			
01129.AW1007F	Compensate 25 nos. trees + Ground Cover + Grass at Tung Lo Wan Garden	10.00d	27-Oct-14	06-Nov-14	13-Oct-14 A	29-Oct-14 A		8.00d	Compensate 25 nos. trees + Ground Cover + Grass at Tung Lo Wan Garden			
01129.AW1001F	Compensate 7 nos. trees at Wan Chai District (Tai Wo Street Playground)*	3.00d	27-Oct-14	29-Oct-14	31-Oct-14	03-Nov-14	26.00d	-4.00d	Compensate 7 nos. trees at Wan Chai District (Tai Wo Street Playground)*			
01129.AW1009F	Compensate Shrubs + Ground Cover + Grass at Wan Chai Gap Park	10.00d	27-Oct-14	06-Nov-14	31-Oct-14*	11-Nov-14	26.00d	-4.00d	Compensate Shrubs + Ground Cover + Grass at Wan Chai Gap Park			
01129.AW1008F	Compensate 5 nos. + Grass at Tai Hang Road Children Playground (Wk39/14 : 28 Sep 2014)	12.00d	24-Oct-14	06-Nov-14	31-Oct-14	13-Nov-14*	38.00d	-6.00d	Compensate 5 nos. + Grass at Tai Hang Road Children Playground (Wk39/14 : 28 Sep 2014)			
01129.AW1003F	Compensate 3 nos. trees and planter at Wan Chai District (Hong Kong Tennis Centre)*	5.00d	27-Oct-14	31-Oct-14	31-Oct-14	05-Nov-14	26.00d	-4.00d	Compensate 3 nos. trees and planter at Wan Chai District (Hong Kong Tennis Centre)*			
01129.AW1010F	Compensate 24 nos. of trees at Wan Chai Gap Park	10.00d	27-Oct-14	06-Nov-14	31-Oct-14*	11-Nov-14	26.00d	-4.00d	Compensate 24 nos. of trees at Wan Chai Gap Park			
Geotechnical Instrumentation (for WA4)												
01129.OW3000	Excavation Permit (XP) Application	94.00d	04-Aug-14	22-Dec-14	04-Aug-14 A	22-Dec-14	121.00d	0.00d	Excavation Permit (XP) Application			
01129.OW3105	TTMS Preparation for SLG Approval	18.00d	30-Sep-14	20-Nov-14	13-Oct-14 A	20-Nov-14	148.00d	0.00d	TTMS Preparation for SLG Approval			
01129.OW3100	Building Settlement Marker Installation (13 nos.)	7.00d	23-Dec-14	02-Jan-15	23-Dec-14*	02-Jan-15	143.00d	0.00d	Building Settlement Marker Installation (13 nos.)			
01129.OW3120	Utility Settlement Marker Installation (17 nos.)	50.00d	23-Dec-14	25-Feb-15	23-Dec-14	25-Feb-15	121.00d	0.00d	Utility Settlement Marker Installation (17 nos.)			
01129.OW3130	OBS/ Piezometer Installation (2 nos.)	20.00d	23-Dec-14	17-Jan-15	23-Dec-14	17-Jan-15	151.00d	0.00d	OBS/ Piezometer Installation (2 nos.)			
01129.OW3140	Tilt Marker Installation (7 nos.)	7.00d	03-Jan-15	10-Jan-15	03-Jan-15	10-Jan-15	143.00d	0.00d	Tilt Marker Installation (7 nos.)			
01129.OW3110	Ground Settlement Marker Installation (19 nos.)	14.00d	12-Jan-15	27-Jan-15	12-Jan-15	27-Jan-15	143.00d	0.00d	Ground Settlement Marker Installation (19 nos.)			
Geotechnical Instrumentation (for WA5)												
01129.OW4000	Excavation Permit (XP) Application	94.00d	04-Aug-14	22-Jan-15	04-Aug-14 A	22-Jan-15	107.00d	0.00d	Excavation Permit (XP) Application			

Actual Level of Effort

Primary Baseline

Actual Work

Remaining Work

Critical Remaining Work

Milestone

Summary

Project ID: 3MRP(2014-10)

3-MONTH-ROLLING PROGRAMME (OCTOBER 2014)

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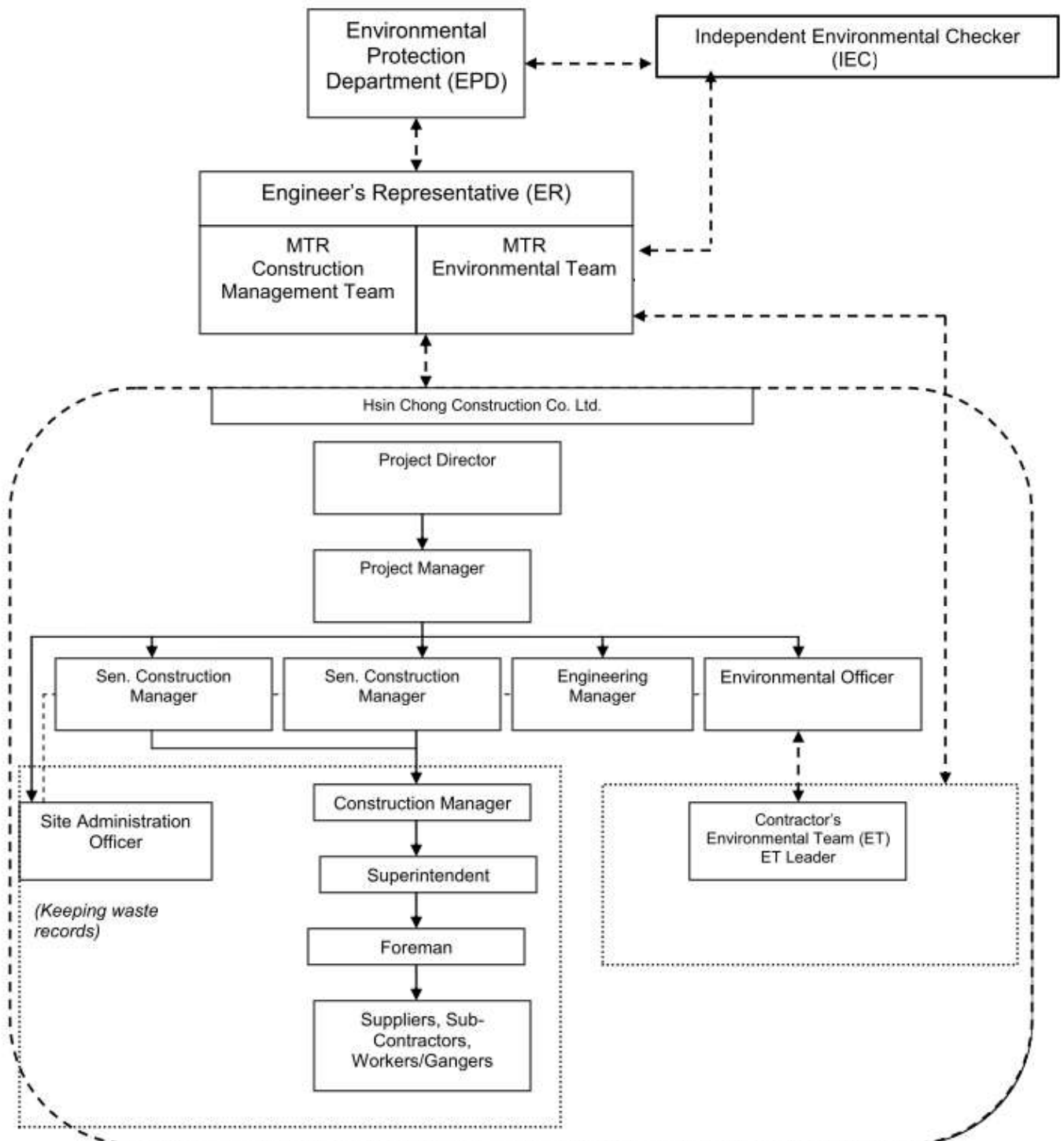
Date	Revision	Checked	Approved
31-Oct-14 00:00	Rev.-	AB	NC

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## **APPENDIX B**

### **Project Organization Structure**

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**Appendix B Project Organisation Structure**



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## **APPENDIX C**

### **Environmental Mitigation Measures Implementation Schedule**

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## Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
<b>Cultural Heritage Impact</b>						
S4.93 & Table 4.2	Erection of decorative and sensibly designed hoarding along the boundary of the works area	To mitigate the temporary visual impact due to surface works.	Contractor	Works Areas in Causeway Bay and Wan Chai, and Works Shaft in Admiralty	Construction Phase	V
<b>Ecological Impact</b>						
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted.	To minimize the contamination of wastewater discharge	Contractor	All land based works areas	Construction Phase	V
<b>Landscape and Visual Impact</b>						
<b>Construction Phase</b>						
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation.	Transplanting and reuse of affected trees.	MTR	Works Sites	Construction Phase	V
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs	Control of height and deposition/ arrangement of temporary facilities in works areas	MTR	Works Sites	Construction Phase	N/A
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis to the satisfaction of the relevant Government Departments.	Reinstatement of temporary works areas.	MTR	Works Sites	Construction Phase	N/A

## Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
<b>Air Quality</b>						
/	Emission from Vehicles and Plants <ul style="list-style-type: none"> <li>All vehicles shall be shut down in intermittent use.</li> <li>Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke.</li> <li>All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)</li> </ul>	Reduce air pollution emission from construction vehicles and plants	Contractor	Works areas	Construction phase	V V V
<b>Construction Dust Impact</b>						
S8.89	Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%. This dust suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.7 L/m <sup>2</sup> for Kowloon side and 1.0 L/m <sup>2</sup> for Hong Kong side once every working hour. Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m <sup>2</sup> for Kowloon side and 1.0 L/m <sup>2</sup> for Hong Kong side to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&A programme as specified in the EM&A Manual.	To minimize dust impact	Contractor	Works areas	Construction Phase	V
S8.90	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: <ul style="list-style-type: none"> <li>Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.</li> <li>Use of frequent watering for particularly dusty construction areas and areas close to ASRs.</li> <li>Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.</li> <li>Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.</li> <li>Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.</li> <li>Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.</li> <li>Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.</li> <li>Provision of not less than 2.4m high hoarding from ground level along site</li> </ul>	To minimize dust impacts	Contractor	Works areas	Construction phase	V V V V V V V

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. <ul style="list-style-type: none"> <li>Imposition of speed controls for vehicles on site haul roads.</li> <li>Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs.</li> <li>Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.</li> <li>Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise</li> </ul>					V V V V
<b>Airborne Noise Impact</b>						
<b>Construction Phase</b>						
S9.55	The following good site practices shall be implemented: <ul style="list-style-type: none"> <li>Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program</li> <li>Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program</li> <li>Mobile plant, if any, shall be sited as far from NSRs as possible</li> <li>Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum</li> <li>Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs</li> <li>Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities</li> </ul>	To minimize construction noise impact	Contractor	Works areas	Construction phase	V V V V V V
S9.56 & Table 9.16	The following quiet PME shall be used: <ul style="list-style-type: none"> <li>Crane lorry, mobile</li> <li>Crane, mobile</li> <li>Asphalt paver</li> <li>Backhoe with hydraulic breaker</li> <li>Breaker, excavator mounted (hydraulic)</li> <li>Hydraulic breaker</li> <li>Concrete lorry mixer</li> <li>Poker, vibrator, hand-held</li> <li>Concrete pump</li> <li>Crawler crane, mobile</li> <li>Mobile crane</li> <li>Dump truck</li> <li>Excavator</li> <li>Truck</li> <li>Rock drill</li> </ul>	To minimize construction noise impact	Contractor	Works areas at: <ul style="list-style-type: none"> <li>Hung Hom</li> <li>Cross Harbour section up to Breakwater of CBTS</li> <li>Breakwater of CBTS to SOV</li> <li>SOV to EXH</li> <li>EXH</li> <li>EXH to open space at the junction of Expo Drive and Convention Avenue</li> <li>Open space at the junction of Expo Drive and Convention Avenue</li> </ul>	Construction phase	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A V N/A N/A N/A

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	<ul style="list-style-type: none"> <li>Lorry</li> <li>Wheel loader</li> <li>Roller vibratory</li> </ul>			to north of ADM <ul style="list-style-type: none"> <li>South of ADM to Overrun Tunnel</li> </ul>		N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: <ul style="list-style-type: none"> <li>Air compressor</li> <li>Asphalt paver</li> <li>Backhoe with hydraulic breaker</li> <li>Bar bender</li> <li>Bar bender and cutter (electric)</li> <li>Breaker, excavator mounted</li> <li>Concrete pump</li> <li>Concrete pump, stationary/lorry mounted</li> <li>Excavator</li> <li>Generator</li> <li>Grout pump</li> <li>Hand held breaker</li> <li>Hydraulic breaker</li> <li>Saw, concrete</li> </ul>	To minimize construction noise impact	Contractor	Works areas at: <ul style="list-style-type: none"> <li>Cross Harbour section up to Breakwater of CBTS</li> <li>Breakwater of CBTS to SOV</li> <li>SOV to EXH</li> <li>EXH</li> <li>EXH to open space at the junction of Expo Drive and Convention Avenue</li> <li>Open space at the junction of Expo Drive and Convention Avenue to north of ADM</li> <li>South of ADM to Overrun Tunnel</li> </ul>	Construction phase	V N/A V V V V N/A N/A N/A V V N/A N/A V

Construction Phase						
S11.222 to 11.245	<p>The site practices outlined in ProPECC PN 1/94 “Construction Site Drainage” shall be followed where practicable.</p> <p><u>Surface Run-off</u></p> <ul style="list-style-type: none"> <li>• Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks.</li> <li>• Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes.</li> <li>• Construction works shall be programmed to minimize soil excavation works in rainy</li> </ul>	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V
						V
						V

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	<p>seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.</p> <ul style="list-style-type: none"> <li>• Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary.</li> <li>• Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities.</li> <li>• Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms.</li> <li>• Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.</li> <li>• Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.</li> </ul> <p><u>Boring and Drilling Water</u></p> <ul style="list-style-type: none"> <li>• Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities.</li> </ul> <p><u>Wheel Washing Water</u></p> <ul style="list-style-type: none"> <li>• All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.</li> </ul> <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> <li>• Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area.</li> <li>• If the used bentonite slurry is intended to be disposed of through the public</li> </ul>					<p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>V</p> <p>N/A</p> <p>N/A</p>

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	<p>drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS.</p> <p><u>Water for Testing &amp; Sterilization of Water Retaining Structures and Water Pipes</u></p> <ul style="list-style-type: none"> <li>Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains.</li> <li>Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable.</li> </ul> <p><u>Acid Cleaning, Etching and Pickling Wastewater</u></p> <ul style="list-style-type: none"> <li>Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.</li> </ul> <p><u>Wastewater from Site Facilities</u></p> <ul style="list-style-type: none"> <li>Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis.</li> <li>Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass.</li> <li>Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.</li> </ul>					<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>V</p>
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	To minimize water quality impacts due to sewage generated from construction workforce	Contractor	Works areas	Construction Phase	V
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be discharged into the storm system via silt traps.	To minimize impact from discharge of uncontaminated groundwater	Contractor	Works areas	Construction Phase	V
S11.249	If land contaminated site is identified from the Stage 2 SI work (refer to Sections 11.188 to 11.191 of the EIA Report), the following mitigation measures shall be	To control site run-off generated from any	Contractor	Any potential contaminated areas to	Construction Phase	N/A



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	implemented for the identified contaminated area. Any transient pile of contaminated soil / material shall be minimized and shall be bottom-lined, bunded and covered with impervious membrane during rain event to avoid generation of contaminated runoff. Appropriate intercepting channels and partial shelters shall be provided where necessary to prevent rainwater from collecting within trenches or footing excavations. Any contaminated water and wastewater generated from the decontamination process shall not be directly discharged to public sewers or site drainage. They shall be treated or tanked away as necessary for proper disposal in compliance with the TM-DSS.	potential contaminated works areas.		be identified from the Stage 2 SI		
S11.250 & S11.251	No direct discharge of groundwater from contaminated areas shall be adopted. If land contamination impact and generation of contaminated groundwater is identified from the Stage 2 SI works (refer to <b>Sections 11.189 to 11.192</b> of the EIA Report), the following mitigation measures shall be adopted. Any contaminated groundwater shall be either properly treated in compliance with the requirements of the TM-DSS or properly recharged into the ground. If wastewater treatment is deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as TPH) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and shall be discharged into the foul sewers. If groundwater recharging wells are deployed, the recharging wells shall be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells shall be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality shall be determined prior to the selection of the recharge wells, and submit a working plan (including the laboratory analytical results showing the quality of groundwater at the proposed recharge location(s) as well as the pollutant levels of groundwater to be recharged) to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Prior to recharge, any prohibited substance such as TPH products shall be removed as necessary by installing the petrol interceptor. The Contractor shall apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.	To minimize potential water quality impact from discharge of contaminated groundwater	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
S11.253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distances of 100 m shall be maintained between the discharge points of construction site effluent and the existing seawater intakes. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V



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	monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.					
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes” published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul style="list-style-type: none"> <li>Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.</li> </ul>	To minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction Phase	V V V
<b>Waste Management Implications</b>						
<b>Construction Phase</b>						
S12.75	<b>Good Site Practices and Waste Reduction Measures</b> <ul style="list-style-type: none"> <li>Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites;</li> <li>Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures;</li> <li>Provision of sufficient waste disposal points and regular collection of waste;</li> <li>Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and</li> <li>Separation of chemical wastes for special handling and appropriate treatment.</li> </ul>	To reduce waste management impacts	Contractor	All Work Sites	Construction Phase	V V V V V

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S12.76	<b>Good Site Practices and Waste Reduction Measures (con't)</b> <ul style="list-style-type: none"> <li>Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.);</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 aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce;</li> <li>Proper storage and site practices to minimize the potential for damage or contamination of construction materials;</li> <li>Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and</li> <li>Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.</li> </ul>	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V V V V V V
S12.77	<b>Good Site Practices and Waste Reduction Measures (con't)</b> The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V
S12.78	<b>Good Site Practices and Waste Reduction Measures (con't)</b> C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	N/A
S12.79	<b>Storage, Collection and Transportation of Waste</b> Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: <ul style="list-style-type: none"> <li>Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution;</li> <li>Maintain and clean storage areas routinely;</li> <li>Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and</li> <li>Different locations shall be designated to stockpile each material to enhance reuse.</li> </ul>	To minimize potential adverse environmental impacts arising from waste storage	Contractor	Work Sites	Construction Phase	V V V V
S12.80	<b>Storage, Collection and Transportation of Waste (con't)</b> Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal	To minimize potential adverse environmental	Contractor	Work Sites	Construction Phase	

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	outlets. The following suggestions shall be enforced to minimize the potential adverse impacts: <ul style="list-style-type: none"> <li>Remove waste in timely manner</li> <li>Waste collectors shall only collect wastes prescribed by their permits</li> <li>Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers</li> <li>Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28)</li> <li>Waste shall be disposed of at licensed waste disposal facilities</li> <li>Maintain records of quantities of waste generated, recycled and disposed</li> </ul>	impacts arising from waste collection and disposal				V V V V V V
S12.81	<b>Storage, Collection and Transportation of Waste (con't)</b> <ul style="list-style-type: none"> <li>Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed.</li> </ul>	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.83 – 12.86	<b>Sorting of C&amp;D Materials</b> <ul style="list-style-type: none"> <li>Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site.</li> <li>Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials.</li> <li>The C&amp;D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills.</li> <li>Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach tunnels.</li> </ul>	To minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	Work Sites	Construction Phase	V V V V
S12.88	<b>Sediments</b> <ul style="list-style-type: none"> <li>The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance.</li> </ul>	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	N/A
S12.89	<b>Sediments (con't)</b> <ul style="list-style-type: none"> <li>The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project</li> </ul>	To determine the best handling and disposal option of the sediments	MTR / Contractor	All works areas with sediments concern	Detailed Design Stage and Construction Phase	N/A

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EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	proponent shall also be responsible for the application of all necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.					
S12.91 – 12.94	<b>Sediments (con't)</b> <ul style="list-style-type: none"> <li>Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO).</li> <li>In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation / material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water.</li> <li>The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, 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 the DEP.</li> <li>In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.</li> </ul>	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
S12.95	<b>Sediments (con't)</b> <ul style="list-style-type: none"> <li>A possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of</li> </ul>	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A

## Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.					
/	<b>Accidental spillage</b> To prevent accidental spillage of chemicals, the following is recommended: <ul style="list-style-type: none"> <li>• Proper storage and handling facilities will be provided.</li> <li>• All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains.</li> <li>• The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings.</li> <li>• Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation.</li> </ul>	To minimize potential adverse environmental impacts arising from accidental spillage	Contractor	Work Sites	Construction Phase	@ V  V  V
S12.97	<b>Containers for Storage of Chemical Waste</b> The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall: <ul style="list-style-type: none"> <li>• Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed;</li> <li>• Have a capacity of less than 450 litters unless the specifications have been approved by EPD; and</li> <li>• Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.</li> </ul>	To register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	Work Sites	Construction Phase	V  V  V
S12.98	<b>Chemical Waste Storage Area</b> <ul style="list-style-type: none"> <li>• Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only;</li> <li>• Be enclosed on at least 3 sides;</li> <li>• Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;</li> <li>• Have adequate ventilation;</li> <li>• Be covered to prevent rainfall from entering; and</li> <li>• Be properly arranged so that incompatible materials are adequately separated.</li> </ul>	To prepare appropriate storage areas for chemical waste at works areas	Contractor	Work Sites	Construction Phase	V  V V  V V V
S12.99	<b>Chemical Waste</b> <ul style="list-style-type: none"> <li>• Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a designated secure place.</li> </ul>	To clearly label the chemical waste at works areas	Contractor	Work Sites	Construction Phase	V

## Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref. / EM&A Log Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S12.100	<b>Collection and Disposal of Chemical Waste</b> <b>A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</b> to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the <i>Waste Disposal (Chemical Waste) (General) Regulation</i> .	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	V
S12.101	<b>General Refuse</b> General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	<b>General Refuse (con't)</b> The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	<b>General Refuse (con't)</b> The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V

Legend: V = implemented;  
 x = not implemented;  
 @ = partially implemented;  
 N/A = not applicable

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## **APPENDIX D**

### **Summary of Action and Limit Levels**

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**Appendix D – Summary of Action and Limit Levels****Action and Limit Levels for Construction Noise  
(0700 – 1900 hrs of normal weekdays)**

ID	Location	Action Level	Limit Level
NM1	Hoi Kung Court	When one documented complaint is received	75 dB(A)



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## **APPENDIX E**

### **Calibration Certificates of Equipments**

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## CERTIFICATE OF CALIBRATION

Certificate No.: 13CA1107 01-01

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	, Microphone
Manufacturer:	Rion Co., Ltd.	, Rion Co., Ltd.
Type/Model No.:	NL-31	, UC-53A
Serial/Equipment No.:	00320528 / N.007.03A	, 90565
Adaptors used:	-	, -

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 07-Nov-2013

Date of test: 08-Nov-2013

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	22-Jun-2014	CIGISMEC
Signal generator	DS 360	33873	15-Apr-2014	CEPREI
Signal generator	DS 360	61227	15-Apr-2014	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $60 \pm 10$  %  
Air pressure:  $1000 \pm 10$  hPa

### Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of  $\pm 20\%$ .
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

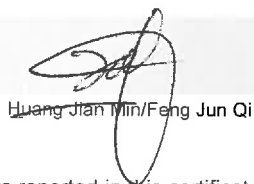
### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

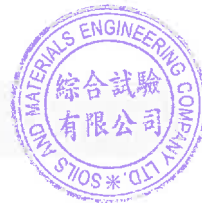
Actual Measurement data are documented on worksheets.

Approved Signatory:

  
Huang Jian Min/Feng Jun Qi

Date: 11-Nov-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 13CA1107 01-01 Page 2 of 2

### 1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	1.0	
	Lin	Pass	2.0	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	2.2
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	N/A	N/A	
	Repeated at frequency of 100 Hz	N/A	N/A	
Time averaging	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

### 2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

### 3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date:

Fung Chi Yip

08-Nov-2013

Checked by:

Date:

Lam Tze Wai

11-Nov-2013

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



## CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0702 01-01 Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	B & K	B & K
Type/Model No.:	2238	4188
Serial/Equipment No.:	2800927 / N.009.06	2791211
Adaptors used:	-	-

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 02-Jul-2014

Date of test: 03-Jul-2014

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

### Ambient conditions

Temperature:  $21 \pm 1^\circ\text{C}$   
Relative humidity:  $60 \pm 10\%$   
Air pressure:  $1000 \pm 10\text{ hPa}$

### Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of  $\pm 20\%$ .
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

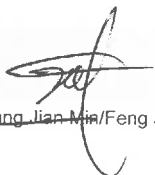
### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

  
Huang Jian Min/Feng Jun Qi

Date: 04-Jul-2014

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.:

14CA0702 01-01

Page 2 of 2

### 1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

### 2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

### 3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date:

Fung Chi Yip  
03-Jul-2014

- End -

Checked by:

Date:

Lam Tze Wai  
04-Jul-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



## CERTIFICATE OF CALIBRATION

Certificate No.: 14CA0702 01-02

Page 1 of 2

### Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	B & K	B & K
Type/Model No.:	2238	4188
Serial/Equipment No.:	2800930 / N.009.07	2250455
Adaptors used:	-	-

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 02-Jul-2014

Date of test: 03-Jul-2014

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	20-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

### Ambient conditions

Temperature:  $21 \pm 1$  °C  
Relative humidity:  $60 \pm 10$  %  
Air pressure:  $1000 \pm 10$  hPa

### Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of  $\pm 20\%$ .
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.


### Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

  
Huang Jian Min/Feng Jun Qi

Date: 04-Jul-2014

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 14CA0702 01-02

Page 2 of 2

### 1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	1.0	
	Lin	Pass	2.0	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	2.2
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Linearity range for SPL	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100 $\mu$ s rectangular pulse	Pass	0.3	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

### 2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

### 3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date:

Fung Chi Yip  
03-Jul-2014

Checked by:

Date:

Lam Tze Wai  
04-Jul-2014

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.





## CERTIFICATE OF CALIBRATION

Certificate No.: 13CA1107 01-02

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Rion Co., Ltd.  
Type/Model No.: NC-73  
Serial/Equipment No.: 10307223 / N.004.08  
Adaptors used: -

### Item submitted by

Customer: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 07-Nov-2013

Date of test: 08-Nov-2013

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	17-Apr-2014	SCL
Preamplifier	B&K 2673	2239857	16-Apr-2014	CEPREI
Measuring amplifier	B&K 2610	2346941	24-Apr-2014	CEPREI
Signal generator	DS 360	61227	15-Apr-2014	CEPREI
Digital multi-meter	34401A	US36087050	10-Dec-2013	CEPREI
Audio analyzer	8903B	GB41300350	15-Apr-2014	CEPREI
Universal counter	53132A	MY40003662	15-Apr-2014	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $60 \pm 10$  %  
Air pressure:  $1000 \pm 10$  hPa

### Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

### Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 11-Nov-2013

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.





## CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 13CA1107 01-02

Page: 2 of 2

### 1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 $\mu$ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	93.86	0.10

### 2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.002 dB

Estimated expanded uncertainty 0.005 dB

### 3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 988.6 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

### 4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.2 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date: 08-Nov-2013

Fung Chi Yip

Checked by:

Date: 11-Nov-2013

Lam Tze Wai

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

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## **APPENDIX F**

### **EM&A Monitoring Schedules**

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**Shatin to Central Link Contract 1129 - Advance Works for NSL  
Impact Environmental Monitoring Schedule for October 2014**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Oct	2-Oct	3-Oct	4-Oct
					Noise (NM1)	
5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct
			Noise (NM1)			
12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct
	Noise (NM1)					
19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct
		Noise (NM1)				
26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	
	Noise (NM1)					

**Noise Monitoring Station**

NM1      Hoi Kung Court

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1129 - Advance Works for NSL**  
**Tentative Impact Environmental Monitoring Schedule for November 2014**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Nov
2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov
			Noise (NM1)			
9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov
	Noise (NM1)					
16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov
					Noise (NM1)	
23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov
				Noise (NM1)		
30-Nov						

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

**Noise Monitoring Station**

NM1          Hoi Kung Court

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1129 - Advance Works for NSL**  
**Tentative Impact Environmental Monitoring Schedule for December 2014**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec
			Noise (NM1)			
7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec
		Noise (NM1)				
14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec
	Noise (NM1)					
21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec
		Noise (NM1)				
28-Dec	29-Dec	30-Dec	31-Dec			

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

**Noise Monitoring Station**

NM1          Hoi Kung Court

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1129 - Advance Works for NSL**  
**Tentative Impact Environmental Monitoring Schedule for January 2015**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Jan	2-Jan	3-Jan
					Noise (NM1)	
4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan
			Noise (NM1)			
11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan
				Noise (NM1)		
18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan
		Noise (NM1)				
25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan
			Noise (NM1)			

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

**Noise Monitoring Station**

NM1          Hoi Kung Court

**Monitoring Frequency**

Once per week

---

## **APPENDIX G**

### **Noise Monitoring Results and their Graphical Presentations**

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## Appendix G - Impact Daytime Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM1 - Hoi Kung Court, Rooftop-20/F

Date	Weather Condition	Noise Level for 30-min, dB(A) *				Baseline Corrected Level, dB(A) #	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
3-Oct-14	Sunny	15:30	68.0	73.0	71.1	54.7	71	75	N
8-Oct-14	Fine	13:35	70.1	72.9	71.4	60.8	71	75	N
13-Oct-14	Fine	16:09	69.8	72.9	71.6	62.7	71	75	N
17-Oct-14	Sunny	15:02	67.8	73.1	70.0	<Baseline Level	71	75	N
27-Oct-14	Sunny	14:30	69.2	72.0	70.9	<Baseline Level	71	75	N

Remark:

\* Façade measurement.

# -The measured Leq is corrected against the corresponding Baseline Level.



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## **APPENDIX H**

### **Event Action Plan**

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**Appendix H Event Action Plan****Event and Action Plan for Construction Noise Monitoring**

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	<ol style="list-style-type: none"> <li>1. Notify the Contractor, IEC and ER;</li> <li>2. Discuss with the ER, IEC and Contractor on the remedial measures required; and</li> <li>3. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the investigation results submitted by the contractor; and</li> <li>2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of complaint in writing;</li> <li>2. Review and agree on the remedial measures proposed by the Contractor; and</li> <li>3. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Investigate the complaint and propose remedial measures;</li> <li>2. Report the results of investigation to the IEC, ET and ER;</li> <li>3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification; and</li> <li>4. Implement noise mitigation proposals.</li> </ol>
Exceedance of Limit Level	<ol style="list-style-type: none"> <li>1. Notify the Contractor, IEC, EPD and ER ;</li> <li>2. Repeat measurement to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken;</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;</li> <li>7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check the Contractor's working method;</li> <li>3. Discuss with the ER, ET and Contractor on the potential remedial measures; and</li> <li>4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>3. Supervise the implementation of remedial measures; and</li> <li>4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Take immediate action to avoid further exceedance;</li> <li>3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Revise and resubmit proposals if problem still not under control; and</li> <li>6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>

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## **APPENDIX I**

### **Cumulative Statistics of Complaints, Notification of Summons and Successful Prosecutions**

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**Appendix I****Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions**

	<b>Date Received</b>	<b>Subject</b>	<b>Status</b>	<b>Total no. received in this month</b>	<b>Total no. received since project commencement</b>
<b>Environmental complaints</b>	-	-	-	0	0
<b>Notification of summons</b>	-	-	-	0	0
<b>Successful Prosecutions</b>	-	-	-	0	0

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**APPENDIX J**

**Waste Flow Table**

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**SCL Contract 1129 Advance Works For NSL**

updated to 30 September 2014

**Monthly Summary C&D Material Flow Table for 2014**

Latest Programme for Generation & Import of Materials in each Reporting Period	Quantity for off-site disposal of Inert C&D materials (m <sup>3</sup> )					Quantity for off-site disposal of Non-inert C&D materials					
	Inert C&D material (m <sup>3</sup> )				Total (m <sup>3</sup> )	Metals (kg)	Paper / Cardboard (kg)	Plastics (kg)	Chemical Waste (kg)	General Waste (m <sup>3</sup> )	Sediment (m <sup>3</sup> )
	CWPFBP(1)	TKO137FB(2)	TKO137SF(3)	^Other Site		Total	Total		Total	Total	Total
2014/01 (Actual)	0	0	0	0	0	0	0	0	0	0	0
2014/02 (Actual)	0	0	0	0	0	0	0	0	0	0	0
2014/03 (Actual)	305	0	0	0	305	0	0	0	0	0	0
2014/04 (Actual)	308	75	0	0	382	0	0	0	0	0	0
2014/05 (Actual)	1,258	7	0	0	1,266	0	0	0	0	5.0	0
2014/06 (Actual)	63	19	0	0	82	4,210	0	0	0	4.9	0
<b>Sub-total</b>	<b>1,934</b>	<b>101</b>	<b>0</b>	<b>0</b>	<b>2,035</b>	<b>4,210</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9.9</b>	<b>0</b>
2014/07 (Actual)	663	116	0	0	779	0	0	0	0	4.4	0
2014/08 (Actual)	1,658	63	0	0	1,721	0	0	0	400	9.5	0
2014/09 (Actual)	1,032	182	0	0	1,214	0	0	0	0	11.3	0
2014/10 (Actual)	545	25	0	0	569	0	0	0	0	8.0	0
2014/11 (Actual)											
2014/12 (Actual)											
<b>Sub-total</b>	<b>3,897</b>	<b>385</b>	<b>0</b>	<b>0</b>	<b>4,282</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>400</b>	<b>33.2</b>	<b>0</b>
<b>Total</b>					<b>6,316</b>	<b>4,210</b>	<b>0</b>	<b>0</b>	<b>400</b>	<b>43.1</b>	<b>0</b>

**Remark:**      \*Assume the density is 2 tonnes per cubic metre  
                      ^Required to be approved by EPD and MTR  
                      1 CWPFBP      Chai Wan Public Fill Barging Point  
                      2 TKO137FB      Fill Bank at Tseung Kwan O Area 137  
                      3 TKO137SF      Sorting Facilities at Tseung Kwan O Area 137

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## **Appendix B**

**Monthly EM&A Report for October 2014 – SCL Works Contract  
1126 Reprovisioning of Harbour Road Sports Centre and Wan  
Chai Swimming Pool**

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MTR Corporation Limited

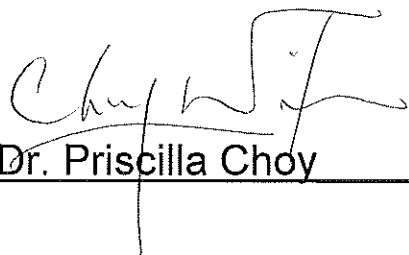
**Shatin to Central Link –  
Hung Hom to Admiralty Section**

Monthly EM&A Report No.4

[Period from 1 to 31 October 2014]

Works Contract 1126 – Reprovisioning of Harbour  
Road Sports Centre and Wan Chai Swimming Pool

(November 2014)

Certified by:   
Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 13<sup>th</sup> November 2014



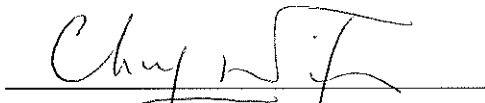
## **Kaden – Leader Joint Venture**

**Shatin to Central Link –  
Contract 1126  
Reprovisioning of Harbour Road Sports  
Centre and Wan Chai Swimming Pool**

**Monthly Environmental  
Monitoring and Audit Report  
For October 2014**

(Version 2.0)

Certified By

  
Dr. Priscilla Choy  
(Environmental Team Leader)

**REMARKS:**

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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## EXECUTIVE SUMMARY

### Introduction

1. This is the 4<sup>th</sup> monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 1126 –Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool**. This report documents the findings of EM&A Works conducted from 1 to 31 October 2014.

### Summary of Construction Works undertaken during Reporting Month

2. The major site activities undertaken in the reporting month include:
  - At Wan Chai Sports Ground (WCSG)
    - Pre-drill and Instrumentation installation for Piezometer and utility settlement marker; and
    - Site cleaning.
  - At Public Transport Interchange (PTI) Area
    - Construction of Petrol Interception;
    - Manhole construction & underground utilities connection;
    - Construction of Store Room;
    - Construction of ducting for street lighting; and
    - Construction of bus lay-by

### Environmental Monitoring and Audit Progress

3. A summary of the monitoring activities in this reporting period is listed below:

#### Regular Construction Noise and Construction Dust Monitoring

- Regular construction noise monitoring during normal working hours  
Noise Monitoring Station ID
  - NM2<sup>(1)(3)</sup> (Harbour Centre) 5 times
- Construction Dust (24-hour TSP) Monitoring  
Dust Monitoring Station ID
  - AM2<sup>(1)(2)</sup> (Wan Chai Sports Ground) 5 times
  - AM3<sup>(1)</sup> (Existing Harbour Road Sports Centre) 5 times

#### Remarks:

- (1) Station ID as identified in approved EM&A Manual for SCL(HUH-ADM).
- (2) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.
- (3) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.

Waste Management

4. Wastes generated from this Project include inert construction and demolition (C&D) materials and non-inert C&D materials. Details of waste management data is presented in Section 5 and **Appendix K**.

Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 15 and 29 October 2014. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 8, 15, 22 and 29 October 2014. The representative of the IEC joined the site inspection on 8 October 2014. Details of the audit findings and implementation status are presented in Section 6.

**Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution**

7. No exceedance of the Action and Limit Levels of regular construction noise monitoring and 24-hour TSP monitoring was recorded during the reporting period.
8. No non-compliance event was recorded during the reporting period.
9. No Project related environmental complaint and notification of summons/successful prosecutions were received in this reporting period.

**Reporting Changes**

10. N/A

**Future Key Issues**

11. Major site activities for the coming reporting month will include:

At Public Transport Interchange (PTI) Area

- Construction of Petrol Interception;
- Manhole construction & underground utilities connection;
- Construction of Store Room;
- Construction of ducting for street lighting;
- Construction of footing for bus shelter and signage post.

12. Key environmental impacts to be considered in the coming month include:

- Dust impact from stockpile of dusty materials and unpaved works area;
- Wastewater from surface runoff;
- Waste management;

- Preservation and protection of retained and transplanted trees; and
- Noise impact from construction works.

## 1 INTRODUCTION

- 1.1 Cinotech Consultants Limited (Cinotech) was appointed by Kaden – Leader Joint Venture (KLJV) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the MTR Shatin to Central Link (SCL) Works Contract 1126 – Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool (hereafter referred to as the Project).

### **Purpose of the Report**

- 1.2 This is the 4<sup>th</sup> EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 October 2014. The major construction works for Contract 1126 commenced on 9 July 2014.

### **Structure of the Report**

- 1.3 The structure of the report is as follows:

Section 1: **Introduction** - details the scope and structure of the report.

Section 2: **Project Information** - summarises background and scope of the project, site description, project organization and contact details, construction programme, the construction works undertaken and the status of Environmental Permits/Licenses during the reporting period.

Section 3: **Environmental Monitoring Requirement** - summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

Section 4: **Implementation Status on Environmental Mitigation Measures** - summarises the implementation of environmental protection measures during the reporting period.

Section 5: **Monitoring Results** - summarises the monitoring results obtained in the reporting period.

Section 6: **Environmental Site Inspection** - summarises the audit findings of the weekly site inspections undertaken within the reporting period.

Section 7: **Environmental Non-conformance** - summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 8: **Future Key Issues** - summarises the impact forecast and monitoring schedule for the next three months.

Section 9: **Conclusions and Recommendations**



## 2 PROJECT INFORMATION

### Background

- 2.1 The Shatin to Central Link – Hung Hom to Admiralty Section (hereafter referred to as SCL (HUH-ADM)) is an approximately 6km extension of the East Rail Line including a rail harbor crossing from Hung Hom across the harbor to Admiralty on Hong Kong Island. It is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).
- 2.2 The Environmental Impact Assessment (EIA) Report for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, Environmental Permits (EP) (EP No: EP-436/2012) was granted on 22 March 2012 for their construction and operation. Variations of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/A) was issued by Director of Environmental Protection (DEP) on 30 April 2014.
- 2.3 The construction of the SCL (HUH-ADM) has been divided into a series of civil construction Works Contracts and this Works Contract 1126 comprises of the Permanent Works and the Temporary Works for the re-provisioning of Harbour Road Sports Centre (HRSC) and Wan Chai Swimming Pool (WCSP). The major construction works for Contract 1126 commenced on 9 July 2014.

### General Site Description

- 2.4 The major works of this Project that was classified as Designated Project under the EIAO include the demolition of grandstand superstructure and water pump room of WCSG, and the temporary works for the future Public Transport Interchange (PTI) Area. The PTI area has been obtained in phases. The alignment and works area for the Works Contract 1126 are shown in **Figure 1**.

### Construction Programme and Activities

- 2.5 A summary of the major construction activities undertaken in this reporting period is shown as follows. The tentative construction programme is presented in **Appendix A**.

#### At Wan Chai Sports Ground (WCSG)

- Pre-drill and Instrumentation installation for Piezometer and utility settlement marker; and
- Site cleaning.

#### At Public Transport Interchange (PTI) Area

- Construction of Petrol Interception;
- Manhole construction & underground utilities connection;
- Construction of Store Room;
- Construction of ducting for street lighting; and
- Construction of bus lay-by

**Project Organisation**

2.6 The project organizational chart and contact details are shown in **Figure 4**.

**Status of Environmental Licences, Notification and Permits**

2.7 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project is presented in **Table 2.1**.

**Table 2.1 Summary of the Status of Environmental Licences, Notification and Permits**

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-436/2012/A	30/04/2014	N/A	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
Ref no.: 370563	14/02/2014	N/A	Valid
Ref no.: 380674	17/10/2014	N/A	Valid
Billing Account for Construction Waste Disposal			
Account No.7019324	10/02/2014	N/A	Valid
Registration of Chemical Waste Producer			
5213-135-K3101-01	14/05/2014	N/A	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
WT00019352-2014	17/06/2014	30/06/2019	Valid
Construction Noise Permit (CNP)			
GW-RS0470-14 <sup>(1)</sup>	19/05/2014	30/10/2014	Valid
GW-RS0761-14 <sup>(2)</sup>	01/08/2014	31/01/2015	Valid

Note:

(1) For the use of transportation of material for hoarding erection in Wan Chai Sports Ground.

(2) For the use of A&A works in Wan Chai Sports Ground.

**Summary of EM&A Requirements**

2.8 The EM&A programme under Works Contract 1126 require regular dust and noise monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event / Action Plans;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirements in contract documents.

2.9 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.

- 2.10 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely construction noise & dust monitoring as well as audit works for the Project in the reporting month.

### 3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### **Regular Construction Noise Monitoring**

- 3.1 In accordance with the EM&A Manual, monitoring of construction noise impact should be conducted at the designated monitoring stations. Since access to the original baseline monitoring location was rejected, alternative location was proposed. The construction noise monitoring locations are listed in **Table 3.1** and shown in **Figure 2**.

**Table 3.1 Regular Construction Noise Monitoring Location**

<b>Regular Construction Noise Monitoring Location</b>	<b>Description</b>	<b>Type of Measurement</b>
NM2 <sup>(1)</sup>	Harbour Centre (7/F) <sup>(2)</sup>	Façade

Note:

- (1) NSR ID as identified in approved EM&A Manual / EIA Report for SCL(HUH-ADM).  
 (2) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.

#### **Monitoring Parameter and Frequency**

- 3.2 Weekly construction noise monitoring was conducted in accordance with the requirements stipulated in the EM&A Manual. If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed. The monitoring schedule for this reporting period is shown in **Appendix D**.
- 3.3 The construction noise levels were measured in terms of the A-weighted equivalent continuous sound pressure level ( $L_{Aeq}$ ) in decibels dB(A).  $L_{Aeq}$  (30min) (one set of 30-minute measurement) was used as the monitoring metric for the time period between 0700 – 1900 hours on normal weekdays.

#### **Monitoring Equipment and Methodology**

##### **Field Monitoring**

- 3.4 The monitoring procedures are as follows:
- The microphone head of the sound level meter was positioned 1m exterior of the noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.
  - The battery condition was checked to ensure good functioning of the meter.
  - Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
    - frequency weighting : A
    - time weighting : Fast
    - measurement time : 30 minutes (one set of 30-minute measurement of a  $L_{eq,30min}$  reading )

- Prior to and after noise measurement, the meter was calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement was required after re-calibration or repair of the equipment.
- The wind speed at the monitoring station was checked with the portable wind meter. Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.
- Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- At the end of the monitoring period, the  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- A façade correction of +3dB(A) shall be made to the noise parameter obtained by free field measurement.

### Monitoring Equipment

- 3.5 The sound level meters and calibrator used for the noise measurement, as listed in **Table 3.2**, compile with the IEC 651: 1979 and 804:1985 (Type 1) specification. The calibration certificates of the sound level meters are included in **Appendix C**.

**Table 3.2 Noise Monitoring Equipment**

Monitoring Equipment	Model (Serial no.)
Sound Level Meter	SVAN 955 (Serial no.: 12553) SVAN 957 (Serial no.: 21460 and 23853)
Calibrator	SV30A (Serial no.: 24791, 24780 and 24803)

### Maintenance and Calibration

- 3.6 Maintenance and Calibration procedures were as follows:
- The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
  - The sound level meter and calibrator were checked and calibrated at yearly intervals. Copies of calibration certificates are attached in **Appendix C**.

### Action & Limit Level for Construction Noise Monitoring

- 3.7 The Action and Limit Levels are presented in **Appendix B** and the Event / Action Plan (EAP) for noise monitoring is presented in **Appendix I**.

**Compliance Checking for Impact Monitoring**

- 3.8 The Baseline noise monitoring was conducted between 1 and 14 September 2014 at Harbour Centre. The Baseline noise monitoring results ( $L_{eq}(30min.)$  dB(A)) during the period without construction works on normal weekdays ranged from 67.1dB(A) to 73.0dB(A). Result of the monitoring (i.e. 69.6dB(A)) was used for correcting the measured noise level during the construction stage of the Project for normal weekdays by this formula:

Measured  $L_{eq}$  at the Harbour Centre – Baseline Noise Level (69.6 dB)

= Construction Noise Level at the Harbour Centre

**Continuous Noise Monitoring**

- 3.9 With reference to the latest Continuous Noise Monitoring Plan (CNMP) and Construction Noise Mitigation Measures Plan (CNMMP) prepared submitted under EP Condition 2.8 and Condition 2.7 respectively, it is predicted that no residual air-borne construction noise impacts exceeding the relevant noise criteria is anticipated. Therefore, no continuous noise monitoring is required during the construction of the SCL (HUH-ADM) under Works Contract 1126.

**Regular Construction Dust Monitoring**

- 3.10 The proposed dust monitoring stations for the construction phase of the Project, as recommended in the approved EM&A Manual, are listed in **Table 3.3** and shown in **Figure 3**. The proposed locations have been agreed with the ER, EPD and IEC.

**Table 3.3 Dust Monitoring Location**

Regular Dust Monitoring Location	Description
AM2 <sup>(1)</sup>	Wan Chai Sports Ground <sup>(2)</sup>
AM3 <sup>(1)</sup>	Existing Harbour Road Sports Centre

Note:

- (1) ASR ID as identified in approved EM&A Manual / EIA Report for SCL(HUH-ADM).  
(2) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.

**Monitoring Parameter and Frequency**

- 3.11 The dust monitoring (in terms of Total Suspended Particulates (TSP)) was conducted at the designated monitoring stations in accordance with the requirements stipulated in the EM&A Manual. The 24-hour TSP levels were monitored at the frequency and duration stated in **Table 3.4**. The TSP monitoring at two monitoring locations was conducted as per the schedule presented in **Appendix D**.

**Table 3.4 Dust Monitoring Parameters and Frequency**

Monitoring Period	Duration	Parameter	Frequency
Impact Monitoring <sup>(1)</sup>	Throughout the construction period	24-hour TSP	Once per 6 days

Note:

(1) 1- hour TSP shall be conducted when one documented valid complaint is received.

### Monitoring Equipment

3.12 **Table 3.5** summarizes the equipment used for the dust monitoring.

**Table 3.5 Dust Monitoring Equipment**

Equipment	Model and Make	Qty.
HVS	Tisch Environmental, Inc.; Model no. TE-5170, Serial no.: 1535, 5280	2
Calibration Orifice	Tisch Environmental, Inc.; Model no. TE – 5025A Orifice ID: 0993	1

### Instrumentation

3.13 High Volume Samplers (HVS) connected with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 Appendix B (Part 50).

### HVS Installation

3.14 The following guidelines were adopted during the installation of HVS:

- A horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- Two samplers should not be placed less than 2m apart;
- The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- A minimum of 2m separation from walls, parapets and penthouses is required for rooftops samplers;
- A minimum of 2m separation from any supporting structure, measures horizontally is required;
- No furnace or incinerator flue is located nearby the samplers;
- Airflow around the sampler is unrestricted;
- The sampler is more than 20m from the dripline;
- Any wire fence and gate to protect the sampler, should not cause any obstruction during monitoring;
- Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- A secured supply of electricity is needed to operate the samplers.

**Filters Preparation**

- 3.15 Fiberglass filters were used which have a collection efficiency of larger than 99% for particles of 0.3  $\mu\text{m}$  diameter. A HOKLAS accredited laboratory, Wellab Ltd. (HOKLAS Registration No. 083), was responsible for the preparation of pre-weighed filter papers for Cinotech's monitoring team.
- 3.16 All filters, which were prepared by Wellab Ltd., were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than  $\pm 3$  °C; the relative humidity (RH) was < 50% and not variable by more than  $\pm 5\%$ . A convenient working RH was 40%.
- 3.17 Wellab Ltd. has a comprehensive quality assurance and quality control programmes.

**Operating/Analytical Procedures**

- 3.18 Operating/analytical procedures for the TSP monitoring were highlighted as follows:
- Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 and 1.4  $\text{m}^3/\text{min.}$ ) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard.
  - The power supply was checked to ensure the sampler worked properly.
  - The filter holding frame and the area surrounding the filter were cleaned.
  - On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the air quality monitoring station.
  - The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
  - The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts to avoid air leakage at the edges.
  - The shelter lid was closed and secured with the aluminum strip.
  - A new flow rate record chart was set into the flow recorder.
  - The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
  - The flow rate of the HVS sampler would be verified to be constant and recorded on the data sheet before and after sampling.
  - The elapsed time and other relevant information was recorded. After sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
  - It was then placed in a clean plastic envelope and sealed and sent to the Wellab Ltd. for weighing.
  - Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment should be between 25°C and 30°C and not vary by more than  $\pm 3^\circ\text{C}$ ; the relative humidity (RH) should be < 50% and not vary by more than  $\pm 5\%$ . A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations collected by each filter.



**Maintenance/Calibration**

3.19 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. Copies of calibration certificates are attached in **Appendix C**.
- The HVS calibration orifice will be calibrated annually.

**Action and Limit Levels for Dust Monitoring**

3.20 The Action and Limit levels have been established and are presented in **Appendix B** and the Event / Action Plan (EAP) for dust monitoring is presented in **Appendix I**.

**Landscape and Visual**

3.21 In accordance with the EM&A Manual, the landscape and visual mitigation measures shall be implemented and a site inspection shall be conducted once every two weeks throughout the construction period. The implementation status is given in **Appendix J**.

#### **4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS**

- 4.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit and EM&A Manual. The implementation status of the environmental mitigation measures of the reporting period is summarized in **Appendix J**. Status of required submissions under the Environmental Permit (EP) of the reporting period is presented in **Table 4.1**.

**Table 4.1 Status of Required Submissions under EP**

<b>EP Condition</b>	<b>Submission</b>	<b>Submission Date</b>
Condition 3.4	Monthly EM&A Report (September 2014)	14 October 2014

## 5 MONITORING RESULTS

### Regular Construction Noise Monitoring

- 5.1 A total of 5 sets of 30-minute construction noise measurements were carried out at the monitoring stations during normal weekdays of the reporting period by ET of SCL Works Contract 1126. No exceedance of the limit level was recorded at designated monitoring stations.
- 5.2 Based on observation during the on-site monitoring, road traffic nearby is considered as a potential noise source other than construction works of the Project that affects the monitoring results of the reporting month.
- 5.3 The noise monitoring results together with their graphical presentations are presented in **Appendix F** and a summary of the noise monitoring results in this reporting month is given in **Table 5.1**.

**Table 5.1 Summary Table of Noise Monitoring Results during the reporting month**

Parameter <sup>(1)</sup>	Location	Range, dB(A), L <sub>eq</sub> (30 mins) <sup>(2)</sup>	Limit Level, dB(A), L <sub>eq</sub> (30 mins)
Noise (NM2)	Harbour Centre	< baseline – 72.4	75

**Remarks:**

- (1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HUH-ADM).
- (2) The Range presented in the above table was baseline corrected noise level.
- 5.4 No exceedance of the Action and Limit Levels of construction noise due to the Project was recorded during the reporting period.

### Regular Dust Monitoring

- 5.5 10 sets of 24-hour TSP monitoring were carried out at the designated monitoring stations during normal weekdays of the reporting period by ET of SCL Works Contract 1126. The monitoring results together with their graphical presentations are presented in **Appendix E** and a summary of the dust monitoring results in this reporting month is given in **Table 5.2**.

**Table 5.2 Summary Table of Dust Monitoring Results during the reporting month**

Parameter	Minimum µg/m <sup>3</sup>	Maximum µg/m <sup>3</sup>	Average µg/m <sup>3</sup>	Action Level, µg/m <sup>3</sup>	Limit Level, µg/m <sup>3</sup>
24-hr TSP (AM2 <sup>(1)</sup> )	115.2	143.7	130.2	160	260
24-hr TSP (AM3 <sup>(1)</sup> )	87.0	125.5	101.6	169	260

**Remarks:** (1) Station ID as identified in approved EM&A Manual / EIA Report for SCL(HUH-ADM).

- 5.6 Based on observation during the on-site monitoring, road traffic emission nearby is considered as a potential dust source other than construction works of the Project that affects the monitoring results of the reporting month.
- 5.7 Wind monitoring data were obtained from Star Ferry Meteorological Station of Hong Kong Observatory and shown on **Appendix E**.

- 5.8 No exceedance of the Action and Limit Levels of the 24-hour TSP was recorded during the reporting period.

### Waste Management

- 5.9 Waste generated from this Project includes inert construction and demolition (C&D) materials and non-inert C&D materials. Non-inert C&D materials are made up of general refuse and recyclable wastes like plastics and paper/cardboard packaging materials. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in **Table 5.3**. Details of waste management data is presented in **Appendix K**. 0 m<sup>3</sup> of inert C&D material was re-used on-site and by other projects.

**Table 5.3 Quantities of Waste Generated from the Project**

Reporting Month	Quantity					
	C&D Materials (inert) <sup>(a)</sup>	C&D Materials (non-inert) <sup>(b)</sup>				
		General Refuse	Chemical Waste	Recycled materials		
				Paper/ cardboard	Plastics	Metals
October 2014	907 m <sup>3</sup>	16 m <sup>3</sup>	0kg	0 kg	0kg	28,285kg
Notes:						
(a) Inert C&D materials include bricks, concrete, building debris, rubble and excavated soil,						
(b) Non-inert C&D materials include steel, paper/cardboard packaging waste, plastics and other wastes such as general refuse and vegetative wastes. Steel materials generated from the project are grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials.						

### Landscape and Visual

- 5.10 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 15 and 29 October 2014. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

## 6 ENVIRONMENTAL SITE INSPECTION

### Site Audit

- 6.1 Site audit was carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audit are attached in **Appendix H**.
- 6.2 Site audits were conducted on 8, 15, 22 and 29 October 2014 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 8 October 2014. No site inspection was conducted by EPD during the reporting month. The details of observations during site audit can refer to **Table 6.1**.

### Implementation Status of Environmental Mitigation Measures

- 6.3 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix J**.
- 6.4 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

**Table 6.1 Observations and Recommendations of Site Audit**

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	--	--	--
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Air Quality</i>	29 Sep 2014	<u>Reminder:</u> Inactive stockpile material is observed to be exposed in WCSG (demolition area). The Contractor is reminded to cover the exposed stockpile material properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 8 October 2014.
	8 Oct 2014	<u>Reminder:</u> Unpaved area in PTI area is observed dry. The Contractor is reminded to provide water spray regularly to avoid dust generation.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 October 2014.
	15 Oct 2014	<u>Observation:</u> Excavation Area in PTI Area was observed dry. The Contractor is reminded to provide water spray to prevent dust generation.	The observation was observed to be improved/rectified by the Contractor during the audit session on 22 October 2014.
	29 Oct 2014	<u>Reminder:</u> To cover the stockpile of dusty material properly by tarpaulin sheets at PTI Area.	Follow up action will be reported in next reporting month.
<i>Waste / Chemical Management</i>	--	--	--
<i>Permits/ Licenses</i>	--	--	--

## **7 ENVIRONMENTAL NON-CONFORMANCE**

### **Summary of Exceedances**

- 7.1 No exceedance of the Action and Limit Levels of regular construction noise monitoring and 24-hour TSP monitoring was recorded during the reporting period. The summary of exceedance is provided in **Appendix G**.

### **Summary of Environmental Non-Compliance**

- 7.2 No environmental non-compliance was recorded in the reporting month.

### **Summary of Environmental Complaint**

- 7.3 No environmental Project-related complaint was received in the reporting month. The Cumulative Complaint Log since the commencement of the Project is presented in **Appendix L**.

### **Summary of Environmental Summon and Successful Prosecution**

- 7.4 There was no successful environmental prosecution or notification of summons received since the Project commencement. The Cumulative Log for environmental summon and successful prosecution since the commencement of the Project is presented in **Appendix L**.

## 8 FUTURE KEY ISSUES

### Construction Programme for the Next Month

- 8.1 A tentative construction programme is provided in **Appendix A**. The major construction activities in the coming month will include:

#### At Public Transport Interchange (PTI) Area

- Construction of Petrol Interception;
- Manhole construction & underground utilities connection;
- Construction of Store Room;
- Construction of ducting for street lighting;
- Construction of footing for bus shelter and signage post.

### Key Issues in the Next Month

- 8.2 Key issues to be considered in the coming month include:

- Dust impact from stockpile of dusty materials and unpaved works area;
- Wastewater from surface runoff;
- Waste management;
- Preservation and protection of retained and transplanted trees; and
- Noise impact from construction works.

### Monitoring Schedule in the Next Month

- 8.3 The tentative schedule of regular construction noise monitoring and 24-hour TSP monitoring at all the monitoring locations in the next reporting period is presented in **Appendix D**. The regular construction noise monitoring and 24-hour TSP monitoring will be conducted at the same monitoring locations in the next reporting period.

## 9 CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- 9.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 31 October 2014 in accordance with EM&A Manual and the requirement under EP.
- 9.2 No exceedance of the Action and Limit Levels of regular construction noise and 24-hour TSP monitoring was recorded at the designated monitoring stations during the reporting month.
- 9.3 4 times of joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET and 2 times of bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted during the reporting period.
- 9.4 There was no Project related environmental complaint, successful prosecution or notification of summons received during the reporting month.
- 9.5 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

### Recommendations

- 9.6 According to the environmental audit performed in the reporting month, the following recommendations were made:

#### Water Quality

- N/A

#### Landscape and Visual

- N/A

#### Noise

- N/A

#### Air Quality

- The Contractor is reminded to provide frequent water spraying to unpaved works area.
- The Contractor is reminded to cover the stockpile of dusty material properly by tarpaulin sheets at PTI Area.

#### Waste/Chemical Management

- N/A



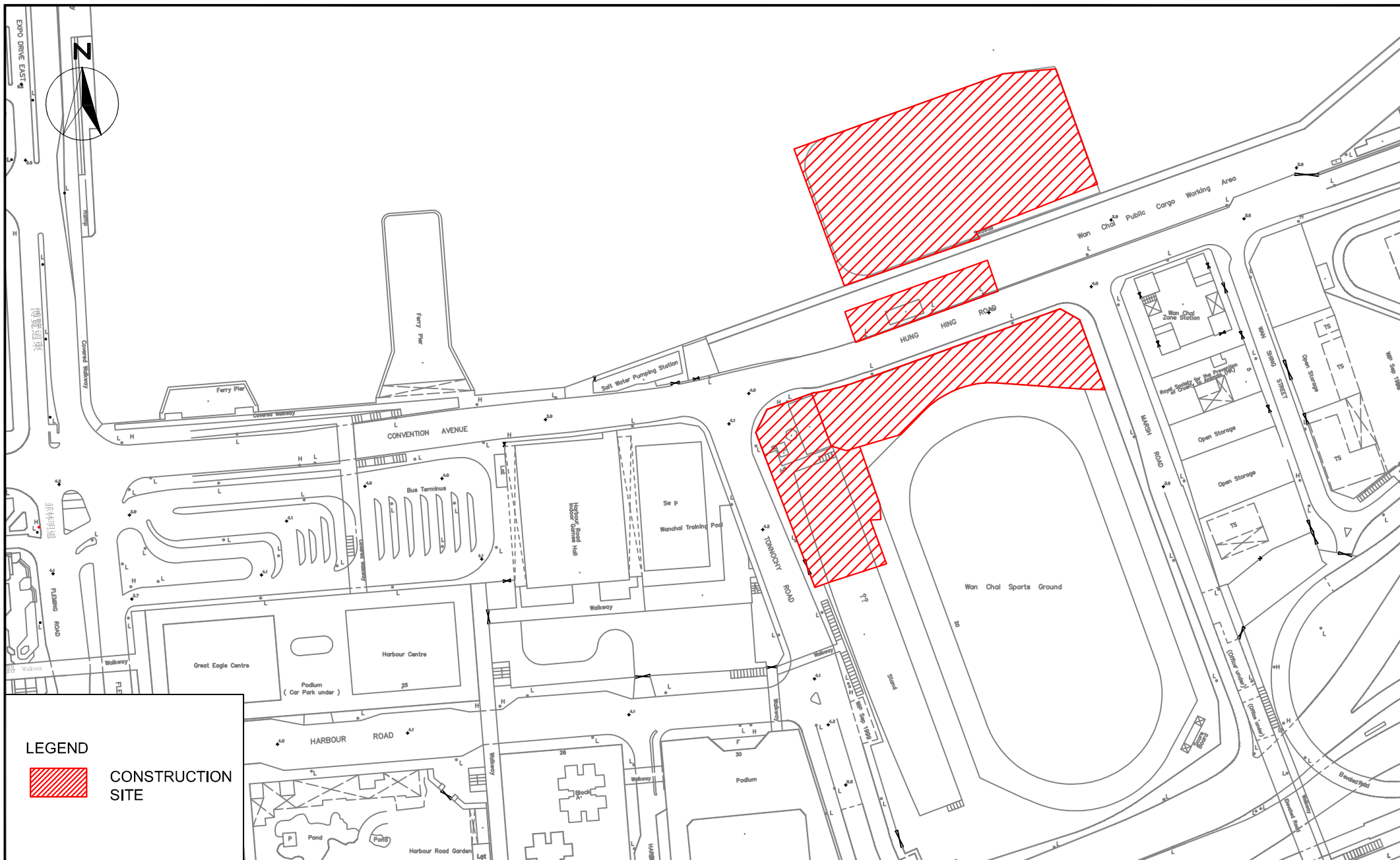
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## FIGURES

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# LEGEND



CONSTRUCTION SITE

**CINOTECH**  
Cinotech Consultants Limited

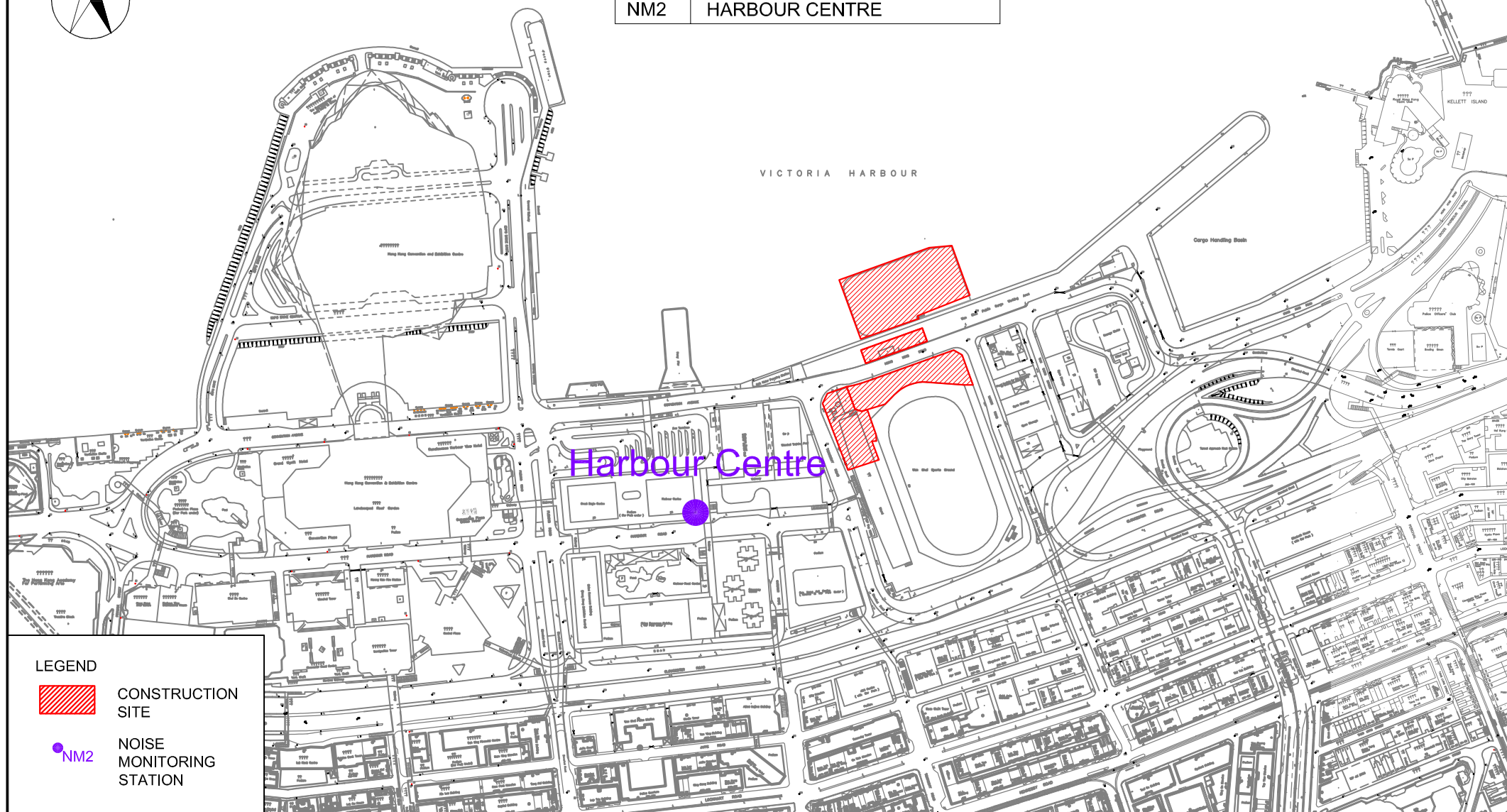
MTR 1126 REPROVISIONING OF HARBOUR ROAD SPORTS CENTRE AND  
WAN CHAI SWIMMING POOL

## SITE LAYOUT PLAN

SCALE	1:2000 @ A4	DATE	NOV 2014
CHECK	JF	DRAWN	JW
JOB No.	MA14009	FIGURE NO.	1
		REV	-



	NOISE MONITORING STATION
NM2	HARBOUR CENTRE



#### LEGEND



CONSTRUCTION  
SITE



NM2  
NOISE  
MONITORING  
STATION

**CINOTECH**  
Cinotech Consultants Limited

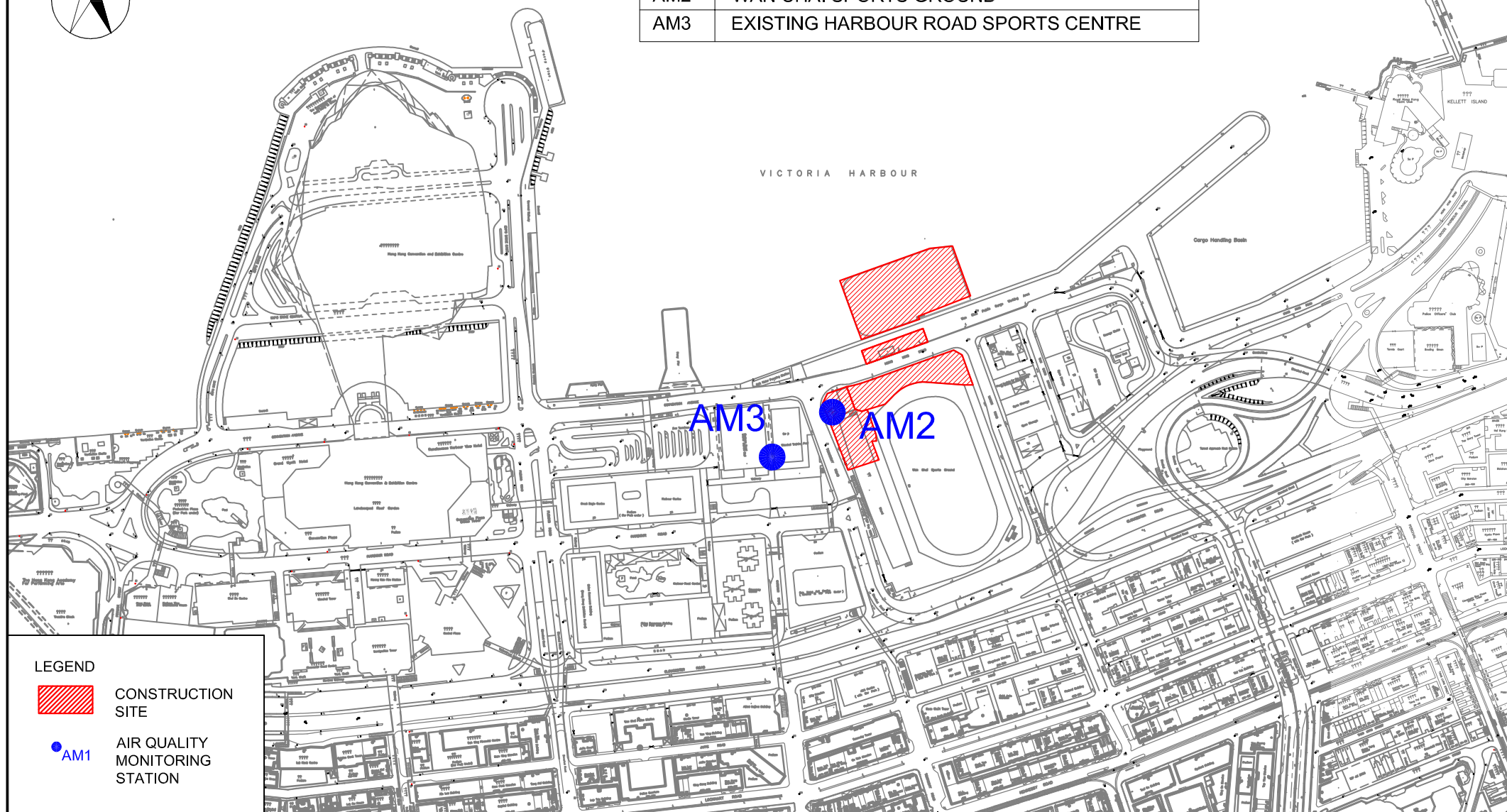
MTR 1126 REPROVISIONING OF HARBOUR ROAD SPORTS CENTRE AND  
WAN CHAI SWIMMING POOL

## LOCATION OF NOISE MONITORING STATION

SCALE	1:5000 @ A4	DATE	NOV 2014
CHECK	JF	DRAWN	JW
JOB No.	MA14009	FIGURE NO.	2
		REV	-



	AIR QUALITY MONITORING STATION
AM2	WAN CHAI SPORTS GROUND
AM3	EXISTING HARBOUR ROAD SPORTS CENTRE



#### LEGEND



CONSTRUCTION  
SITE



AM1

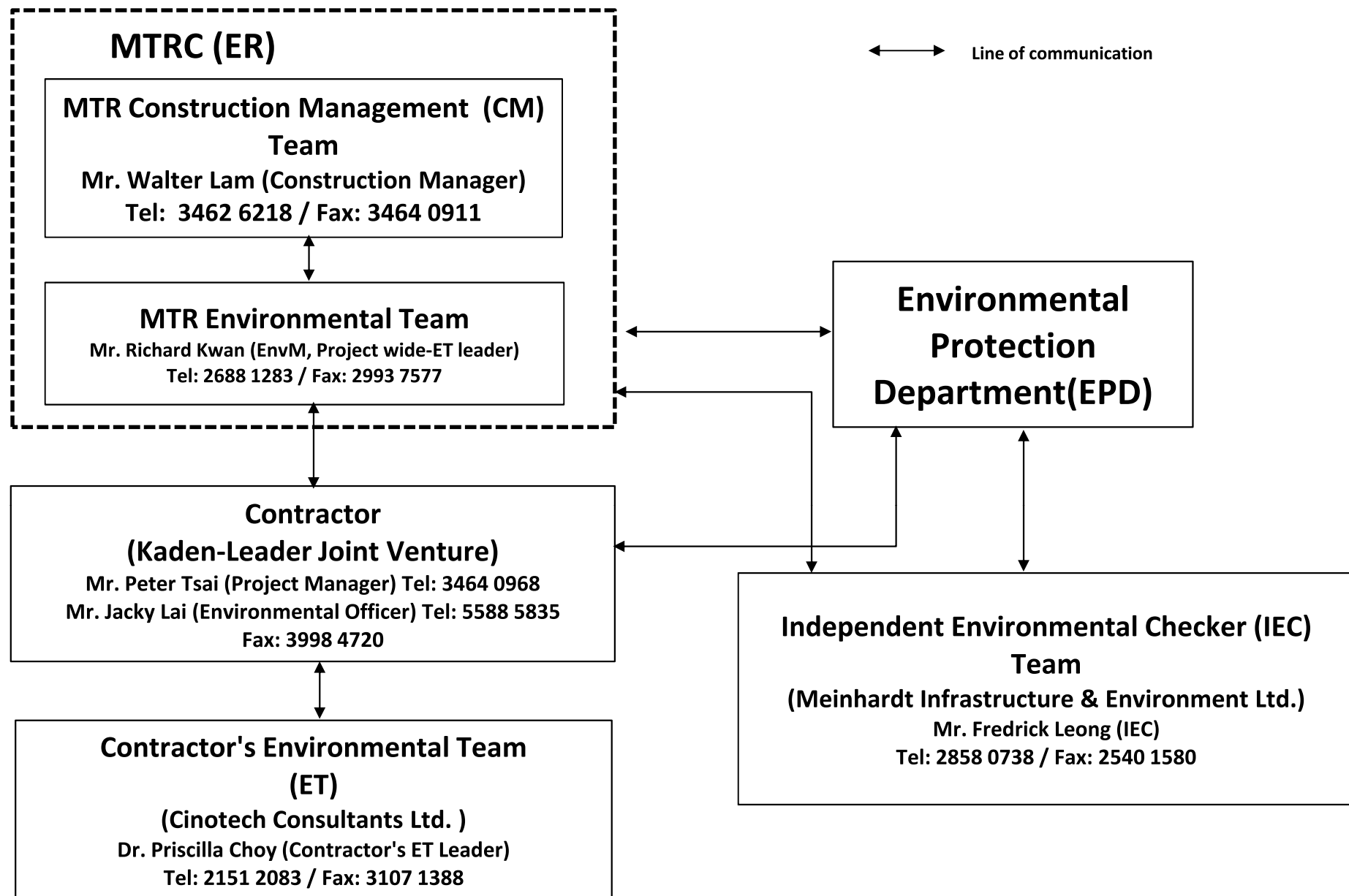
AIR QUALITY  
MONITORING  
STATION

**CINOTECH**  
Cinotech Consultants Limited

MTR 1126 REPROVISIONING OF HARBOUR ROAD SPORTS CENTRE AND  
WAN CHAI SWIMMING POOL

## LOCATION OF AIR QUALITY MONITORING STATIONS

SCALE	1:5000 @ A4	DATE	NOV 2014
CHECK	JF	DRAWN	JW
JOB No.	MA14009	FIGURE NO.	3
		REV	-



Title SCL Contract 1126  
The Shatin to Central Link -  
Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool  
Project Organisation for Environmental Works

Scale	N.T.S	Proposal No.	MA14009
Date	Jul-14	Figure	4

**CINOTECH**

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**APPENDIX A  
TENTATIVE CONSTRUCTION  
PROGRAMME**


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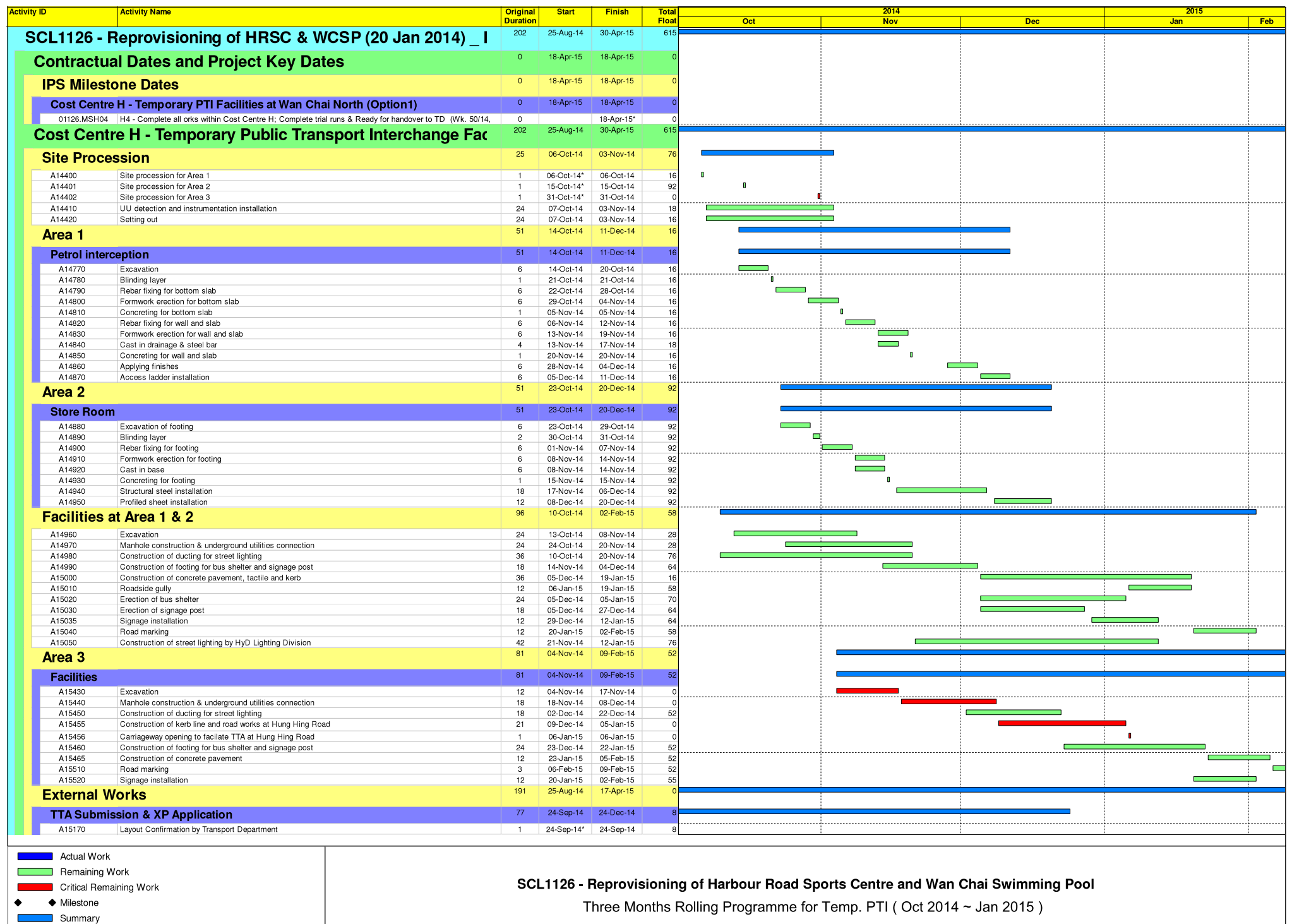
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2014					2015	
						Oct	Nov	Dec	Jan	Feb		
A4224	Submission of Final Amendment to FSD	2	28-Jul-14 A	28-Jul-14 A								
A4225	Approval of Final Amendment from FSD	24	29-Jul-14 A	29-Jul-14 A								
A4230	Submit Forms FS 314 & FS 501	10	29-Aug-14 A	24-Sep-14 A								
A4240	FS Inspection	1	25-Sep-14 A	25-Sep-14 A								
A4250	Obtain FS Certificate & OP	2	29-Sep-14 A	30-Sep-14 A								
A5590	Cleaning and Pre-handover to LCSD	1	10-Sep-14 A	11-Sep-14 A								
A5600	Site handover to LCSD (New Provisions)	1	12-Sep-14 A	12-Sep-14 A								
<b>Cost Centre F - Demolition Works at WCSG</b>		247	12-May-14 A	20-Oct-14 A								
<b>Demolition Plan</b>		87	12-May-14 A	10-Jul-14 A								
A9560	Demolition Plan - Prepare & Submit - 1st Round	6	12-May-14 A	16-May-14 A								
A9570	Demolition Plan - Comment & Approval - 1st Round	6	17-May-14 A	23-May-14 A								
A9580	Demolition Plan - Prepare & Submit - 2nd Round	6	24-May-14 A	12-Jun-14 A								
A9590	Demolition Plan - Comment & Approval - 2nd Round	6	13-Jun-14 A	09-Jul-14 A								
A9600	Demolition Plan - ICC Submission & Approval	10	10-Jul-14 A	10-Jul-14 A								
<b>Demolition Works</b>		235	03-Jun-14 A	20-Oct-14 A								
A9610	Site Procession	0	03-Jun-14 A	03-Jun-14 A								
A9620	Erection of covered hoarding and temp. staircase outside Sport Ground	12	03-Jun-14 A	16-Jun-14 A								
A9630	Erection of covered hoarding and temp. staircase inside Sport Ground	6	16-Jun-14 A	25-Jul-14 A								
A9640	Temporary works / precaution measures for demolition works	6	14-Jun-14 A	07-Jul-14 A								
A9650	Joint site inspection and obtain approval by ICC prior to actual demolition	3	08-Jul-14 A	08-Jul-14 A								
A9660	Demolition works	72	09-Jul-14 A	22-Sep-14 A								
A9670	Ground formation	26	23-Sep-14 A	26-Sep-14 A								
A9671	Pre-drill and instrumentation installation (Piezometer and utility settlement marker)	6	22-Sep-14 A	17-Oct-14 A								
A9680	Site cleaning and touch up	26	27-Sep-14 A	20-Oct-14 A								
A9690	Ready for site handover and Handover	60	30-Sep-14 A	30-Sep-14 A								

 Actual Work  
 Remaining Work  
 Critical Remaining Work  
 Milestone  
 Summary

### SCL1126 - Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool

Three Months Rolling Programme for WCSG ( Oct 2014 ~ Jan 2015 )





Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2014					2015			
						Oct	Nov	Dec	Jan	Feb				
A15180	Preparation of operation plan for Fleming Road Junction Convention Avenue	12	25-Sep-14	10-Oct-14	8									
A15190	Submission and Approval of operation plan for Fleming Road Junction Convetion Avenue	52	11-Oct-14	10-Dec-14	8									
A15200	Preparation of operation plan for Hung Hing Road Junction Marsh Road	24	25-Sep-14	24-Oct-14	8									
A15210	Submission and Approval of operation plan for Hung Hing Road Junction Marsh Road	52	25-Oct-14	24-Dec-14	8									
<b>Hung Hing Road Junction Marsh Road</b>		129	08-Nov-14	17-Apr-15	0									
A15070	eProms ordering by EMSD	52	08-Nov-14	10-Jan-15	68									
A15080	Construction of ducting and draw pits for traffic signal at Hung Hing Road (Link by link)	24	07-Jan-15	03-Feb-15	0									
A15090	Construction of road island at Hung Hing Road	12	04-Feb-15	17-Feb-15	0									
A15091	Construction of ducting and draw pits for traffic signal at Marsh Road	24	18-Feb-15	20-Mar-15	0									
A15092	Construction of pedestrian crossing at Marsh Road	18	14-Mar-15	07-Apr-15	0									
A15100	Installation of traffic signal	6	08-Apr-15	14-Apr-15	0									
A15110	Road marking	3	15-Apr-15	17-Apr-15	0									
<b>Bus Stop at Convention Avenue</b>		57	11-Dec-14	18-Feb-15	44									
A15150	Removal of existing railing (3nos of bus stop)	12	02-Feb-15	14-Feb-15	8									
A15160	Road marking (3nos of bus stop)	3	16-Feb-15	18-Feb-15	44									
<b>1 no of bus stop with bus shelter</b>		42	11-Dec-14	31-Jan-15	8									
A15540	Relocation of street lighting (1no of bus stop)	24	11-Dec-14	10-Jan-15	8									
A15550	Construction of footing and erection of bus shelter	18	12-Jan-15	31-Jan-15	8									
<b>Bus Stop at Fleming Road</b>		183	25-Aug-14	08-Apr-15	8									
A15230	Relocation of street lighting	18	25-Aug-14*	15-Sep-14	134									
A15240	Relocation of signage	12	16-Sep-14	29-Sep-14	134									
A15250	Construction of bus lay-by	24	30-Sep-14	29-Oct-14	134									
A15260	Road marking	3	02-Apr-15	08-Apr-15	8									
<b>Modification Works at Fleming Road</b>		39	16-Feb-15	08-Apr-15	8									
A15280	Relocation of street lighting	12	16-Feb-15	04-Mar-15	8									
A15290	Modification work of island	12	05-Mar-15	18-Mar-15	8									
A15300	Relocation of traffic signal	12	19-Mar-15	01-Apr-15	8									
A15310	Road marking	3	02-Apr-15	08-Apr-15	8									
<b>Bus Stop at Harbour Road</b>		1	08-Apr-15	08-Apr-15	8									
A15270	Road marking	1	08-Apr-15	08-Apr-15	8									
<b>Statutory Inspection and Handover</b>		25	30-Mar-15	30-Apr-15	615									
A15051	Submission of FS314 and 251	12	30-Mar-15	15-Apr-15	0									
A15052	FSD Inspection	2	16-Apr-15	17-Apr-15	0									
A15053	FS Certificate	6	18-Apr-15	24-Apr-15	1									
A15055	Handover to MTR	1	18-Apr-15	18-Apr-15	0									
A15060	Trial Run	10	20-Apr-15	30-Apr-15	615									

- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone
- Summary

**SCL1126 - Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool**  
Three Months Rolling Programme for Temp. PTI ( Oct 2014 ~ Jan 2015 )

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**APPENDIX B**  
**ACTION AND LIMIT LEVELS**

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**APPENDIX B – Action and Limit Levels****24-Hour TSP**

<b>Regular Dust Monitoring Location</b>	<b>Description</b>	<b>Action Level, <math>\mu\text{g}/\text{m}^3</math></b>	<b>Limit Level, <math>\mu\text{g}/\text{m}^3</math></b>
AM2 <sup>(1)(2)</sup>	Wan Chai Sports Ground	160	260
AM3 <sup>(1)</sup>	Existing Harbour Road Sports Centre	169	260

Note:

(1) ASR ID as identified in approved EM&amp;A Manual / EIA Report for SCL(HUH-ADM).

(2) The spectator stand at Wan Chai Sports Ground was not available for impact dust monitoring, therefore impact monitoring was conducted at the existing water pump room area at Wan Chai Sports Ground.

**Construction Noise**

<b>Regular Construction Noise Monitoring Location<sup>(1)</sup></b>	<b>Description</b>	<b>Time Period</b>	<b>Action Level</b>	<b>Limit Level</b>
NM2 <sup>(1)(2)</sup>	Harbour Centre (7/F)	0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)

Note:

(1) NSR ID as identified in approved EM&amp;A Manual / EIA Report for SCL(HUH-ADM).

(2) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.

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**APPENDIX C  
CALIBRATION CERTIFICATES FOR  
MONITORING EQUIPEMENT**

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# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET

**CINOTECH**

File No. MA14009/53/0003

Station AM2 - Wan Chai Sports Ground Operator: WK  
 Date: 3-Oct-14 Next Due Date: 2-Dec-14  
 Equipment No.: A-01-53 Serial No. 1535

Ambient Condition			
Temperature, Ta (K)	303.5	Pressure, Pa (mmHg)	758.6

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0582	Intercept, bc	-0.0249
Last Calibration Date:	27-Sep-14	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Sep-15	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	$\Delta H$ (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	$\Delta W$ (HVS), in. of oil Y-axis	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$
1	11.5	3.36	58.11	6.7	2.56
2	8.9	2.95	51.17	5.3	2.28
3	7.5	2.71	47.01	4.3	2.05
4	4.8	2.17	37.69	2.8	1.66
5	3.1	1.74	30.38	1.9	1.36

### By Linear Regression of Y on X

Slope, mw = 0.0436 Intercept, bw = 0.0253

Correlation coefficient\* = 0.9992

\*If Correlation Coefficient < 0.990, check and recalibrate.

### Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W =  $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  3.69

Remarks: \_\_\_\_\_

Conducted by: Wk Tang

Signature: \_\_\_\_\_

Date: 3/10/14

Checked by: Wk Tang

Signature: \_\_\_\_\_

Date: 3 October 2014

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET

**CINOTECH**

File No. MA14009/41/0003

Station AM3 - Existing Harbour Road Sports Centre Operator: WK  
 Date: 3-Oct-14 Next Due Date: 2-Dec-14  
 Equipment No.: A-01-41 Serial No. 5280

Ambient Condition			
Temperature, Ta (K)	303.3	Pressure, Pa (mmHg)	760

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0582	Intercept, bc	-0.0249
Last Calibration Date:	27-Sep-14	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Sep-15	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	$\Delta H$ (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	$\Delta W$ (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	10.7	3.24	56.14	7.0	2.62
2	8.4	2.87	49.79	5.6	2.35
3	6.5	2.53	43.85	4.5	2.10
4	4.2	2.03	35.33	2.9	1.69
5	2.1	1.44	25.11	1.8	1.33

By Linear Regression of Y on X

Slope, mw = 0.0422 Intercept, bw = 0.2419

Correlation coefficient\* = 0.9986

\*If Correlation Coefficient < 0.990, check and recalibrate.

### Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point;  $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  4.31

Remarks: \_\_\_\_\_

Conducted by: Wk. Tang

Signature: \_\_\_\_\_

Date: 3/10/14

Checked by: h

Signature: \_\_\_\_\_

Date: 3 October 2014

## TEST REPORT

Description Calibration Orifice  
Serial No. 0993  
Model No. TE-5025A  
Date 27 September 2014

Manufacturer TISCH  
Temperature, Ta (K) 299  
Pressure, Pa (mmHg) 761.8  
Equipment No.: A-04-04

Plate	Diff.Vol (m <sup>3</sup> )	Diff.Time (min)	Diff.Hg (mm)	Diff.H <sub>2</sub> O (in.)
1	1.00	1.4230	3.3	2.00
2	1.00	1.0050	6.5	4.00
3	1.00	0.8950	8.2	5.00
4	1.00	0.8570	9.0	5.50
5	1.00	0.7080	13.0	8.00

### DATA TABULATION

Vstd	(X axis) Qstd	(Y axis)
0.9947	0.6990	1.4135
0.9905	0.9856	1.9990
0.9883	1.1042	2.2350
0.9872	1.1519	2.3441
0.9820	1.3870	2.8270

Y axis=  $\text{SQRT}[\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta})]$

Qstd Slope ( m ) = 2.05398

Intercept ( b ) = -0.02487

Coefficient ( r ) = 0.99996

Va	(X axis) Qa	(Y axis)
0.9957	0.6997	0.8860
0.9915	0.9865	1.2530
0.9892	1.1053	1.4009
0.9882	1.1531	1.4693
0.9829	1.3883	1.7720

Y axis=  $\text{SQRT}[\text{H}_2\text{O}(\text{Ta}/\text{Pa})]$

Qa Slope ( m ) = 1.28617

Intercept ( b ) = -0.01559

Coefficient ( r ) = 0.99996

### CALCULATIONS

$V_{\text{std}} = \text{Diff. Vol}[(\text{Pa} - \text{Diff. Hg})/760](298/\text{Ta})$

$Q_{\text{std}} = V_{\text{std}}/\text{Time}$

$V_{\text{a}} = \text{Diff. Vol}[(\text{Pa} - \text{Diff. Hg})/\text{Pa}]$

$Q_{\text{a}} = V_{\text{a}}/\text{Time}$

For subsequent flow rate calculations:

$Q_{\text{std}} = 1/m\{[\text{SQRT}(\text{H}_2\text{O}(\text{Pa}/760)(298/\text{Ta}))]-b\}$

$Q_{\text{a}} = 1/m\{[\text{SQRT}(\text{H}_2\text{O}(\text{Ta}/\text{Pa}))]-b\}$

PREPARED AND CHECKED BY:  
For and On Behalf of **WELLAB Ltd.**

*Patrick Tse*

**PATRICK TSE**  
Laboratory Manager



## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.: C/N/140919/1  
Date of Issue: 2014-09-21  
Date Received: 2014-09-19  
Date Tested: 2014-09-21  
Date Completed: 2014-09-21  
Next Due Date: 2015-09-20

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description : 'SVANTEK' Integrating Sound Level Meter  
Manufacturer : SVANTEK  
Model No. : SVAN 955  
Serial No. : 12553  
Microphone No. : 35222  
Equipment No. : N-08-02

**Test conditions:**

Room Temperature : 23 degree Celsius  
Relative Humidity : 55%

**Test Specifications:**

Performance checking at 94 and 114 dB

**Methodology:**


In-house method, according to manufacturer instruction manual

**Results:**

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/140822/1
Date of Issue:	2014-08-25
Date Received:	2014-08-22
Date Tested:	2014-08-22
Date Completed:	2014-08-25
Next Due Date:	2015-08-24

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21460
Microphone No.	: 43679
Equipment No.	: N-08-09

**Test conditions:**

Room Temperature	: 22 degree Celsius
Relative Humidity	: 55%

**Test Specifications:**

Performance checking at 94 and 114 dB

**Methodology:**

In-house method, according to manufacturer instruction manual

**Results:**

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/131129/1
Date of Issue:	2013-11-30
Date Received:	2013-11-29
Date Tested:	2013-11-29
Date Completed:	2013-11-30
Next Due Date:	2014-11-29

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Certificate of Calibration

**Item for calibration:**

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 23853
Microphone No.	: 48530
Equipment No.	: N-08-10

**Test conditions:**

Room Temperature	: 19 degree Celsius
Relative Humidity	: 57%

**Test Specifications:**

Performance checking at 94 and 114 dB

**Methodology:**

In-house method, according to manufacturer instruction manual

**Results:**

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/141003/1
Date of Issue:	2014-10-04
Date Received:	2014-10-03
Date Tested:	2014-10-03
Date Completed:	2014-10-04
Next Due Date:	2015-10-03

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

### Test conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 56%

### Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**

Laboratory Manager

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/131004/1
Date of Issue:	2013-10-05
Date Received:	2013-10-04
Date Tested:	2013-10-04
Date Completed:	2013-10-05
Next Due Date:	2014-10-04

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

### Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 57%

### Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/131004/2
Date of Issue:	2013-10-05
Date Received:	2013-10-04
Date Tested:	2013-10-04
Date Completed:	2013-10-05
Next Due Date:	2014-10-04

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24791
Equipment No.	: N-09-04

### Test conditions:

Room Temperature	: 21 degree Celsius
Relative Humidity	: 57%

### Methodology:

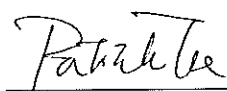
The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**

Laboratory Manager

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/141003/2
Date of Issue:	2014-10-04
Date Received:	2014-10-03
Date Tested:	2014-10-03
Date Completed:	2014-10-04
Next Due Date:	2015-10-03

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24791
Equipment No.	: N-09-04

### Test conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 56%

### Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**

*Laboratory Manager*

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/131004/3
Date of Issue:	2013-10-05
Date Received:	2013-10-04
Date Tested:	2013-10-04
Date Completed:	2013-10-05
Next Due Date:	2014-10-04

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24780
Equipment No.	: N-09-05

### Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 57%

### Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

*PREPARED AND CHECKED BY:*  
For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager



## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/N/141003/3
Date of Issue:	2014-10-04
Date Received:	2014-10-03
Date Tested:	2014-10-03
Date Completed:	2014-10-04
Next Due Date:	2015-10-03

**ATTN:** Mr. W.K. Tang

Page: 1 of 1

### Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24780
Equipment No.	: N-09-05

### Test conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 56%

### Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

### Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

---

**APPENDIX D**  
**IMPACT MONITORING SCHEDULE**

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**Shatin to Central Link – Contract 1126 Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool  
Environmental Monitoring Schedule for October 2014**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			<b>1-Oct</b>	<b>2-Oct</b>	3-Oct	4-Oct
					Noise Monitoring	
<b>5-Oct</b>	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct
	24 hr TSP		Noise Monitoring			24 hr TSP
<b>12-Oct</b>	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct
		Noise Monitoring			24 hr TSP	
<b>19-Oct</b>	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct
	Noise Monitoring			24 hr TSP		
<b>26-Oct</b>	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	
			24 hr TSP	Noise Monitoring		

**Noise Monitoring Station**

NM2: Harbour Centre

**Air Quality Monitoring Station**

AM2: Wan Chai Sports Ground

AM3: Existing Harbour Road Sports Centre

**Shatin to Central Link – Contract 1126 Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool  
Tentative Environmental Monitoring Schedule for November 2014**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Nov
2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov
		24 hr TSP	Noise Monitoring			
9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov
	24 hr TSP		Noise Monitoring		24 hr TSP	
16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov
		Noise Monitoring		24 hr TSP		
23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov
			24 hr TSP	Noise Monitoring		
30-Nov						

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Noise Monitoring Station**

NM2: Harbour Centre

**Air Quality Monitoring Station**

AM2: Wan Chai Sports Ground

AM3: Existing Harbour Road Sports Centre

**Shatin to Central Link – Contract 1126 Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool**  
**Tentative Environmental Monitoring Schedule for December 2014**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec
		24 hr TSP		Noise Monitoring		
7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec
	24 hr TSP		Noise Monitoring		24 hr TSP	
14-Dec	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec
			Noise Monitoring	24 hr TSP		
21-Dec	22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec
		Noise Monitoring	24 hr TSP			
28-Dec	29-Dec	30-Dec	31-Dec			
	Noise Monitoring	24 hr TSP				

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Noise Monitoring Station**

NM2: Harbour Centre

**Air Quality Monitoring Station**

AM2: Wan Chai Sports Ground

AM3: Existing Harbour Road Sports Centre

**Shatin to Central Link – Contract 1126 Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool**  
**Tentative Environmental Monitoring Schedule for January 2015**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Jan	2-Jan	3-Jan
4-Jan	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan	10-Jan
	24 hr TSP		Noise Monitoring		24 hr TSP	
11-Jan	12-Jan	13-Jan	14-Jan	15-Jan	16-Jan	17-Jan
			Noise Monitoring	24 hr TSP		
18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan
		Noise Monitoring	24 hr TSP			
25-Jan	26-Jan	27-Jan	28-Jan	29-Jan	30-Jan	31-Jan
	Noise Monitoring	24 hr TSP				

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Noise Monitoring Station**

NM2: Harbour Centre

**Air Quality Monitoring Station**

AM2: Wan Chai Sports Ground

AM3: Existing Harbour Road Sports Centre

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**APPENDIX E**  
**24-HOUR TSP MONITORING RESULTS**  
**AND GRAPHICAL PRESENTATIONIS**

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## Appendix E - 24-hour TSP Monitoring Results

### Location AM2 - Wan Chai Sports Ground

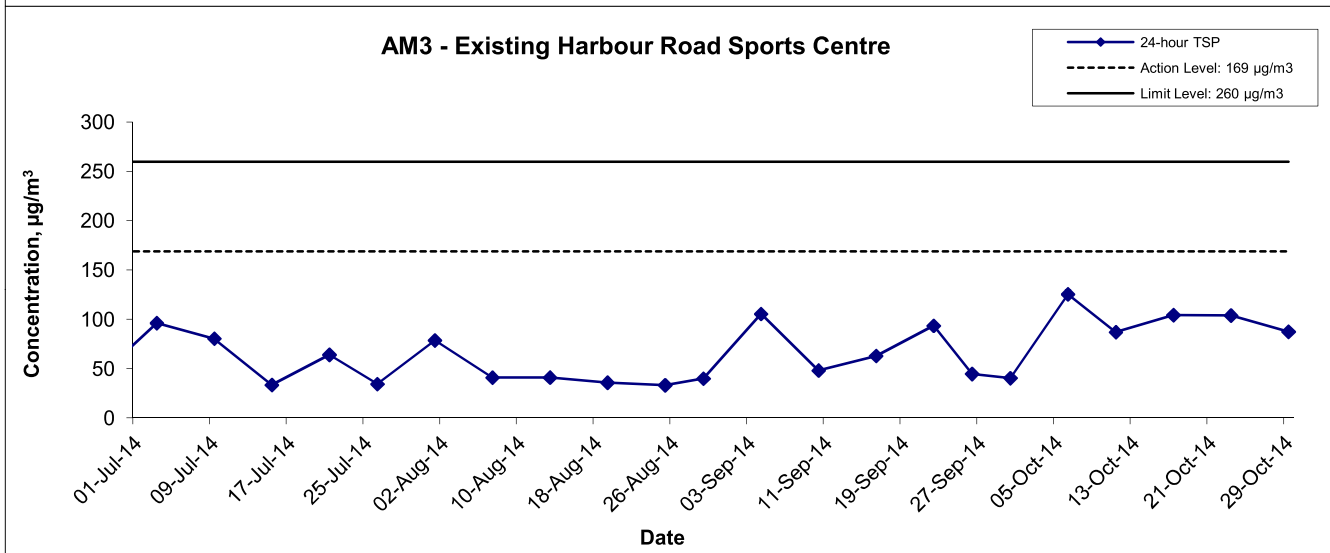
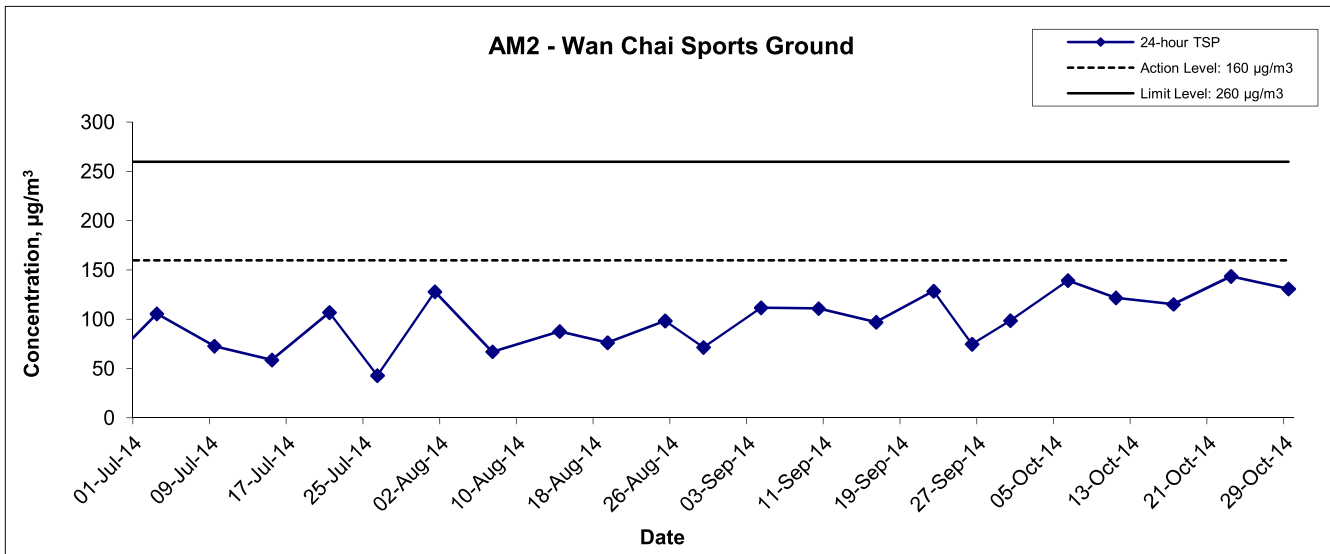
Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
					Initial	Final		Initial	Final		Initial	Final			
6-Oct-14	13:00	Sunny	301.9	763.4	3.2214	3.4676	0.2462	6042.4	6066.4	24.0	1.23	1.23	1.23	1766.6	139.4
11-Oct-14	09:00	Sunny	299.5	761.8	3.2375	3.4533	0.2158	6066.4	6090.4	24.0	1.23	1.23	1.23	1771.9	121.8
17-Oct-14	09:00	Sunny	297.2	767.1	3.1441	3.3498	0.2057	6090.4	6114.4	24.0	1.24	1.24	1.24	1785.0	115.2
23-Oct-14	09:00	Sunny	295.4	765.7	3.2137	3.4707	0.2570	6114.4	6138.4	24.0	1.24	1.24	1.24	1788.8	143.7
29-Oct-14	09:00	Cloudy	297.6	766.5	3.2350	3.4685	0.2335	6138.4	6162.4	24.0	1.24	1.24	1.24	1783.1	131.0
														Min	115.2
														Max	143.7
														Average	130.2

### Location AM3 - Existing Harbour Road Sports Centre

Sampling Date	Start Time	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
					Initial	Final		Initial	Final		Initial	Final			
6-Oct-14	13:20	Sunny	301.7	763.7	3.2468	3.4678	0.2210	3703.3	3727.3	24.0	1.22	1.22	1.22	1761.3	125.5
11-Oct-14	09:00	Sunny	299.9	761.7	3.2067	3.3603	0.1536	3727.3	3751.3	24.0	1.23	1.23	1.23	1764.9	87.0
17-Oct-14	09:00	Sunny	297.4	767.5	3.2761	3.4619	0.1858	3751.3	3775.3	24.0	1.24	1.24	1.24	1780.7	104.3
23-Oct-14	09:00	Sunny	295.4	765.7	3.2227	3.4082	0.1855	3775.3	3799.3	24.0	1.24	1.24	1.24	1785.1	103.9
29-Oct-14	09:00	Cloudy	297.8	766.4	3.2414	3.3969	0.1555	3799.3	3823.3	24.0	1.23	1.23	1.23	1777.9	87.5
														Min	87.0
														Max	125.5
														Average	101.6



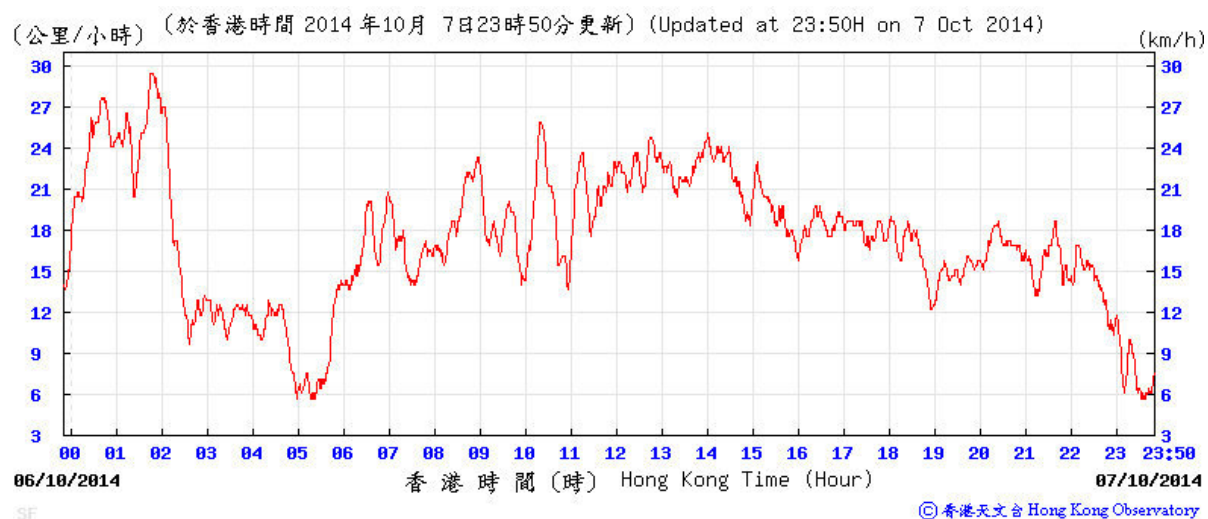
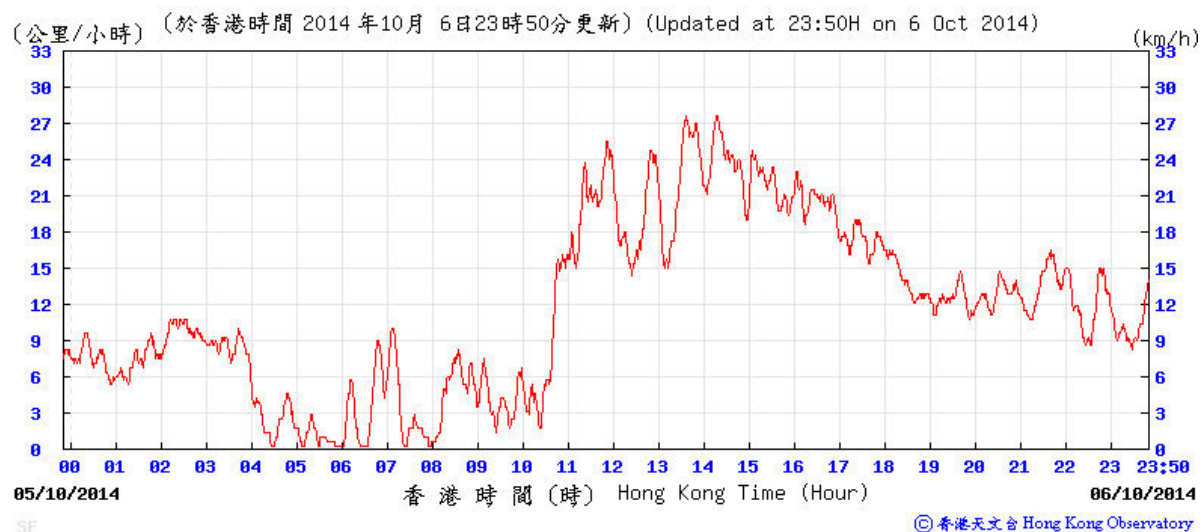
## 24-hour TSP Concentration Levels



Title Shatin to Central Link – Contract 1126 Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool  Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S	Project No. MA14009	
	Date Oct 14	Appendix E	

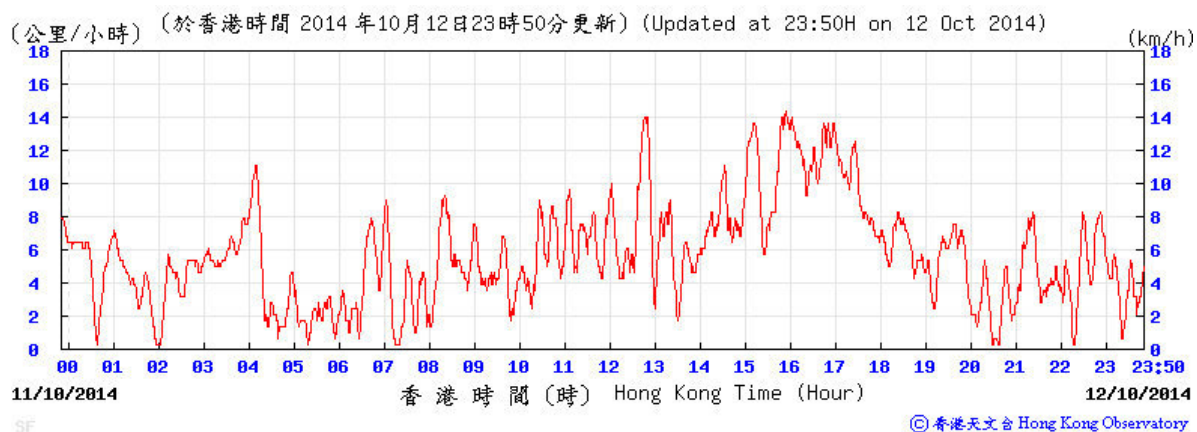
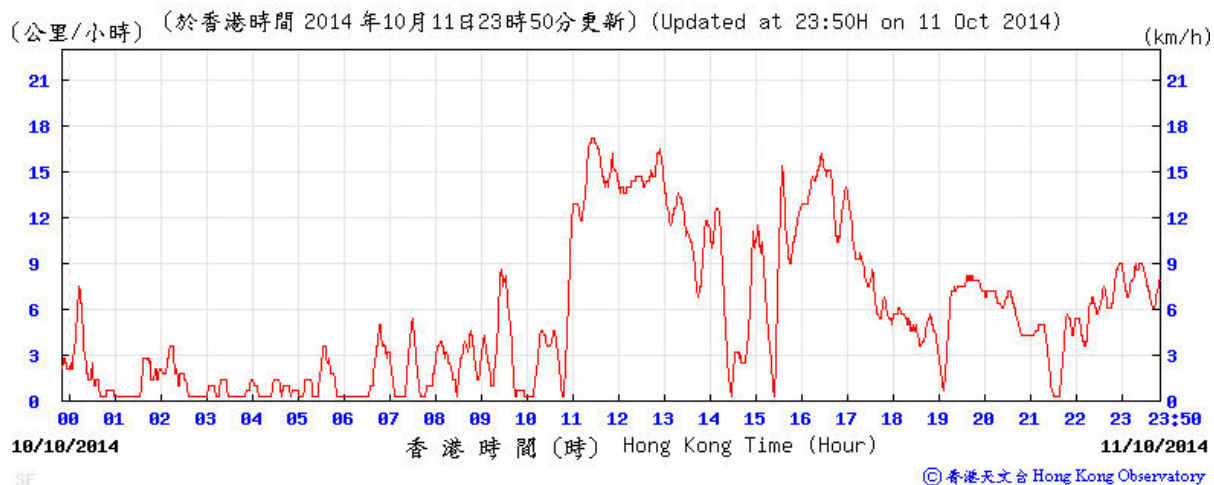
# Average wind speed obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

6-7 October 2014



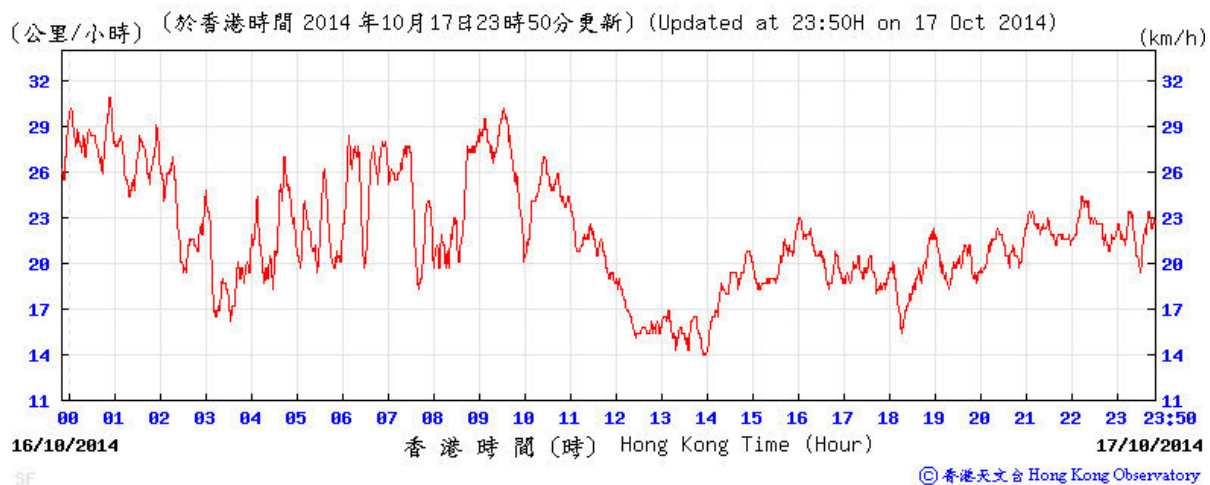
# Average wind speed obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

11-12 October 2014



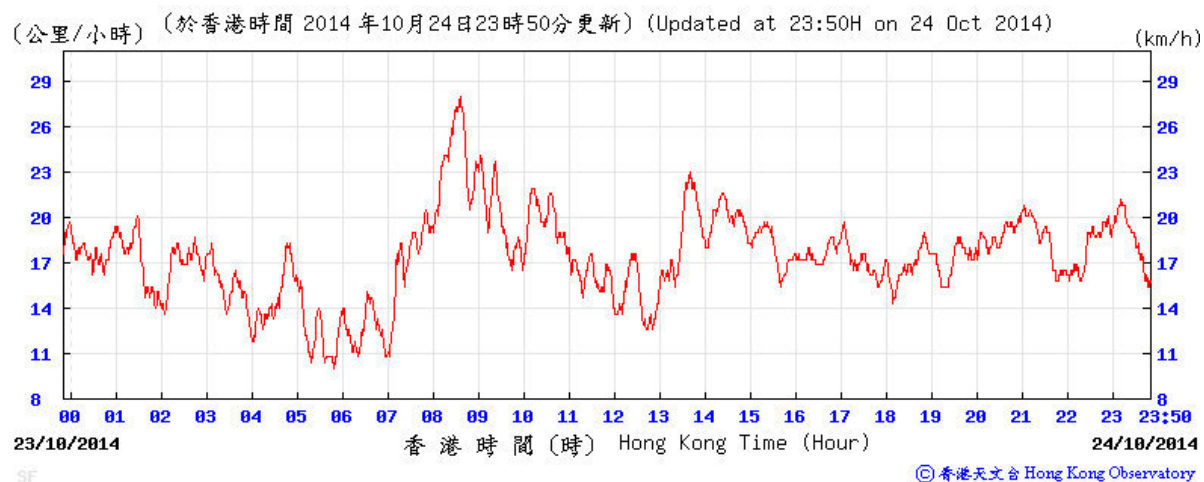
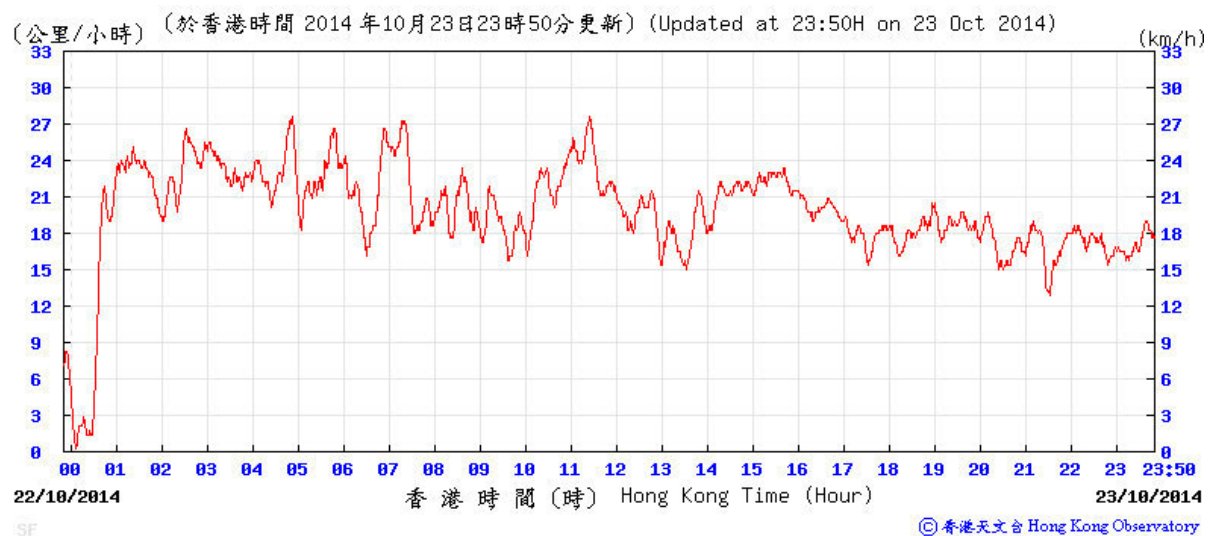
# Average wind speed obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

17-18 October 2014



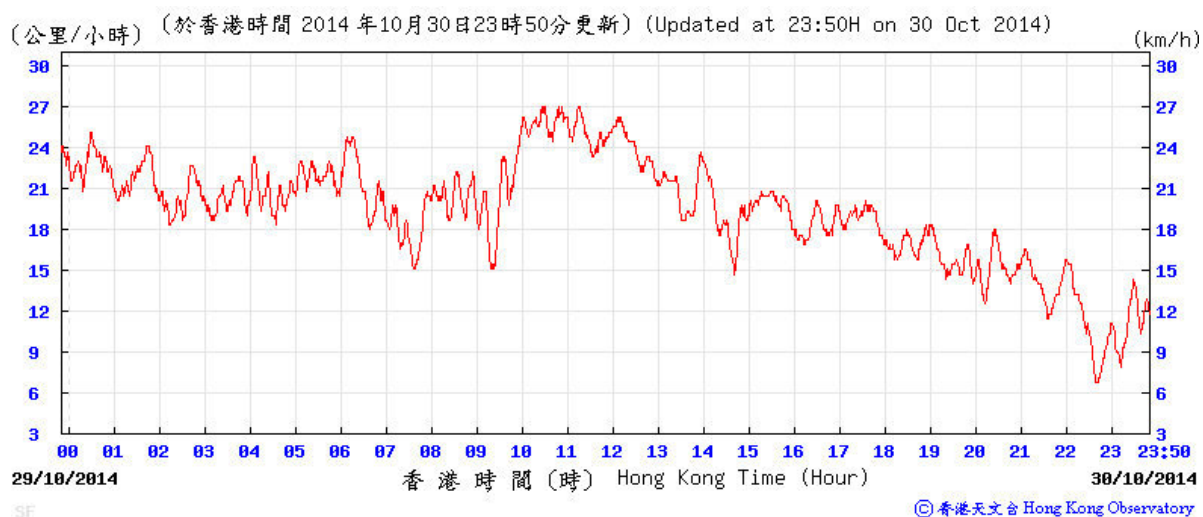
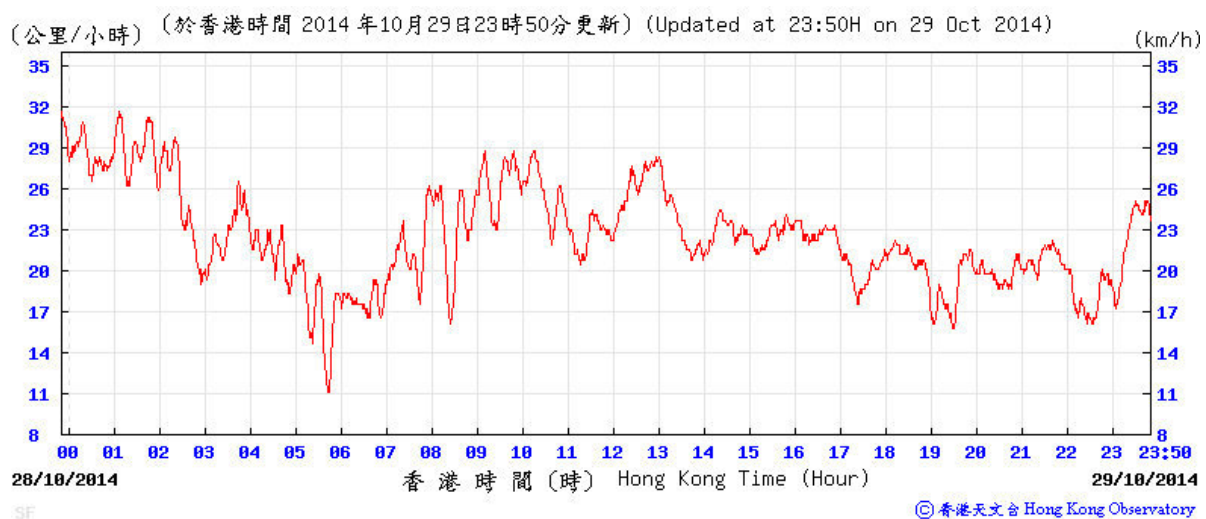
# Average wind speed obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

23-24 October 2014



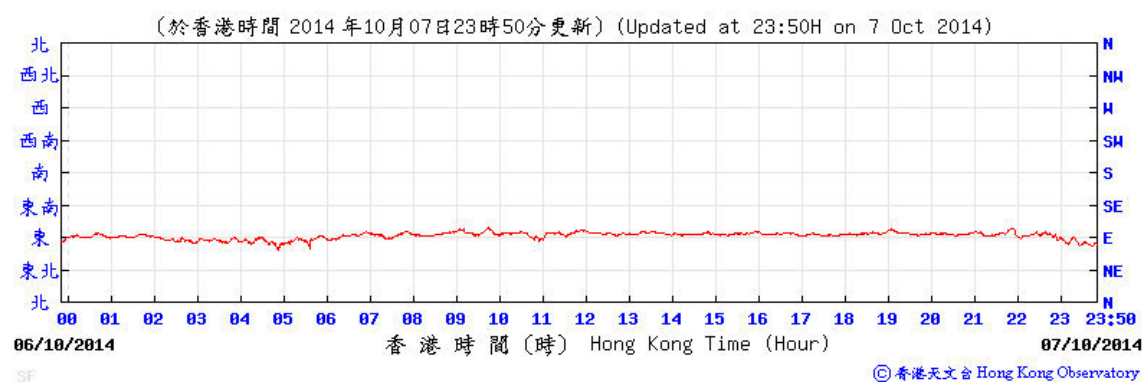
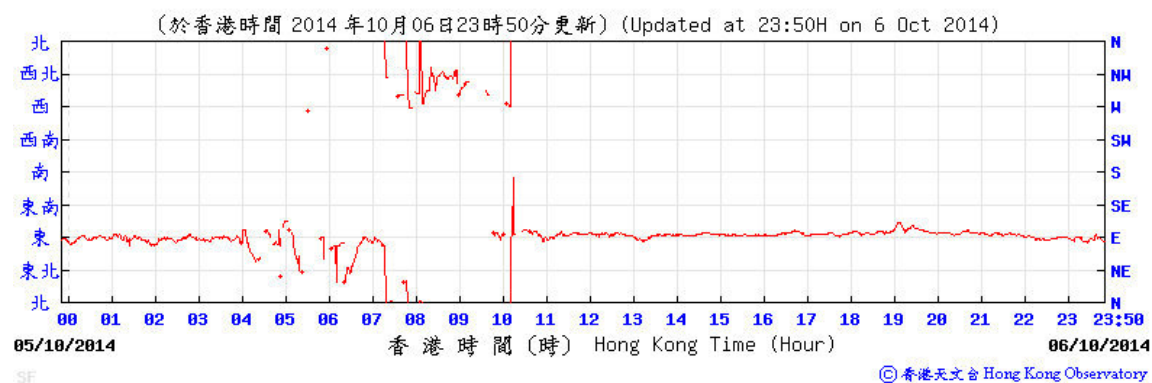
# Average wind speed obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

29-30 October 2014



# Wind direction obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

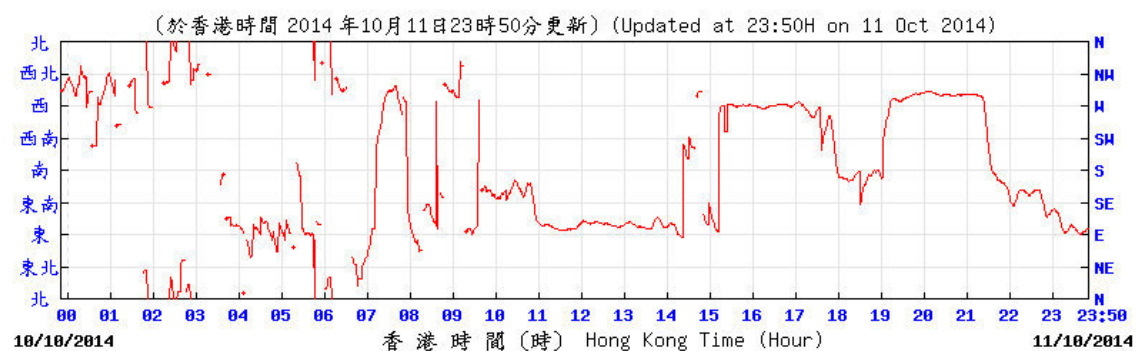
6-7 October 2014



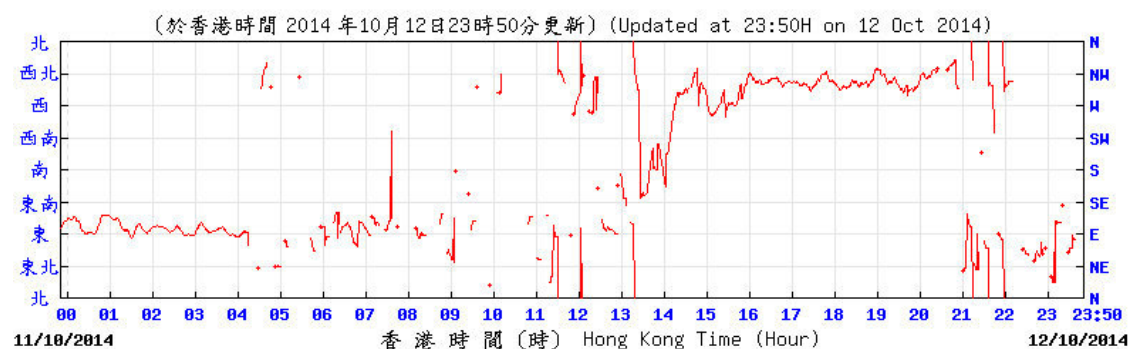


# Wind direction obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

11-12 October 2014



SF © 香港天文台 Hong Kong Observatory

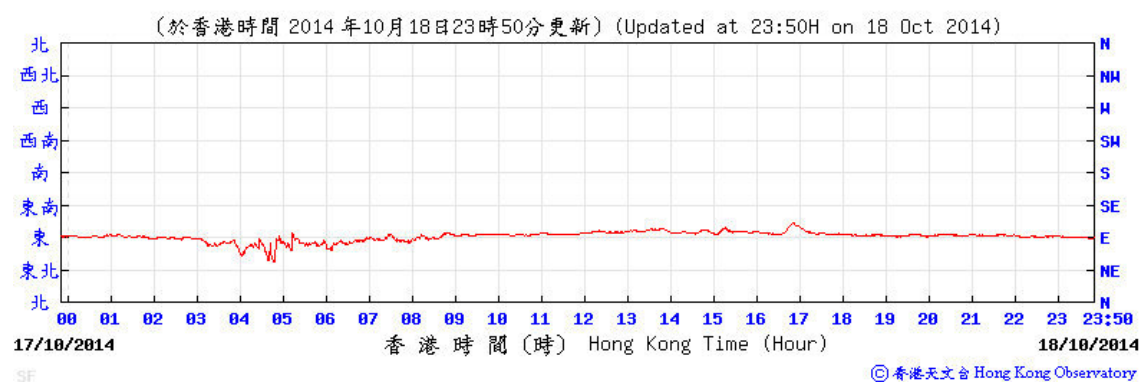
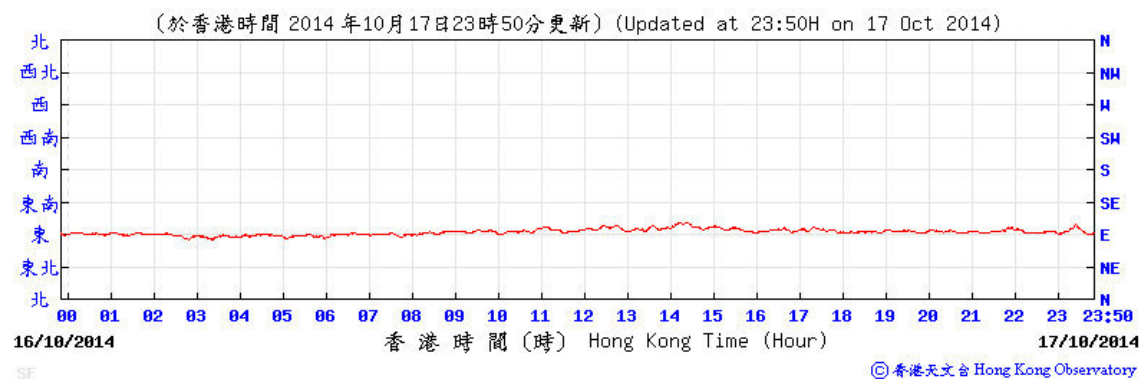


SF © 香港天文台 Hong Kong Observatory



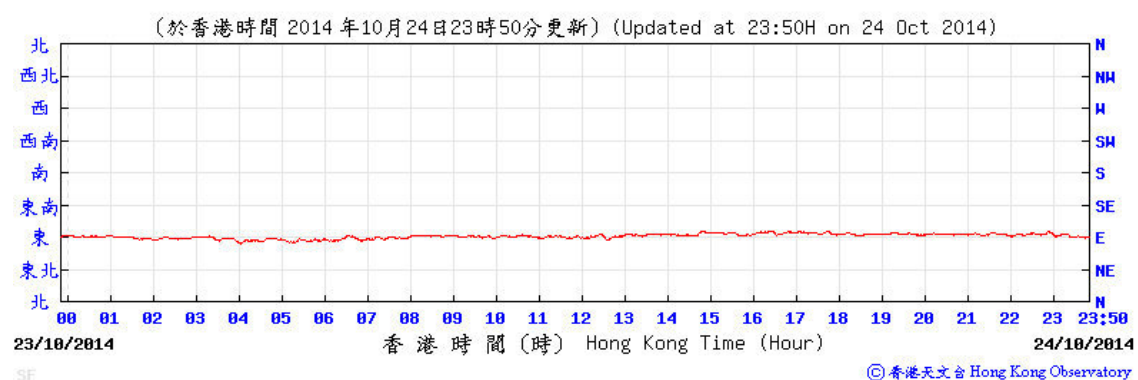
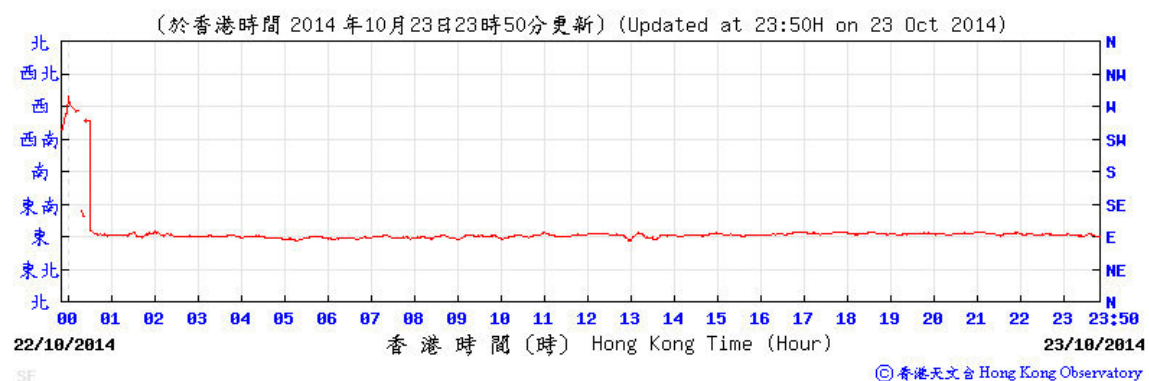
# Wind direction obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

17-18 October 2014



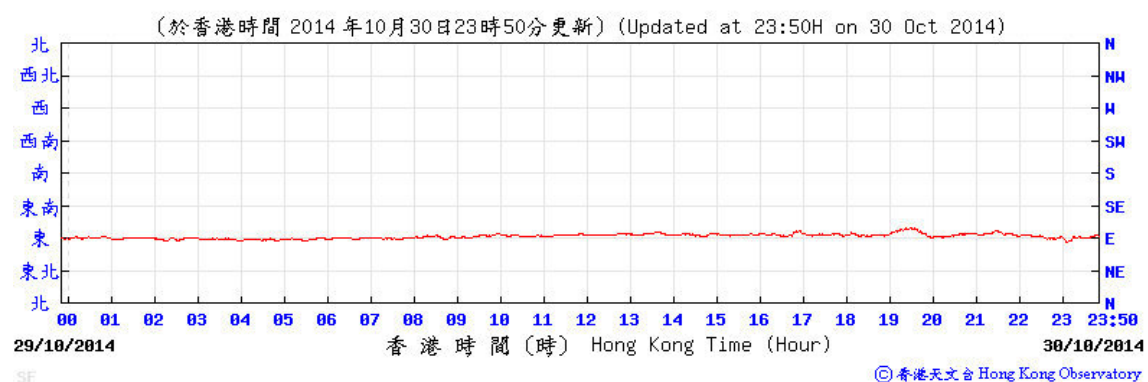
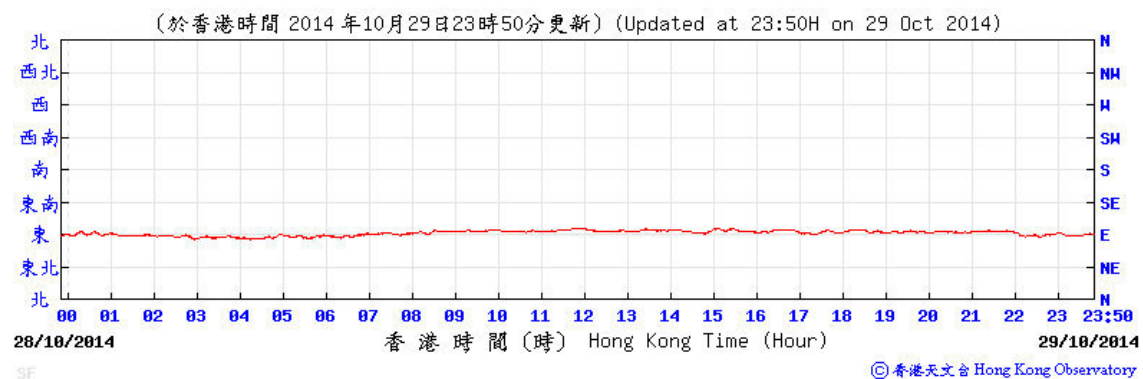
# Wind direction obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

23-24 October 2014



# Wind direction obtained from the meteorological station at Star Ferry from the Hong Kong Observatory (HKO)

29-30 October 2014



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**APPENDIX F**  
**NOISE MONITORING RESULTS AND**  
**GRAPHICAL PRESENTATIONS**

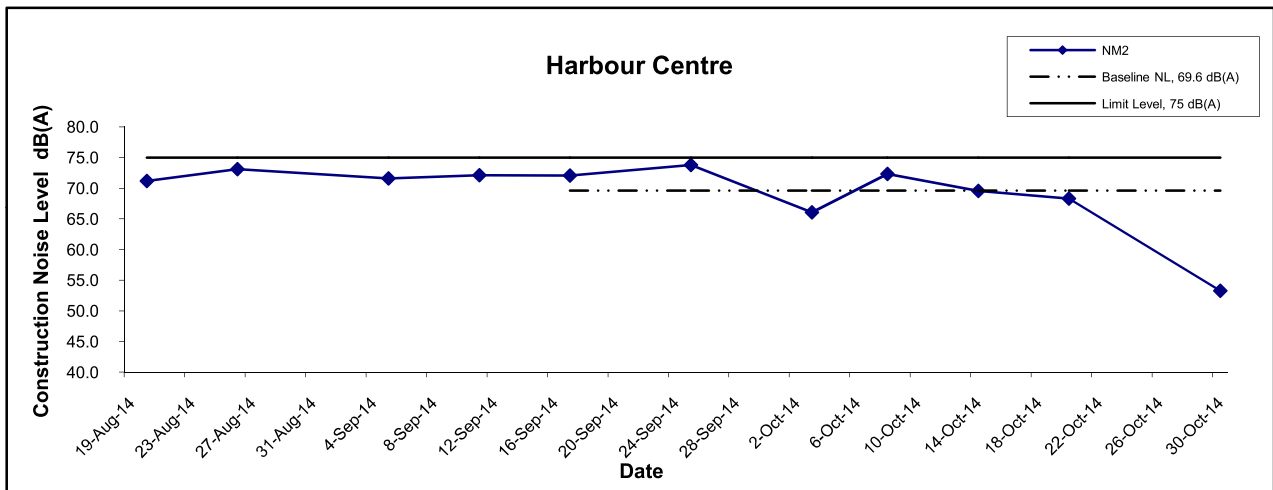
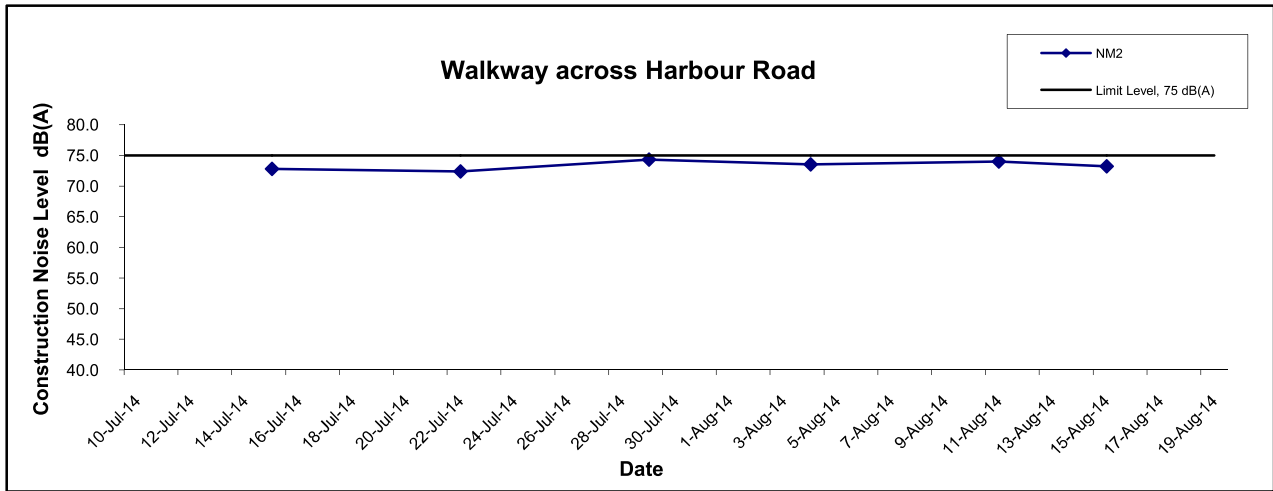
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## App F - Noise Monitoring Results

Location NM2 - Harbour Centre							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub>	L <sub>eq</sub>
3-Oct-14	10:30	Sunny	71.2	73.8	69.1	69.6	66.1
8-Oct-14	10:30	Sunny	74.2	76.5	71.4		72.4
14-Oct-14	11:25	Sunny	72.6	73.8	68.0		69.6
20-Oct-14	11:15	Sunny	68.3	70.4	60.9		68.3 Measured ≤ Baseline
30-Oct-14	15:40	Cloudy	69.7	71.0	68.2		53.3

## Noise Levels



<b>Title</b> Shatin to Central Link - Contract 1126 Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool  Graphical Presentation of Construction Noise Monitoring Results	<b>Scale</b> N.T.S	<b>Project No.</b> MA14009	
	<b>Date</b> Oct 14	<b>Appendix</b> F	

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**APPENDIX G**  
**SUMMARY OF EXCEEDANCE**

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## **APPENIDX G – SUMMARY OF EXCEEDANCE**

**Reporting Month:** October 2014

**a) Exceedance Report for Dust Monitoring (NIL)**

**b) Exceedance Report for Noise Monitoring (NIL)**



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**APPENDIX H**  
**SITE AUDIT SUMMARY**

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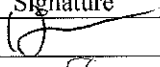

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141008
Date	8 October 2014 (Wednesday)
Time	10:00 – 11:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141008-R02	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"> <li>Unpaved area in PTI area is observed dry. The Contractor is reminded to provide water spray regularly to avoid dust generation.</li> </ul>	D 5
141008-R01	<p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>Wooden dust observed on the ground of rooftop area of WCSP. The Contractor is reminded to remove the wooden dust regularly.</li> </ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on previous audit section (Ref. No.:140929), all environmental deficiencies were observed improved/rectified by the Contractor.</li> </ul>	F 4ii, 8

	Name	Signature	Date
Recorded by	Johnny Fung		8 October 2014
Checked by	Dr. Priscilla Choy		8 October 2014

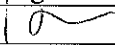

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141015
Date	15 October 2014 (Wednesday)
Time	10:00 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141015-O01	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul>	D 5
141015-R02	<p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"> <li>Excavation Area in PTI Area was observed dry. The Contractor is reminded to provide water spray to prevent dust generation.</li> <li>Some excavated materials observed deposited near the public road at Harbour Road. The Contractor is reminded to remove the materials properly from the Public Road.</li> </ul> <p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on previous audit section (Ref. No.:141008), all environmental deficiencies were observed improved/rectified by the Contractor.</li> </ul>	D 3

	Name	Signature	Date
Recorded by	Johnny Fung		15 October 2014
Checked by	Dr. Priscilla Choy		15 October 2014

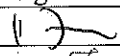

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141022
Date	22 October 2014 (Wednesday)
Time	10:00 – 11:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141022-R02	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"> <li>Some mud and observed near the site entrance of WCSP. The Contractor is reminded to clean the site entrance regularly.</li> </ul>	D 3
141022-O01	<p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>Construction waste observed deposited with general refuse in WCSP. The Contractor is reminded to provide sorting to the waste.</li> </ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on previous audit section (Ref. No.:141015), all environmental deficiencies were observed improved/rectified by the Contractor.</li> </ul>	F 4ii

	Name	Signature	Date
Recorded by	Johnny Fung		22 October 2014
Checked by	Dr. Priscilla Choy		22 October 2014

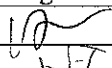
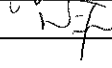
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141029
Date	29 October 2014 (Wednesday)
Time	10:00 – 11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141029-R01	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"> <li>To cover the stockpile of dusty material properly by tarpaulin sheets at PTI Area.</li> </ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part H - Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on previous audit section (Ref. No.:141022), all environmental deficiencies were observed improved/rectified by the Contractor.</li> </ul>	D 6

	Name	Signature	Date
Recorded by	Johnny Fung		29 October 2014
Checked by	Dr. Priscilla Choy		29 October 2014

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**APPENDIX I**  
**EVENT AND ACTION PLANS**

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## Appendix I - Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> <li>1. Notify the Contractor, IEC and ER</li> <li>2. Discuss with the ER and Contractor on the remedial measures required; and</li> <li>3. Increase monitoring frequency to check mitigation effectiveness</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the investigation results submitted by the contractor;</li> <li>2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of complaint in writing;</li> <li>2. Review and agree on the remedial measures proposed by the Contractor; and</li> <li>3. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Investigate the complaint and propose remedial measures ;</li> <li>2. Report the results of investigation to the IEC, ET and ER;</li> <li>3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification.; and</li> <li>4. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify the Contractor, IEC, EPD and ER;</li> <li>2. Repeat measurement to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>5. Arrange meeting with the IEC, and ER to discuss the remedial measures to be taken;</li> <li>6. Review the effectiveness of</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check the Contractor's working method;</li> <li>3. Discuss with the ER, ET and Contractor on the potential remedial measures ; and</li> <li>4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>3. Supervise the implementation of remedial measures; and</li> <li>4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Take immediate action to avoid further exceedance;</li> <li>3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Revise and resubmit proposals if problem still not under control; and</li> </ol>

## Appendix I - Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	<p>Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and</p> <p>7. If exceedance stops, cease additional monitoring the results.</p>		<p>exceedance is abated</p>	<p>6. Stop the relevant portion of works as determined by the ER until the exceedance is abated</p>



## Appendix I - Event and Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>ACTION LEVEL</b>				
1. Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Inform the Contractor, IEC and ER;</li> <li>2. Discuss with the Contractor on the remedial measures required;</li> <li>3. Repeat measurement to confirm findings; and</li> <li>4. Increase monitoring frequency</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check Contractor's working method; and</li> <li>3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s), investigate the causes of exceedance and propose remedial measures;</li> <li>2. Implement remedial measures; and</li> <li>3. Amend working methods agreed with the ER as appropriate.</li> </ol>
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Inform the Contractor, IEC and ER;</li> <li>2. Discuss with the ER and Contractor on the remedial measures required;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; and</li> <li>6. If exceedance stops, cease additional monitoring</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check Contractor's working method; and</li> <li>3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Review and agree on the remedial measures proposed by the Contractor; and</li> <li>3. Supervise Implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification;</li> <li>3. Implement the agreed proposals; and</li> <li>4. Amend proposal as appropriate.</li> </ol>

## Appendix I - Event and Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>LIMIT LEVEL</b>				
1.Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Inform the Contractor, IEC, EPD and ER;</li> <li>2. Repeat measurement to confirm findings;</li> <li>3. Increase monitoring frequency to daily; and</li> <li>4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check the Contractor's working method;</li> <li>3. Discuss with the ET, ER and Contractor on possible remedial measures; and</li> <li>4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Review and agree on the remedial measures proposed by the Contractor; and</li> <li>3. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s) and investigate the causes of exceedance;</li> <li>2. Take immediate action to avoid further exceedance;</li> <li>3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Amend proposal if appropriate.</li> </ol>

## Appendix I - Event and Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>LIMIT LEVEL</b>				
2.Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Notify Contractor, IEC EPD and ER;</li> <li>2. Repeat measurement to confirm findings;</li> <li>3. Increase monitoring frequency to daily;</li> <li>4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented;</li> <li>5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken;</li> <li>6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by the ET;</li> <li>2. Check the Contractor's working method;</li> <li>3. Discuss with ET, ER, and Contractor on the potential remedial measures; and</li> <li>4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>3. Supervise the implementation of remedial measures; and</li> <li>4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s) and investigate the causes of exceedance;</li> <li>2. Take immediate action to avoid further exceedance;</li> <li>3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Revise and resubmit proposals if problem still not under control;</li> <li>6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>

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**APPENDIX J  
UPDATED ENVIRONMENTAL  
MITIGATION IMPLEMENTATION  
SCHEDULE**

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## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
<b>Ecology (Construction Phase)</b>							
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted	Minimise the contamination of wastewater discharge	Contractor	All land based works areas	Construction phase	• EIAO-TM	^
<b>Landscape &amp; Visual (Construction Phase)</b>							
Table 7.9	CM1 - Trees unavoidably affected by the works shall be transplanted as far as possible in accordance with ETWB TC(W) 3/2006 – Tree Preservation	Transplanting and reuse of affected trees	MTR	All works sites	Construction phase	• EIAO-TM • ETWB TC(W) 3/2006	^
Table 7.9	CM2a - Compensatory tree planting shall be provided in accordance with ETWB TC(W) 3/2006 – Tree Preservation to compensate for felled trees and maintained until end of the establishment period.	Compensation for the removal of existing trees due to the Project.	MTR	All works sites	Construction phase	• EIAO-TM • ETWB TC(W) 3/2006	^
	CM2b - Compensatory shrub planting shall be provided to compensate for the loss of shrub planting in amenity areas.	Compensation for the removal of existing shrub planting due to the Project.	MTR	All works sites	Construction phase	• EIAO-TM	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	^
Table 7.9	CM4 - Erection of decorative screen hoarding compatible with the surrounding setting.	Minimize the visual impact of the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	^
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	Control of height and deposition/arrangement of temporary facilities in works areas	MTR	All works sites	Construction phase	• EIAO-TM	^
Table 7.9	CM6 - All hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like to-like basis to the satisfaction of the relevant Government Departments	Reinstatement of temporary works areas	MTR	All works sites	Construction phase	• EIAO-TM	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S7.126	<p>The following good site practice measures shall also be incorporated in the construction phase of the project:</p> <ul style="list-style-type: none"> <li>Topsoil, where identified, shall be stripped and stored for re-use in the construction of the soft landscape works.</li> <li>Existing trees to be retained on site shall be carefully protected during construction.</li> </ul>	Minimize landscape and visual impact	Contractor	All works areas	Construction phase	• EIAO-TM	N/A  ^
<b>Construction Dust Impact</b>							
S8.89	<p>Watering once every working hour on active works areas, exposed areas and paved haul roads to reduce dust emission by 91.7%.</p> <p>This suppression efficiency is derived based on the average haul road traffic, average evaporation rate and an assumed application intensity of 1.0 L/m<sup>2</sup> for Hong Kong side once every working hour.</p> <p>Any potential dust impact and watering mitigation would be subject to the actual site condition. For example, a construction activity that produces inherently wet conditions or in cases under rainy weather, the above water application intensity may not be unreservedly applied. While the above watering frequency is to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.0 L/m<sup>2</sup> for Hong Kong side to achieve the removal efficiency.</p> <p>The dust levels would be monitored and managed under an EM&amp;A</p>	Minimize dust impact	Contractor	All works areas	Construction phase	• APCO	*

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	programme as specified in the EM&A Manual.						
S8.90	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> <li>• Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.</li> <li>• Use of frequent watering for particularly dusty construction areas and areas close to ASRs</li> <li>• Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.</li> <li>• Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.</li> <li>• Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations</li> <li>• Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.</li> <li>• Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in</li> </ul>	Minimize dust impact	All works areas	Construction phase	<ul style="list-style-type: none"> <li>• APCO</li> <li>• Air Pollution Control (Construction dust) Regulation</li> </ul>	All works areas	<p>*</p> <p>^</p> <p>^</p> <p>*</p> <p>^</p> <p>^</p> <p>^</p>



## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>dry seasons/ periods.</p> <ul style="list-style-type: none"> <li>• Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.</li> <li>• Imposition of speed controls for vehicles on site haul roads.</li> <li>• Where possible, routing of vehicles and positioning of construction plant shall be at the maximum possible distance from ASRs.</li> <li>• Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.</li> <li>• Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.</li> </ul>						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
<b>Construction Noise (Airborne)</b>							
S9.55	<p>The following good site practices shall be implemented:</p> <ul style="list-style-type: none"> <li>• Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program</li> <li>• Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program</li> <li>• Mobile plant, if any, shall be sited as far from NSRs as possible</li> </ul>	Minimize construction noise impact	Contractor	All works areas	Construction phase	• EIAO-TM	<p>^</p> <p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>• Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum</li> <li>• Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs</li> <li>• Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>						<p>^</p> <p>^</p> <p>^</p>
S9.56 & Table 9.16	<p>The following quiet PME shall be used:</p> <ul style="list-style-type: none"> <li>• Crane lorry, mobile</li> <li>• Crane, mobile</li> <li>• Asphalt paver</li> <li>• Backhoe with hydraulic breaker</li> <li>• Breaker, excavator mounted (hydraulic)</li> <li>• Hydraulic breaker</li> <li>• Concrete lorry mixer</li> <li>• Poker, vibrator, hand-held</li> <li>• Concrete pump</li> <li>• Crawler crane, mobile</li> <li>• Mobile crane</li> </ul>	To minimize construction noise impact	Contractor	Works areas under this Contract	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> </ul>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>• Dump truck</li> <li>• Excavator</li> <li>• Truck</li> <li>• Rock drill</li> <li>• Lorry</li> <li>• Wheel loader</li> <li>• Roller vibratory</li> </ul>						N/A N/A N/A N/A N/A N/A N/A
S9.58 – S9.59 & Table 9.17	Movable noise barrier shall be used for the following PME: <ul style="list-style-type: none"> <li>• Air compressor</li> <li>• Asphalt paver</li> <li>• Backhoe with hydraulic breaker</li> <li>• Bar bender</li> <li>• Bar bender and cutter (electric)</li> <li>• Breaker, excavator mounted</li> <li>• Concrete pump</li> <li>• Concrete pump, stationary/lorry</li> <li>• Excavator</li> <li>• Generator</li> <li>• Grout pump</li> <li>• Hand held breaker</li> <li>• Hydraulic breaker</li> </ul>	Minimize construction noise impact	Contractor	Works areas under this Contract	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> </ul>	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>• Saw, concrete</li> </ul>						N/A
S9.60 & Table 9.17	<p>Noise insulating fabric shall be used for</p> <ul style="list-style-type: none"> <li>• Drill rig, rotary type</li> <li>• Piling, diaphragm wall, bentonite filtering plant</li> <li>• Piling, diaphragm wall, grab and chisel</li> <li>• Piling, diaphragm wall, hydraulic extractor</li> <li>• Piling, large diameter bored, grab and chisel</li> <li>• Piling, hydraulic extractor</li> <li>• Piling, earth auger, auger</li> <li>• Rock drill, crawler mounted (pneumatic)</li> </ul>	Minimize construction noise impact	Contractor	Works areas under this Contract	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> </ul>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
<b>Water Quality (Construction Phase)</b>							
S11.216	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront:</p> <ul style="list-style-type: none"> <li>• Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works.</li> <li>• Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front</li> </ul>	minimize release of construction wastes from construction works at or close to the seafront	Contractor	Construction works at or close to the seafront	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	<p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>and storm drainage.</p> <ul style="list-style-type: none"> <li>Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the nearby receiving waters.</li> </ul>						^
S11.222 to 11.245	<p>The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed where practicable.</p> <p><u>Surface Run-off</u></p> <ul style="list-style-type: none"> <li>Surface run-off from construction sites shall be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries shall be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks.</li> <li>Silt removal facilities, channels and manholes shall be maintained and the deposited silt and grit shall be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any</li> </ul>	<p>minimize water quality impact from construction site runoff and general construction activities</p>	Contractor	All construction sites where practicable	Construction phase	<ul style="list-style-type: none"> <li>EIAO-TM</li> <li>WPCO</li> <li>TM-DSS</li> <li>WDO</li> <li>ProPECC PN 1/94</li> </ul>	<p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>practical options for the diversion and re-alignment of drainage shall comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distances of 100 m shall be maintained between the discharge points of construction site runoff and the existing saltwater intakes.</p> <ul style="list-style-type: none"> <li>Construction works shall be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.</li> <li>Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent</li> </ul>						<p>^</p> <p>N/A</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>erosion caused by rainstorms. Appropriate drainage like intercepting channels shall be provided where necessary.</p> <ul style="list-style-type: none"> <li>Measures shall be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they shall be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations shall be discharged into storm drains via silt removal facilities.</li> <li>Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites shall be covered with tarpaulin or similar fabric during rainstorms.</li> <li>Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.</li> <li>Good site practices shall be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.</li> </ul>						<p>^</p> <p>^</p> <p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p><u>Boring and Drilling Water</u></p> <ul style="list-style-type: none"> <li>Water used in ground boring and drilling for site investigation or rock / soil anchoring shall as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater shall be discharged into storm drains via silt removal facilities.</li> </ul> <p><u>Wheel Washing Water</u></p> <ul style="list-style-type: none"> <li>All vehicles and plant shall be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay shall be provided at every site exit if practicable and wash-water shall have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road shall be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.</li> </ul> <p><u>Bentonite Slurries</u></p> <ul style="list-style-type: none"> <li>Bentonite slurries used in diaphragm wall and bore-pile construction shall be reconditioned and used again wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the bentonite slurries shall either be dewatered or mixed with inert fill material for disposal to a public filling area.</li> </ul>						<p>N/A</p> <p>^</p> <p>N/A</p>



## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the TM-DSS.</li> </ul> <p><u>Water for Testing &amp; Sterilization of Water Retaining Structures and Water Pipes</u></p> <ul style="list-style-type: none"> <li>Water used in water testing to check leakage of structures and pipes shall be used for other purposes as far as practicable. Surplus unpolluted water will be discharged into storm drains.</li> <li>Sterilization is commonly accomplished by chlorination. Specific advice from EPD shall be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water shall be used again wherever practicable.</li> </ul> <p><u>Wastewater from Building Construction</u></p> <ul style="list-style-type: none"> <li>Before commencing any demolition works, all sewer and drainage connections shall be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.</li> <li>Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities shall not be discharged into the</li> </ul>						<p>N/A</p> <p>^</p> <p>N/A</p> <p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>stormwater drainage system. If the wastewater is to be discharged into foul sewers, it shall undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary.</p> <p><u>Acid Cleaning, Etching and Pickling Wastewater</u></p> <ul style="list-style-type: none"> <li>Acidic wastewater generated from acid cleaning, etching, pickling and similar activities shall be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater shall be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.</li> </ul> <p><u>Wastewater from Site Facilities</u></p> <ul style="list-style-type: none"> <li>Wastewater collected from any temporary canteen kitchens, including that from basins, sinks and floor drains, shall be discharged into foul sewer via grease traps. In case connection to the public foul sewer is not feasible, wastewater generated from kitchens or canteen, if any, shall be collected in a temporary storage tank. A licensed waste collector shall be deployed to clean the temporary storage tank on a regular basis.</li> <li>Drainage serving an open oil filling point shall be connected to storm drains via petrol interceptors with peak storm bypass.</li> </ul>						<p>^</p> <p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>Vehicle and plant servicing areas, vehicle wash bays and lubrication bays shall as far as possible be located within roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor. Oil leakage or spillage shall be contained and cleaned up immediately. Waste oil shall be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.</li> </ul>						^
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. The Contractor shall also be responsible for waste disposal and maintenance practices. Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.	minimize water quality impacts due to sewage generated from construction workforce	Contractor	All works areas	Construction phase	<ul style="list-style-type: none"> <li>EIAO-TM</li> <li>WPCO</li> <li>TM-DSS</li> <li>WDO</li> </ul>	^
S11.248	In case seepage of uncontaminated groundwater occurs, groundwater shall be pumped out from the works areas and discharged into the storm system via silt removal facilities. Uncontaminated groundwater from dewatering process shall also be	minimize impact from discharge of uncontaminated groundwater	Contractor	All works areas	Construction phase	<ul style="list-style-type: none"> <li>EIAO-TM</li> <li>WPCO</li> <li>TM-DSS</li> </ul>	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	discharged into the storm system via silt traps						
S11. 253	There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas shall be treated so that it satisfies all the standards listed in the TM-DSS. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring shall be carried out in accordance with the WPCO license which is under the ambit of Regional Office (RO) of EPD.	minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> </ul>	^
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	^
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall	minimize water quality impact from accidental	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	spillage of chemical				<ul style="list-style-type: none"> <li>• TM-DSS</li> <li>• WDO</li> </ul>	
S11.256	<p>Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows:</p> <ul style="list-style-type: none"> <li>• Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>• Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>• Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.</li> </ul>	<p>minimize water quality impact from accidental spillage of chemical</p>	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	<p>^</p> <p>^</p> <p>^</p>
<b>Waste Management (Construction Waste)</b>							
S12.75	<p><b>Good Site Practices and Waste Reduction Measures</b></p> <ul style="list-style-type: none"> <li>- Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites;</li> <li>- Training of site personnel in, site cleanliness, proper waste</li> </ul>	reduce waste management impacts	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• Waste Disposal Ordinance (Cap. 354)</li> <li>• Land (Miscellaneous</li> </ul>	<p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>management and chemical handling procedures;</p> <ul style="list-style-type: none"> <li>- Provision of sufficient waste disposal points and regular collection of waste;</li> <li>- Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and</li> <li>- Separation of chemical wastes for special handling and appropriate treatment.</li> </ul>					<p>Provisions)</p> <p>Ordinance (Cap. 28)</p> <ul style="list-style-type: none"> <li>• DEVB TCW No. 6/2010</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
S12.76	<p><b><i>Good Site Practices and Waste Reduction Measures (Con't)</i></b></p> <ul style="list-style-type: none"> <li>- Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.);</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 aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce;</li> <li>- Proper storage and site practices to minimize the potential for</li> </ul>	achieve waste reduction	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• Waste Disposal Ordinance (Cap. 354)</li> <li>• Land (Miscellaneous Provisions) Ordinance (Cap. 28)</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>damage or contamination of construction materials;</p> <ul style="list-style-type: none"> <li>- Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and</li> <li>- Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.</li> </ul>						<p>^</p> <p>^</p>
S12.77	<p><b><i>Good Site Practices and Waste Reduction Measures (Con't)</i></b></p> <ul style="list-style-type: none"> <li>- The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP shall be reviewed regularly and updated by the Contractor,</li> </ul>	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	preferably in a monthly basis.						
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^
S12.79	<p><b><i>Storage, Collection and Transportation of Waste</i></b></p> <p>Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> <li>- Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution;</li> <li>- Maintain and clean storage areas routinely;</li> <li>- Stockpiling area shall be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and</li> <li>- Different locations shall be designated to stockpile each material to enhance reuse</li> </ul>	minimize potential adverse environmental impacts arising from waste storage	Contractor	All works sites	Construction phase	- ETWB TCW No. 19/2005	^  ^  ^  ^
S12.80	<p><b><i>Storage, Collection and Transportation of Waste (Con't)</i></b></p> <p>Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts:</p>	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	- ETWB TCW No. 19/2005	



## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>- Remove waste in timely manner</li> <li>- Waste collectors shall only collect wastes prescribed by their permits</li> <li>- Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers</li> <li>- Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28)</li> <li>- Waste shall be disposed of at licensed waste disposal facilities</li> <li>- Maintain records of quantities of waste generated, recycled and disposed</li> </ul>						^  ^  ^  ^   ^  ^
S12.81	<b><i>Storage, Collection and Transportation of Waste (Con't)</i></b> <ul style="list-style-type: none"> <li>- Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed</li> </ul>	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^
S12.83 – 12.86	<b><i>Sorting of C&amp;D Materials</i></b> <ul style="list-style-type: none"> <li>- Sorting to be performed to recover the inert materials, reusable</li> </ul>	minimize potential adverse environmental	Contractor	All works sites	Construction phase	• DEVB TCW No. 6/2010	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>and recyclable materials before disposal off-site.</p> <ul style="list-style-type: none"> <li>- Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials.</li> <li>- The C&amp;D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be investigated before disposal of at designated landfills.</li> <li>- Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach</li> </ul>	<p>impacts during the handling, transportation and disposal of C&amp;D materials</p>				<ul style="list-style-type: none"> <li>• ETWB TCW No. 33/2002</li> <li>• ETWB TCW No. 19/2005</li> </ul>	<p>^</p> <p>^</p> <p>^</p>
S12.97	<p><b>Containers for Storage of Chemical Waste</b></p> <p>The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall:</p> <ul style="list-style-type: none"> <li>- Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed;</li> <li>- Have a capacity of less than 450 liters unless the specifications</li> </ul>	<p>register with EPD as a Chemical waste producer and store chemical waste in appropriate containers</p>	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</li> </ul>	<p>^</p> <p>^</p>

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	have been approved by EPD; and - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation						^
S12.98	<b><i>Chemical Waste Storage Area</i></b> - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only; - Be enclosed on at least 3 sides; - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest; - Have adequate ventilation; - Be covered to prevent rainfall from entering; and - Be properly arranged so that incompatible materials are adequately separated.	prepare appropriate storage areas for chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^  ^  ^  ^  ^
S12.98	<b><i>Chemical Waste</i></b> - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	individual containers which are fully labelled in English and Chinese and stored in a designated secure place.					Storage of Chemical Wastes	
S12.100	<p><b><i>Collection and Disposal of Chemical Waste</i></b></p> <p>A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	All works sites	Construction phase	• Waste Disposal (Chemical Waste) (General) Regulation	^
S12.101	<p><b><i>General Refuse</i></b></p> <p>General refuse shall be stored in enclosed bins or compaction units separate from C&amp;D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&amp;D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.</p>	properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All works sites	Construction phase	- Public Health and Municipal Services Ordinance (Cap. 132)	^
S12.102	<p><b><i>General Refuse (Con't)</i></b></p> <p>The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of recycling bins for different types of</p>	facilitate recycling of recyclable portions of refuse	Contractor	All works sites	Construction phase	- Public Health and Municipal Services Ordinance (Cap.	^

## SCL Works Contract 1126 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.					132)	
S12.102	<b>General Refuse (Con't)</b>  The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders	raise workers' awareness on recycling issue	Contractor	All works sites	Construction phase	- Public Health and Municipal Services Ordinance (Cap. 132)	^

Remarks:    ^    Compliance of mitigation measure                      X    Non-compliance of mitigation measure

•    Non-compliance but rectified by the contractor

\*    Observation/reminder was made during site audit but improved/rectified by the contractor.

N/A    Not Applicable

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**APPENDIX K  
WASTE GENERATION IN THE  
REPORTING MONTH**

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**Contract No:** MTR SCL 1126 - Reprovisioning of Harbour Road Sports Centre and Wan Chai Swimming Pool

**Date of Report:** October, 2014

### Monthly Summary Waste Flow Table for 2014 at Wan Chai Sports Ground and Passenger Transport Interchange

Monthly	Actual Quantities of C&D Materials Generated Monthly						Actual Quantities of Non-inert C&D Wastes Generated Monthly					Remarks
	Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse (see Note 3)	
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )	
Jul	0.267	0.000	0.000	0.000	0.267	0.000	3.780	0.000	0.000	0.000	0.020	
Aug	0.260	0.010	0.000	0.000	0.250	0.000	11.090	0.000	0.000	0.000	0.031	
Sept	0.163	0.009	0.000	0.000	0.154	0.000	24.550	0.000	0.000	0.000	0.023	
Oct	0.907	0.000	0.000	0.000	0.907	0.000	28.285	0.000	0.000	0.000	0.016	
Nov												
Dec												
Total	1.597	0.019	0.000	0.000	1.578	0.000	67.705	0.000	0.000	0.000	0.091	

Notes:

- 1) The waste flow table shall also include C&D materials that are specified in the contract to be imported for use at the site.
- 2) Plastic refer to plastic bottle/ containers, plastic sheets/ foam from packaging material.
- 3) The general refuse with non-recyclable materials were disposed to Landfill.  
Assume the densities of Rock, Soil, Mix Rock and Soil, are Regular Spoil to be 2.0 tonnes/m<sup>3</sup>. Assumption the densities of general refuse is 1.0 tonnes/m<sup>3</sup>

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**APPENDIX L  
CUMULATIVE LOG FOR COMPLAINT  
LOGS, NOTIFICATION OF SUMMONS  
AND SUCCESSFUL PROSECUTIONS**

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## Appendix L - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions

### Cumulative Complaint Log

Log Ref.	Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/ Mitigation Action	File Closed
--	--	--	--	--	--

### Cumulative Log for Notifications of Summons

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
--	--	--	--	--	--

### Cumulative Log for Successful Prosecutions

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since the commencement of the project
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## **Appendix C**

**Monthly EM&A Report for October 2014 – SCL Works Contract  
11227 Advance Works for NSL Cross Harbour Tunnels**

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MTR Corporation Limited


**Shatin to Central Link –  
Hung Hom to Admiralty Section**

Monthly EM&A Report No.3

[Period from 1 to 31 October 2014]

Works Contract 11227 – Advance Works for NSL  
Cross Harbour Tunnels

(November 2014)

Certified by:   
Dr. Priscilla Choy

Position: Environmental Team Leader

Date: 10<sup>th</sup> November 2014

# **Concentric – Hong Kong River Joint Venture**

## **Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels**

### **Monthly Environmental Monitoring and Audit Report For October 2014**

(version 2.0)

Certified By



Dr. Priscilla Choy  
(Environmental Team Leader)

#### REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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## EXECUTIVE SUMMARY

### Introduction

1. This is the 3<sup>rd</sup> monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for **MTR Shatin to Central Link (SCL) Works Contract 11227 – Advance Works for NSL Cross Harbour Tunnels**. This report documents the findings of EM&A Works conducted from 1 to 31 October 2014.

### Summary of Construction Works undertaken during Reporting Month

2. The major site activities undertaken in the reporting month include:

#### Shek O Casting Basin

- Seabed leveling works at channel exit; and
- Rock filling works in Casting Basin.

#### Victoria Harbour

- Dredging of trial trench in Victoria Harbour.

### Environmental Monitoring and Audit Progress

3. A summary of the monitoring activities in this reporting period is listed below:

#### Regular Water Quality Monitoring

- Water Quality Monitoring at each monitoring station (Shek O Casting Basin) 14 times
- Water Quality Monitoring at each monitoring station (Victoria Harbour) 14 times

#### Waste Management

4. Wastes generated from this Project include marine sediments. Details of waste management data is presented in Section 5 and **Appendix K**.

#### Landscape and Visual

5. Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 8 and 22 October 2014. Most of the necessary mitigation measures have been implemented and recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 6.

#### Environmental Site Inspection

6. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET on 3, 8, 15, 22 and 29 October 2014. The representative of the IEC joined the site inspection on 22 October 2014. Details of the audit findings and implementation status are presented in Section 6.

**Environmental Exceedance/Non-conformance/Complaint/Summons and Successful Prosecution**

7. No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded during the reporting period.
8. No non-compliance event was recorded during the reporting period.
9. No Project related environmental complaint and notification of summons/successful prosecutions were received in this reporting period.

**Reporting Changes**

10. There was no reporting change in the reporting period.

**Future Key Issues**

11. Major site activities for the coming reporting month will include:
  - Seabed levelling works at channel exit;
  - Rock filling works in Casting Basin; and
  - Dredging of trial trench in Victoria Harbour.
12. Key environmental impacts to be considered in the coming month include:
  - Water quality impact in the vicinity of the marine construction activities.



## 1 INTRODUCTION

- 1.1 Cinotech Consultants Limited (Cinotech) was appointed by Concentric – Hong Kong River Joint Venture (CCL-HKRJV) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the MTR Shatin to Central Link (SCL) Works Contract 11227 – Advance Works for NSL Cross Harbour Tunnels (hereafter referred to as the Project).

### **Purpose of the Report**

- 1.2 This is the 3<sup>rd</sup> EM&A report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period from 1 to 31 October 2014. The major construction works for Contract 11227 commenced on 1 August 2014 for Shek O Casting Basin. The major construction works in Victoria Harbour for Contract 11227 commenced on 11 September 2014

### **Structure of the Report**

- 1.3 The structure of the report is as follows:

Section 1: **Introduction** - details the scope and structure of the report.

Section 2: **Project Information** - summarises background and scope of the project, site description, project organization and contact details, construction programme, the construction works undertaken and the status of Environmental Permits/Licenses during the reporting period.

Section 3: **Environmental Monitoring Requirement** - summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, Event / Action Plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.

Section 4: **Implementation Status on Environmental Mitigation Measures** - summarises the implementation of environmental protection measures during the reporting period.

Section 5: **Monitoring Results** - summarises the monitoring results obtained in the reporting period.

Section 6: **Environmental Site Inspection** - summarises the audit findings of the weekly site inspections undertaken within the reporting period.

Section 7: **Environmental Non-conformance** - summarises any monitoring exceedance, environmental complaints and environmental summons within the reporting period.

Section 8: **Future Key Issues** - summarises the impact forecast and monitoring schedule for the next three months.

Section 9: **Conclusions and Recommendations**

## 2 PROJECT INFORMATION

### Background

- 2.1 The Shatin to Central Link – Hung Hom to Admiralty Section (hereafter referred to as SCL (HUH-ADM)) is an approximately 6km extension of the East Rail Line including a rail harbor crossing from Hung Hom across the harbor to Admiralty on Hong Kong Island. It is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).
- 2.2 The Environmental Impact Assessment (EIA) Report for SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] (Register No.: AEIAR-166/2012) was approved on 17 February 2012 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, Environmental Permits (EP) (EP No: EP-436/2012) was granted on 22 March 2012 for their construction and operation.
- 2.3 An “Environmental Review Report – Design Changes of North Ventilation Building and Shek O Casting Basin” (ERR) was submitted to the EPD in February 2014 to identify and assess the likely environmental issues pertinent to the proposed design changes at North Ventilation (NOV) Building and Shek O Casting Basin, and to identify any additional environmental mitigation measures that may be required for compliance with environmental standards. Variations of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/A) was issued by Director of Environmental Protection (DEP) on 30 April 2014.
- 2.4 The construction of the SCL (HUH-ADM) has been divided into a series of civil construction Works Contracts and this Works Contract 11227 comprises of the seabed levelling and rock filling works in Shek O, and dredging of trial trench in Victoria Harbour. The major construction works for Contract 11227 commenced on 1 August and 11 September 2014 for Shek O Casting Basin and Victoria Harbour respectively.

### General Site Description

- 2.5 The alignment and works area for the Works Contract 11227 are shown in **Figure 1a-1c**.

### Construction Programme and Activities

- 2.6 A summary of the major construction activities undertaken in this reporting period is shown as follows. The tentative construction programme is presented in **Appendix A**.

#### Shek O Casting Basin

- Seabed levelling works at channel exit; and
- Rock filling works in Casting Basin.

#### Victoria Harbour

- Dredging of trial trench in Victoria Harbour.

### Project Organisation

- 2.7 The project organizational chart and contact details are shown in **Figure 4**.

**Status of Environmental Licences, Notification and Permits**

2.8 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project is presented in **Table 2.1**.

**Table 2.1 Summary of the Status of Environmental Licences, Notification and Permits**

Permit / License No.	Valid Period		Status
	From	To	
Environmental Permit (EP)			
EP-436/2012/A	30/04/2014	N/A	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation			
EPD Ref no.: 375940	20/06/2014	N/A	Valid
Billing Account for Construction Waste Disposal			
N/A			
Registration of Chemical Waste Producer			
WPN5296-197-C3902-01	10/10/2014	N/A	Valid
Effluent Discharge License under Water Pollution Control Ordinance			
N/A			
Construction Noise Permit (CNP)			
GW-RS0737-14	28/07/2014	27/01/2015	Valid
GW-RS1052-14	04/10/2014	03/04/2015	Valid
Marine Dumping Permit			
EP/MD/15-057	25/08/2014	24/02/2015	Valid
EP/MD/15-123	27/09/2014	26/10/2014	Valid
EP/MD/15-137	27/10/2014	26/11/2014	Valid

**Summary of EM&A Requirements**

2.9 The EM&A programme under Works Contract 11227 require regular water quality monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event / Action Plans;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirements in contract documents.

2.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.

2.11 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely marine water quality monitoring as well as audit works for the Project in the reporting month.

### 3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### Regular Water Quality Monitoring

- 3.1 In accordance with the EM&A Manual and the ERR, marine water quality monitoring should be carried out during the period of seabed levelling work in Shek O Casting Basin and trenching work in Victoria Harbour. The water quality monitoring stations and control stations of Project are shown in **Figure 2** and **Figure 3**. The co-ordinates of the proposed monitoring stations are listed in **Table 3.1**. As shown in **Table 3.1**, the proposed locations are classified as Impact Station and Control Station according to their functions.
- 3.2 According to the Water Quality Monitoring Plan for Trial Trenching Works (WQMP) and the Baseline Water Quality Monitoring Report for Trial Trenching Works, water quality monitoring in Victoria Harbour will be carried out in two impact monitoring stations (namely A and WSD9) in dry season and four impact monitoring stations (namely A, WSD9, 14 and WSD17) in wet season.

**Table 3.1 Water Quality Monitoring Stations**

Station	Description	East	North	Parameters to be measured
<b>Shek O Casting Basin</b>				
GB3	Turtle Cove Beach	841120	810280	DO, Turbidity, SS
C3	Control Station for ebb tide	841200	806210	DO, Turbidity, SS
C4	Control Station for flood tide	843330	807320	DO, Turbidity, SS
<b>Victoria Harbour (Dry Season) <sup>(3)</sup></b>				
A	Wan Chai WSD Flushing Water Intake (Reprovisioned)	836268 <sup>(1)</sup>	816045 <sup>(1)</sup>	DO, Turbidity, SS
WSD9	Tai Wan WSD Flushing Water Intake	837930 <sup>(2)</sup>	818357 <sup>(2)</sup>	DO, Turbidity, SS
C1	Control Station 1	833977	817442	DO, Turbidity, SS
C2	Control Station 2	841088	817223	DO, Turbidity, SS

Note:

- (1) According to the Baseline Water Quality Monitoring Report for Trial Trenching Works, the original coordinates of monitoring location A (Easting: 836286, Northing: 816024) is the exact location taken from the design of re-provisioned Wan Chai Salt Water Pumping Station and Salt Water Intake Culvert. Based on actual site condition for taking water sampling, minor adjustment was made on monitoring location.
- (2) According to the Baseline Water Quality Monitoring Report for Trial Trenching Works, the original coordinates of monitoring location WSD9 (Easting: 838133, Northing: 817790) as proposed in WQMP were minor moved closer to sensitive receiver according to the actual site condition.
- (3) According to the Water Quality Monitoring Plan for Trial Trenching Works (WQMP) and the Baseline Water Quality Monitoring Report for Trial Trenching Works, water quality monitoring in Victoria Harbour will be carried out in two impact monitoring stations (namely A and WSD9) in dry season and four impact monitoring stations (namely A, WSD9, 14 and WSD17) in wet season.

#### **Monitoring Parameter, Frequency and Programme**

- 3.3 Water quality monitoring was conducted in accordance with the requirements stipulated in the approved SCL(HUH-ADM) EM&A Manual and the ERR. **Table 3.2** summarized the monitoring frequency and water quality parameters for the impact monitoring. The monitoring schedule for this reporting period is shown in **Appendix C**.

**Table 3.2 Water Quality Impact Monitoring Programme**

	<b>Impact Monitoring</b>
Monitoring Period	During seabed levelling work in Shek O Casting Basin and trenching work in Victoria Harbour
Monitoring Frequency	3 Days in a Week, at mid-flood and mid-ebb tides
Monitoring Locations	GB3, C3, C4, A, WSD9, C1, C2
Monitoring Parameters	DO, temperature, turbidity, pH, salinity and SS
Intervals between 2 Sets of Monitoring	Not less than 36 hours
Tide Range	Individual flood and ebb tides not less than 0.5m

**Monitoring Equipment and Methodology*****pH Measurement Instrument***

- 3.4 The instrument should consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It should be readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 should be used for calibration of the instrument before and after use.

***Dissolved Oxygen and Temperature Measuring Equipment***

- 3.5 The Dissolved Oxygen (DO) measuring equipment should be portable and weatherproof. It should complete with cable and sensor, and a DC power source. The equipment should be capable of measuring:
- a DO level in the range of 0 - 20 mg·L<sup>-1</sup> and 0 - 200% saturation; and
  - a temperature of 0 - 45 degree Celsius (°C).
- 3.6 It should have a membrane electrode with automatic temperature compensation complete with a cable.
- 3.7 Should salinity compensation not be built-in to the DO equipment, in-situ salinity should be measured to calibrate the DO measuring equipment prior to each DO measurement.

***Turbidity Measurement Instrument***

- 3.8 The turbidity measuring instrument should be a portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU (for example, Hach model 2100P or an approved similar instrument).

***Sampler***

- 3.9 A water sampler is required for SS monitoring. It should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

***Water Depth Detector***

- 3.10 A portable, battery-operated echo sounder should be used for the determination of water

depth at each monitoring station. This unit can either be hand-held or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

### ***Salinity***

- 3.11 A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring station.

### ***Sample Containers and Storage***

- 3.12 Water samples for SS monitoring should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4 °C without being frozen) and delivered to the laboratory and analyzed as soon as possible after collection.

### ***Monitoring Position Equipment***

- 3.13 A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message “screen pop-up” facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel at the correct location before taking measurements.

### ***Calibration of In-Situ Instruments***

- 3.14 The pH meter, DO meter and turbidimeter shall be checked and calibrated before use. DO meter and turbidimeter shall be certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes should be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring location.
- 3.15 **Table 3.3** summarizes the equipment used in the water quality monitoring program. The calibration certificates for the in-situ instruments are presented in **Appendix E**.

**Table 3.3 Water Quality Monitoring Equipment**

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	3
Multi-parameter Water Quality System	YSI 6820-C-M	1
	YSI 6920-M	1
	Aquaread AP-2000-D	1
Monitoring Position Equipment	“Magellan” Handheld GPS Model GPS-320	2
Water Depth Detector	Fishfinder 140	2

**Laboratory Measurement / Analysis for Marine Water**

- 3.16 Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when some equipment are under maintenance, calibration, etc.
- 3.17 Duplicate samples from each independent sampling event are required by EPD for all parameters. Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory. Sufficient water samples shall be collected at the monitoring stations for carrying out the laboratory SS determinations, with detection limit shown in **Table 3.4**. The SS determination work shall start within 24 hours after collection of the water samples. The analyses shall follow the standard methods according to Table 3.3 and as described in “American Public Health Association (APHA) Standard Methods for the Examination of Water and Wastewater”, 19th edition, unless otherwise specified.

**Table 3.4 Analytical Methods to be applied to Marine Water Quality Samples**

Determinant	Standard Method	Detection Limit
Suspended Solids (mg/L)	APHA 2540 D	0.1 mg/L

- 3.18 Quality Control Reports as attached in **Appendix F** are available for the SS analyzed in the HOKLAS-accredited laboratory, WELLAB Ltd.

**Action and Limit Levels**

- 3.19 The action and limit levels for water quality monitoring are presented in **Appendix B**.

**Event and Action Plan**

- 3.20 Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Appendix I** shall be carried out.

**Landscape and Visual**

- 3.21 In accordance with the EM&A Manual, the landscape and visual mitigation measures shall be implemented and a site inspection shall be conducted once every two weeks throughout the construction period. The implementation status is summarised in **Table 6.1** of Section 6.

#### 4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

- 4.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the Environmental Permit, EM&A Manual and the ERR. The implementation status of the environmental mitigation measures of the reporting period is summarized in **Appendix J**. Status of required submissions under the Environmental Permit (EP) of the reporting period is presented in **Table 4.1**.

**Table 4.1 Status of Required Submissions under EP**

EP Condition	Submission	Submission Date
Condition 3.4	Monthly EM&A Report (September 2014)	14 October 2014



## 5 MONITORING RESULTS

### Water Quality Monitoring

- 5.1 A total of 14 sets of water quality monitoring were carried out at the designated monitoring stations in Shek O Casting Basin and Victoria Harbour respectively in this reporting period. All water quality monitoring was conducted as scheduled in the reporting month. The water quality impact monitoring schedule for this reporting period is shown in **Appendix C**.
- 5.2 The monitoring results together with graphical presentations are shown in **Appendix D**.
- 5.3 Action and Limit Levels for water quality monitoring in Shek O Casting Basin and in Victoria Harbour have been established in the baseline water quality monitoring conducted. Action and Limit Levels for water quality is summarised in **Appendix B**.
- 5.4 No exceedance of Action and Limit Levels of water quality was recorded during the reporting period.

### Waste Management

- 5.5 Waste generated from this Project includes mainly marine sediments. Details of waste management data is presented in **Appendix K**.
- 5.6 With reference to relevant handling records of this Project, 1,912 m<sup>3</sup> (in total bulk volume) of materials - Type 1 (Category L) sediments were generated from construction activities during this reporting period. Such materials would be collected and disposed at Capping of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau). No contaminated materials - Type 1 (dedicated sites) and 11,910 m<sup>3</sup> (in total bulk volume) of Type 2 - Confined Marine Disposal (Category M) sediments were generated from construction activities during this reporting period. Such materials would be collected and disposed at Mud Pits CMP1 or CMP2 of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau).

### Landscape and Visual

- 5.7 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 8 and 22 October 2014. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

## 6 ENVIRONMENTAL SITE INSPECTION

### Site Audit

- 6.1 Site audit was carried out by ET on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audit are attached in **Appendix H**.
- 6.2 Site audits were conducted on 3, 8, 15, 22 and 29 October 2014 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 22 October 2014. No site inspection was conducted by EPD during the reporting month. The details of observations during site audit can refer to **Table 6.1**.

### Implementation Status of Environmental Mitigation Measures

- 6.3 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Environmental Mitigation Implementation Schedule (EMIS) is provided in **Appendix J**.
- 6.4 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit sessions are summarized in **Table 6.1**.

**Table 6.1 Observations and Recommendations of Site Audit**

Parameters	Date	Observations and Recommendations	Follow-up
<i>Shek O Casting Basin</i>			
<i>Water Quality</i>	3 Oct 2014	<u>Reminder</u> : Clear the discarded silt curtain at the shore area between Southern and Northern Gate properly	The observation was observed to be improved/rectified by the Contractor during the audit session on 8 Oct 2014.
	8 Oct 2014	<u>Observation</u> : Some fabric of the silt curtain observed floating on the water at the Northern Gate. The Contractor is reminded to repair the silt curtain properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 Oct 2014.
	8 Oct 2014	<u>Observation</u> : General refuse is deposited near the silt curtain at both Northern and Southern Gate. The Contractor is reminded to clear it properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 Oct 2014.
	15 Oct 2014	<u>Observation</u> : Some fabric of the silt curtain observed floating on the water at the Northern Gate. The Contractor is reminded to repair the silt curtain properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 Nov 2014.
	22 Oct 2014	<u>Observation</u> : Some fabric of the silt curtain observed floating on the water at the end of Northern Gate. The Contractor is reminded to repair the silt curtain properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 Nov 2014.
	29 Oct 2014	<u>Observation</u> : Some fabric of the silt curtain observed floating on the water at the end of Northern Gate. The Contractor is reminded to repair properly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 Nov 2014.
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--

Parameters	Date	Observations and Recommendations	Follow-up
<b>Shek O Casting Basin</b>			
<i>Air Quality</i>	--	--	--
<i>Waste / Chemical Management</i>	8 Oct 2014	<u>Reminder:</u> To provide proper rubbish bin on the target barge.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 Oct 2014.
	29 Oct 2014	<u>Observation:</u> General refuse observed near the silt curtain at Southern Gate. The Contractor is reminded to clear it regularly.	The observation was observed to be improved/rectified by the Contractor during the audit session on 5 Nov 2014.
<i>Permits/ Licenses</i>	--	--	--
<b>Victoria Harbour</b>			
<i>Water Quality</i>	3 Oct 2014	<u>Observation:</u> The silt curtain at grab is under maintenance. The Contractor was reminded to ensure the silt curtain can function properly before commencing the dredging works.	The observation was observed to be improved/rectified by the Contractor during the audit session on 15 Oct 2014.
	15 Oct 2014	<u>Reminder:</u> To remove the dredged sediments at near the side of the barge.	The observation was observed to be improved/rectified by the Contractor during the audit session on 22 Oct 2014.
	29 Oct 2014	<u>Observation:</u> Some fabric of part of the frame-type silt curtain observed floating on the water at Victoria Harbour. The Contractor is reminded to repair it properly.	Follow up action will be reported in next reporting month.
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Air Quality</i>	--	--	--
<i>Waste / Chemical Management</i>	15 Oct 2014	<u>Observation:</u> Chemical containers on the barge observed without secondary containment. The Contractor is reminded to provide drip tray to the containers.	The observation was observed to be improved/rectified by the Contractor during the audit session on 22 Oct 2014.
<i>Permits/ Licenses</i>	--	--	--

## **7 ENVIRONMENTAL NON-CONFORMANCE**

### **Summary of Exceedances**

- 7.1 No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded during the reporting period. The summary of exceedance is provided in **Appendix G**.

### **Summary of Environmental Non-Compliance**

- 7.2 No environmental non-compliance was recorded in the reporting month.

### **Summary of Environmental Complaint**

- 7.3 No environmental Project-related complaint was received in the reporting month. The Cumulative Complaint Log since the commencement of the Project is presented in **Appendix L**.

### **Summary of Environmental Summon and Successful Prosecution**

- 7.4 There was no successful environmental prosecution or notification of summons received since the Project commencement. The Cumulative Log for environmental summon and successful prosecution since the commencement of the Project is presented in **Appendix L**.

## 8 FUTURE KEY ISSUES

### Construction Programme for the Next Month

- 8.1 A tentative construction programme is provided in **Appendix A**. The major construction activities in the coming month will include:
- Seabed levelling works at channel exit;
  - Rock filling works in Casting Basin; and
  - Dredging of trial trench in Victoria Harbour.

### Key Issues in the Next Month

- 8.2 Key issues to be considered in the coming month include:
- Water quality impact in the vicinity of the marine construction activities.

### Monitoring Schedule in the Next Month

- 8.3 The tentative schedule of regular water quality monitoring at all the monitoring locations in the next reporting period is presented in **Appendix C**. The regular construction water quality monitoring will be conducted at the same monitoring locations in the next reporting period.

## 9 CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- 9.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 1 to 31 October 2014 in accordance with EM&A Manual and the requirement under EP.
- 9.2 No exceedance of the Action and Limit Levels of regular water quality monitoring was recorded at the designated monitoring stations during the reporting month.
- 9.3 5 times of joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Contractor's ET and 2 times of bi-weekly inspection of the implementation of landscape and visual mitigation measures were conducted during the reporting period.
- 9.4 There was no Project related environmental complaint, successful prosecution or notification of summons received during the reporting month.
- 9.5 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

### Recommendations

- 9.6 According to the environmental audit performed in the reporting month, the following recommendations were made:

#### Water Quality

- The contractor is reminded to properly repair the silt curtain at Northern Gate at the Shek O Casting Basin.
- The Contractor is reminded to remove the dredged sediments at near the side of the barge in Victoria Harbour.
- The Contractor is reminded to clear properly the general refuse deposited near the silt curtain at both Northern and Southern Gate at Shek O Casting Basin.
- Some fabric of part of the frame-type silt curtain observed floating on the water at Victoria Harbour. The Contractor is reminded to repair it properly.
- The Contractor was reminded to ensure the silt curtain can function properly before commencing the dredging works at Victoria Harbour if the silt curtain at grab is under maintenance. .

#### Landscape and Visual

- N/A

#### Noise

- N/A

#### Air Quality

- N/A

#### Waste/Chemical Management

- To provide drip tray to chemical container.
- To provide proper rubbish bin on the target barge in Shek O.

- The Contractor is reminded to clear properly the general refuse deposited near the silt curtain at both Northern and Southern Gate at Shek O Casting Basin.

Permits/Licenses

- N/A

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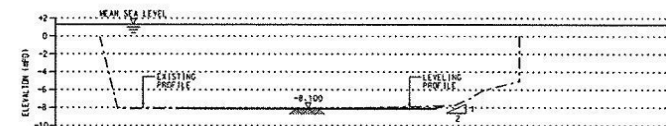
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## FIGURES

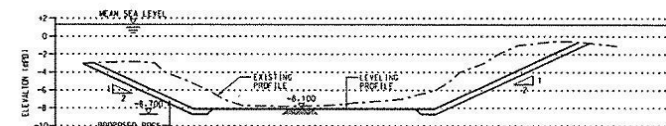
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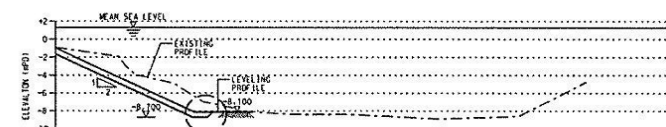




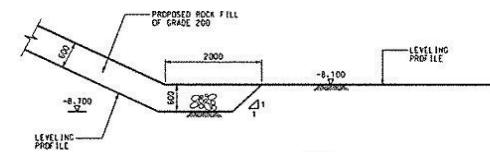
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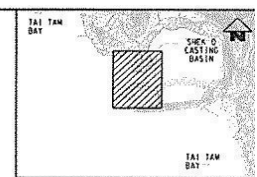
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SECTION C  
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DETAIL 1  
SCALE 1:50



KEY PLAN

#### NOTES:

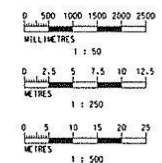
1. UNLESS NOTED OTHERWISE, LEVELS ARE SHOWN IN METRES RELATIVE TO HONG KONG PRINCIPAL DATUM (HPD).
2. TOPOGRAPHIC INFORMATION AND HYDROGRAPHIC SURVEY RESULTS SHOWN ON THE DRAWING ARE INDICATIVE ONLY.
3. BASED ON THE AVAILABLE C.I. INFORMATION SITUATION ON SEABED IS ANTICIPATED. HYDROGRAPHIC SURVEY RESULT IS SHOWN ON THE DRAWING FOR INFORMATION.

#### LEGEND:

- WORKS BOUNDARY
- HYDROGRAPHIC SURVEY RECORD
- TOPOGRAPHICAL SURVEY RECORD
- LEVELING SIDE SLOPE
- FINISHED LEVEL
- SETTING OUT POINT

#### SETTING OUT POINT

SETTING OUT POINT	EASTING	NORTHING
SOP201	842495.934	809064.474
SOP202	842585.299	809064.190
SOP203	842472.124	809035.647
SOP204	842581.026	809039.030



Title

Contract 11227  
Advance Works for NSL Cross Harbour Tunnels  
The Alignment and Works Area for Works Contract 11227

Scale

N.T.S

Project

No. MA14028

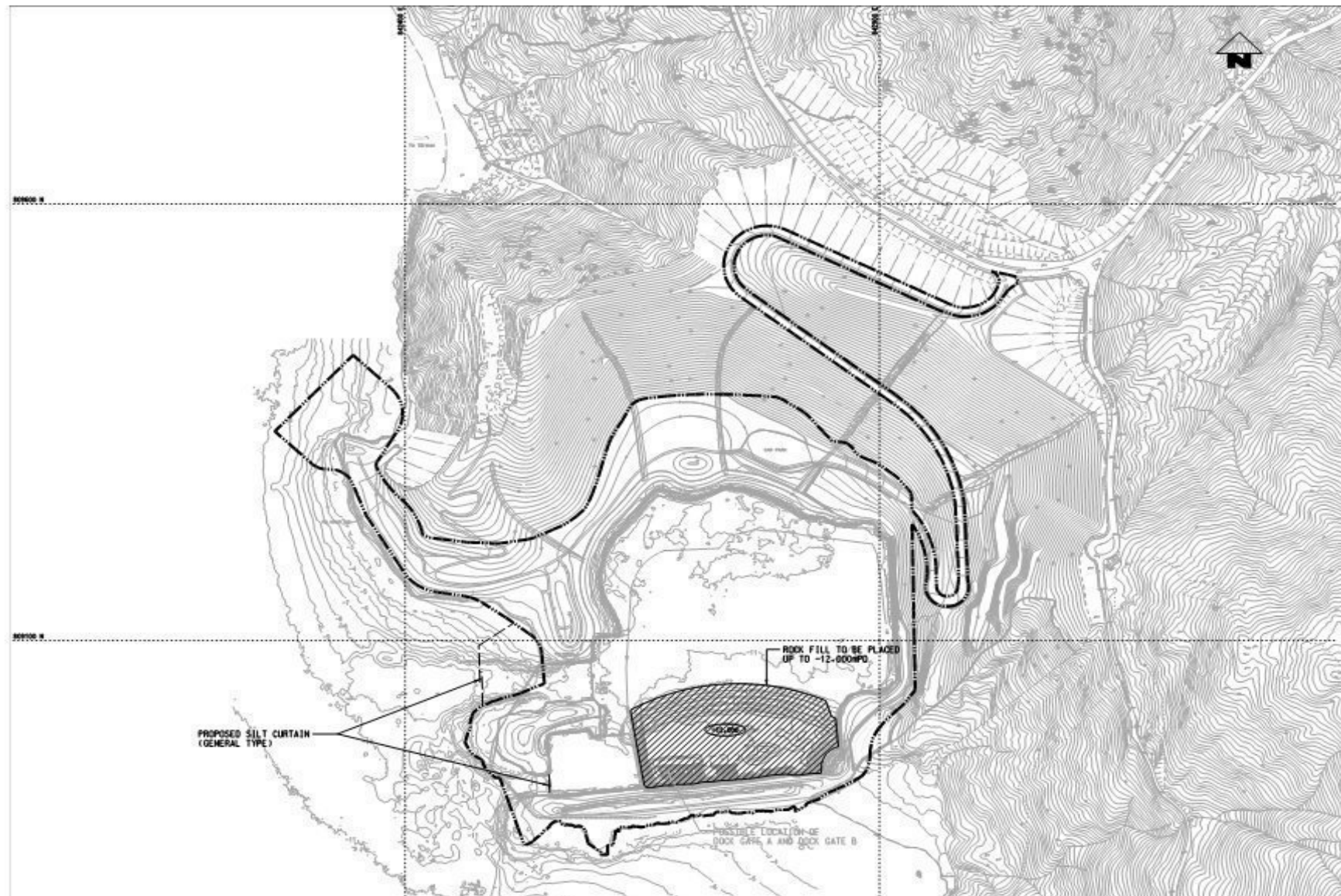
Date

Aug-14

Figure

1a

CINOTECH



Title

Contract 11227

Advance Works for NSL Cross Harbour Tunnels

The Alignment and Works Area for Works Contract 11227

Scale

N.T.S

Project

No. MA14028

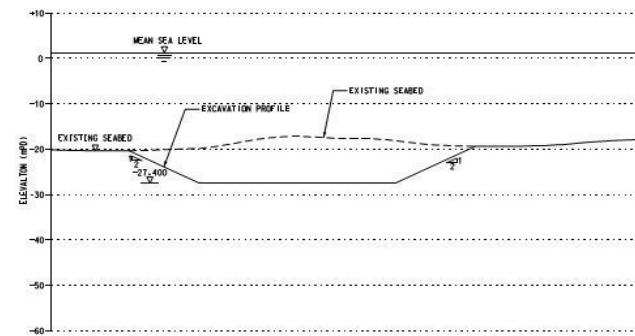
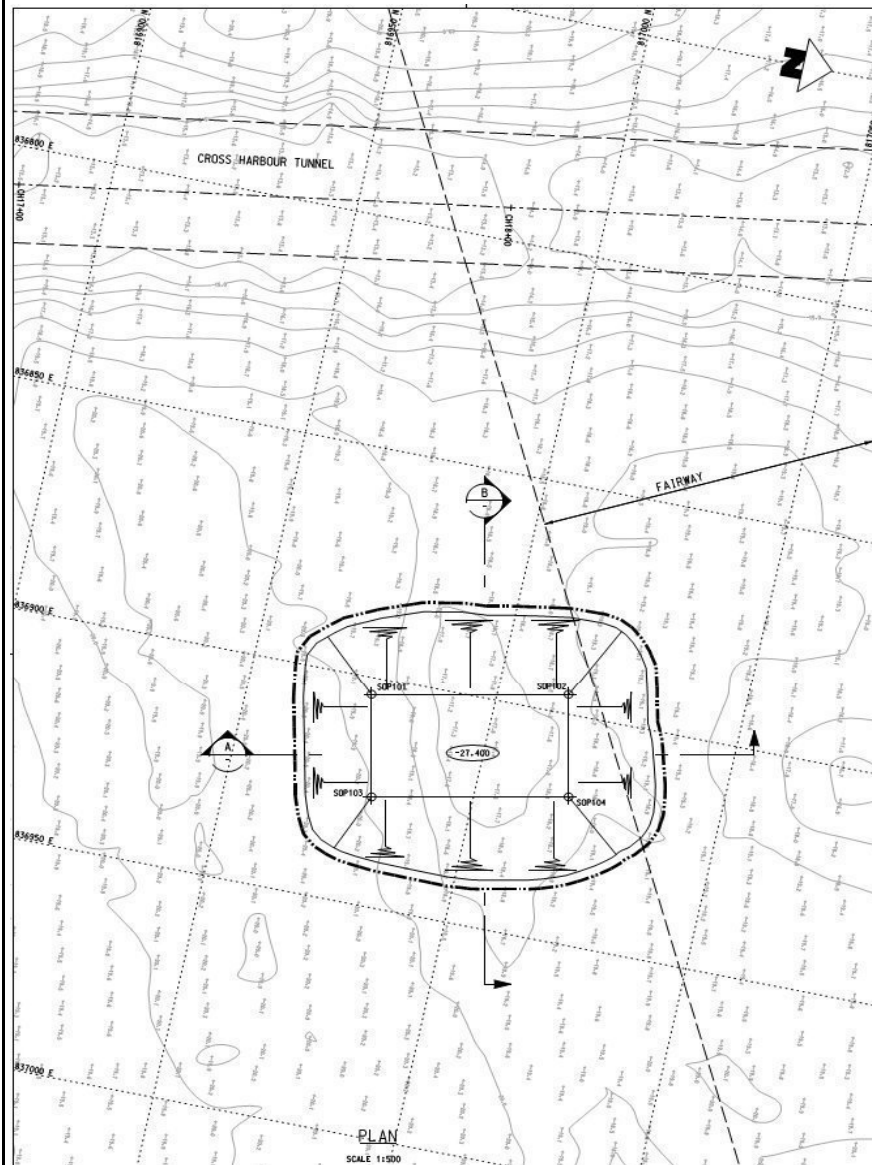
Date

Aug-14

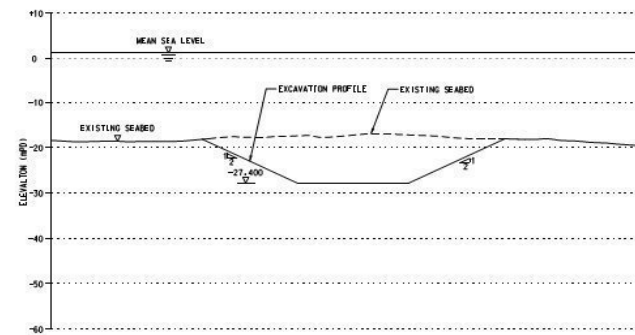
Figure

1b

CINOTECH



SECTION A  
SCALE 1:500



SECTION B  
SCALE 1:500



KEY PLAN

NOTES:

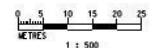
1. UNLESS NOTED OTHERWISE, LEVELS ARE SHOWN IN METRES RELATIVE TO HONG KONG PRINCIPAL DATUM (HKPD).
2. HYDROGRAPHIC SURVEY RESULTS SHOWN ON THE DRAWING ARE INDICATIVE ONLY.

LEGEND:

- WORKS BOUNDARY
- CH10+00 CROSS HARBOUR TUNNEL CHAINAGE
- TRIAL TRENCHING SIDE SLOPE
- EXCAVATION LEVEL
- SETTING OUT POINT
- HYDROGRAPHIC SURVEY RECORD (HKPD)

SETTING OUT POINT

SETTING OUT POINT	COORDINATES	
	EASTING	NORTHING
SOP101	836903.922	816975.082
SOP102	836905.469	817014.231
SOP103	836926.072	816979.763
SOP104	836917.819	817018.902



Title

Contract 11227  
Advance Works for NSL Cross Harbour Tunnels  
The Alignment and Works Area for Works Contract 11227

Scale

N.T.S

Date

Aug-14

Project

No. MA14028

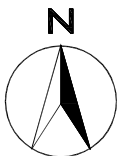
Appendix

1c

CINOTECH



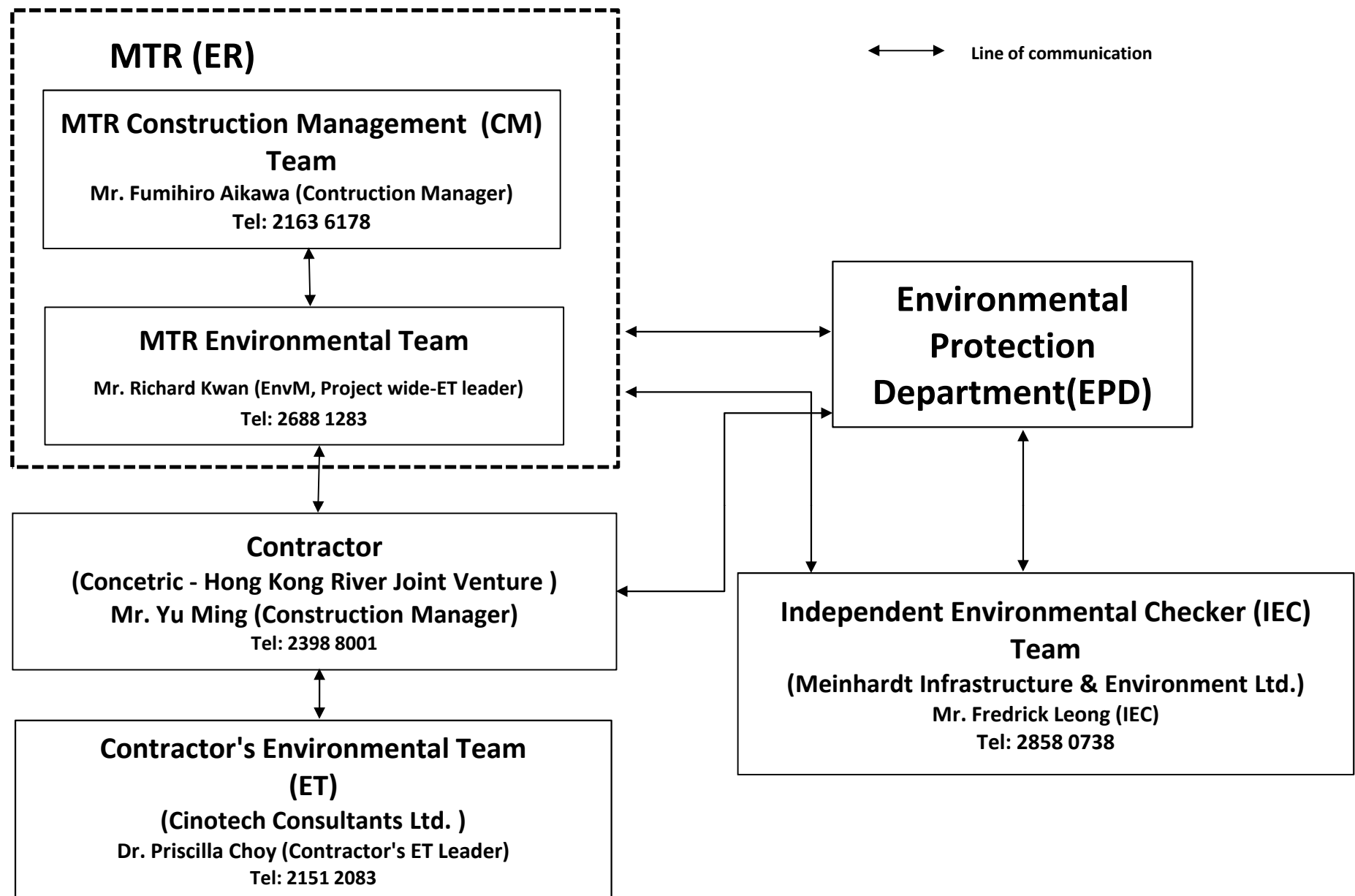




COORDINATE	EASTING	NORTHING
A	836268	816045
WSD9	837930	818357
C1	833977	817442
C2	841088	817223

## LEGEND

- Water Quality Monitoring Station (Dry Season)



Title

SCL Contract 11227  
The Shatin to Central Link -  
Advance Works for NSL Cross Harbour Tunnels  
Project Organisation for Environmental Works

Scale

N.T.S

Date

Aug-14

Project

No. MA14028

Figure

4

**CINOTECH**

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**APPENDIX A  
TENTATIVE CONSTRUCTION  
PROGRAMME**









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**Shatin to Central Link (SCL)**

**Works Contract 11227 - Advance Works for NSL Cross Harbour Tunnels**

**Programme of Marine Works (Shek O)**

Item	Activity	Year 2014					
		Jul	Aug	Sep	Oct	Nov	Dec
1	Mobilization of vessels and equipment						
2	Deployment of silt curtain for seabed levelling (northern gate)						
3	Seabed levelling works at channel exit						
2	Deployment of silt curtain for rock filling (southern gate)						
4	Rock filling works in Casting Basin						
5	Completion of marine works						
6	Decommissioning of silt curtains						
7	Demobilization of vessels and equipment						



**Shatin to Central Link (SCL)**

**Works Contract 11227 - Advance Works for NSL Cross Harbour Tunnels**

**Programme of Marine Works (Victoria Harbour)**

Item	Activity	Year 2014				
		Aug	Sep	Oct	Nov	Dec
1	Mobilization of vessels and equipment		■			
2	Deployment of silt curtain		■			
3	Dredging of trial trench		■■■■■			
4	Completion of marine works				◆	
5	Decommissioning of silt curtain				■	
6	Demobilization of vessels and equipment				■	

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**APPENDIX B**  
**ACTION AND LIMIT LEVELS**

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**APPENDIX B – Action and Limit Levels****Derived Action and Limit Levels for Water Quality at Intakes A and WSD9 (Dry Season)**

<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
DO in mg/L	<2.1	<2
SS in mg/L	5.0	5.5
Turbidity in NTU	5.3	5.6

**Derived Action and Limit Levels for Water Quality at Intakes A, WSD9, 14 and WSD17 (Wet Season)**

<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
DO in mg/L	<2.1	<2
SS in mg/L	4.4	4.8
Turbidity in NTU	5.3	5.6

**Derived Action and Limit Levels for Water Quality at GB3 (Dry Season)**

<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
DO in mg/L	6.8	6.5
SS in mg/L	9.3	9.3
Turbidity in NTU	5.0	5.6

**Derived Action and Limit Levels for Water Quality at GB3 (Wet Season)**

<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
DO in mg/L	5.5	5.3
SS in mg/L	4.5	4.5
Turbidity in NTU	2.1	2.4

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**APPENDIX C**  
**WATER QUALITY MONITORING**  
**SCHEDULE**

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**Shatin to Central Link - Contract No. 11227**  
**Advance Works for NSL Cross Harbour Tunnels**  
**Water Quality Monitoring Schedule (October 2014) (Shek O)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Oct	2-Oct	3-Oct	4-Oct
			Mid-Flood 11:56 *Mid-Ebb 17:14		Mid-Ebb 07:17 Mid-Flood 14:48	
5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct
	Mid-Ebb 10:19 Mid-Flood 16:59		Mid-Ebb 11:56 Mid-Flood 18:10		Mid-Flood 07:24 Mid-Ebb 13:22	
12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct
	Mid-Flood 09:56 *Mid-Ebb 15:21			Mid-Ebb 06:06 *Mid-Flood 18:44		Mid-Ebb 08:26 Mid-Flood 15:43
19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct
	Mid-Ebb 10:05 Mid-Flood 16:34		Mid-Ebb 11:20 Mid-Flood 17:17		Mid-Ebb 12:30 Mid-Flood 18:11	
26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	
	Mid-Flood 08:44 *Mid-Ebb 14:22		Mid-Flood 10:37 *Mid-Ebb 15:59		Mid-Flood 13:02 *Mid-Ebb 18:28	

**Water Quality Monitoring Stations**

C3, C4, GB3

\* indicates that the tidal range of individual flood or ebb tide is less than 0.5m

Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Tai Miu Wan Station)

2) The reasons for choosing the monitoring day (i.e. 1, 13, 16, 27, 29 and 31 October 2014) in which the tidal ranges are less than 0.5m include:

a) The tidal range of less than 0.5m occurs for 2 or more consecutive days

b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours

**Shatin to Central Link - Contract No. 11227**  
**Advance Works for NSL Cross Harbour Tunnels**  
**Water Quality Monitoring Schedule (October 2014) (Victoria Harbour)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Oct	2-Oct	3-Oct	4-Oct
			Mid-Flood 12:02 *Mid-Ebb 17:25		Mid-Ebb 07:17 Mid-Flood 14:58	
5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct
	Mid-Ebb 10:24 Mid-Flood 17:04		Mid-Ebb 11:59 Mid-Flood 18:13		Mid-Flood 07:27 Mid-Ebb 13:26	
12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct
	Mid-Flood 10:01 *Mid-Ebb 15:32			Mid-Ebb 06:06 *Mid-Flood 18:44		Mid-Ebb 08:26 Mid-Flood 15:49
19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct
	Mid-Ebb 10:11 Mid-Flood 16:41		Mid-Ebb 11:25 Mid-Flood 17:22		Mid-Ebb 12:36 Mid-Flood 18:17	
26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	
	Mid-Flood 08:47 *Mid-Ebb 14:27		Mid-Flood 10:42 *Mid-Ebb 16:11		Mid-Flood 13:08 *Mid-Ebb 18:36	

**Water Quality Monitoring Stations**

A, C1, C2, WSD9

\* indicates that the tidal range of individual flood or ebb tide is less than 0.5m

Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)

2) The commencement date of the water quality monitoring works is subject to the construction programme

3) The reasons for choosing the monitoring day (i.e. 1, 13, 16, 27, 29 and 31 October 2014) in which the tidal ranges are less than 0.5m include:

a) The tidal range of less than 0.5m occurs for 2 or more consecutive days

b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours

**Shatin to Central Link - Contract No. 11227**  
**Advance Works for NSL Cross Harbour Tunnels**  
**Tentative Water Quality Monitoring Schedule (November 2014) (Shek O)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Nov
2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov
	Mid-Ebb 09:00 Mid-Flood 15:42		Mid-Ebb 10:48 Mid-Flood 16:58		Mid-Ebb 12:21 Mid-Flood 18:08	
9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov
	Mid-Flood 08:54 *Mid-Ebb 14:17		Mid-Flood 10:40 *Mid-Ebb 15:32			Mid-Ebb 04:53 Mid-Flood 13:53
16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov
	Mid-Ebb 08:07 Mid-Flood 15:07		Mid-Ebb 10:01 Mid-Flood 15:59		Mid-Ebb 11:25 Mid-Flood 16:57	
23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov
	*Mid-Ebb 13:25 Mid-Flood 18:44		Mid-Flood 09:31 *Mid-Ebb 14:57		Mid-Flood 11:23 *Mid-Ebb 16:57	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Water Quality Monitoring Stations**

C3, C4, GB3

\* indicates that the tidal range of individual flood or ebb tide is less than 0.5m

Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Tai Miu Wan Station)

2) The reasons for choosing the monitoring day (i.e. 10, 12, 24, 26 and 28 November 2014) in which the tidal ranges are less than 0.5m include:

a) The tidal range of less than 0.5m occurs for 2 or more consecutive days

b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours

**Shatin to Central Link - Contract No. 11227**  
**Advance Works for NSL Cross Harbour Tunnels**  
**Tentative Water Quality Monitoring Schedule (November 2014) (Victoria Harbour)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Nov
2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov
	Mid-Ebb 09:07 Mid-Flood 15:49		Mid-Ebb 10:53 Mid-Flood 17:03		Mid-Ebb 12:25 Mid-Flood 18:12	
9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov
	Mid-Flood 08:59 *Mid-Ebb 14:27		Mid-Flood 10:47 *Mid-Ebb 15:36			Mid-Ebb 05:11 Mid-Flood 13:58
16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov
	Mid-Ebb 08:10 Mid-Flood 15:12		Mid-Ebb 10:07 Mid-Flood 16:04		Mid-Ebb 11:31 Mid-Flood 17:04	
23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov
	*Mid-Ebb 13:31 Mid-Flood 18:51		Mid-Flood 09:36 *Mid-Ebb 15:07		Mid-Flood 11:29 *Mid-Ebb 17:07	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

**Water Quality Monitoring Stations**

A, C1, C2, WSD9

\* indicates that the tidal range of individual flood or ebb tide is less than 0.5m

Remark: 1) Reference was made to the tidal information of Hong Kong Observatory (Quarry Bay Station)

2) The reasons for choosing the monitoring day (i.e. 10, 12, 24, 26 and 28 November 2014) in which the tidal ranges are less than 0.5m include:

a) The tidal range of less than 0.5m occurs for 2 or more consecutive days

b) In compliance with the requirement of (i) three days per week at mid-ebb and mid-flood tide and (ii) the interval between two sets of monitoring not less than 36 hours



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**APPENDIX D**  
**WATER QUALITY MONITORING RESULTS**  
**AND GRAPHICAL PRESENTATIONS**

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# Water Quality Monitoring Results at C3 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	17:51	Surface	1	29.6 29.5	29.6	8.2 8.2	8.2	33.2 33.2	33.2	110.7 110.7	110.7	7.0 7.0	7.0	7.0	1.3 1.4	1.4	1.6	4 4	4.0	4.3
				Middle	11	29.5 29.5	29.5	8.2 8.2	8.2	33.1 33.2	33.2	109.7 109.5	109.6	7.0 7.0	7.0		1.3 1.5	1.4		4 4	4.0	
				Bottom	21	29.5 29.5	29.5	8.2 8.2	8.2	33.6 33.7	33.7	109.4 109.2	109.3	6.9 6.9	6.9		1.8 2.0	1.9		5 5	5.0	
3-Oct-14	Sunny	Moderate	08:07	Surface	1	29.3 29.3	29.3	8.3 8.2	8.3	31.1 31.4	31.3	108.4 108.6	108.5	7.0 7.0	7.0	7.0	0.5 0.6	0.6	1.9	6 6	6.0	4.3
				Middle	11.5	29.3 29.3	29.3	8.2 8.2	8.2	32.0 32.3	32.2	108.9 108.9	108.9	7.0 7.0	7.0		2.3 2.3	2.3		4 4	4.0	
				Bottom	22	29.3 29.3	29.3	8.2 8.2	8.2	33.1 33.6	33.4	109.2 109.1	109.2	7.0 6.9	7.0		2.8 2.9	2.9		3 3	3.0	
6-Oct-14	Sunny	Moderate	10:51	Surface	1	26.7 28.9	27.8	7.6 7.4	7.5	30.2 30.9	30.6	106.9 111.9	109.4	7.2 7.3	7.3	7.2	1.6 1.8	1.7	1.8	4 4	4.0	4.3
				Middle	11.5	27.1 29.0	28.1	7.1 7.0	7.1	31.6 30.4	31.0	106.8 109.1	108.0	7.1 7.1	7.1		1.3 1.4	1.4		4 4	4.0	
				Bottom	22	27.7 29.1	28.4	6.8 6.4	6.6	30.5 30.4	30.5	107.1 106.7	106.9	7.1 6.9	7.0		2.4 2.4	2.4		5 5	5.0	
8-Oct-14	Sunny	Moderate	12:19	Surface	1	28.5 28.6	28.6	8.3 8.3	8.3	32.6 32.5	32.6	108.3 107.9	108.1	7.0 7.0	7.0	7.0	1.8 1.9	1.9	1.7	4 4	4.0	4.0
				Middle	12	28.8 28.9	28.9	8.3 8.3	8.3	32.6 32.6	32.6	107.2 107.1	107.2	6.9 6.9	6.9		1.6 1.5	1.6		4 4	4.0	
				Bottom	23	29.1 29.1	29.1	8.3 8.3	8.3	32.4 32.4	32.4	106.9 106.7	106.8	6.9 6.9	6.9		1.6 1.6	1.6		4 4	4.0	
10-Oct-14	Sunny	Moderate	14:37	Surface	1	27.8 29.0	28.4	8.1 8.1	8.1	28.6 28.8	28.7	107.4 110.8	109.1	7.2 7.3	7.3	7.1	1.6 1.5	1.6	2.0	3 3	3.0	4.3
				Middle	11.5	28.1 29.0	28.6	8.5 8.0	8.3	29.1 29.4	29.3	103.6 105.2	104.4	6.9 6.9	6.9		1.7 1.7	1.7		5 5	5.0	
				Bottom	22	28.4 29.1	28.8	8.4 7.7	8.1	31.5 31.7	31.6	108.5 111.4	110.0	7.1 7.2	7.2		2.5 2.6	2.6		5 5	5.0	
13-Oct-14	Sunny	Moderate	15:00	Surface	1	29.1 29.0	29.1	7.7 8.2	8.0	32.3 29.6	31.0	114.7 113.2	114.0	7.4 7.4	7.4	7.5	2.2 2.4	2.3	3.1	5 5	5.0	4.5
				Middle	12	29.0 28.9	29.0	8.2 8.2	8.2	29.7 30.4	30.1	114.6 112.8	113.7	7.5 7.4	7.5		3.4 3.4	3.4		5 5	5.0	
				Bottom	23	29.0 28.9	29.0	8.2 8.2	8.2	29.6 30.4	30.0	114.5 113.3	113.9	7.5 7.4	7.5		3.6 3.8	3.7		3 4	3.5	
16-Oct-14	Sunny	Moderate	07:12	Surface	1	25.1 27.9	26.5	7.7 7.6	7.7	28.1 27.7	27.9	107.1 110.8	109.0	7.5 7.5	7.5	7.4	1.1 1.1	1.1	1.7	5 5	5.0	8.2
				Middle	11	26.3 28.1	27.2	7.6 7.6	7.6	27.6 28.2	27.9	102.6 107.9	105.3	7.1 7.2	7.2		1.7 1.7	1.7		8 7	7.5	
				Bottom	21	27.0 28.2	27.6	7.6 7.6	7.6	28.5 28.6	28.6	103.2 106.1	104.7	7.0 7.1	7.1		2.3 2.2	2.3		12 12	12.0	
18-Oct-14	Sunny	Moderate	08:28	Surface	1	28.2 28.2	28.2	8.4 8.4	8.4	32.6 32.7	32.7	108.8 108.8	108.8	7.1 7.1	7.1	7.1	3.2 3.1	3.2	4.4	5 6	5.5	5.2
				Middle	11	28.1 28.1	28.1	8.4 8.4	8.4	32.9 32.9	32.9	108.2 108.3	108.3	7.0 7.1	7.1		4.3 4.2	4.3		6 6	6.0	
				Bottom	21	28.1 28.1	28.1	8.4 8.4	8.4	32.9 32.9	32.9	108.2 108.2	108.2	7.0 7.0	7.0		5.4 5.8	5.6		4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C3 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	10:25	Surface	1	27.9 27.9	27.9	6.9 6.9	6.9	31.4 32.0	31.7	106.8 107.0	106.9	7.0 7.0	7.0	7.0	2.3 2.4	2.4	2.8	5 5	5.0	5.0
				Middle	12.5	27.9 27.9	27.9	8.0 7.3	7.7	31.3 31.4	31.4	106.7 106.6	106.7	7.0 7.0	7.0		2.2 2.7	2.5		4 4	4.0	
				Bottom	24	27.9 27.9	27.9	7.5 7.0	7.3	32.0 32.0	32.0	106.4 106.4	106.4	7.0 7.0	7.0		3.4 3.6	3.5		6 6	6.0	
22-Oct-14	Sunny	Moderate	11:34	Surface	1	26.2 27.8	27.0	7.7 7.9	7.8	29.6 29.9	29.8	98.1 95.8	97.0	7.4 7.2	7.3	7.2	2.5 2.4	2.5	4.5	3 3	3.0	4.7
				Middle	11.5	26.8 27.9	27.4	7.6 7.9	7.8	32.5 31.6	32.1	94.3 93.5	93.9	7.1 7.1	7.1		4.6 4.5	4.6		7 7	7.0	
				Bottom	22	27.3 27.9	27.6	7.3 7.7	7.5	30.8 33.0	31.9	83.4 84.2	83.8	6.9 7.0	7.0		6.9 5.6	6.3		4 4	4.0	
24-Oct-14	Cloudy	Moderate	12:44	Surface	1	26.9 27.4	27.2	7.8 7.6	7.7	30.8 29.1	30.0	110.3 110.4	110.4	7.4 7.4	7.4	7.4	1.4 1.4	1.4	2.7	9 9	9.0	6.7
				Middle	11	27.0 27.4	27.2	7.8 7.7	7.8	31.0 28.8	29.9	110.2 108.8	109.5	7.4 7.3	7.4		2.5 2.7	2.6		6 6	6.0	
				Bottom	21	27.2 27.4	27.3	7.9 7.9	7.9	31.4 31.1	31.3	109.7 109.0	109.4	7.3 7.3	7.3		3.6 4.4	4.0		5 5	5.0	
27-Oct-14	Sunny	Moderate	13:28	Surface	1	24.7 27.2	26.0	8.2 8.5	8.4	23.8 28.0	25.9	102.5 108.1	105.3	7.4 7.3	7.4	7.3	4.8 4.4	4.6	4.4	3 3	3.0	4.3
				Middle	11.5	25.2 27.2	26.2	8.1 9.0	8.6	29.4 30.0	29.7	105.6 104.9	105.3	7.4 7.0	7.2		3.3 3.5	3.4		7 7	7.0	
				Bottom	22	25.8 26.9	26.4	8.6 8.7	8.7	31.8 33.0	32.4	102.3 104.5	103.4	7.0 6.9	7.0		5.4 5.2	5.3		3 3	3.0	
29-Oct-14	Sunny	Moderate	15:43	Surface	1	26.9 26.9	26.9	8.4 8.4	8.4	31.2 31.2	31.2	111.4 111.4	111.4	7.5 7.5	7.5	7.5	1.2 1.4	1.3	2.8	10 10	10.0	6.8
				Middle	11.5	26.9 26.9	26.9	8.4 8.4	8.4	31.2 31.2	31.2	111.6 111.9	111.8	7.5 7.5	7.5		3.4 3.3	3.4		5 5	5.0	
				Bottom	22	26.9 26.9	26.9	8.4 8.4	8.4	31.2 31.2	31.2	111.8 111.9	111.9	7.5 7.5	7.5		3.8 3.8	3.8		6 5	5.5	
31-Oct-14	Fine	Moderate	17:41	Surface	1	25.0 26.3	25.7	7.9 7.9	7.9	29.9 31.8	30.9	98.4 100.3	99.4	7.6 7.5	7.6	7.5	4.2 4.0	4.1	4.3	7 6	6.5	6.2
				Middle	11.5	25.1 26.4	25.8	7.9 7.9	7.9	29.3 31.9	30.6	94.5 97.3	95.9	7.3 7.3	7.3		3.0 3.7	3.4		8 8	8.0	
				Bottom	22	25.6 26.5	26.1	7.9 7.9	7.9	29.4 32.0	30.7	90.1 91.1	90.6	6.9 6.8	6.9		5.8 4.9	5.4		4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C3 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	12:04	Surface	1	29.7 29.7	29.7	8.2 8.2	8.2	32.6 32.1	32.4	116.7 116.2	116.5	7.4 7.4	7.4	7.4	1.0 1.1	1.1	1.7	3 3	3.0	3.7
				Middle	11	29.6 29.6	29.6	8.3 8.3	8.3	32.7 32.7	32.7	116.5 116.9	116.7	7.4 7.4	7.4		1.8 1.8	1.8		5 5	5.0	
				Bottom	21	29.0 29.0	29.0	8.2 8.2	8.2	33.0 33.0	33.0	110.1 109.7	109.9	7.1 7.0	7.1		2.2 2.4	2.3		3 3	3.0	
3-Oct-14	Sunny	Moderate	14:11	Surface	1	28.9 29.0	29.0	8.2 8.2	8.2	31.1 31.4	31.3	108.5 108.5	108.5	7.0 7.0	7.0	7.0	1.2 1.2	1.2	1.8	3 3	3.0	3.7
				Middle	11	29.1 29.1	29.1	7.9 7.4	7.7	31.6 31.9	31.8	108.6 109.0	108.8	7.0 7.0	7.0		1.9 1.8	1.9		4 4	4.0	
				Bottom	21	29.3 29.4	29.4	6.9 7.1	7.0	32.3 32.4	32.4	109.6 109.9	109.8	7.0 7.0	7.0		2.2 2.2	2.2		4 4	4.0	
6-Oct-14	Sunny	Moderate	16:09	Surface	1	27.2 29.4	28.3	8.2 7.8	8.0	29.7 29.1	29.4	114.7 120.1	117.4	7.7 7.8	7.8	7.4	0.9 0.9	0.9	1.4	5 4	4.5	3.8
				Middle	11.5	27.9 29.4	28.7	8.2 7.3	7.8	28.5 32.7	30.6	103.4 110.9	107.2	6.9 7.1	7.0		1.1 1.1	1.1		4 4	4.0	
				Bottom	22	28.3 29.5	28.9	8.0 6.9	7.5	32.6 33.3	33.0	108.2 109.3	108.8	7.0 6.9	7.0		2.4 2.2	2.3		3 3	3.0	
8-Oct-14	Fine	Moderate	16:55	Surface	1	27.7 27.9	27.8	8.3 8.3	8.3	29.6 29.7	29.7	110.3 110.1	110.2	7.4 7.3	7.4	7.3	1.5 1.6	1.6	1.7	4 5	4.5	4.2
				Middle	11.5	28.6 28.6	28.6	8.3 8.3	8.3	29.7 29.7	29.7	108.7 108.2	108.5	7.1 7.1	7.1		1.2 1.2	1.2		4 4	4.0	
				Bottom	22	29.0 29.1	29.1	8.3 8.3	8.3	29.6 29.5	29.6	106.9 106.5	106.7	7.0 7.0	7.0		2.3 2.3	2.3		4 4	4.0	
10-Oct-14	Sunny	Moderate	08:25	Surface	1	28.3 27.3	27.8	8.7 8.9	8.8	33.8 30.4	32.1	108.1 102.4	105.3	7.0 6.9	7.0	7.0	1.2 1.2	1.2	1.8	3 3	3.0	3.7
				Middle	11.5	27.4 27.6	27.5	8.7 8.7	8.7	33.9 31.2	32.6	106.6 105.0	105.8	7.0 7.0	7.0		1.8 1.8	1.8		4 4	4.0	
				Bottom	22	28.3 28.6	28.5	8.7 8.8	8.8	34.0 32.1	33.1	108.2 107.3	107.8	7.0 7.0	7.0		2.4 2.4	2.4		4 4	4.0	
13-Oct-14	Sunny	Moderate	10:17	Surface	1	28.9 28.9	28.9	7.0 6.9	7.0	31.8 32.0	31.9	108.8 110.5	109.7	7.0 7.1	7.1	7.2	2.4 2.4	2.4	2.8	5 5	5.0	5.2
				Middle	11.5	28.8 28.9	28.9	8.1 7.0	7.6	31.4 32.7	32.1	110.7 110.6	110.7	7.2 7.1	7.2		2.1 2.6	2.4		5 5	5.0	
				Bottom	22	28.8 28.9	28.9	7.4 6.9	7.2	31.7 32.0	31.9	110.9 109.8	110.4	7.2 7.1	7.2		3.4 3.5	3.5		5 6	5.5	
16-Oct-14	Fine	Moderate	17:44	Surface	1	24.7 27.6	26.2	7.6 7.6	7.6	28.9 28.9	28.9	110.1 113.7	111.9	7.8 7.6	7.7	7.4	1.2 1.2	1.2	1.6	8 8	8.0	5.3
				Middle	10.5	25.6 28.0	26.8	7.7 7.6	7.7	30.3 30.1	30.2	99.8 109.8	104.8	6.9 7.3	7.1		1.2 1.2	1.2		4 4	4.0	
				Bottom	20	26.8 28.2	27.5	7.7 7.6	7.7	30.3 30.5	30.4	112.4 101.9	107.2	7.6 6.7	7.2		2.3 2.2	2.3		4 4	4.0	
18-Oct-14	Sunny	Moderate	14:47	Surface	1	28.1 28.1	28.1	8.4 8.4	8.4	34.3 34.3	34.3	116.3 116.3	116.3	7.5 7.5	7.5	7.5	4.1 4.3	4.2	4.6	5 4	4.5	4.3
				Middle	11	28.1 28.1	28.1	8.4 8.4	8.4	34.7 34.7	34.7	115.0 115.1	115.1	7.4 7.4	7.4		4.6 4.2	4.4		4 5	4.5	
				Bottom	21	28.1 28.0	28.1	8.4 8.4	8.4	34.8 34.9	34.9	114.3 114.5	114.4	7.4 7.4	7.4		5.2 5.2	5.2		4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C3 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:41	Surface	1	28.1 28.1	28.1	7.9 8.5	8.2	24.5 30.3	27.4	108.8 110.1	109.5	7.4 7.3	7.4	7.4	1.2 1.4	1.3	2.9	3 5	3.0	3.5
				Middle	11.5	28.1 28.1	28.1	7.7 8.1	7.9	28.2 30.3	29.3	109.6 110.4	110.0	7.3 7.3	7.3		3.5 3.4	3.5		4	4.5	
				Bottom	22	28.1 28.0	28.1	8.3 8.1	8.2	30.7 31.3	31.0	109.6 109.0	109.3	7.2 7.2	7.2		3.7 3.8	3.8		3 3	3.0	
22-Oct-14	Sunny	Moderate	16:30	Surface	1	25.5 27.5	26.5	7.9 8.0	8.0	24.6 28.7	26.7	95.4 95.8	95.6	7.2 7.2	7.2	7.2	4.1 3.6	3.9	4.0	6 6	6.0	5.2
				Middle	11.5	26.0 27.7	26.9	7.7 8.6	8.2	29.9 30.6	30.3	90.0 88.6	89.3	7.1 7.0	7.1		2.7 2.6	2.7		4 3	3.5	
				Bottom	22	26.5 27.8	27.2	8.2 8.2	8.2	32.6 33.6	33.1	84.9 83.8	84.4	7.0 7.0	7.0		5.8 4.7	5.3		6 6	6.0	
24-Oct-14	Cloudy	Moderate	17:16	Surface	1	26.7 27.4	27.1	8.2 8.2	8.2	29.8 29.9	29.9	106.7 108.1	107.4	7.2 7.2	7.2	7.2	1.5 1.7	1.6	2.8	6 6	6.0	4.7
				Middle	11.5	27.2 27.4	27.3	7.8 7.9	7.9	30.3 30.0	30.2	105.8 105.2	105.5	7.1 7.0	7.1		3.7 3.5	3.6		3 3	3.0	
				Bottom	22	27.3 27.4	27.4	7.9 7.8	7.9	29.9 30.2	30.1	105.4 105.8	105.6	7.1 7.1	7.1		3.1 3.1	3.1		5 5	5.0	
27-Oct-14	Sunny	Moderate	10:02	Surface	1	25.9 27.3	26.6	8.1 8.4	8.3	28.9 29.2	29.1	110.8 110.1	110.5	7.7 7.4	7.6	7.4	2.0 2.0	2.0	4.1	3 3	3.0	4.0
				Middle	11.5	26.2 27.0	26.6	8.1 8.3	8.2	31.9 30.9	31.4	107.2 107.6	107.4	7.2 7.2	7.2		4.5 4.7	4.6		6 6	6.0	
				Bottom	22	26.4 27.0	26.7	7.9 8.2	8.1	30.1 32.2	31.2	105.3 108.2	106.8	7.2 7.2	7.2		5.8 5.5	5.7		3 3	3.0	
29-Oct-14	Sunny	Moderate	10:45	Surface	1	26.8 26.9	26.9	8.4 8.4	8.4	32.6 32.7	32.7	109.2 108.8	109.0	7.3 7.2	7.3	7.3	2.3 2.5	2.4	2.7	4 4	4.0	5.7
				Middle	12.5	26.8 26.9	26.9	8.4 8.4	8.4	32.7 32.7	32.7	109.0 108.8	108.9	7.3 7.2	7.3		2.1 2.1	2.1		6 6	6.0	
				Bottom	24	26.8 26.9	26.9	8.4 8.4	8.4	32.7 32.7	32.7	109.1 109.0	109.1	7.3 7.2	7.3		3.4 3.5	3.5		7 7	7.0	
31-Oct-14	Sunny	Moderate	13:11	Surface	1	26.1 26.5	26.3	8.0 8.0	8.0	32.2 26.5	29.4	104.8 100.3	102.6	7.6 7.5	7.6	7.4	3.5 3.7	3.6	3.8	6 5	5.5	3.8
				Middle	11.5	26.4 26.5	26.5	8.0 8.0	8.0	25.9 26.5	26.2	93.6 94.4	94.0	7.2 7.2	7.2		3.8 3.7	3.8		3 3	3.0	
				Bottom	22	26.4 26.5	26.5	8.0 8.0	8.0	26.2 26.7	26.5	90.8 91.2	91.0	7.0 7.0	7.0		4.1 4.0	4.1		3 3	3.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C4 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	18:11	Surface	1	29.6 29.6	29.6	8.2 8.2	8.2	33.7 33.7	33.7	111.8 112.0	111.9	7.1 7.1	7.1	7.2	0.9 1.1	1.0	1.9	4 4	4.0	4.3
				Middle	9	29.1 29.1	29.1	8.2 8.2	8.2	33.9 34.0	34.0	113.7 113.8	113.8	7.2 7.2	7.2		1.6 1.6			5 5	5.0	
				Bottom	17	28.8 28.8	28.8	8.1 8.1	8.1	34.0 34.0	34.0	110.9 110.0	110.5	7.1 7.0	7.1		2.9 3.0			4 4	4.0	
3-Oct-14	Sunny	Moderate	07:54	Surface	1	29.5 29.5	29.5	8.6 8.6	8.6	30.5 30.6	30.6	107.7 107.7	107.7	6.9 6.9	6.9	6.9	0.8 0.8	0.8	2.0	3 3	3.0	3.3
				Middle	9	29.5 29.5	29.5	8.5 8.5	8.5	30.8 30.9	30.9	107.2 107.1	107.2	6.9 6.9	6.9		2.6 2.6			3 3	3.0	
				Bottom	17	29.5 29.5	29.5	8.4 8.4	8.4	32.4 32.3	32.4	107.8 108.0	107.9	6.9 6.9	6.9		2.5 2.5			4 4	4.0	
6-Oct-14	Sunny	Moderate	10:35	Surface	1	28.9 27.6	28.3	8.2 8.2	8.2	31.2 31.0	31.1	108.6 114.2	111.4	7.0 7.6	7.3	7.2	1.8 1.9	1.9	1.8	4 4	4.0	4.0
				Middle	9	29.3 27.7	28.5	7.9 7.6	7.8	30.0 30.7	30.4	110.1 106.0	108.1	7.1 7.0	7.1		1.4 1.4			5 5	5.0	
				Bottom	17	29.4 28.0	28.7	7.4 6.9	7.2	30.5 30.5	30.5	107.2 106.1	106.7	6.9 7.0	7.0		2.2 2.0			3 3	3.0	
8-Oct-14	Sunny	Moderate	12:26	Surface	1	28.0 28.2	28.1	8.3 8.3	8.3	33.2 33.2	33.2	109.7 109.2	109.5	7.1 7.1	7.1	7.0	0.4 0.5	0.5	1.4	4 4	4.0	4.0
				Middle	9	28.7 28.8	28.8	8.3 8.3	8.3	33.0 32.9	33.0	107.4 107.3	107.4	6.9 6.9	6.9		1.8 1.7			4 4	4.0	
				Bottom	17	29.1 29.2	29.2	8.3 8.3	8.3	32.6 32.5	32.6	107.9 107.4	107.7	6.9 6.9	6.9		1.8 1.8			4 4	4.0	
10-Oct-14	Sunny	Moderate	14:26	Surface	1	28.6 29.0	28.8	8.2 7.9	8.1	28.4 28.7	28.6	110.0 112.0	111.0	7.3 7.4	7.4	7.3	1.3 1.4	1.4	1.6	5 5	5.0	4.3
				Middle	9.5	28.8 29.0	28.9	7.6 7.4	7.5	28.8 28.9	28.9	106.8 108.0	107.4	7.0 7.1	7.1		1.0 1.1			5 5	5.0	
				Bottom	18	29.0 29.1	29.1	7.2 6.8	7.0	29.5 29.2	29.4	109.6 108.4	109.0	7.2 7.1	7.2		2.5 2.2			3 3	3.0	
13-Oct-14	Sunny	Moderate	14:52	Surface	1	28.8 29.1	29.0	8.4 7.7	8.1	31.9 31.3	31.6	108.7 114.5	111.6	7.0 7.4	7.2	7.3	1.6 1.3	1.5	2.9	5 5	5.0	4.3
				Middle	10	29.1 29.1	29.1	8.2 7.9	8.1	30.6 32.2	31.4	114.6 114.5	114.6	7.4 7.4	7.4		3.4 3.4			4 4	4.0	
				Bottom	19	29.1 29.1	29.1	7.8 7.8	7.8	30.8 32.3	31.6	114.7 115.0	114.9	7.4 7.4	7.4		3.7 3.6			4 4	4.0	
16-Oct-14	Sunny	Moderate	06:57	Surface	1	24.9 28.3	26.6	7.7 7.7	7.7	27.8 28.5	28.2	117.5 122.9	120.2	8.3 8.2	8.3	7.9	1.2 1.2	1.2	1.6	11 11	11.0	8.2
				Middle	8.5	27.0 28.4	27.7	7.7 7.7	7.7	28.8 29.2	29.0	109.6 111.2	110.4	7.4 7.4	7.4		1.2 1.2			7 7	7.0	
				Bottom	16	28.0 28.5	28.3	7.7 7.7	7.7	29.5 29.5	29.5	107.6 106.3	107.0	7.2 7.0	7.1		2.3 2.4			6 7	6.5	
18-Oct-14	Sunny	Moderate	08:54	Surface	1	27.8 27.9	27.9	8.4 8.4	8.4	32.9 32.9	32.9	113.5 113.2	113.4	7.4 7.4	7.4	7.3	3.7 3.8	3.8	3.9	5 5	5.0	5.3
				Middle	9	27.9 27.9	27.9	8.4 8.4	8.4	33.0 33.0	33.0	110.8 110.6	110.7	7.2 7.2	7.2		4.1 3.9			7 8	7.5	
				Bottom	17	27.9 27.9	27.9	8.4 8.4	8.4	33.0 33.0	33.0	111.1 111.1	111.1	7.3 7.3	7.3		3.8 4.1			3 4	3.5	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C4 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	10:14	Surface	1	27.9 27.9	27.9	8.4 6.9	7.7	32.6 33.0	32.8	105.9 106.0	106.0	6.9 6.9	6.9	6.9	1.6 1.4	1.5	3.0	4 4	4.0	4.0
				Middle	10	27.9 27.9	27.9	7.2 7.4	7.3	32.4 33.0	32.7	105.9 106.1	106.0	6.9 6.9	6.9		3.7 3.6	3.7		3 3	3.0	
				Bottom	19	27.9 27.9	27.9	7.4 7.9	7.7	32.6 33.1	32.9	105.8 106.3	106.1	6.9 6.9	6.9		3.9 3.7	3.8		5 5	5.0	
22-Oct-14	Sunny	Moderate	11:26	Surface	1	27.5 27.9	27.7	7.8 7.7	7.8	31.2 29.7	30.5	84.2 83.4	83.8	7.0 6.9	7.0	7.0	1.2 1.1	1.2	3.0	4 4	4.0	3.3
				Middle	9.5	27.8 27.9	27.9	7.6 7.5	7.6	27.9 32.0	30.0	82.7 82.4	82.6	6.9 6.9	6.9		3.2 3.3	3.3		3 3	3.0	
				Bottom	18	27.9 27.9	27.9	7.9 7.9	7.9	32.4 34.5	33.5	77.0 75.9	76.5	7.1 7.0	7.1	7.1	4.6 4.4	4.5		3 3	3.0	
24-Oct-14	Cloudy	Moderate	12:33	Surface	1	26.6 27.4	27.0	8.7 7.7	8.2	29.0 29.0	29.0	110.3 109.8	110.1	7.5 7.4	7.5	7.4	1.7 1.7	1.7	2.3	7 6	6.5	5.8
				Middle	10.5	27.2 27.4	27.3	8.5 7.6	8.1	31.0 31.6	31.3	108.6 108.3	108.5	7.3 7.2	7.3		2.7 2.5	2.6		7 7	7.0	
				Bottom	20	27.4 27.4	27.4	7.8 7.5	7.7	31.0 31.7	31.4	107.3 108.4	107.9	7.1 7.2	7.2	7.2	2.7 2.7	2.7		4 4	4.0	
27-Oct-14	Sunny	Moderate	13:21	Surface	1	25.8 27.2	26.5	7.7 8.2	8.0	28.3 28.3	28.3	103.9 110.1	107.0	7.2 7.5	7.4	7.3	3.4 3.1	3.3	3.7	3 3	3.0	3.0
				Middle	9	26.4 27.4	26.9	7.2 8.2	7.7	29.1 28.3	28.7	105.0 105.4	105.2	7.2 7.1	7.2		3.6 2.9	3.3		3 3	3.0	
				Bottom	17	27.1 27.6	27.4	8.1 8.1	8.1	28.0 28.4	28.2	102.5 103.3	102.9	7.0 7.0	7.0	7.0	4.1 5.0	4.6		3 3	3.0	
29-Oct-14	Sunny	Moderate	15:32	Surface	1	26.9 26.9	26.9	8.5 8.5	8.5	31.1 29.4	30.3	111.4 111.0	111.2	7.5 7.5	7.5	7.5	1.6 1.3	1.5	2.8	4 4	4.0	6.7
				Middle	9.5	26.9 26.9	26.9	8.5 8.5	8.5	31.2 29.4	30.3	111.6 111.0	111.3	7.5 7.5	7.5		3.4 3.2	3.3		11 11	11.0	
				Bottom	18	26.9 26.9	26.9	8.5 8.5	8.5	31.2 31.1	31.2	111.6 111.3	111.5	7.5 7.5	7.5	7.5	3.5 3.6	3.6		5 5	5.0	
31-Oct-14	Fine	Moderate	17:23	Surface	1	25.2 26.5	25.9	8.0 8.0	8.0	28.9 29.1	29.0	102.8 104.3	103.6	7.2 7.1	7.2	7.3	3.7 3.4	3.6	3.1	4 4	4.0	4.7
				Middle	9.5	26.2 26.5	26.4	8.0 8.0	8.0	29.1 29.1	29.1	99.1 98.6	98.9	7.4 7.3	7.4		2.4 2.3	2.4		5 5	5.0	
				Bottom	18	26.3 26.5	26.4	8.0 8.0	8.0	29.1 29.1	29.1	94.2 93.6	93.9	7.1 7.0	7.1	7.1	3.3 3.3	3.3		5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C4 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	12:26	Surface	1	29.9 29.9	29.9	8.3 8.3	8.3	32.5 32.5	32.5	118.4 117.9	118.2	7.5 7.5	7.5	7.4	1.5 1.5 1.6 1.8	1.5	1.9	3 4 4 4	3.5	3.5
				Middle	9	29.4 29.4	29.4	8.2 8.2	8.2	32.8 32.8	32.8	115.0 114.7	114.9	7.3 7.3	7.3		1.6 1.7	1.7		4 4 4	4.0	
				Bottom	17	29.3 29.3	29.3	8.2 8.2	8.2	33.1 33.1	33.1	109.2 108.9	109.1	7.0 6.9	7.0		2.5 2.5	2.5		3 3 3	3.0	
3-Oct-14	Sunny	Moderate	14:01	Surface	1	28.9 29.0	29.0	7.3 7.3	7.3	30.5 31.5	31.0	116.5 117.0	116.8	7.6 7.6	7.6	7.6	1.8 1.9 1.6 1.5	1.9	1.7	4 4 5 5	4.0	4.0
				Middle	9.5	29.2 29.3	29.3	7.3 7.2	7.3	33.5 33.8	33.7	117.8 117.8	117.8	7.5 7.5	7.5		1.6 1.5	1.6		3 3 3	3.0	
				Bottom	18	29.5 29.5	29.5	7.0 7.0	7.0	33.3 33.5	33.4	117.4 117.5	117.5	7.5 7.5	7.5		1.6 1.6	1.6		3 3 3	3.0	
6-Oct-14	Sunny	Moderate	15:55	Surface	1	28.1 29.4	28.8	8.2 7.5	7.9	29.7 30.6	30.2	112.0 118.9	115.5	7.4 7.7	7.6	7.5	1.8 1.8 1.6 1.6	1.8	1.7	3 3 4 4	3.0	3.5
				Middle	9.5	28.3 29.5	28.9	8.0 7.1	7.6	31.9 31.4	31.7	113.8 112.3	113.1	7.4 7.2	7.3		1.6 1.6	1.6		3 3 4	3.5	
				Bottom	18	28.8 29.6	29.2	7.5 6.8	7.2	33.0 32.1	32.6	109.8 110.2	110.0	7.1 7.0	7.1		1.6 1.6	1.6		4 4 4	4.0	
8-Oct-14	Fine	Moderate	17:03	Surface	1	28.1 28.3	28.2	8.2 8.2	8.2	31.3 31.1	31.2	111.6 111.4	111.5	7.3 7.3	7.3	7.3	1.1 1.2 1.5 1.5	1.2	1.9	6 6 3 3	6.0	4.3
				Middle	9	28.8 28.9	28.9	8.3 8.3	8.3	31.0 30.8	30.9	110.4 110.5	110.5	7.2 7.2	7.2		1.5 1.5	1.5		3 3 4	3.0	
				Bottom	17	34.1 29.3	31.7	8.2 8.3	8.3	28.6 28.3	28.5	119.4 107.6	113.5	7.2 7.0	7.1		2.9 3.3	3.1		4 4 4	4.0	
10-Oct-14	Sunny	Moderate	08:09	Surface	1	28.6 28.1	28.4	8.6 8.9	8.8	31.9 33.8	32.9	110.4 110.9	110.7	7.2 7.2	7.2	7.1	1.3 1.4 1.3 1.3	1.4	1.8	3 3 5 5	3.0	3.7
				Middle	9	27.5 28.5	28.0	8.7 8.8	8.8	31.9 32.8	32.4	104.3 109.1	106.7	6.9 7.1	7.0		1.3 1.3	1.3		3 3 3	3.0	
				Bottom	17	27.8 28.1	28.0	8.7 8.7	8.7	32.1 33.9	33.0	108.3 104.5	106.4	7.1 6.8	7.0		3.0 2.6	2.8		3 3 3	3.0	
13-Oct-14	Sunny	Moderate	10:06	Surface	1	28.4 28.9	28.7	8.6 6.7	7.7	32.4 32.3	32.4	107.4 107.5	107.5	7.0 6.9	7.0	7.0	1.6 1.4 3.7 3.5	1.5	3.0	11 11 8 8	11.0	8.7
				Middle	9	28.9 28.9	28.9	7.4 7.6	7.5	31.9 31.8	31.9	107.5 108.3	107.9	6.9 7.0	7.0		3.7 3.8	3.6		7 7 7	7.0	
				Bottom	17	28.9 28.9	28.9	7.3 7.8	7.6	31.0 30.1	30.6	106.9 107.5	107.2	6.9 7.0	7.0		3.8 3.7	3.8		7 7 7	7.0	
16-Oct-14	Fine	Moderate	17:33	Surface	1	24.6 28.1	26.4	7.7 7.5	7.6	27.2 29.1	28.2	108.9 113.7	111.3	7.8 7.6	7.7	7.6	1.4 1.4 1.6 1.6	1.4	1.6	8 8 4 4	8.0	5.2
				Middle	9	25.7 28.4	27.1	7.5 7.5	7.5	29.4 29.6	29.5	107.4 112.7	110.1	7.4 7.4	7.4		1.6 1.6	1.6		3 3 4	4.0	
				Bottom	17	27.1 28.4	27.8	7.4 7.4	7.4	30.1 30.2	30.2	105.8 110.9	108.4	7.1 7.3	7.2		1.9 1.9	1.9		3 4 4	3.5	
18-Oct-14	Sunny	Moderate	15:07	Surface	1	28.1 28.1	28.1	8.4 8.4	8.4	34.8 34.8	34.8	115.7 115.7	115.7	7.5 7.5	7.5	7.4	4.3 4.5 4.8 4.8	4.4	4.8	4 5 6 7	4.5	7.3
				Middle	9	28.1 28.1	28.1	8.4 8.4	8.4	35.1 35.1	35.1	114.2 114.1	114.2	7.3 7.3	7.3		4.8 4.8	4.8		11 11 11	11.0	
				Bottom	17	28.0 28.0	28.0	8.4 8.4	8.4	35.4 35.3	35.4	113.5 113.5	113.5	7.3 7.3	7.3		5.2 5.4	5.3		11 11 11	11.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.



# Water Quality Monitoring Results at C4 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:29	Surface	1	28.0 28.0	28.0	8.5 7.9	8.2	30.6 31.6	31.1	109.5 109.5	109.5	7.2 7.2	7.2	7.2	1.6 1.3	1.5	2.8	5 4	4.5	3.5
				Middle	9	28.0 28.0	28.0	8.7 7.6	8.2	30.7 30.8	30.8	109.4 109.5	109.5	7.2 7.2	7.2		3.3 3.3			3 3	3.0	
				Bottom	17	28.0 28.0	28.0	8.2 8.0	8.1	31.2 31.1	31.2	109.4 109.3	109.4	7.2 7.2	7.2		3.7 3.6			3 3	3.0	
22-Oct-14	Sunny	Moderate	16:23	Surface	1	26.3 27.9	27.1	7.3 7.7	7.5	28.8 29.2	29.0	89.8 91.6	90.7	6.9 6.9	6.9	7.1	3.7 3.5	3.6	3.3	5 5	5.0	5.3
				Middle	9	27.3 27.9	27.6	6.7 7.8	7.3	29.9 28.9	29.4	87.8 88.9	88.4	7.3 7.3	7.3		2.7 2.3			5 5	5.0	
				Bottom	17	27.6 28.0	27.8	7.8 7.8	7.8	28.9 28.9	28.9	84.2 85.3	84.8	7.0 7.1	7.1		3.4 4.2			6 6	6.0	
24-Oct-14	Cloudy	Moderate	17:08	Surface	1	26.8 27.3	27.1	7.7 7.5	7.6	29.7 30.8	30.3	107.5 108.8	108.2	7.3 7.3	7.3	7.3	1.6 1.5	1.6	2.6	7 7	7.0	5.3
				Middle	10.5	26.9 27.4	27.2	8.0 7.8	7.9	30.2 30.4	30.3	107.0 106.8	106.9	7.2 7.1	7.2		3.5 3.3			5 5	5.0	
				Bottom	20	27.1 27.4	27.3	8.3 8.1	8.2	30.6 30.3	30.5	106.8 105.7	106.3	7.2 7.1	7.2		3.0 2.8			4 4	4.0	
27-Oct-14	Sunny	Moderate	09:54	Surface	1	26.6 27.5	27.1	8.3 8.0	8.2	30.4 28.9	29.7	107.9 109.8	108.9	7.3 7.4	7.4	7.4	2.7 2.8	2.8	4.0	3 3	3.0	3.7
				Middle	9.5	27.0 27.3	27.2	8.0 7.9	8.0	27.4 31.3	29.4	106.2 109.6	107.9	7.3 7.3	7.3		3.8 4.0			3 3	3.0	
				Bottom	18	27.5 27.1	27.3	8.4 8.4	8.4	31.9 33.9	32.9	105.0 106.0	105.5	6.9 7.0	7.0		5.3 5.0			5 5	5.0	
29-Oct-14	Sunny	Moderate	10:34	Surface	1	26.8 26.8	26.8	8.4 8.4	8.4	32.6 32.7	32.7	108.7 108.8	108.8	7.2 7.2	7.2	7.2	1.6 1.5	1.6	3.0	5 5	5.0	5.0
				Middle	10	26.8 26.8	26.8	8.4 8.4	8.4	32.7 32.8	32.8	108.7 108.7	108.7	7.2 7.2	7.2		3.8 3.5			5 5	5.0	
				Bottom	19	26.8 26.8	26.8	8.4 8.4	8.4	32.7 32.8	32.8	108.8 108.5	108.7	7.2 7.2	7.2		3.9 3.6			5 5	5.0	
31-Oct-14	Sunny	Moderate	12:53	Surface	1	26.8 26.7	26.8	8.0 7.9	8.0	29.9 29.3	29.6	107.4 104.3	105.9	7.3 7.1	7.2	7.2	2.3 2.3	2.3	3.5	3 3	3.0	3.7
				Middle	9.5	26.8 26.6	26.7	8.0 7.9	8.0	32.7 37.5	35.1	99.3 101.2	100.3	7.2 7.2	7.2		3.6 3.7			3 3	3.0	
				Bottom	18	26.8 26.6	26.7	7.9 7.9	7.9	27.1 25.5	26.3	94.2 93.3	93.8	7.1 7.1	7.1		4.5 4.4			5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at GB3 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	18:31	Surface	1	30.4 30.4	30.4	8.3 8.3	8.3	33.7 33.7	33.7	119.2 119.4	119.3	7.4 7.5	7.5	7.5	1.3 1.3	1.7	1.7	5 4	4.5	4.3
				Middle	3	30.3 30.2	30.3	8.3 8.3	8.3	33.8 33.9	33.9	119.2 119.2	119.2	7.5 7.5	7.5		1.6 1.8			5 4	4.5	
				Bottom	5	30.0 30.0	30.0	8.3 8.3	8.3	33.8 33.8	33.8	116.7 116.0	116.4	7.3 7.3	7.3		2.2 2.2			4 4	4.0	
3-Oct-14	Sunny	Moderate	07:36	Surface	1	29.7 29.7	29.7	8.3 8.2	8.3	28.1 28.1	28.1	108.0 107.8	107.9	7.0 7.0	7.0	7.0	1.3 1.3	1.9	1.9	3 3	3.0	3.3
				Middle	3	29.7 29.7	29.7	8.3 8.3	8.3	28.8 28.9	28.9	106.4 106.9	106.7	6.9 6.9	6.9		2.1 2.1			4 4	4.0	
				Bottom	5	29.7 29.7	29.7	8.3 8.3	8.3	29.2 29.2	29.2	106.8 106.9	106.9	6.9 6.9	6.9		2.2 2.2			3 3	3.0	
6-Oct-14	Sunny	Moderate	10:20	Surface	1	29.3 29.5	29.4	7.9 8.2	8.1	29.7 29.3	29.5	115.6 115.3	115.5	7.5 7.5	7.5	7.2	0.9 0.9	1.1	1.1	3 3	3.0	4.2
				Middle	3.5	29.5 29.5	29.5	7.7 8.2	8.0	30.4 30.3	30.4	102.6 111.6	107.1	6.6 7.2	6.9		0.7 0.7			4 5	4.5	
				Bottom	6	29.5 29.6	29.6	7.5 7.7	7.6	30.5 30.6	30.6	111.3 108.7	110.0	7.2 7.0	7.1		1.7 1.7			5 5	5.0	
8-Oct-14	Sunny	Moderate	12:09	Surface	1	29.4 29.4	29.4	8.3 8.3	8.3	29.7 29.8	29.8	108.4 108.5	108.5	7.0 7.0	7.0	7.0	1.6 1.5	1.9	1.9	3 3	3.0	3.8
				Middle	3.5	29.3 29.3	29.3	8.3 8.3	8.3	30.2 30.2	30.2	107.0 107.0	107.0	6.9 6.9	6.9		1.7 1.9			5 4	4.5	
				Bottom	6	29.2 29.1	29.2	8.3 8.3	8.3	30.3 30.6	30.5	106.9 106.1	106.5	6.9 6.9	6.9		2.4 2.4			4 4	4.0	
10-Oct-14	Sunny	Moderate	14:10	Surface	1	32.3 29.2	30.8	8.2 8.2	8.2	31.3 29.1	30.2	112.7 105.9	109.3	6.9 6.9	6.9	7.0	1.6 1.4	1.6	1.6	4 4	4.0	3.7
				Middle	3.5	29.8 29.2	29.5	8.2 8.7	8.5	31.1 31.5	31.3	109.0 108.5	108.8	7.0 7.0	7.0		1.2 1.2			3 3	3.0	
				Bottom	6	29.3 29.2	29.3	8.8 8.9	8.9	32.5 31.2	31.9	109.1 106.8	108.0	7.0 6.9	7.0		2.0 2.4			4 4	4.0	
13-Oct-14	Sunny	Moderate	14:38	Surface	1	28.8 29.0	28.9	6.5 8.3	7.4	32.0 30.6	31.3	109.5 109.3	109.4	7.1 7.1	7.1	7.2	3.3 3.1	3.4	3.4	3 3	3.0	5.2
				Middle	4	29.1 28.8	29.0	8.2 8.3	8.3	29.7 31.4	30.6	112.5 108.7	110.6	7.3 7.1	7.2		3.4 3.1			5 6	5.5	
				Bottom	7	29.1 28.8	29.0	8.3 8.4	8.4	29.8 31.4	30.6	112.5 109.2	110.9	7.3 7.1	7.2		3.6 3.7			7 7	7.0	
16-Oct-14	Sunny	Moderate	06:39	Surface	1	25.2 27.8	26.5	7.7 7.7	7.7	30.1 30.3	30.2	112.0 113.9	113.0	7.8 7.6	7.7	7.4	1.2 1.2	1.6	1.6	9 9	9.0	6.7
				Middle	3	27.3 27.9	27.6	7.7 7.7	7.7	30.1 30.1	30.1	104.2 104.0	104.1	7.0 6.9	7.0		1.3 1.2			5 5	5.0	
				Bottom	5	27.4 28.0	27.7	7.7 7.6	7.7	30.6 30.3	30.5	105.4 107.6	106.5	7.0 7.1	7.1		2.3 2.3			6 6	6.0	
18-Oct-14	Sunny	Moderate	08:02	Surface	1	27.6 27.7	27.7	8.3 8.3	8.3	33.1 33.0	33.1	111.8 111.4	111.6	7.3 7.3	7.3	7.3	3.4 3.2	4.3	4.3	6 5	5.5	4.5
				Middle	3	27.7 27.7	27.7	8.4 8.4	8.4	33.0 33.0	33.0	109.7 109.4	109.6	7.2 7.2	7.2		4.5 4.6			3 3	3.0	
				Bottom	5	27.6 27.6	27.6	8.3 8.4	8.4	33.0 33.0	33.0	107.6 107.5	107.6	7.1 7.1	7.1		4.9 4.9			5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at GB3 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	09:58	Surface	1	27.9 27.8	27.9	8.0 8.7	8.4	30.4 30.9	30.7	109.3 108.4	108.9	7.2 7.2	7.2	7.2	2.2 2.3	2.3	2.7	3 3	3.0	3.5
				Middle	4	27.8 27.8	27.8	8.5 8.6	8.6	30.8 30.8	30.8	108.1 107.9	108.0	7.2 7.1	7.2		2.3 2.3	2.3		4 5	4.5	
				Bottom	7	27.7 27.8	27.8	8.6 7.9	8.3	32.2 31.2	31.7	106.0 107.1	106.6	7.0 7.1	7.1		3.6 3.6	3.6		3 3	3.0	
22-Oct-14	Sunny	Moderate	11:16	Surface	1	27.8 28.0	27.9	7.6 7.7	7.7	31.6 29.3	30.5	99.2 96.3	97.8	7.5 7.3	7.4	7.4	3.5 2.9	3.2	3.5	3 3	3.0	4.2
				Middle	3.5	28.0 28.1	28.1	7.5 7.6	7.6	30.0 29.2	29.6	89.9 88.6	89.3	7.4 7.3	7.4		3.3 3.0	3.2		5 6	5.5	
				Bottom	6	28.0 28.1	28.1	7.8 7.9	7.9	31.0 29.5	30.3	82.8 84.1	83.5	6.9 7.0	7.0		4.0 4.2	4.1		4 4	4.0	
24-Oct-14	Cloudy	Moderate	12:20	Surface	1	26.9 27.4	27.2	8.3 7.6	8.0	30.2 31.8	31.0	113.1 115.2	114.2	7.6 7.6	7.6	7.6	1.9 2.2	2.1	2.7	4 4	4.0	4.3
				Middle	3.5	27.2 27.4	27.3	8.4 8.3	8.4	32.0 31.9	32.0	113.1 112.0	112.6	7.5 7.4	7.5		2.7 3.1	2.9		5 5	5.0	
				Bottom	6	27.4 25.8	26.6	7.2 7.1	7.2	32.1 32.1	32.1	112.2 109.1	110.7	7.4 7.4	7.4		3.1 2.9	3.0		4 4	4.0	
27-Oct-14	Sunny	Moderate	13:11	Surface	1	29.5 27.8	28.7	8.2 7.6	7.9	34.3 29.0	31.7	119.3 110.5	114.9	7.5 7.4	7.5	7.5	2.6 3.0	2.8	2.7	3 3	3.0	4.2
				Middle	3.5	28.6 27.9	28.3	8.0 7.5	7.8	32.4 28.8	30.6	110.6 112.4	111.5	7.2 7.5	7.4		2.2 2.0	2.1		4 4	4.0	
				Bottom	6	28.4 27.5	28.0	8.3 8.2	8.3	28.5 29.5	29.0	105.9 105.1	105.5	7.0 7.0	7.0		3.3 3.1	3.2		6 5	5.5	
29-Oct-14	Sunny	Moderate	15:16	Surface	1	27.1 27.0	27.1	8.5 8.5	8.5	31.4 30.8	31.1	116.9 114.7	115.8	7.8 7.7	7.8	7.8	2.8 3.0	2.9	3.3	4 4	4.0	5.3
				Middle	3.5	27.1 27.0	27.1	8.5 8.5	8.5	31.2 30.8	31.0	115.8 113.2	114.5	7.7 7.6	7.7		3.4 3.2	3.3		7 7	7.0	
				Bottom	6	27.0 27.0	27.0	8.4 8.5	8.5	31.2 30.7	31.0	112.1 111.6	111.9	7.5 7.5	7.5		3.8 3.8	3.8		5 5	5.0	
31-Oct-14	Fine	Moderate	17:08	Surface	1	27.3 27.2	27.3	7.8 8.0	7.9	29.7 29.3	29.5	107.4 105.9	106.7	7.2 7.1	7.2	7.2	2.1 2.4	2.3	2.3	7 7	7.0	4.5
				Middle	3.5	27.3 27.3	27.3	7.9 8.0	8.0	30.1 29.4	29.8	97.2 95.3	96.3	7.1 7.0	7.1		1.6 1.7	1.7		4 3	3.5	
				Bottom	6	27.3 27.3	27.3	8.0 8.0	8.0	32.2 31.4	31.8	93.5 93.2	93.4	6.9 6.9	6.9		2.8 2.7	2.8		3 3	3.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at GB3 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	12:49	Surface	1	30.5 30.6	30.6	8.3 8.3	8.3	32.0 32.0	32.0	132.0 132.0	132.0	8.3 8.3	8.3	8.3	1.3 1.3	1.3	1.9	3 3	3.0	3.8
				Middle	3	30.5 30.5	30.5	8.3 8.3	8.3	32.2 32.2	32.2	131.6 131.6	131.6	8.3 8.3	8.3		1.9 1.9			4 4	4.0	
				Bottom	5	30.1 30.0	30.1	8.2 8.2	8.2	32.3 32.4	32.4	110.3 109.7	110.0	7.0 6.9	7.0		2.6 2.6			4 5	4.5	
3-Oct-14	Sunny	Moderate	13:49	Surface	1	32.1 31.9	32.0	8.3 8.3	8.3	28.6 28.9	28.8	109.6 109.8	109.7	6.9 6.9	6.9	7.0	0.4 0.5	0.5	1.6	4 4	4.0	3.8
				Middle	3	31.6 31.5	31.6	8.3 8.3	8.3	29.5 29.8	29.7	110.8 111.4	111.1	6.9 7.0	7.0		1.8 1.7			3 4	3.5	
				Bottom	5	31.2 31.1	31.2	8.2 8.2	8.2	30.2 30.3	30.3	109.5 108.6	109.1	6.9 6.8	6.9		2.5 2.5			4 4	4.0	
6-Oct-14	Sunny	Moderate	15:41	Surface	1	32.7 30.0	31.4	8.0 8.2	8.1	29.2 29.1	29.2	115.9 106.0	111.0	7.2 6.8	7.0	7.0	0.6 0.6	0.6	1.3	4 3	3.5	3.8
				Middle	3.5	31.3 29.9	30.6	7.8 7.7	7.8	31.5 31.4	31.5	109.2 108.7	109.0	6.8 6.9	6.9		1.3 1.2			3 3	3.0	
				Bottom	6	30.6 29.8	30.2	7.6 7.7	7.7	32.7 32.4	32.6	110.8 109.4	110.1	6.9 6.9	6.9		1.9 1.8			5 5	5.0	
8-Oct-14	Fine	Moderate	16:44	Surface	1	28.8 28.8	28.8	9.2 9.2	9.2	27.7 28.6	28.2	111.6 111.9	111.8	7.4 7.4	7.4	7.4	1.2 1.2	1.2	1.9	3 3	3.0	4.2
				Middle	3	29.0 29.1	29.1	9.4 9.4	9.4	30.4 30.5	30.5	111.5 111.3	111.4	7.3 7.2	7.3		2.0 2.0			4 3	3.5	
				Bottom	5	29.2 29.2	29.2	9.5 9.5	9.5	30.7 30.8	30.8	111.0 110.6	110.8	7.2 7.2	7.2		2.5 2.5			6 6	6.0	
10-Oct-14	Sunny	Moderate	07:52	Surface	1	29.5 29.1	29.3	8.8 8.8	8.8	30.4 30.3	30.4	108.3 108.0	108.2	7.0 7.0	7.0	7.1	1.7 1.8	1.8	1.6	3 3	3.0	3.8
				Middle	3.5	28.8 28.8	28.8	8.9 8.7	8.8	30.0 30.7	30.4	107.3 108.5	107.9	7.0 7.1	7.1		0.6 0.5			4 3	3.5	
				Bottom	6	30.0 29.1	29.6	8.8 8.9	8.9	32.6 29.1	30.9	109.3 106.3	107.8	6.9 7.0	7.0		2.3 2.6			5 5	5.0	
13-Oct-14	Sunny	Moderate	09:56	Surface	1	28.5 28.4	28.5	8.2 8.6	8.4	31.8 31.4	31.6	107.3 106.1	106.7	7.0 6.9	7.0	7.0	2.3 2.8	2.6	2.8	4 5	4.5	6.2
				Middle	3.5	28.5 28.4	28.5	8.6 8.4	8.5	31.3 31.9	31.6	107.0 104.3	105.7	7.0 6.8	6.9		2.3 2.3			5 9	5.0	
				Bottom	6	28.5 28.9	28.7	8.6 8.0	8.3	30.8 30.5	30.7	110.5 113.1	111.8	7.2 7.4	7.3		3.6 3.6			9 9	9.0	
16-Oct-14	Fine	Moderate	17:22	Surface	1	26.2 27.8	27.0	7.6 7.5	7.6	28.9 29.3	29.1	112.8 117.2	115.0	7.8 7.8	7.8	7.5	0.9 1.0	1.0	1.6	7 7	7.0	5.0
				Middle	3	26.6 27.9	27.3	7.7 7.5	7.6	29.2 29.4	29.3	103.3 106.7	105.0	7.0 7.1	7.1		1.4 1.4			4 4	4.0	
				Bottom	5	27.3 28.1	27.7	7.5 7.5	7.5	30.3 30.2	30.3	104.1 104.4	104.3	7.0 6.9	7.0		2.5 2.5			4 4	4.0	
18-Oct-14	Sunny	Moderate	14:28	Surface	1	28.7 28.5	28.6	8.4 8.4	8.4	33.3 33.4	33.4	117.4 117.7	117.6	7.6 7.6	7.6	7.7	4.1 3.9	4.0	4.7	3 3	3.0	3.7
				Middle	3	28.2 28.1	28.2	8.4 8.4	8.4	34.0 34.1	34.1	118.6 119.0	118.8	7.7 7.7	7.7		4.5 4.6			4 4	4.0	
				Bottom	5	28.0 28.0	28.0	8.4 8.4	8.4	34.3 34.3	34.3	118.0 118.0	118.0	7.6 7.6	7.6		5.2 5.5			4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at GB3 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:17	Surface	1	28.2 28.0	28.1	8.2 8.3	8.3	29.4 30.3	29.9	120.6 119.3	120.0	8.0 7.9	8.0	7.9	2.2 2.1	2.2	3.1	3 3	3.0	3.0
				Middle	3.5	28.1 27.9	28.0	8.1 8.1	8.1	29.8 31.2	30.5	120.2 115.6	117.9	8.0 7.6	7.8		3.5 3.2	3.4		3 3	3.0	
				Bottom	6	28.1 27.9	28.0	8.2 8.1	8.2	30.0 31.3	30.7	118.1 113.3	115.7	7.8 7.5	7.7		3.8 3.8	3.8		3 3	3.0	
22-Oct-14	Sunny	Moderate	16:12	Surface	1	30.4 28.4	29.4	7.7 7.0	7.4	34.9 29.5	32.2	96.4 96.1	96.3	7.3 7.3	7.3	7.3	1.7 1.7	1.7	2.5	3 3	3.0	3.3
				Middle	3.5	29.5 28.4	29.0	7.4 7.0	7.2	33.1 29.5	31.3	94.7 96.5	95.6	7.2 7.3	7.3		1.3 1.5	1.4		3 3	3.0	
				Bottom	6	29.1 28.2	28.7	7.7 7.7	7.7	29.2 30.1	29.7	90.2 92.8	91.5	6.8 7.0	6.9		4.5 4.5	4.5		4 4	4.0	
24-Oct-14	Cloudy	Moderate	16:58	Surface	1	26.3 27.2	26.8	7.5 7.5	7.5	30.0 31.3	30.7	117.1 117.8	117.5	8.0 7.9	8.0	7.9	1.9 1.9	1.9	2.9	6 6	6.0	5.0
				Middle	3.5	26.7 27.3	27.0	8.0 7.8	7.9	30.6 31.1	30.9	116.6 116.0	116.3	7.9 7.7	7.8		2.9 2.8	2.9		5 5	5.0	
				Bottom	6	26.9 27.3	27.1	8.2 8.1	8.2	31.0 31.0	31.0	116.7 115.7	116.2	7.8 7.7	7.8		3.6 4.4	4.0		4 4	4.0	
27-Oct-14	Sunny	Moderate	09:44	Surface	1	27.5 27.7	27.6	8.2 8.0	8.1	30.7 28.5	29.6	113.6 112.0	112.8	7.6 7.5	7.6	7.3	3.5 3.7	3.6	4.1	3 3	3.0	3.8
				Middle	3.5	27.5 27.3	27.4	7.8 7.9	7.9	29.3 28.6	29.0	105.0 103.2	104.1	7.0 7.0	7.0		3.9 3.8	3.9		4 4	4.0	
				Bottom	6	27.7 27.7	27.7	8.4 8.4	8.4	30.5 29.0	29.8	105.3 104.3	104.8	7.0 7.0	7.0		4.7 5.1	4.9		5 4	4.5	
29-Oct-14	Sunny	Moderate	10:20	Surface	1	26.9 26.8	26.9	8.4 8.5	8.5	32.0 32.3	32.2	109.3 108.7	109.0	7.3 7.3	7.3	7.3	2.3 2.3	2.3	2.7	6 6	6.0	5.2
				Middle	4	26.9 26.8	26.9	8.4 8.5	8.5	32.1 32.3	32.2	109.2 108.7	109.0	7.3 7.3	7.3		2.3 2.3	2.3		7 6	6.5	
				Bottom	7	26.9 26.8	26.9	8.4 8.4	8.4	32.1 32.4	32.3	108.2 108.6	108.4	7.2 7.2	7.2		3.6 3.5	3.6		3 3	3.0	
31-Oct-14	Sunny	Moderate	12:32	Surface	1	27.5 27.2	27.4	7.8 7.9	7.9	32.1 34.0	33.1	103.9 105.7	104.8	6.9 6.9	6.9	7.2	3.9 4.0	4.0	3.8	3 3	3.0	3.3
				Middle	3.5	27.4 27.2	27.3	7.8 7.9	7.9	26.2 32.1	29.2	98.8 103.2	101.0	7.4 7.5	7.5		3.4 3.2	3.3		3 3	3.0	
				Bottom	6	27.3 27.2	27.3	7.8 7.9	7.9	27.3 28.1	27.7	99.2 100.2	99.7	7.4 7.4	7.4		4.1 4.1	4.1		4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C1 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	17:04	Surface	1	26.8 26.8	26.8	7.4 7.4	7.4	30.4 31.1	30.8	79.6 77.0	78.3	5.4 5.2	5.3	5.1	5.0 5.0 4.9	5.0	5.0	3 3 3	3.0	3.5
				Middle	8	26.8 26.8	26.8	7.4 7.4	7.4	31.5 31.5	31.5	71.2 70.7	71.0	4.8 4.7	4.8		4.8 4.7	4.8		3 3 3	3.0	
				Bottom	15	26.8 26.8	26.8	7.4 7.4	7.4	31.5 31.5	31.5	64.3 64.3	64.3	4.3 4.3	4.3		5.2 5.4	5.3		4 5	4.5	
3-Oct-14	Sunny	Moderate	07:34	Surface	1	29.5 29.5	29.5	8.1 8.1	8.1	30.8 30.9	30.9	74.6 73.5	74.1	4.8 4.7	4.8	4.8	2.7 2.7 2.9	2.7	3.0	4 4 3	4.0	4.0
				Middle	8	29.4 29.4	29.4	8.0 8.0	8.0	31.3 31.4	31.4	72.3 71.1	71.7	4.7 4.6	4.7		2.9 2.9	2.9		3 3 5	3.0	
				Bottom	15	29.3 29.3	29.3	8.0 8.0	8.0	31.6 31.8	31.7	68.5 67.2	67.9	4.4 4.3	4.4		3.3 3.3	3.3		5 5	5.0	
6-Oct-14	Sunny	Moderate	10:11	Surface	1	29.3 29.3	29.3	8.1 8.1	8.1	35.5 36.2	35.9	79.3 76.5	77.9	5.0 4.8	4.9	4.7	1.7 1.7 1.6	1.7	3.1	3 3 4	3.0	3.7
				Middle	8	29.4 29.4	29.4	8.1 8.1	8.1	36.6 36.7	36.7	72.7 72.3	72.5	4.5 4.5	4.5		1.6 1.6	1.6		4 4 4	4.0	
				Bottom	15	29.5 29.5	29.5	8.1 8.1	8.1	37.0 37.1	37.1	71.1 71.1	71.1	4.4 4.4	4.4		5.6 6.3	6.0		4 4 4	4.0	
8-Oct-14	Sunny	Moderate	12:12	Surface	1	28.8 28.9	28.9	8.2 8.2	8.2	29.8 30.1	30.0	83.4 81.6	82.5	5.5 5.3	5.4	5.2	1.8 1.8 1.9	1.8	2.4	3 3 3	3.0	4.0
				Middle	8	29.4 29.4	29.4	8.2 8.2	8.2	30.7 30.6	30.7	75.7 76.0	75.9	4.9 4.9	4.9		1.9 1.9	1.9		3 3 6	3.0	
				Bottom	15	29.3 29.3	29.3	8.2 8.2	8.2	31.1 31.1	31.1	74.6 74.6	74.6	4.8 4.8	4.8		3.3 3.6	3.5		6 6	6.0	
10-Oct-14	Sunny	Moderate	14:33	Surface	1	29.4 29.5	29.5	8.2 8.2	8.2	30.0 30.1	30.1	79.7 78.0	78.9	5.2 5.0	5.1	4.9	2.1 2.1 1.7	2.1	4.5	3 3 3	3.0	3.0
				Middle	7	29.4 29.4	29.4	8.2 8.2	8.2	30.9 30.9	30.9	72.9 72.2	72.6	4.7 4.7	4.7		1.7 1.7	1.7		3 3 3	3.0	
				Bottom	13	29.3 29.3	29.3	8.2 8.2	8.2	31.2 31.2	31.2	70.3 69.6	70.0	4.5 4.5	4.5		9.6 9.6	9.6		3 3	3.0	
13-Oct-14	Sunny	Moderate	15:16	Surface	1	28.1 28.3	28.2	8.2 8.2	8.2	27.8 28.1	28.0	79.6 78.8	79.2	5.3 5.3	5.3	5.2	2.4 2.4 2.5	2.4	3.4	5 5 4	5.0	4.0
				Middle	8	28.7 28.8	28.8	8.2 8.2	8.2	28.7 28.8	28.8	75.1 75.2	75.2	5.0 5.0	5.0		2.5 2.4	2.5		4 4 3	4.0	
				Bottom	15	29.0 29.1	29.1	8.2 8.2	8.2	29.1 29.1	29.1	73.1 72.9	73.0	4.8 4.8	4.8		5.3 5.3	5.3		3 3	3.0	
16-Oct-14	Sunny	Moderate	06:11	Surface	1	27.3 27.3	27.3	7.9 7.9	7.9	32.4 32.4	32.4	88.5 88.2	88.4	6.1 6.1	6.1	6.1	3.2 3.3 3.5	3.3	3.7	3 3 4	3.0	4.2
				Middle	8	27.3 27.3	27.3	8.0 8.0	8.0	32.4 32.4	32.4	87.1 87.1	87.1	6.0 6.0	6.0		3.7 3.7	3.6		5 5 5	4.5	
				Bottom	15	27.3 27.3	27.3	8.0 8.0	8.0	32.6 32.5	32.6	84.3 84.2	84.3	5.8 5.8	5.8		4.4 4.0	4.2		5 5	5.0	
18-Oct-14	Sunny	Moderate	08:38	Surface	1	27.6 27.6	27.6	7.9 7.9	7.9	32.0 31.9	32.0	75.4 75.6	75.5	5.0 5.0	5.0	4.9	2.5 2.5 2.8	2.5	2.9	4 4 4	4.0	4.3
				Middle	8	27.6 27.5	27.6	7.9 7.9	7.9	31.9 32.0	32.0	71.7 70.7	71.2	4.7 4.7	4.7		2.8 2.8	2.8		4 4 5	4.0	
				Bottom	15	27.5 27.5	27.5	7.9 7.9	7.9	32.0 32.0	32.0	63.3 62.1	62.7	4.2 4.1	4.2		3.3 3.3	3.3		5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C1 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	10:05	Surface	1	29.6	29.6	8.0	8.0	31.7	31.8	84.5	84.0	5.4	5.4	5.4	2.1	2.2	2.6	4	4.5	4.7
				Middle	8	29.6	29.6	8.0	8.0	32.2	32.3	82.3	81.8	5.3	5.3		2.2	2.3		5	5.0	
						29.6	29.6	8.0	8.0	32.3	32.3	81.2	81.8	5.2	5.3		2.3	2.2		5	5.0	
22-Oct-14	Sunny	Moderate	11:27	Surface	1	27.7	27.7	8.2	8.4	34.4	35.4	83.6	81.2	5.4	5.3	4.7	2.1	2.2	5.1	3	3.0	4.2
				Middle	8	27.6	27.0	8.5	8.2	36.3	36.7	78.7	62.0	5.1	4.1		2.3	5.1		3	5.0	
						26.9	26.8	8.1	8.1	36.9	37.8	59.6	53.1	3.9	3.5		5.2	8.1		5	4.5	
24-Oct-14	Cloudy	Moderate	11:28	Surface	1	27.9	27.9	8.1	8.1	31.9	31.9	61.2	61.9	4.0	4.1	4.2	1.9	1.9	2.7	4	4.5	4.0
				Middle	8	27.9	27.9	8.1	8.2	31.9	31.9	62.6	64.4	4.1	4.2		1.9	1.9		5	3.5	
						27.9	27.9	8.2	8.2	31.9	31.6	64.4	64.9	4.2	4.3		1.9	4.4		3	4.0	
27-Oct-14	Sunny	Moderate	14:01	Surface	1	27.8	27.8	8.2	8.3	32.5	32.6	75.7	76.1	5.0	5.0	5.0	2.3	2.3	4.2	3	3.0	3.3
				Middle	8	27.8	27.8	8.3	8.3	32.7	32.9	76.5	74.9	5.0	4.9		2.3	4.6		3	4.0	
						27.8	27.9	8.3	8.3	32.9	33.1	74.9	74.8	4.9	4.9		4.6	5.8		4	3.0	
29-Oct-14	Sunny	Moderate	15:32	Surface	1	25.5	25.8	8.3	8.3	30.5	30.7	62.0	69.4	4.3	4.8	5.0	1.7	1.7	2.9	3	3.0	3.3
				Middle	8	26.0	26.6	6.8	7.6	30.8	28.3	76.7	74.8	5.2	5.1		1.7	2.8		3	3.0	
						26.5	26.9	7.6	8.0	27.9	30.0	75.1	68.6	5.1	4.6		2.8	4.2		3	4.0	
31-Oct-14	Fine	Moderate	18:09	Surface	1	27.1	27.1	8.0	8.1	27.6	27.5	74.1	73.6	5.1	5.1	5.1	2.2	2.2	4.6	3	3.0	3.5
				Middle	8.5	27.1	27.1	8.1	8.2	27.4	28.1	73.0	73.1	5.0	5.0		2.1	4.1		3	4.0	
						27.1	27.1	8.1	8.3	28.0	28.7	73.2	70.7	5.0	4.8		4.0	7.6		4	3.5	
31-Oct-14	Fine	Moderate	18:09	Surface	1	27.1	27.1	8.2	8.3	28.7	28.7	70.6	70.7	4.8	4.8	4.8	2.2	2.2	4.6	3	3.0	3.5
				Middle	8.5	27.1	27.1	8.1	8.2	27.4	28.1	73.0	73.1	5.0	5.0		2.1	4.1		3	4.0	
						27.1	27.1	8.1	8.3	28.0	28.7	73.2	70.7	5.0	4.8		4.0	7.6		4	3.5	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	10:51	Surface	1	28.2 28.2	28.2	7.7 7.7	7.7	30.1 30.1	30.1	99.2 98.9	99.1	6.6 6.5	6.6	6.5	3.6 3.6	3.6	4.0	3 3	3.0	3.5
				Middle	8	28.2 28.2	28.2	7.7 7.7	7.7	30.7 30.7	30.7	95.6 95.6	95.6	6.3 6.3	6.3		3.9 3.8	3.9		3 3	3.0	
				Bottom	15	28.2 28.2	28.2	7.7 7.7	7.7	30.8 30.8	30.8	85.8 87.9	86.9	5.6 5.8	5.7		4.6 4.6	4.6		4 5	4.5	
3-Oct-14	Sunny	Moderate	14:43	Surface	1	29.6 29.4	29.5	8.0 7.9	8.0	29.3 29.3	29.3	68.3 68.1	68.2	4.4 4.4	4.4	4.4	2.8 2.9	2.9	3.0	4 4	4.0	3.8
				Middle	8	31.1 31.2	31.2	7.9 8.0	8.0	31.9 31.9	31.9	69.3 69.4	69.4	4.3 4.3	4.3		2.9 2.7	2.8		3 3	3.0	
				Bottom	15	31.1 31.0	31.1	7.9 7.9	7.9	31.9 31.9	31.9	69.3 69.1	69.2	4.3 4.3	4.3		3.2 3.3	3.3		5 4	4.5	
6-Oct-14	Sunny	Moderate	17:05	Surface	1	29.4 29.5	29.5	8.2 8.2	8.2	37.7 37.7	37.7	81.2 79.3	80.3	5.0 4.9	5.0	4.9	1.8 1.8	1.8	4.3	4 4	4.0	4.0
				Middle	8	29.6 29.6	29.6	8.2 8.2	8.2	38.1 38.1	38.1	77.3 77.0	77.2	4.8 4.8	4.8		3.0 3.0	3.0		4 4	4.0	
				Bottom	15	29.6 29.6	29.6	8.2 8.2	8.2	38.2 38.2	38.2	76.9 76.7	76.8	4.7 4.7	4.7		7.6 8.5	8.1		4 4	4.0	
8-Oct-14	Fine	Moderate	17:43	Surface	1	29.2 29.2	29.2	8.2 8.2	8.2	31.3 31.3	31.3	77.8 77.7	77.8	5.0 5.0	5.0	5.0	2.4 2.4	2.4	3.2	3 3	3.0	3.5
				Middle	8	29.4 29.4	29.4	8.2 8.2	8.2	31.6 31.5	31.6	76.3 76.5	76.4	4.9 4.9	4.9		2.7 2.6	2.7		4 5	4.5	
				Bottom	15	29.4 29.4	29.4	8.2 8.2	8.2	31.6 31.6	31.6	75.7 75.8	75.8	4.9 4.9	4.9		4.3 4.7	4.5		3 3	3.0	
10-Oct-14	Sunny	Moderate	08:10	Surface	1	29.2 29.2	29.2	8.2 8.2	8.2	29.6 29.7	29.7	72.2 71.3	71.8	4.7 4.6	4.7	4.6	2.7 2.6	2.7	4.2	3 3	3.0	4.0
				Middle	7.5	29.2 29.2	29.2	8.2 8.2	8.2	30.1 30.2	30.2	70.0 69.8	69.9	4.5 4.5	4.5		4.5 4.6	4.6		4 4	4.0	
				Bottom	14	29.2 29.2	29.2	8.2 8.2	8.2	30.4 30.5	30.5	70.1 70.2	70.2	4.5 4.6	4.6		5.3 5.4	5.4		5 5	5.0	
13-Oct-14	Sunny	Moderate	10:37	Surface	1	28.6 28.7	28.7	8.2 8.2	8.2	31.0 30.9	31.0	69.1 68.5	68.8	4.5 4.5	4.5	4.4	3.1 3.1	3.1	3.7	5 4	4.5	4.5
				Middle	8	29.0 28.9	29.0	8.2 8.2	8.2	31.0 30.9	31.0	66.0 66.1	66.1	4.3 4.3	4.3		3.7 3.6	3.7		5 5	5.0	
				Bottom	15	29.0 29.0	29.0	8.2 8.2	8.2	30.8 30.8	30.8	65.7 65.8	65.8	4.3 4.3	4.3		4.2 4.3	4.3		4 4	4.0	
16-Oct-14	Fine	Moderate	18:31	Surface	1	28.0 28.1	28.1	8.0 8.0	8.0	32.1 32.5	32.3	89.1 88.9	89.0	6.2 6.2	6.2	6.2	4.0 4.0	4.0	4.0	3 3	3.0	4.5
				Middle	8	28.1 28.0	28.1	8.0 8.0	8.0	32.5 32.0	32.3	88.1 88.2	88.2	6.1 6.1	6.1		3.8 3.8	3.8		4 4	4.0	
				Bottom	15	28.0 28.1	28.1	8.0 8.0	8.0	32.1 32.5	32.3	86.7 86.7	86.7	6.0 6.0	6.0		4.3 4.1	4.2		7 6	6.5	
18-Oct-14	Sunny	Moderate	15:58	Surface	1	27.0 27.1	27.1	7.6 7.7	7.7	31.0 31.8	31.4	89.1 87.3	88.2	6.0 5.8	5.9	5.5	2.5 2.4	2.5	2.6	4 4	4.0	4.7
				Middle	8	27.3 27.4	27.4	7.7 7.7	7.7	32.4 32.4	32.4	77.4 75.3	76.4	5.1 5.0	5.1		2.5 2.4	2.5		5 5	5.0	
				Bottom	15	27.4 27.5	27.5	7.8 7.8	7.8	32.5 32.5	32.5	70.5 68.9	69.7	4.7 4.5	4.6		2.7 2.7	2.7		5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.



# Water Quality Monitoring Results at C1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:59	Surface	1	29.7 29.7	29.7	7.9 7.9	7.9	30.2 30.2	30.2	78.0 78.0	78.0	5.0 5.0	5.0	5.0	3.2 3.2	3.2	3.4	3 3	3.0	3.8
				Middle	8	29.7 29.7	29.7	7.9 7.9	7.9	32.8 32.8	32.8	77.5 77.5	77.5	4.9 4.9	4.9		3.5 3.2			4 5	4.5	
				Bottom	15	29.7 29.7	29.7	7.9 7.9	7.9	32.8 32.8	32.8	77.6 77.4	77.5	4.9 4.9	4.9		3.6 3.7			4 4	4.0	
22-Oct-14	Sunny	Moderate	17:08	Surface	1	26.9 26.8	26.9	8.3 8.3	8.3	36.7 36.9	36.8	88.5 82.8	85.7	5.8 5.4	5.6	4.9	1.9 1.9	1.9	4.6	4 4	4.0	4.7
				Middle	8	26.8 27.1	27.0	8.2 8.3	8.3	37.5 37.3	37.4	64.2 61.4	62.8	4.2 4.0	4.1		3.2 3.6			5 5	5.0	
				Bottom	15	27.0 26.8	26.9	8.2 8.2	8.2	38.0 38.2	38.1	50.6 48.0	49.3	3.3 3.1	3.2		8.4 8.4			5 5	5.0	
24-Oct-14	Cloudy	Moderate	17:43	Surface	1	26.4 26.9	26.7	8.2 8.2	8.2	32.7 32.1	32.4	82.4 73.7	78.1	5.5 4.9	5.2	4.9	2.3 2.3	2.3	3.3	3 3	3.0	3.2
				Middle	8	27.6 27.5	27.6	8.2 8.2	8.2	32.7 32.6	32.7	68.6 69.3	69.0	4.5 4.6	4.6		2.8 2.7			3 3	3.0	
				Bottom	15	27.7 27.8	27.8	8.2 8.1	8.2	32.7 32.5	32.6	66.6 63.0	64.8	4.4 4.1	4.3		4.6 5.0			3 4	3.5	
27-Oct-14	Sunny	Moderate	08:54	Surface	1	28.4 28.4	28.4	8.2 8.2	8.2	28.2 28.3	28.3	77.7 76.4	77.1	5.0 4.9	5.0	4.9	1.9 1.8	1.9	4.1	3 3	3.0	3.5
				Middle	8	28.4 28.4	28.4	8.2 8.2	8.2	28.4 28.5	28.5	75.2 73.3	74.3	4.8 4.7	4.8		4.6 4.4			4 4	4.0	
				Bottom	15	28.4 28.4	28.4	8.2 8.2	8.2	29.0 29.0	29.0	71.6 70.1	70.9	4.6 4.5	4.6		5.8 5.9			3 4	3.5	
29-Oct-14	Sunny	Moderate	11:17	Surface	1	26.7 26.8	26.8	8.5 8.5	8.5	29.4 29.7	29.6	96.4 88.9	92.7	6.6 6.0	6.3	5.8	2.2 2.2	2.2	3.4	3 3	3.0	4.0
				Middle	8	27.0 27.0	27.0	8.8 8.8	8.8	28.9 28.5	28.7	76.0 77.1	76.6	5.2 5.2	5.2		3.2 3.1			4 4	4.0	
				Bottom	15	27.1 27.1	27.1	9.4 9.4	9.4	28.7 28.8	28.8	73.8 73.9	73.9	5.0 5.0	5.0		4.7 4.8			5 5	5.0	
31-Oct-14	Sunny	Moderate	13:06	Surface	1	27.1 27.2	27.2	8.1 8.1	8.1	31.3 31.0	31.2	72.4 72.2	72.3	4.8 4.8	4.8	4.8	2.3 2.7	2.5	5.1	3 3	3.0	3.7
				Middle	8	27.2 27.2	27.2	8.2 8.1	8.2	31.9 31.9	31.9	72.0 71.7	71.9	4.8 4.8	4.8		6.5 6.3			4 4	4.0	
				Bottom	15	27.1 27.1	27.1	8.2 8.2	8.2	33.0 33.4	33.2	71.2 71.1	71.2	4.7 4.7	4.7		6.5 6.5			4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C2 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	16:10	Surface	1	26.8 26.8	26.8	7.4 7.4	7.4	29.9 29.9	29.9	75.0 74.7	74.9	5.1 5.1	5.1	5.0	4.5 4.5	4.5	5.1	3 3	3.0	3.7
				Middle	9.5	26.8 26.8	26.8	7.1 7.4	7.3	24.0 27.4	25.7	69.7 71.3	70.5	4.9 4.9	4.9		5.3 5.2	5.3		4 4	4.0	
				Bottom	18	26.8 26.8	26.8	7.4 7.4	7.4	28.4 28.7	28.6	65.3 65.4	65.4	4.5 4.5	4.5		5.5 5.6	5.6		4 4	4.0	
3-Oct-14	Sunny	Moderate	08:25	Surface	1	29.4 29.4	29.4	8.0 8.1	8.1	31.7 31.1	31.4	84.4 85.0	84.7	5.4 5.5	5.5	5.2	2.8 2.7	2.8	3.3	4 4	4.0	3.7
				Middle	9	29.3 29.3	29.3	8.1 8.0	8.1	31.5 32.1	31.8	78.4 71.2	74.8	5.0 4.6	4.8		3.6 3.4	3.5		3 3	3.0	
				Bottom	17	29.1 29.1	29.1	8.0 8.0	8.0	33.0 33.0	33.0	65.5 64.9	65.2	4.2 4.2	4.2		3.5 3.8	3.7		4 4	4.0	
6-Oct-14	Sunny	Moderate	11:05	Surface	1	28.9 29.1	29.0	8.2 8.2	8.2	36.6 36.6	36.6	85.5 82.1	83.8	5.4 5.2	5.3	5.1	1.7 1.7	1.7	4.4	3 3	3.0	3.3
				Middle	8.5	29.5 29.5	29.5	8.2 8.2	8.2	37.0 37.1	37.1	78.6 78.7	78.7	4.9 4.9	4.9		4.3 5.1	4.7		3 3	3.0	
				Bottom	16	29.6 29.6	29.6	8.2 8.2	8.2	37.4 37.5	37.5	79.7 80.3	80.0	4.9 5.0	5.0		6.4 7.1	6.8		4 4	4.0	
8-Oct-14	Sunny	Moderate	13:12	Surface	1	29.3 29.3	29.3	8.2 8.2	8.2	31.0 31.1	31.1	77.7 77.6	77.7	5.0 5.0	5.0	5.1	1.9 1.9	1.9	3.0	3 3	3.0	4.0
				Middle	8.5	29.4 29.4	29.4	8.3 8.3	8.3	31.5 31.5	31.5	78.9 78.8	78.9	5.1 5.1	5.1		3.0 3.3	3.2		4 3	3.5	
				Bottom	16	29.4 29.4	29.4	8.3 8.3	8.3	31.7 31.7	31.7	81.6 81.7	81.7	5.2 5.2	5.2		3.8 4.2	4.0		5 6	5.5	
10-Oct-14	Sunny	Moderate	13:41	Surface	1	30.2 29.9	30.1	8.2 8.2	8.2	31.4 31.6	31.5	80.4 80.1	80.3	5.1 5.1	5.1	5.0	3.6 3.6	3.6	4.3	3 4	3.5	4.2
				Middle	8	29.5 29.5	29.5	8.2 8.2	8.2	32.1 32.1	32.1	76.5 76.2	76.4	4.9 4.9	4.9		4.4 4.4	4.4		4 4	4.0	
				Bottom	15	29.3 29.3	29.3	8.2 8.2	8.2	32.4 32.4	32.4	74.7 74.2	74.5	4.8 4.8	4.8		4.9 4.8	4.9		5 5	5.0	
13-Oct-14	Sunny	Moderate	14:31	Surface	1	29.8 29.7	29.8	8.3 8.3	8.3	29.1 29.3	29.2	87.1 87.0	87.1	5.6 5.6	5.6	5.6	3.0 3.0	3.0	3.6	3 3	3.0	3.0
				Middle	9.5	29.5 29.4	29.5	8.3 8.3	8.3	29.7 29.8	29.8	85.9 85.8	85.9	5.6 5.6	5.6		3.8 3.7	3.8		3 3	3.0	
				Bottom	18	29.2 29.2	29.2	8.3 8.3	8.3	30.0 30.0	30.0	85.3 85.1	85.2	5.5 5.5	5.5		4.0 4.1	4.1		3 3	3.0	
16-Oct-14	Sunny	Moderate	07:21	Surface	1	27.2 27.2	27.2	8.4 8.4	8.4	32.8 32.8	32.8	92.9 92.8	92.9	6.4 6.4	6.4	6.4	2.7 2.8	2.8	4.0	5 5	5.0	4.7
				Middle	9	27.2 27.2	27.2	8.4 8.4	8.4	32.9 32.8	32.9	91.0 90.9	91.0	6.3 6.3	6.3		3.6 3.6	3.6		5 5	5.0	
				Bottom	17	27.2 27.2	27.2	8.4 8.3	8.4	32.9 32.8	32.9	89.0 88.9	89.0	6.1 6.1	6.1		5.6 5.4	5.5		4 4	4.0	
18-Oct-14	Sunny	Moderate	09:28	Surface	1	27.4 27.4	27.4	7.5 7.5	7.5	27.7 29.9	28.8	92.1 88.9	90.5	6.2 6.0	6.1	5.6	2.3 2.3	2.3	2.7	3 3	3.0	4.3
				Middle	9	27.4 27.4	27.4	7.4 7.4	7.4	31.2 31.6	31.4	77.5 74.7	76.1	5.2 5.0	5.1		2.5 2.6	2.6		4 4	4.0	
				Bottom	17	27.4 27.4	27.4	7.3 7.2	7.3	31.9 32.0	32.0	63.1 61.5	62.3	4.2 4.1	4.2		2.9 3.2	3.1		6 6	6.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C2 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	10:56	Surface	1	29.4 29.0	29.2	8.0 8.0	8.0	32.6 32.0	32.3	77.0 89.0	83.0	4.9 5.7	5.3	5.4	3.1 2.9	3.0	3.3	4 4	4.0	4.3
				Middle	9	29.1 29.3	29.2	8.0 8.0	8.0	32.4 33.0	32.7	87.8 81.0	84.4	5.6 5.2	5.4		3.5 3.3	3.4		5 4	4.5	
				Bottom	17	29.4 29.4	29.4	8.0 8.0	8.0	33.9 33.9	33.9	75.6 75.0	75.3	4.8 4.8	4.8		3.4 3.8	3.6		5 4	4.5	
22-Oct-14	Sunny	Moderate	12:14	Surface	1	27.4 27.3	27.4	8.1 8.1	8.1	35.1 35.4	35.3	83.0 80.9	82.0	5.4 5.3	5.4	4.8	3.6 3.7	3.7	4.8	3 3	3.0	3.3
				Middle	9	27.2 27.0	27.1	8.4 8.3	8.4	36.7 37.1	36.9	66.2 59.9	63.1	4.3 3.9	4.1		5.6 5.7	5.7		4 4	4.0	
				Bottom	17	27.1 26.9	27.0	8.4 8.3	8.4	36.9 37.4	37.2	61.1 56.6	58.9	4.0 3.7	3.9		4.9 5.0	5.0		3 3	3.0	
24-Oct-14	Cloudy	Moderate	12:06	Surface	1	25.7 26.0	25.9	8.3 8.3	8.3	27.8 33.0	30.4	81.1 83.0	82.1	5.7 5.6	5.7	5.4	2.2 2.1	2.2	3.4	4 4	4.0	4.0
				Middle	8	27.2 27.1	27.2	8.3 8.3	8.3	33.6 33.6	33.6	77.4 77.9	77.7	5.1 5.1	5.1		3.3 3.6	3.5		5 5	5.0	
				Bottom	15	27.6 27.7	27.7	8.3 8.3	8.3	33.5 33.4	33.5	76.8 76.7	76.8	5.0 5.0	5.0		4.2 4.5	4.4		3 3	3.0	
27-Oct-14	Sunny	Moderate	13:07	Surface	1	27.6 27.6	27.6	8.3 8.3	8.3	30.8 31.1	31.0	79.2 78.3	78.8	5.3 5.2	5.3	5.2	2.8 3.0	2.9	4.0	3 3	3.0	3.7
				Middle	9	27.7 27.8	27.8	8.3 8.3	8.3	31.8 32.0	31.9	76.2 75.3	75.8	5.0 5.0	5.0		3.5 3.9	3.7		4 4	4.0	
				Bottom	17	27.8 27.8	27.8	8.3 8.3	8.3	32.1 32.6	32.4	75.2 76.2	75.7	4.9 5.0	5.0		5.3 5.2	5.3		4 4	4.0	
29-Oct-14	Sunny	Moderate	14:48	Surface	1	27.8 27.6	27.7	7.3 6.3	6.8	28.7 28.8	28.8	92.9 92.5	92.7	6.2 6.2	6.2	6.2	2.4 2.4	2.4	3.9	3 3	3.0	3.3
				Middle	9	27.0 27.0	27.0	8.0 7.7	7.9	30.3 30.1	30.2	91.6 91.7	91.7	6.2 6.2	6.2		4.3 4.3	4.3		3 3	3.0	
				Bottom	17	27.0 27.0	27.0	8.6 8.6	8.6	30.4 30.3	30.4	90.3 89.8	90.1	6.1 6.0	6.1		4.8 4.9	4.9		4 4	4.0	
31-Oct-14	Fine	Moderate	17:18	Surface	1	27.1 27.0	27.1	8.0 8.1	8.1	31.0 31.3	31.2	86.9 86.4	86.7	5.8 5.8	5.8	5.8	2.8 2.9	2.9	4.7	3 3	3.0	3.2
				Middle	9	26.9 26.9	26.9	8.1 8.2	8.2	32.3 31.8	32.1	86.6 86.4	86.5	5.8 5.8	5.8		5.2 5.3	5.3		3 3	3.0	
				Bottom	17	26.9 26.9	26.9	8.1 8.2	8.2	33.9 32.8	33.4	86.9 86.6	86.8	5.7 5.8	5.8		5.9 6.0	6.0		4 3	3.5	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C2 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	11:56	Surface	1	28.1 28.1	28.1	7.7 7.7	7.7	32.2 32.2	32.2	81.4 81.3	81.4	5.3 5.3	5.3	5.3	3.8 3.9	3.9	4.4	3 3	3.0	4.0
				Middle	9	28.1 28.1	28.1	7.7 7.7	7.7	32.3 32.3	32.3	78.9 78.9	78.9	5.2 5.2	5.2		4.4 4.5	4.5		5 5	5.0	
				Bottom	17	28.1 28.1	28.1	7.7 7.7	7.7	32.5 32.5	32.5	73.4 73.3	73.4	4.8 4.8	4.8		4.7 4.9	4.8		4 4	4.0	
3-Oct-14	Sunny	Moderate	13:59	Surface	1	30.7 30.3	30.5	8.0 8.0	8.0	31.6 31.9	31.8	71.8 70.8	71.3	4.5 4.5	4.5	4.6	2.9 3.1	3.0	3.5	3 3	3.0	3.8
				Middle	9.5	30.1 30.0	30.1	8.0 8.0	8.0	32.3 32.5	32.4	73.1 73.7	73.4	4.6 4.7	4.7		3.4 3.3	3.4		3 3	3.0	
				Bottom	18	29.8 29.8	29.8	8.0 8.0	8.0	32.9 33.0	33.0	74.3 74.1	74.2	4.7 4.7	4.7		4.1 4.2	4.2		5 6	5.5	
6-Oct-14	Sunny	Moderate	16:03	Surface	1	31.1 30.7	30.9	8.2 8.2	8.2	38.5 38.5	38.5	90.0 87.9	89.0	5.4 5.3	5.4	5.5	2.6 2.6	2.6	4.5	3 3	3.0	3.0
				Middle	8	30.1 29.9	30.0	8.3 8.3	8.3	39.3 39.1	39.2	88.8 89.6	89.2	5.4 5.5	5.5		3.6 3.6	3.6		3 3	3.0	
				Bottom	15	29.8 29.8	29.8	8.3 8.3	8.3	39.1 39.3	39.2	90.2 91.2	90.7	5.5 5.6	5.6		6.9 7.8	7.4		3 3	3.0	
8-Oct-14	Fine	Moderate	16:48	Surface	1	29.4 29.4	29.4	8.2 8.2	8.2	30.9 31.0	31.0	82.1 81.9	82.0	5.3 5.3	5.3	5.4	2.7 2.6	2.7	3.4	3 3	3.0	3.7
				Middle	8	29.4 29.4	29.4	8.3 8.3	8.3	31.4 31.4	31.4	84.1 83.7	83.9	5.4 5.4	5.4		3.1 3.1	3.1		5 5	5.0	
				Bottom	15	29.4 29.4	29.4	8.3 8.3	8.3	31.6 31.7	31.7	84.2 84.3	84.3	5.4 5.4	5.4		4.3 4.7	4.5		3 3	3.0	
10-Oct-14	Sunny	Moderate	08:50	Surface	1	28.6 28.8	28.7	8.3 8.3	8.3	30.4 30.4	30.4	88.0 86.6	87.3	5.8 5.7	5.8	5.7	3.3 3.3	3.3	4.7	3 3	3.0	4.2
				Middle	8	29.2 29.2	29.2	8.3 8.3	8.3	30.8 30.9	30.9	84.6 84.5	84.6	5.5 5.5	5.5		4.5 4.7	4.6		3 4	3.5	
				Bottom	15	29.3 29.3	29.3	8.3 8.3	8.3	31.0 31.0	31.0	84.2 84.2	84.2	5.4 5.4	5.4		5.9 6.2	6.1		6 6	6.0	
13-Oct-14	Sunny	Moderate	11:21	Surface	1	27.8 28.1	28.0	8.3 8.3	8.3	30.8 31.2	31.0	89.8 87.1	88.5	5.9 5.7	5.8	5.7	3.4 3.4	3.4	4.1	3 4	3.5	3.2
				Middle	9	28.6 28.6	28.6	8.3 8.3	8.3	31.2 31.6	31.4	84.3 84.4	84.4	5.5 5.5	5.5		4.0 4.0	4.0		3 3	3.0	
				Bottom	17	28.8 28.9	28.9	8.3 8.3	8.3	31.5 31.3	31.4	83.1 83.2	83.2	5.4 5.4	5.4		4.8 5.0	4.9		3 3	3.0	
16-Oct-14	Fine	Moderate	17:22	Surface	1	27.6 27.7	27.7	8.3 8.2	8.3	32.1 32.5	32.3	92.9 92.8	92.9	6.4 6.4	6.4	6.4	3.9 3.5	3.7	4.8	3 3	3.0	4.3
				Middle	9	27.7 27.6	27.7	8.2 8.2	8.2	32.6 32.1	32.4	91.0 90.9	91.0	6.3 6.3	6.3		5.0 5.1	5.1		5 5	5.0	
				Bottom	17	27.6 27.7	27.7	8.2 8.2	8.2	32.2 32.5	32.4	89.0 88.9	89.0	6.1 6.1	6.1		5.8 5.4	5.6		5 5	5.0	
18-Oct-14	Sunny	Moderate	15:08	Surface	1	27.9 27.8	27.9	7.8 7.7	7.8	33.0 33.1	33.1	85.1 82.5	83.8	5.6 5.4	5.5	5.2	2.5 2.5	2.5	2.7	4 4	4.0	3.7
				Middle	9.5	27.8 27.8	27.8	7.5 7.5	7.5	33.5 33.4	33.5	73.8 71.8	72.8	4.8 4.7	4.8		2.7 2.6	2.7		3 3	3.0	
				Bottom	18	27.8 27.8	27.8	7.4 7.3	7.4	33.2 33.0	33.1	67.1 65.3	66.2	4.4 4.3	4.4		2.8 2.9	2.9		4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at C2 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:15	Surface	1	30.4 30.0	30.2	8.0 8.0	8.0	32.5 32.8	32.7	81.3 80.3	80.8	5.1 5.1	5.1	5.2	3.4 3.3	3.4	4.0	4 4	4.0	4.8
				Middle	9.5	29.8 29.7	29.8	8.0 8.0	8.0	33.2 33.4	33.3	82.6 83.2	82.9	5.2 5.3	5.3		4.0 4.0	4.0		4 4	4.0	
				Bottom	18	29.5 29.5	29.5	8.0 8.0	8.0	33.8 33.9	33.9	83.8 83.6	83.7	5.3 5.3	5.3		4.5 4.5	4.5		7 6	6.5	
22-Oct-14	Sunny	Moderate	16:02	Surface	1	27.7 27.7	27.7	8.2 7.9	8.1	32.7 32.5	32.6	75.9 78.9	77.4	5.0 5.2	5.1	4.7	2.5 2.6	2.6	4.8	4 4	4.0	4.7
				Middle	9	27.2 27.2	27.2	8.0 8.0	8.0	35.8 36.0	35.9	64.6 66.2	65.4	4.2 4.3	4.3		3.5 3.5	3.5		5 5	5.0	
				Bottom	17	27.0 26.9	27.0	8.0 7.9	8.0	36.6 36.9	36.8	62.6 62.9	62.8	4.1 4.1	4.1		8.2 8.2	8.2		5 5	5.0	
24-Oct-14	Cloudy	Moderate	16:54	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	32.9 32.9	32.9	72.5 72.0	72.3	4.7 4.7	4.7	4.7	2.7 2.6	2.7	3.6	6 6	6.0	4.3
				Middle	9	27.8 27.8	27.8	8.2 8.2	8.2	33.2 33.3	33.3	70.6 70.6	70.6	4.6 4.6	4.6		3.3 3.2	3.3		3 3	3.0	
				Bottom	17	27.8 27.8	27.8	8.2 8.3	8.3	33.2 33.2	33.2	71.2 71.2	71.2	4.7 4.7	4.7		4.7 5.1	4.9		4 4	4.0	
27-Oct-14	Sunny	Moderate	09:41	Surface	1	28.5 28.5	28.5	8.2 8.2	8.2	31.0 31.6	31.3	69.8 65.4	67.6	4.4 4.1	4.3	4.1	2.3 2.3	2.3	4.0	5 5	5.0	4.0
				Middle	8	28.5 28.5	28.5	8.2 8.2	8.2	32.0 31.8	31.9	63.2 60.1	61.7	4.0 3.8	3.9		4.5 4.5	4.5		4 4	4.0	
				Bottom	15	28.5 28.5	28.5	8.2 8.2	8.2	32.0 32.1	32.1	53.4 52.5	53.0	3.3 3.3	3.3		5.2 5.4	5.3		3 3	3.0	
29-Oct-14	Sunny	Moderate	12:05	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	30.7 31.8	31.3	94.4 94.0	94.2	6.3 6.3	6.3	6.2	2.3 2.3	2.3	4.0	3 3	3.0	4.0
				Middle	9	27.0 26.9	27.0	7.6 8.0	7.8	31.0 30.7	30.9	88.5 88.7	88.6	5.9 6.0	6.0		3.9 4.0	4.0		5 5	5.0	
				Bottom	17	26.9 26.9	26.9	6.7 6.9	6.8	31.4 31.2	31.3	87.4 87.6	87.5	5.9 5.9	5.9		5.5 5.8	5.7		4 4	4.0	
31-Oct-14	Sunny	Moderate	13:49	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	31.3 31.4	31.4	84.4 84.3	84.4	5.7 5.6	5.7	5.7	3.5 3.6	3.6	4.6	3 3	3.0	3.7
				Middle	9	26.9 26.9	26.9	8.1 8.2	8.2	31.6 31.6	31.6	83.8 83.7	83.8	5.6 5.6	5.6		4.9 4.8	4.9		3 4	3.5	
				Bottom	17	26.9 26.9	26.9	8.2 8.2	8.2	33.3 32.5	32.9	84.1 84.0	84.1	5.6 5.6	5.6		5.3 5.4	5.4		4 5	4.5	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	16:39	Surface	1	27.0 27.0	27.0	7.3 7.3	7.3	31.1 31.1	31.1	82.1 82.2	82.2	5.5 5.5	5.5	5.5	4.8 4.9	5.0	5.0	4 4	4.0	4.2
				Middle	6	27.0 27.0	27.0	7.3 7.3	7.3	31.2 31.4	31.3	80.4 81.1	80.8	5.4 5.4	5.4		5.0 5.1			4 5	4.5	
				Bottom	11	27.0 27.0	27.0	7.3 7.3	7.3	34.4 36.1	35.3	75.5 75.6	75.6	5.0 4.9	5.0		5.1 5.1			4 4	4.0	
3-Oct-14	Sunny	Moderate	07:59	Surface	1	29.6 29.6	29.6	8.0 8.0	8.0	30.7 30.7	30.7	72.4 71.7	72.1	4.7 4.6	4.7	4.7	2.9 3.1	3.3	4.6	3 3	3.0	3.3
				Middle	5.5	29.5 29.5	29.5	8.1 8.1	8.1	31.0 31.1	31.1	71.1 71.2	71.2	4.6 4.6	4.6		3.2 3.1			4 4	4.0	
				Bottom	10	29.5 29.4	29.5	8.1 8.1	8.1	31.2 31.3	31.3	71.3 71.3	71.3	4.6 4.6	4.6		3.6 3.6			3 3	3.0	
6-Oct-14	Sunny	Moderate	10:32	Surface	1	28.9 29.1	29.0	8.2 8.2	8.2	36.7 36.7	36.7	76.8 74.2	75.5	4.8 4.7	4.8	4.7	1.8 2.1	2.6	4.4	4 3	3.5	4.2
				Middle	5	29.5 29.6	29.6	8.2 8.2	8.2	36.7 36.8	36.8	71.9 71.1	71.5	4.5 4.4	4.5		1.8 1.8			4 4	4.0	
				Bottom	9	29.6 29.6	29.6	8.2 8.2	8.2	37.0 37.2	37.1	70.4 70.1	70.3	4.4 4.4	4.4		3.9 4.1			5 5	5.0	
8-Oct-14	Sunny	Moderate	12:39	Surface	1	29.2 29.3	29.3	8.2 8.2	8.2	30.8 30.8	30.8	77.8 77.0	77.4	5.0 5.0	5.0	5.0	2.1 2.2	2.6	4.8	3 3	3.0	4.0
				Middle	5.5	29.5 29.5	29.5	8.2 8.2	8.2	31.1 31.0	31.1	75.8 75.8	75.8	4.9 4.9	4.9		2.5 2.5			3 3	3.0	
				Bottom	10	29.5 29.5	29.5	8.3 8.3	8.3	31.2 31.2	31.2	75.2 75.1	75.2	4.8 4.8	4.8		2.9 3.0			6 6	6.0	
10-Oct-14	Sunny	Moderate	14:11	Surface	1	29.2 29.3	29.3	8.2 8.2	8.2	30.2 30.2	30.2	71.5 70.9	71.2	4.6 4.6	4.6	4.6	2.2 2.3	4.9	4.4	3 3	3.0	4.0
				Middle	5	29.5 29.5	29.5	8.2 8.2	8.2	30.5 30.5	30.5	69.2 68.9	69.1	4.5 4.4	4.5		4.5 4.6			3 3	3.0	
				Bottom	9	29.5 29.5	29.5	8.2 8.2	8.2	30.7 30.8	30.8	68.5 68.2	68.4	4.4 4.4	4.4		7.8 7.7			6 6	6.0	
13-Oct-14	Sunny	Moderate	14:55	Surface	1	28.8 28.9	28.9	8.2 8.2	8.2	28.9 28.9	28.9	67.2 66.8	67.0	4.4 4.4	4.4	4.3	2.7 2.8	3.7	4.2	3 3	3.0	3.7
				Middle	6	29.1 29.1	29.1	8.2 8.2	8.2	29.0 29.1	29.1	64.5 64.4	64.5	4.2 4.2	4.2		3.4 3.5			4 4	4.0	
				Bottom	11	29.2 29.2	29.2	8.2 8.2	8.2	29.3 29.4	29.4	64.6 64.8	64.7	4.2 4.2	4.2		4.9 4.8			4 4	4.0	
16-Oct-14	Sunny	Moderate	06:46	Surface	1	27.4 27.4	27.4	8.4 8.4	8.4	32.7 32.7	32.7	79.6 79.4	79.5	5.5 5.5	5.5	5.4	1.4 1.2	2.7	5.3	4 4	4.0	4.0
				Middle	5.5	27.4 27.4	27.4	8.4 8.4	8.4	32.7 32.8	32.8	76.3 77.1	76.7	5.3 5.3	5.3		2.2 2.2			3 3	3.0	
				Bottom	10	27.4 27.4	27.4	8.4 8.3	8.4	33.0 33.0	33.0	75.5 76.5	76.0	5.2 5.3	5.3		4.1 4.8			5 5	5.0	
18-Oct-14	Sunny	Moderate	08:55	Surface	1	28.1 28.0	28.1	7.8 7.8	7.8	26.2 28.5	27.4	86.3 82.8	84.6	5.8 5.5	5.7	5.2	2.4 2.5	2.5	3.8	4 4	4.0	4.2
				Middle	5.5	28.0 27.9	28.0	7.8 7.8	7.8	31.3 31.5	31.4	69.9 67.6	68.8	4.6 4.5	4.6		2.2 2.2			4 3	3.5	
				Bottom	10	27.9 27.9	27.9	7.8 7.8	7.8	31.7 31.7	31.7	57.2 56.0	56.6	3.8 3.7	3.8		2.8 2.9			5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at A - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	10:29	Surface	1	29.6 29.7	29.7	8.0 8.0	8.0	31.6 31.6	31.6	82.2 81.6	81.9	5.3 5.2	5.3	5.3	2.3 2.3	2.3	2.8	3 3	3.0	3.7
				Middle	5.5	29.7 29.7	29.7	8.0 8.0	8.0	31.9 32.0	32.0	81.1 81.1	81.1	5.2 5.2	5.2		2.6 2.6	2.6		4 4	4.0	
				Bottom	10	29.6 29.6	29.6	8.0 8.0	8.0	32.1 32.2	32.2	81.2 81.2	81.2	5.2 5.2	5.2		3.4 3.6	3.5		4 4	4.0	
22-Oct-14	Sunny	Moderate	11:44	Surface	1	27.5 27.4	27.5	8.2 8.2	8.2	34.1 34.5	34.3	87.1 84.0	85.6	5.7 5.5	5.6	5.5	2.0 2.2	2.1	4.8	4 4	4.0	3.7
				Middle	5.5	27.3 27.2	27.3	8.2 8.6	8.4	35.1 36.4	35.8	81.4 80.7	81.1	5.3 5.2	5.3		3.3 3.8	3.6		3 3	3.0	
				Bottom	10	26.7 26.8	26.8	8.4 8.4	8.4	36.9 37.8	37.4	67.3 65.7	66.5	4.4 4.3	4.4		8.3 8.8	8.6		4 4	4.0	
24-Oct-14	Cloudy	Moderate	11:36	Surface	1	27.2 27.3	27.3	8.2 8.2	8.2	32.2 32.6	32.4	71.2 70.1	70.7	4.7 4.6	4.7	4.6	2.1 2.3	2.2	2.7	3 3	3.0	4.2
				Middle	5.5	27.8 27.8	27.8	8.2 8.2	8.2	32.0 32.2	32.1	66.0 66.2	66.1	4.3 4.4	4.4		2.3 2.3	2.3		5 4	4.5	
				Bottom	10	27.9 27.9	27.9	8.2 8.2	8.2	31.7 31.7	31.7	66.5 66.6	66.6	4.4 4.4	4.4		3.6 3.7	3.7		5 5	5.0	
27-Oct-14	Sunny	Moderate	13:34	Surface	1	27.8 27.8	27.8	8.3 8.3	8.3	30.8 31.8	31.3	76.9 76.1	76.5	5.1 5.0	5.1	5.1	2.0 2.1	2.1	4.6	5 5	5.0	4.0
				Middle	5.5	27.8 27.8	27.8	8.3 8.3	8.3	32.5 32.4	32.5	76.0 75.3	75.7	5.0 4.9	5.0		5.4 5.7	5.6		4 4	4.0	
				Bottom	10	27.8 27.8	27.8	8.3 8.3	8.3	32.8 33.3	33.1	75.5 75.4	75.5	4.9 4.9	4.9		5.6 6.4	6.0		3 3	3.0	
29-Oct-14	Sunny	Moderate	15:15	Surface	1	25.3 25.9	25.6	6.8 6.7	6.8	31.0 31.9	31.5	94.9 83.7	89.3	6.5 5.7	6.1	5.6	1.9 2.0	2.0	3.2	4 4	4.0	4.5
				Middle	5.5	26.9 26.9	26.9	7.0 6.9	7.0	29.5 29.5	29.5	74.8 74.5	74.7	5.1 5.0	5.1		3.3 3.4	3.4		5 4	4.5	
				Bottom	10	26.9 26.9	26.9	6.2 6.1	6.2	30.3 30.1	30.2	58.8 48.8	53.8	4.0 3.3	3.7		4.2 4.3	4.3		5 5	5.0	
31-Oct-14	Fine	Moderate	17:43	Surface	1	26.9 27.1	27.0	8.0 8.1	8.1	29.2 28.6	28.9	63.2 61.4	62.3	4.3 4.2	4.3	4.3	3.0 3.1	3.1	4.8	4 4	4.0	3.3
				Middle	5.5	27.0 27.0	27.0	8.2 8.1	8.2	29.6 29.0	29.3	62.1 63.8	63.0	4.2 4.3	4.3		4.2 4.5	4.4		3 3	3.0	
				Bottom	10	27.0 27.0	27.0	8.2 8.2	8.2	30.0 29.4	29.7	65.3 67.0	66.2	4.4 4.5	4.5		6.7 6.8	6.8		3 3	3.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at A - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	11:13	Surface	1	28.4 28.4	28.4	7.7 7.7	7.7	29.8 29.9	29.9	85.0 84.1	84.6	5.6 5.5	5.6	5.5	4.0 4.1	4.1	4.1	5 5	5.0	4.0
				Middle	5.5	28.4 28.4	28.4	7.7 7.7	7.7	30.5 30.5	30.5	80.4 80.3	80.4	5.3 5.3	5.3		3.7 3.8			3 3	3.0	
				Bottom	10	28.4 28.4	28.4	7.7 7.7	7.7	30.9 30.9	30.9	75.1 75.2	75.2	4.9 4.9	4.9		4.3 4.3			4 4	4.0	
3-Oct-14	Sunny	Moderate	14:25	Surface	1	28.4 28.5	28.5	8.0 8.0	8.0	31.4 31.5	31.5	67.2 67.3	67.3	4.4 4.4	4.4	4.4	2.9 2.8	2.9	3.1	3 4	3.5	3.2
				Middle	6	29.9 30.1	30.0	8.0 8.0	8.0	31.7 31.8	31.8	68.7 68.8	68.8	4.4 4.4	4.4		3.2 3.0			3 3	3.0	
				Bottom	11	28.1 28.2	28.2	8.0 8.0	8.0	31.8 31.9	31.9	66.5 66.5	66.5	4.4 4.4	4.4		3.2 3.5			3 3	3.0	
6-Oct-14	Sunny	Moderate	16:37	Surface	1	29.4 29.5	29.5	8.1 8.1	8.1	37.0 37.3	37.2	78.5 76.3	77.4	4.9 4.7	4.8	4.7	1.4 1.4	1.4	3.9	3 3	3.0	3.0
				Middle	5	29.7 29.7	29.7	8.1 8.1	8.1	37.8 37.8	37.8	73.1 72.1	72.6	4.5 4.5	4.5		3.2 3.2			3 3	3.0	
				Bottom	9	29.7 29.6	29.7	8.1 8.1	8.1	38.0 38.0	38.0	72.3 72.1	72.2	4.5 4.5	4.5		7.0 7.1			3 3	3.0	
8-Oct-14	Fine	Moderate	17:22	Surface	1	29.3 29.3	29.3	8.2 8.2	8.2	31.2 31.2	31.2	74.8 74.7	74.8	4.8 4.8	4.8	4.8	2.1 2.2	2.2	3.2	3 3	3.0	4.0
				Middle	5.5	29.5 29.5	29.5	8.2 8.2	8.2	31.6 31.5	31.6	73.8 73.8	73.8	4.7 4.7	4.7		3.3 3.3			4 4	4.0	
				Bottom	10	29.5 29.5	29.5	8.2 8.2	8.2	31.6 31.6	31.6	73.5 73.5	73.5	4.7 4.7	4.7		4.1 4.1			5 5	5.0	
10-Oct-14	Sunny	Moderate	08:24	Surface	1	28.9 29.0	29.0	8.2 8.2	8.2	29.7 29.8	29.8	69.7 68.5	69.1	4.6 4.5	4.6	4.5	3.1 3.1	3.1	4.8	3 3	3.0	3.5
				Middle	5	29.2 29.2	29.2	8.2 8.2	8.2	30.1 30.3	30.2	66.7 66.9	66.8	4.3 4.3	4.3		4.4 4.8			4 4	4.0	
				Bottom	9	29.2 29.2	29.2	8.2 8.2	8.2	30.5 30.5	30.5	67.3 67.5	67.4	4.4 4.4	4.4		6.5 6.7			4 3	3.5	
13-Oct-14	Sunny	Moderate	10:54	Surface	1	26.9 27.1	27.0	8.2 8.2	8.2	25.2 30.6	27.9	77.2 76.0	76.6	5.4 5.1	5.3	4.8	3.2 3.2	3.2	3.9	4 4	4.0	4.0
				Middle	5.5	28.2 28.4	28.3	8.2 8.2	8.2	31.7 31.7	31.7	66.4 66.4	66.4	4.3 4.3	4.3		3.8 3.9			4 4	4.0	
				Bottom	10	28.8 28.8	28.8	8.2 8.2	8.2	31.5 31.5	31.5	63.6 63.7	63.7	4.1 4.1	4.1		4.6 4.7			4 4	4.0	
16-Oct-14	Fine	Moderate	17:50	Surface	1	27.8 27.9	27.9	8.3 8.3	8.3	32.0 32.4	32.2	79.6 79.4	79.5	5.5 5.5	5.5	5.4	1.7 1.5	1.6	3.2	4 4	4.0	4.3
				Middle	5.5	27.9 27.8	27.9	8.2 8.3	8.3	32.4 32.1	32.3	76.3 77.1	76.7	5.3 5.3	5.3		2.7 2.7			5 5	5.0	
				Bottom	10	27.8 28.0	27.9	8.2 8.2	8.2	32.3 32.7	32.5	75.5 76.5	76.0	5.2 5.3	5.3		4.9 5.9			4 4	4.0	
18-Oct-14	Sunny	Moderate	15:30	Surface	1	27.2 27.3	27.3	7.7 7.7	7.7	31.8 31.8	31.8	88.9 86.5	87.7	5.9 5.7	5.8	5.3	2.4 2.4	2.4	2.7	4 4	4.0	4.7
				Middle	5.5	27.5 27.5	27.5	7.7 7.6	7.7	32.2 32.1	32.2	73.8 71.7	72.8	4.9 4.7	4.8		2.8 2.9			7 7	7.0	
				Bottom	10	27.6 27.6	27.6	7.6 7.5	7.6	31.9 31.9	31.9	68.1 66.8	67.5	4.5 4.4	4.5		2.7 2.6			3 3	3.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.



# Water Quality Monitoring Results at A - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:41	Surface	1	29.7 29.7	29.7	7.9 7.9	7.9	32.3 32.4	32.4	78.4 78.5	78.5	5.0 5.0	5.0	5.0	2.5 2.4	2.5	3.1	3 3	3.0	4.0
				Middle	6	29.7 29.7	29.7	7.9 7.9	7.9	32.6 32.7	32.7	78.3 78.1	78.2	5.0 5.0	5.0		3.0 2.9	3.0		4 5	4.5	
				Bottom	11	29.7 29.7	29.7	7.9 7.9	7.9	32.7 32.8	32.8	78.0 78.0	78.0	5.0 5.0	5.0		3.4 3.9	3.7		4 5	4.5	
22-Oct-14	Sunny	Moderate	16:36	Surface	1	27.4 27.2	27.3	8.1 8.1	8.1	35.8 36.0	35.9	82.8 79.5	81.2	5.4 5.2	5.3	4.4	2.1 2.2	2.2	4.8	4 4	4.0	4.3
				Middle	5.5	27.4 27.3	27.4	8.5 8.3	8.4	36.7 37.0	36.9	52.9 50.6	51.8	3.4 3.3	3.4		4.7 4.7	4.7		5 5	5.0	
				Bottom	10	27.0 26.9	27.0	8.3 8.2	8.3	37.3 37.5	37.4	52.6 52.2	52.4	3.4 3.4	3.4		7.5 7.6	7.6		4 4	4.0	
24-Oct-14	Cloudy	Moderate	17:24	Surface	1	27.8 27.5	27.7	8.2 8.2	8.2	29.8 29.9	29.9	65.1 64.6	64.9	4.3 4.3	4.3	4.3	2.1 2.1	2.1	3.2	3 4	3.5	3.2
				Middle	5.5	27.9 27.9	27.9	8.2 8.2	8.2	32.5 32.5	32.5	64.2 64.5	64.4	4.2 4.2	4.2		3.0 3.0	3.0		3 3	3.0	
				Bottom	10	27.9 27.9	27.9	8.2 8.2	8.2	32.6 32.6	32.6	63.9 63.8	63.9	4.2 4.2	4.2		4.5 4.6	4.6		3 3	3.0	
27-Oct-14	Sunny	Moderate	09:10	Surface	1	28.4 28.3	28.4	8.2 8.2	8.2	28.1 28.3	28.2	81.3 78.0	79.7	5.2 5.0	5.1	5.0	1.4 1.6	1.5	4.8	3 3	3.0	3.0
				Middle	5.5	28.3 28.4	28.4	8.2 8.2	8.2	29.3 29.1	29.2	79.2 75.9	77.6	5.0 4.8	4.9		3.8 3.9	3.9		3 3	3.0	
				Bottom	10	28.4 28.4	28.4	8.2 8.2	8.2	29.7 30.1	29.9	69.6 68.0	68.8	4.4 4.3	4.4		8.8 9.4	9.1		3 3	3.0	
29-Oct-14	Sunny	Moderate	11:30	Surface	1	26.7 26.7	26.7	7.5 7.5	7.5	29.5 29.6	29.6	75.7 74.4	75.1	5.1 5.1	5.1	5.0	1.5 1.6	1.6	3.4	3 3	3.0	4.0
				Middle	5.5	27.0 27.0	27.0	7.4 7.4	7.4	29.7 29.8	29.8	71.0 71.0	71.0	4.8 4.8	4.8		3.3 3.1	3.2		5 5	5.0	
				Bottom	10	27.0 27.0	27.0	7.6 7.6	7.6	29.9 29.9	29.9	70.8 70.8	70.8	4.8 4.8	4.8		5.3 5.6	5.5		4 4	4.0	
31-Oct-14	Sunny	Moderate	13:17	Surface	1	26.8 26.9	26.9	8.1 8.1	8.1	31.2 31.5	31.4	67.6 66.7	67.2	4.5 4.5	4.5	4.4	2.0 2.0	2.0	4.4	4 4	4.0	3.7
				Middle	5.5	27.0 27.0	27.0	8.1 8.1	8.1	32.2 32.5	32.4	65.2 65.2	65.2	4.3 4.3	4.3		3.0 3.3	3.2		4 4	4.0	
				Bottom	10	27.0 27.0	27.0	8.2 8.2	8.2	33.2 33.7	33.5	65.2 65.2	65.2	4.3 4.3	4.3		7.4 8.8	8.1		3 3	3.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at WSD9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	16:25	Surface	1	27.1 27.1	27.1	7.4 7.4	7.4	32.0 32.0	32.0	82.6 82.6	82.6	5.5 5.5	5.5	5.5	4.0 4.0	4.0	5.0	5 5	5.0	4.0
				Middle	4	27.1 27.1	27.1	7.4 7.4	7.4	32.3 32.3	32.3	81.7 81.5	81.6	5.4 5.4	5.4		5.4 5.3	5.4		3 3	3.0	
				Bottom	7	27.1 27.1	27.1	7.4 7.4	7.4	32.3 32.4	32.4	72.3 72.0	72.2	4.8 4.8	4.8		5.5 5.4	5.5		4 4	4.0	
3-Oct-14	Sunny	Moderate	08:12	Surface	1	29.4 29.4	29.4	8.0 8.0	8.0	31.5 31.5	31.5	61.6 61.6	61.6	4.0 4.0	4.0	3.7	3.2 3.4	3.3	3.3	4 4	4.0	3.5
				Middle	4	29.4 29.4	29.4	8.0 8.0	8.0	31.4 31.5	31.5	53.4 53.2	53.3	3.4 3.4	3.4		3.3 3.1	3.2		3 3	3.0	
				Bottom	7	29.3 29.3	29.3	8.0 8.0	8.0	31.5 31.7	31.6	53.2 53.2	53.2	3.4 3.4	3.4		3.3 3.5	3.4		4 3	3.5	
6-Oct-14	Sunny	Moderate	10:49	Surface	1	29.3 29.4	29.4	8.2 8.2	8.2	36.5 36.6	36.6	83.1 81.8	82.5	5.2 5.1	5.2	5.1	1.6 1.9	1.8	2.8	3 3	3.0	3.2
				Middle	5	29.6 29.7	29.7	8.2 8.2	8.2	36.9 37.0	37.0	79.7 79.4	79.6	5.0 4.9	5.0		1.5 1.5	1.5		3 3	3.0	
				Bottom	9	29.7 29.7	29.7	8.2 8.2	8.2	37.1 37.3	37.2	79.1 79.0	79.1	4.9 4.9	4.9		4.8 5.5	5.2		4 3	3.5	
8-Oct-14	Sunny	Moderate	12:56	Surface	1	29.1 29.2	29.2	8.3 8.3	8.3	31.0 31.1	31.1	84.4 83.9	84.2	5.5 5.4	5.5	5.5	2.0 2.0	2.0	2.4	3 3	3.0	3.0
				Middle	3.5	29.5 29.4	29.5	8.3 8.3	8.3	31.4 31.4	31.4	83.4 83.6	83.5	5.4 5.4	5.4		2.0 2.0	2.0		3 3	3.0	
				Bottom	6	29.5 29.5	29.5	8.3 8.3	8.3	31.6 31.6	31.6	84.1 84.0	84.1	5.4 5.4	5.4		3.1 3.4	3.3		3 3	3.0	
10-Oct-14	Sunny	Moderate	13:57	Surface	1	29.1 29.2	29.2	8.3 8.3	8.3	31.6 31.6	31.6	82.2 80.8	81.5	5.3 5.2	5.3	5.2	2.2 2.2	2.2	2.9	3 3	3.0	3.8
				Middle	5	29.3 29.4	29.4	8.3 8.3	8.3	31.9 31.9	31.9	79.2 79.0	79.1	5.1 5.1	5.1		2.2 2.1	2.2		4 5	3.5	
				Bottom	9	29.4 29.4	29.4	8.3 8.3	8.3	31.9 31.9	31.9	78.8 78.7	78.8	5.1 5.0	5.1		4.3 4.3	4.3		5 5	5.0	
13-Oct-14	Sunny	Moderate	14:44	Surface	1	29.0 29.0	29.0	8.2 8.2	8.2	28.8 28.9	28.9	78.4 77.9	78.2	5.1 5.1	5.1	5.0	2.8 2.8	2.8	3.1	3 4	3.5	4.2
				Middle	4	29.1 29.1	29.1	8.2 8.2	8.2	29.2 29.2	29.2	75.0 74.7	74.9	4.9 4.9	4.9		2.8 2.7	2.8		5 5	5.0	
				Bottom	7	29.1 29.1	29.1	8.2 8.2	8.2	29.4 29.5	29.5	74.3 74.6	74.5	4.9 4.9	4.9		3.6 3.7	3.7		4 4	4.0	
16-Oct-14	Sunny	Moderate	07:03	Surface	1	27.3 27.0	27.2	8.1 8.1	8.1	32.8 32.4	32.6	91.8 90.7	91.3	6.4 6.3	6.4	6.4	2.6 2.6	2.6	4.0	4 5	4.5	4.2
				Middle	4	27.3 27.2	27.3	8.1 8.1	8.1	32.8 32.4	32.6	92.0 90.9	91.5	6.4 6.3	6.4		3.8 4.2	4.0		3 3	3.0	
				Bottom	7	27.3 27.0	27.2	8.1 8.1	8.1	32.8 32.4	32.6	92.3 91.2	91.8	6.4 6.3	6.4		5.3 5.2	5.3		5 5	5.0	
18-Oct-14	Sunny	Moderate	09:07	Surface	1	28.1 28.1	28.1	7.9 7.9	7.9	29.3 29.6	29.5	95.6 93.0	94.3	6.4 6.2	6.3	5.8	2.3 2.2	2.3	2.5	3 3	3.0	3.7
				Middle	4	27.9 27.9	27.9	7.9 7.9	7.9	31.5 31.7	31.6	80.2 78.2	79.2	5.3 5.1	5.2		2.5 2.5	2.5		4 4	4.0	
				Bottom	7	27.7 27.7	27.7	7.9 7.9	7.9	32.2 32.2	32.2	65.4 64.0	64.7	4.3 4.2	4.3		2.6 2.7	2.7		4 4	4.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at WSD9 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	10:42	Surface	1	29.0 29.0	29.0	8.0 8.0	8.0	32.4 32.4	32.4	70.9 70.9	70.9	4.6 4.6	4.6	4.3	2.4 2.5	2.5	2.9	3 3	3.0	3.3
				Middle	4	29.3 29.4	29.4	8.0 8.0	8.0	32.3 32.4	32.4	63.0 62.9	63.0	4.0 4.0	4.0		2.9 2.8	2.9		3 3	3.0	
				Bottom	7	29.4 29.4	29.4	8.0 8.0	8.0	32.4 32.6	32.5	62.9 63.0	63.0	4.0 4.0	4.0		3.3 3.4	3.4		4 4	4.0	
22-Oct-14	Sunny	Moderate	11:59	Surface	1	27.6 27.5	27.6	8.2 8.3	8.3	35.7 35.9	35.8	80.6 84.3	82.5	5.2 5.5	5.4	4.9	1.8 1.9	1.9	4.6	4 4	4.0	3.3
				Middle	4	27.2 27.2	27.2	8.1 8.1	8.1	37.2 37.0	37.1	71.3 65.7	68.5	4.6 4.2	4.4		4.2 4.3	4.3		3 3	3.0	
				Bottom	7	26.9 26.7	26.8	8.1 7.8	8.0	37.4 37.5	37.5	70.0 63.8	66.9	4.5 4.1	4.3	4.3	7.5 7.4	7.5		3 3	3.0	
24-Oct-14	Cloudy	Moderate	11:49	Surface	1	27.3 27.5	27.4	8.2 8.2	8.2	32.5 32.4	32.5	67.5 66.8	67.2	4.5 4.4	4.5	4.4	2.1 2.2	2.2	2.7	3 3	3.0	3.7
				Middle	3.5	27.9 27.9	27.9	8.2 8.2	8.2	32.2 32.2	32.2	64.1 64.1	64.1	4.2 4.2	4.2		2.1 2.1	2.1		4 4	4.0	
				Bottom	6	27.9 27.9	27.9	8.2 8.2	8.2	32.3 32.2	32.3	63.6 63.6	63.6	4.2 4.2	4.2	4.2	3.5 3.8	3.7		4 4	4.0	
27-Oct-14	Sunny	Moderate	13:21	Surface	1	27.6 27.7	27.7	8.3 8.3	8.3	31.0 31.2	31.1	78.6 77.6	78.1	5.2 5.1	5.2	5.1	2.3 2.3	2.3	4.1	3 3	3.0	4.2
				Middle	4	27.7 27.8	27.8	8.3 8.3	8.3	31.7 31.9	31.8	76.4 75.6	76.0	5.0 5.0	5.0		4.5 4.5	4.5		5 4	4.5	
				Bottom	7	27.8 27.8	27.8	8.3 8.3	8.3	32.1 32.2	32.2	75.2 75.1	75.2	4.9 4.9	4.9	4.9	5.6 5.5	5.6		5 5	5.0	
29-Oct-14	Sunny	Moderate	15:02	Surface	1	25.9 26.0	26.0	7.1 7.1	7.1	28.5 30.4	29.5	93.9 92.1	93.0	6.5 6.3	6.4	6.0	2.1 2.1	2.1	3.1	5 5	5.0	4.0
				Middle	4	26.9 26.9	26.9	7.9 7.9	7.9	30.5 30.4	30.5	83.4 83.5	83.5	5.6 5.6	5.6		3.2 3.3	3.3		4 4	4.0	
				Bottom	7	26.9 26.9	26.9	8.1 8.1	8.1	30.4 30.2	30.3	54.4 46.2	50.3	3.7 3.1	3.4	3.4	3.9 3.9	3.9		3 3	3.0	
31-Oct-14	Fine	Moderate	17:30	Surface	1	27.0 27.1	27.1	8.1 8.0	8.1	30.0 30.4	30.2	76.3 75.0	75.7	5.1 5.0	5.1	5.1	3.7 3.9	3.8	5.2	3 3	3.0	3.7
				Middle	4	27.1 27.1	27.1	8.2 8.2	8.2	30.8 31.0	30.9	74.8 74.2	74.5	5.0 5.0	5.0		4.8 4.9	4.9		5 5	5.0	
				Bottom	7	27.0 27.0	27.0	8.2 8.3	8.3	32.3 31.8	32.1	74.0 73.9	74.0	4.9 4.9	4.9	4.9	6.8 6.9	6.9		3 3	3.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

# Water Quality Monitoring Results at WSD9 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
1-Oct-14	Sunny	Moderate	11:29	Surface	1	28.5 28.5	28.5	7.8 7.8	7.8	31.9 31.9	31.9	107.2 106.9	107.1	7.0 7.0	7.0	6.9	4.0 3.9	4.0	4.1	4 4	4.0	4.2
				Middle	4	28.5 28.5	28.5	7.8 7.8	7.8	32.1 32.1	32.1	103.5 103.5	103.5	6.7 6.7	6.7		4.1 4.1			4 4	4.0	
				Bottom	7	28.5 28.5	28.5	7.8 7.8	7.8	32.1 32.2	32.2	95.6 95.8	95.7	6.2 6.2	6.2		4.2 4.3			4 5	4.5	
3-Oct-14	Sunny	Moderate	14:11	Surface	1	29.5 29.5	29.5	8.0 8.0	8.0	31.0 31.1	31.1	76.6 75.5	76.1	4.9 4.9	4.9	4.8	2.8 2.9	2.9	3.0	3 4	3.5	4.2
				Middle	4	29.7 29.8	29.8	8.0 8.0	8.0	31.2 31.2	31.2	72.3 72.1	72.2	4.6 4.6	4.6		3.0 2.8			6 5	5.5	
				Bottom	7	29.9 29.9	29.9	8.0 8.0	8.0	31.5 31.5	31.5	69.6 69.3	69.5	4.4 4.4	4.4		3.1 3.2			4 3	3.5	
6-Oct-14	Sunny	Moderate	16:19	Surface	1	29.2 29.4	29.3	8.2 8.2	8.2	38.8 38.7	38.8	86.3 84.3	85.3	5.3 5.2	5.3	5.1	2.1 2.2	2.2	4.7	4 4	4.0	3.8
				Middle	4.5	29.6 29.7	29.7	8.2 8.2	8.2	38.8 38.8	38.8	80.0 78.5	79.3	4.9 4.8	4.9		5.2 5.2			4 4	4.0	
				Bottom	8	29.8 29.8	29.8	8.2 8.2	8.2	38.8 38.8	38.8	78.0 78.2	78.1	4.8 4.8	4.8		7.3 6.3			3 4	3.5	
8-Oct-14	Fine	Moderate	17:11	Surface	1	28.7 28.8	28.8	8.3 8.3	8.3	31.3 31.4	31.4	87.1 86.0	86.6	5.7 5.6	5.7	5.6	2.5 2.6	2.6	3.5	3 3	3.0	4.2
				Middle	4	29.3 29.3	29.3	8.3 8.3	8.3	31.7 31.7	31.7	83.1 83.3	83.2	5.3 5.4	5.4		3.7 3.6			4 4	4.0	
				Bottom	7	29.4 29.5	29.5	8.3 8.3	8.3	31.7 31.7	31.7	82.3 82.6	82.5	5.3 5.3	5.3		4.4 4.1			6 5	5.5	
10-Oct-14	Sunny	Moderate	08:38	Surface	1	28.5 29.1	28.8	8.3 8.3	8.3	30.4 30.5	30.5	81.9 80.9	81.4	5.4 5.3	5.4	5.3	3.1 3.4	3.3	3.5	3 4	3.5	3.8
				Middle	4.5	29.2 28.6	28.9	8.3 8.3	8.3	30.7 30.4	30.6	77.3 77.5	77.4	5.0 5.1	5.1		2.1 2.3			5 5	5.0	
				Bottom	8	29.1 29.2	29.2	8.3 8.3	8.3	30.5 30.7	30.6	77.7 77.3	77.5	5.0 5.0	5.0		4.9 4.8			3 3	3.0	
13-Oct-14	Sunny	Moderate	11:08	Surface	1	28.1 28.2	28.2	8.2 8.2	8.2	33.7 31.6	32.7	77.8 76.1	77.0	5.0 5.0	5.0	4.9	3.3 3.4	3.4	3.5	5 4	4.5	4.8
				Middle	4	28.6 28.7	28.7	8.2 8.2	8.2	31.2 31.2	31.2	72.9 73.2	73.1	4.8 4.8	4.8		3.1 3.1			5 5	5.0	
				Bottom	7	28.8 28.9	28.9	8.2 8.2	8.2	31.7 31.8	31.8	72.4 72.3	72.4	4.7 4.7	4.7		4.1 4.1			5 5	5.0	
16-Oct-14	Fine	Moderate	17:35	Surface	1	27.5 27.2	27.4	8.2 8.2	8.2	31.8 31.8	31.8	90.9 89.9	90.4	6.3 6.2	6.3	6.3	3.9 3.3	3.6	4.2	5 5	5.0	4.0
				Middle	4	27.6 27.3	27.5	8.2 8.2	8.2	32.2 31.4	31.8	91.1 90.0	90.6	6.3 6.2	6.3		4.2 4.1			4 4	4.0	
				Bottom	7	27.5 27.2	27.4	8.2 8.2	8.2	31.8 31.8	31.8	91.4 90.3	90.9	6.3 6.2	6.3		4.6 4.8			3 3	3.0	
18-Oct-14	Sunny	Moderate	15:14	Surface	1	27.3 27.4	27.4	7.7 7.7	7.7	24.9 28.1	26.5	97.9 94.5	96.2	6.8 6.4	6.6	6.0	2.4 2.4	2.4	2.7	4 4	4.0	4.7
				Middle	4.5	27.7 27.7	27.7	7.7 7.7	7.7	32.2 32.2	32.2	80.4 78.3	79.4	5.3 5.2	5.3		2.8 2.8			5 5	5.0	
				Bottom	8	27.8 27.8	27.8	7.7 7.7	7.7	32.1 32.1	32.1	71.9 70.5	71.2	4.7 4.6	4.7		2.8 2.8			5 5	5.0	

Remarks: \*DA: Depth-Averaged

\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

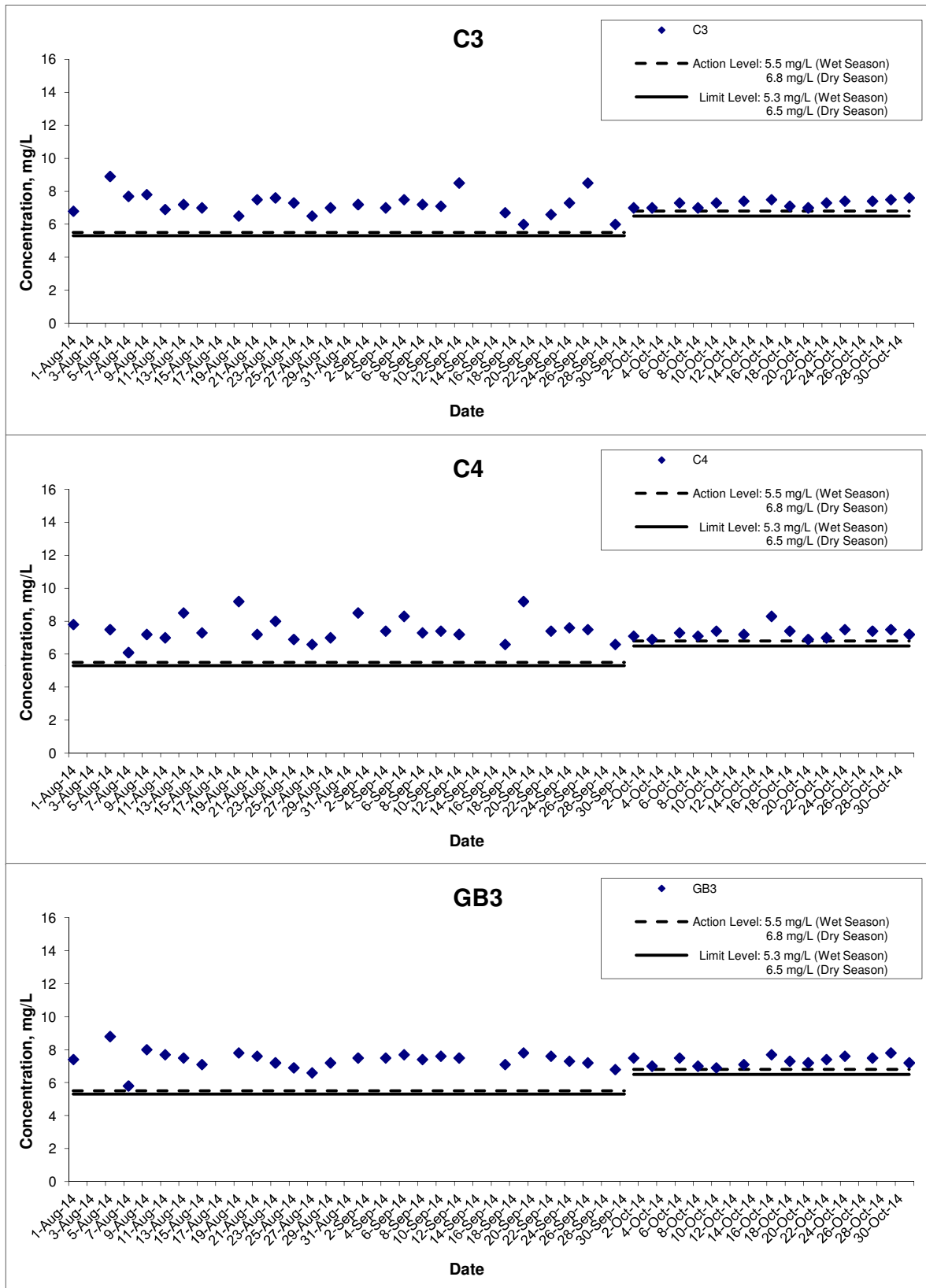
# Water Quality Monitoring Results at WSD9 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
20-Oct-14	Sunny	Moderate	15:27	Surface	1	29.2 29.2	29.2	8.0 8.0	8.0	31.9 32.0	32.0	85.9 84.8	85.4	5.5 5.5	5.5	5.4	2.8 2.8	2.8	3.0	5 5	5.0	3.7
				Middle	4	29.4 29.5	29.5	8.0 8.0	8.0	32.1 32.1	32.1	81.7 81.5	81.6	5.2 5.2	5.2		3.0 2.8	2.9		3 3	3.0	
						Bottom	7	29.6 29.6	29.6	8.0 8.0	8.0	32.4 32.4	32.4	79.0 78.7	78.9		5.0 5.0	5.0		3.3 3.4	3.4	
				22-Oct-14	Sunny	Moderate	16:19	Surface	1	27.4 27.4	27.4	8.1 8.3	8.2	35.8 36.2	36.0	80.0 82.8	81.4	5.2 5.4		5.3	5.1	
Middle	5	27.3 27.3	27.3					8.5 8.4	8.5	36.6 37.0	36.8	70.6 76.2	73.4	4.6 4.9	4.8	5.1 5.2	5.2	3 3	3.0			
		Bottom	9					26.8 27.0	26.9	8.3 8.2	8.3	37.5 38.1	37.8	51.8 63.5	57.7	3.4 4.1	3.8	6.5 6.7	6.6	6 5		5.5
24-Oct-14	Cloudy	Moderate	17:09					Surface	1	27.2 27.3	27.3	8.2 8.2	8.2	33.2 33.2	33.2	72.5 72.0	72.3	4.8 4.7	4.8	4.7	2.4 2.5	2.5
				Middle	4	27.7 27.6	27.7	8.2 8.2	8.2	33.4 33.4	33.4	70.3 70.5	70.4	4.6 4.6	4.6	3.5 3.5	3.5	3 3	3.0			
						Bottom	7	27.7 27.7	27.7	8.2 8.2	8.2	33.5 33.5	33.5	70.1 70.1	70.1	4.6 4.6	4.6	4.6 4.2	4.4		4 3	3.5
				27-Oct-14	Sunny	Moderate	09:26	Surface	1	28.5 28.4	28.5	8.2 8.2	8.2	27.5 29.1	28.3	65.5 68.4	67.0	4.2 4.4	4.3	3.8	1.5 1.5	1.5
Middle	4	28.5 28.4	28.5					8.2 8.2	8.2	30.1 30.4	30.3	50.2 52.3	51.3	3.2 3.3	3.3	4.3 4.8	4.6	6 6	6.0			
		Bottom	7					28.4 28.4	28.4	8.2 8.2	8.2	30.7 31.0	30.9	47.6 49.6	48.6	3.0 3.1	3.1	5.2 5.3	5.3		3 3	3.0
29-Oct-14	Sunny	Moderate	11:45					Surface	1	25.5 25.8	25.7	7.7 7.7	7.7	28.7 28.6	28.7	91.2 89.8	90.5	6.4 6.2	6.3	6.0	1.9 1.9	1.9
				Middle	4	26.8 26.4	26.6	7.6 7.6	7.6	28.8 28.6	28.7	80.6 83.5	82.1	5.5 5.7	5.6	2.9 3.0	3.0	3 3	3.0			
						Bottom	7	27.0 27.0	27.0	7.6 7.6	7.6	28.7 28.6	28.7	79.1 79.0	79.1	5.4 5.4	5.4	3.5 3.6	3.6		3 3	3.0
				31-Oct-14	Sunny	Moderate	13:29	Surface	1	26.9 27.1	27.0	8.1 8.2	8.2	30.5 31.4	31.0	80.9 78.7	79.8	5.4 5.3	5.4	5.4	3.8 3.8	3.8
Middle	4	27.1 27.2	27.2					8.2 8.2	8.2	32.8 31.2	32.0	78.0 79.2	78.6	5.2 5.3	5.3	4.2 4.3	4.3	4 4	4.0			
		Bottom	7					27.2 27.2	27.2	8.2 8.2	8.2	31.9 33.0	32.5	77.8 77.7	77.8	5.2 5.1	5.2	6.2 6.3	6.3		7 6	6.5

Remarks: \*DA: Depth-Averaged

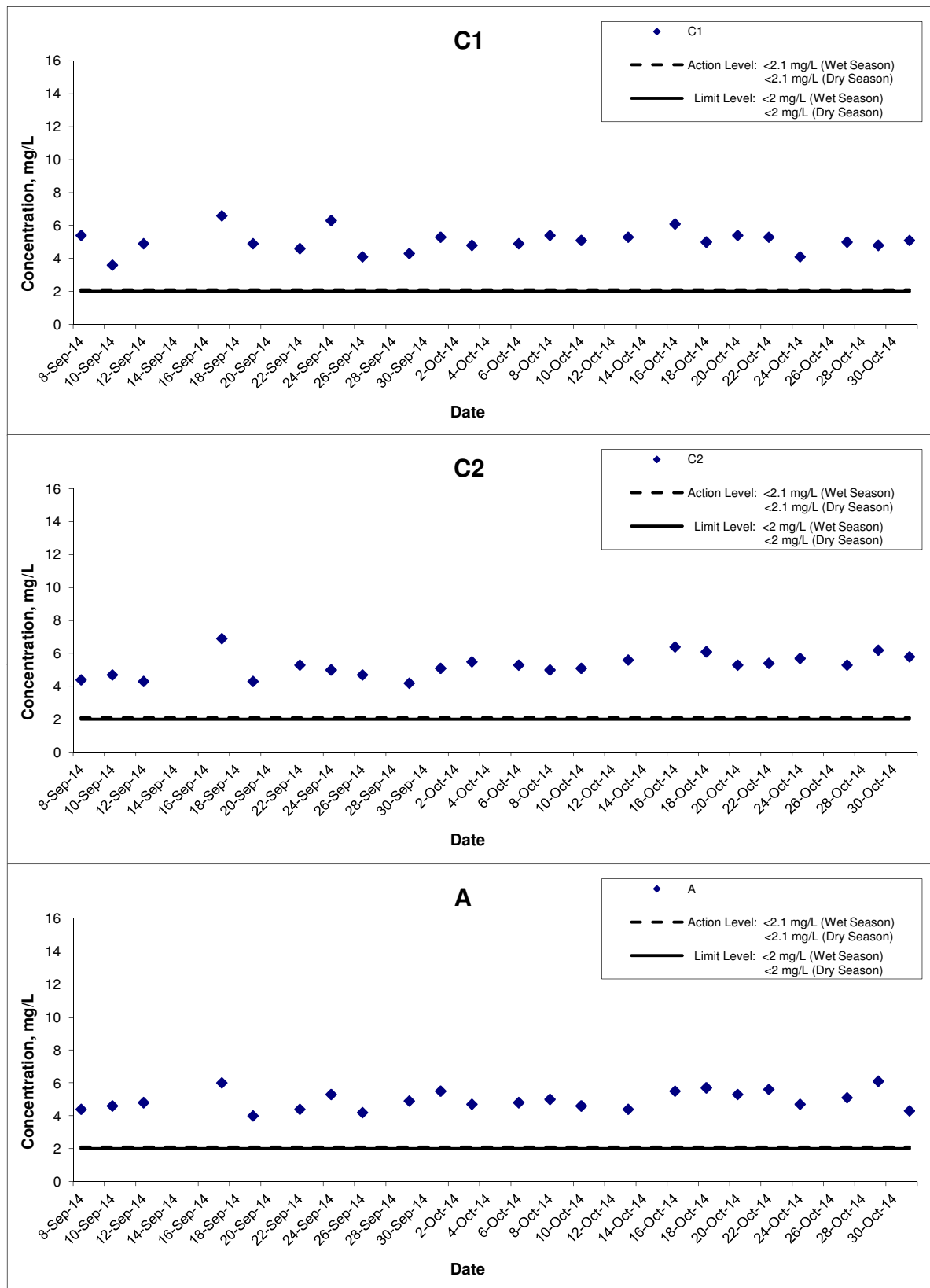
\*\*Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

## Dissolved Oxygen (Surface) at Mid-Ebb Tide



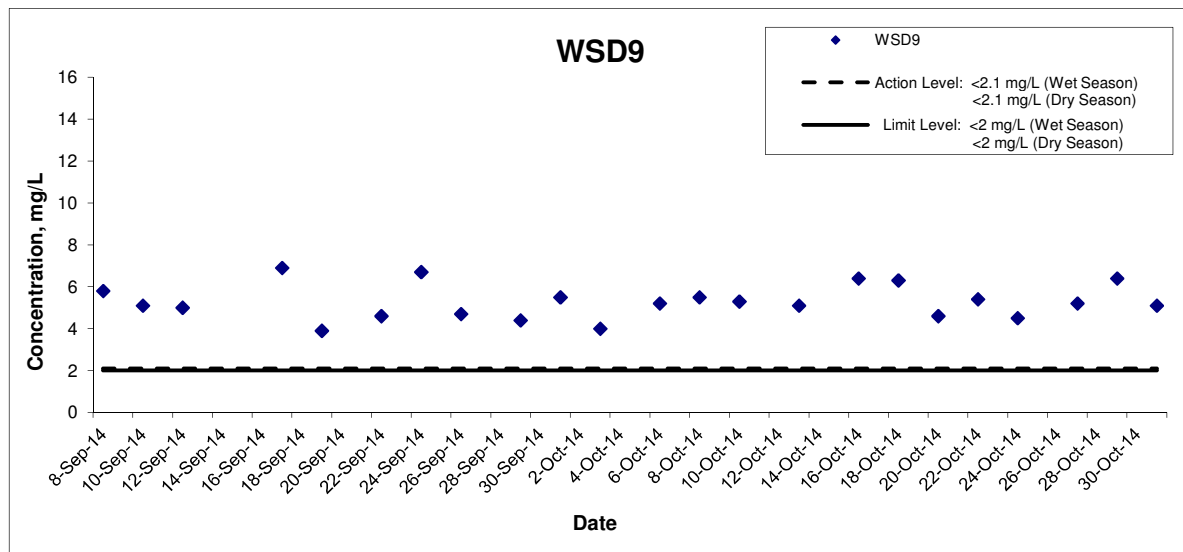
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	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Surface) at Mid-Ebb Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)		Date	Oct 14	Appendix	D	

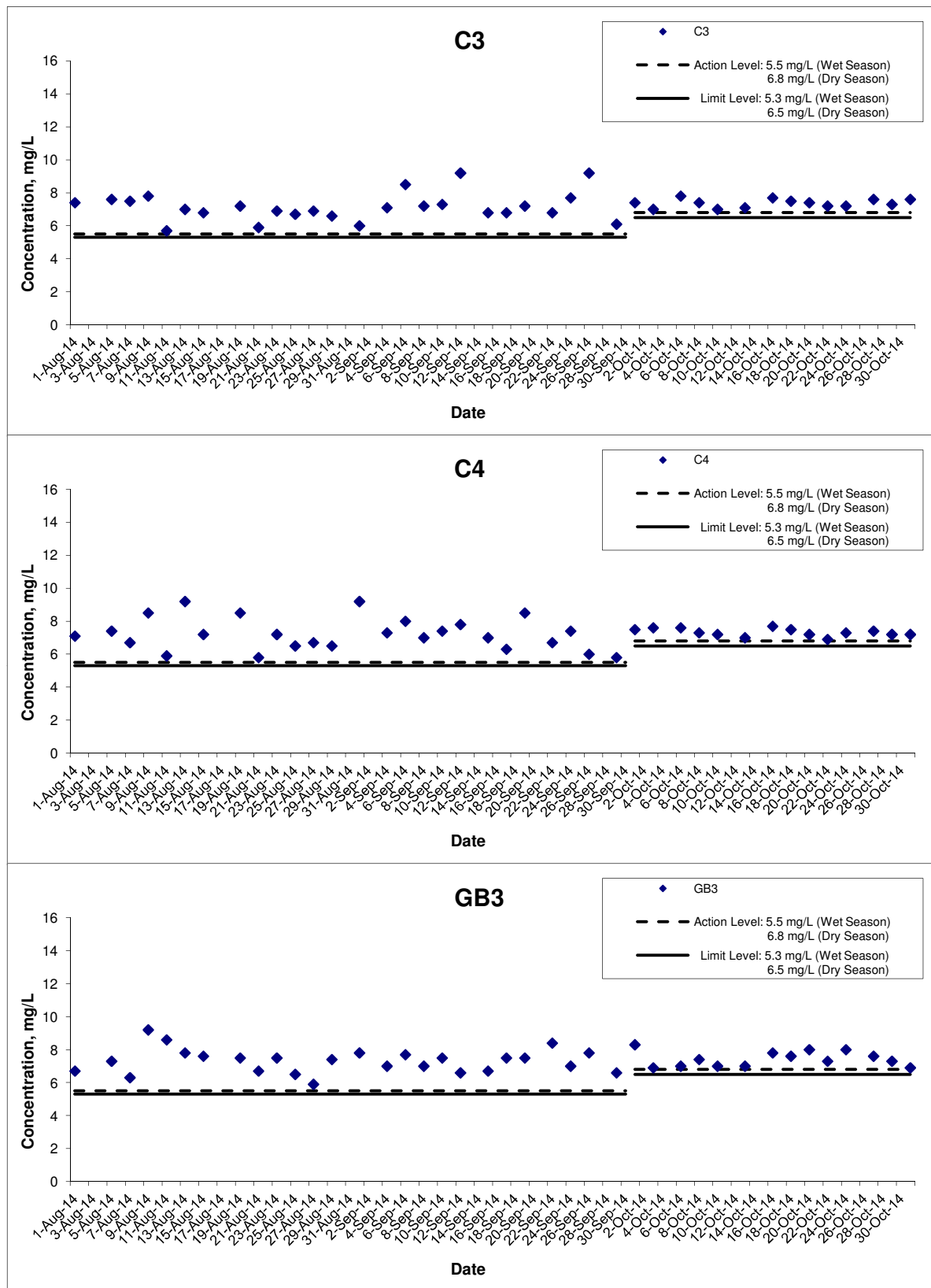
## Dissolved Oxygen (Surface) at Mid-Ebb Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	

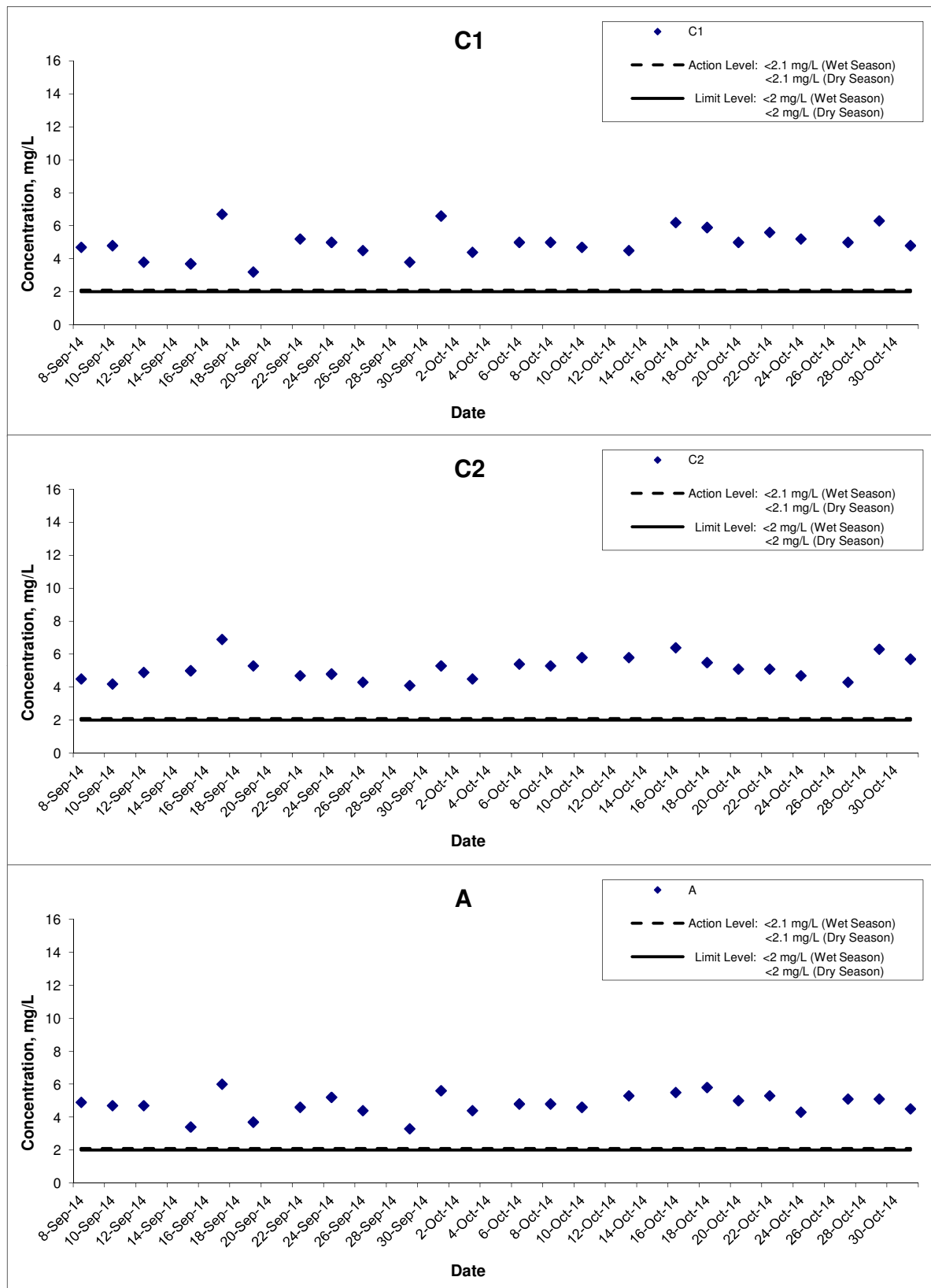


## Dissolved Oxygen (Surface) at Mid-Flood Tide



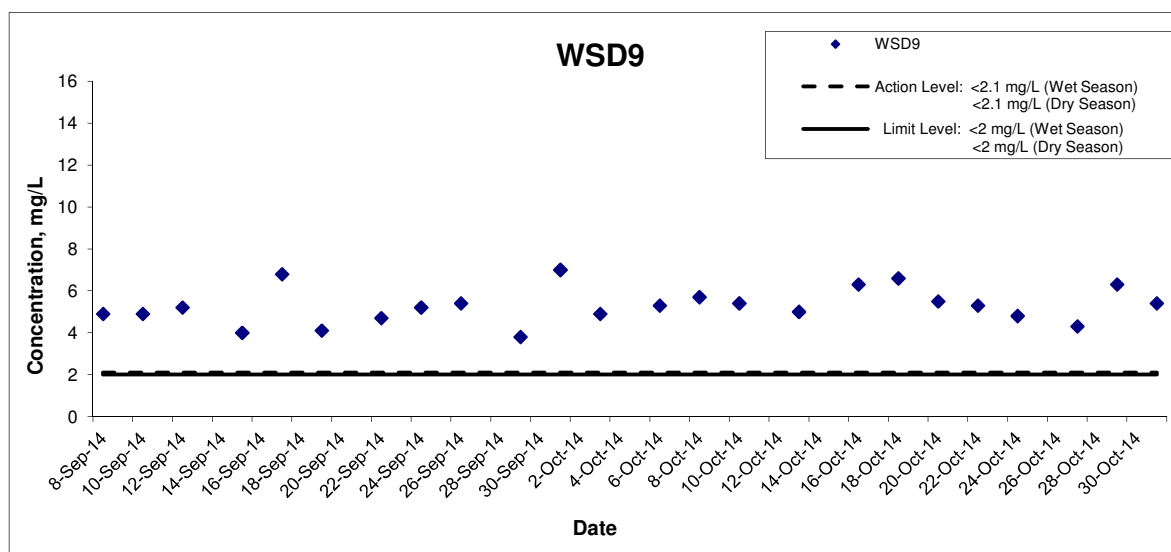
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	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Surface) at Mid-Flood Tide



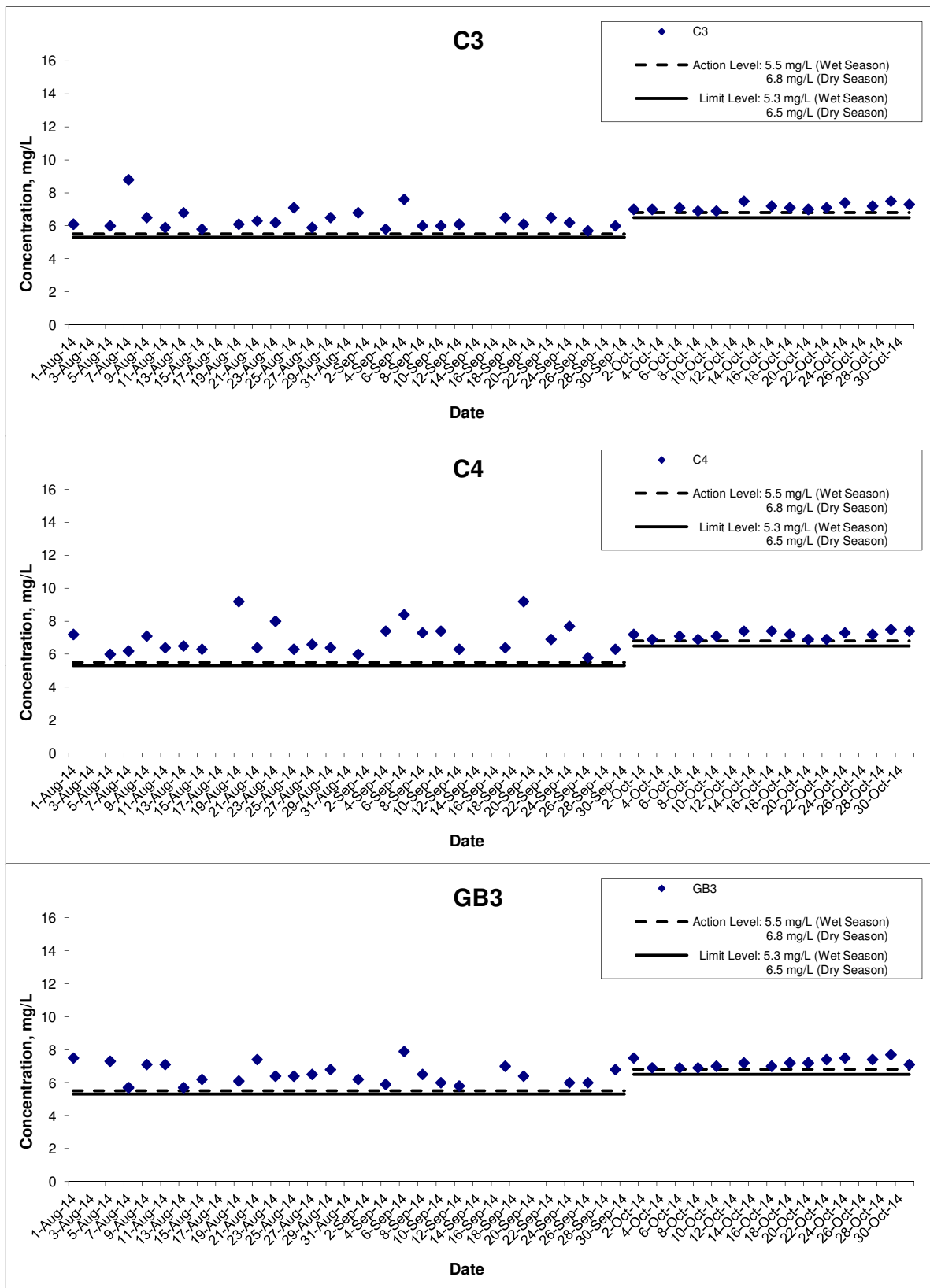
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	Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Surface) at Mid-Flood Tide



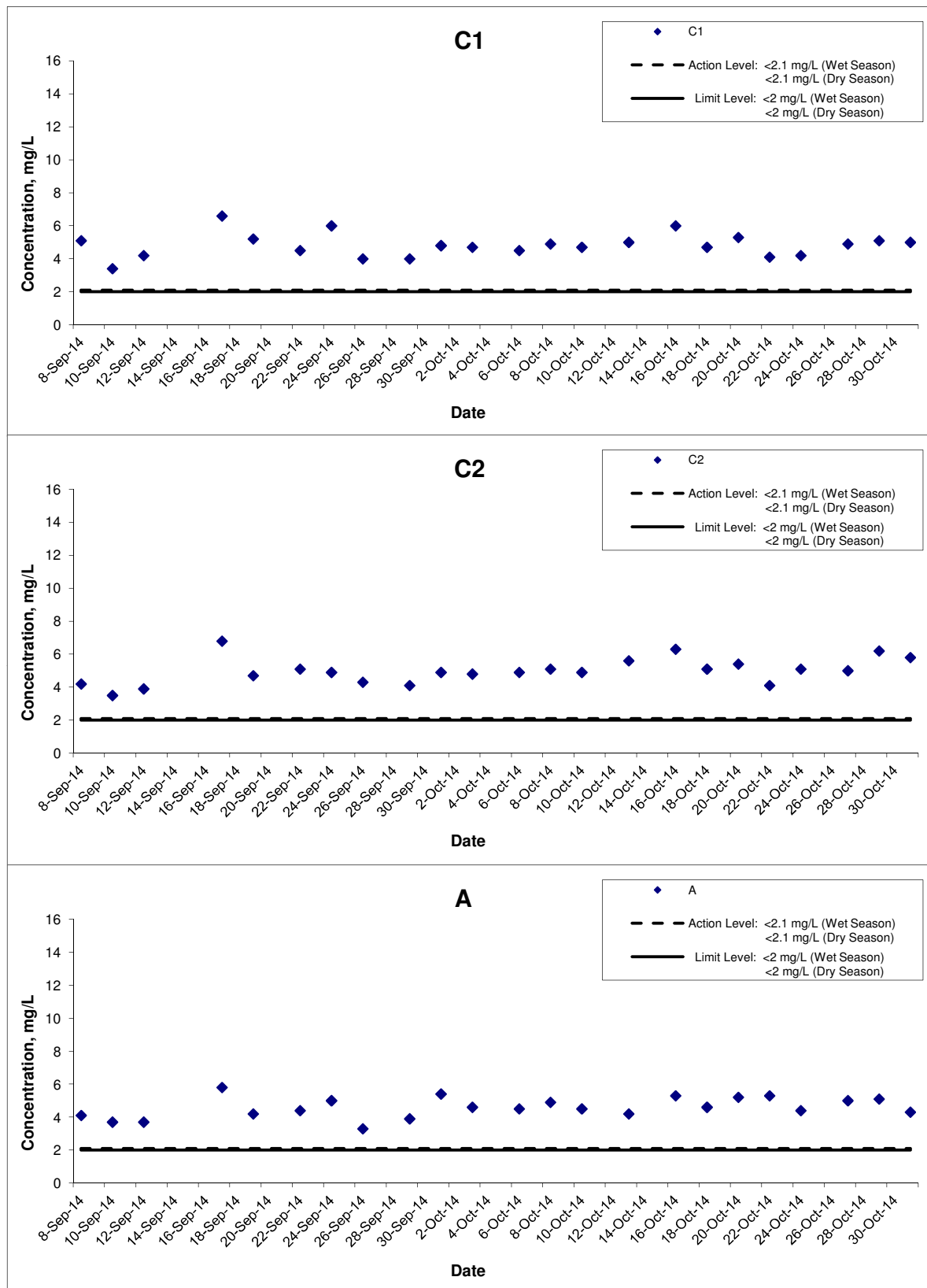
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		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Middle) at Mid-Ebb Tide



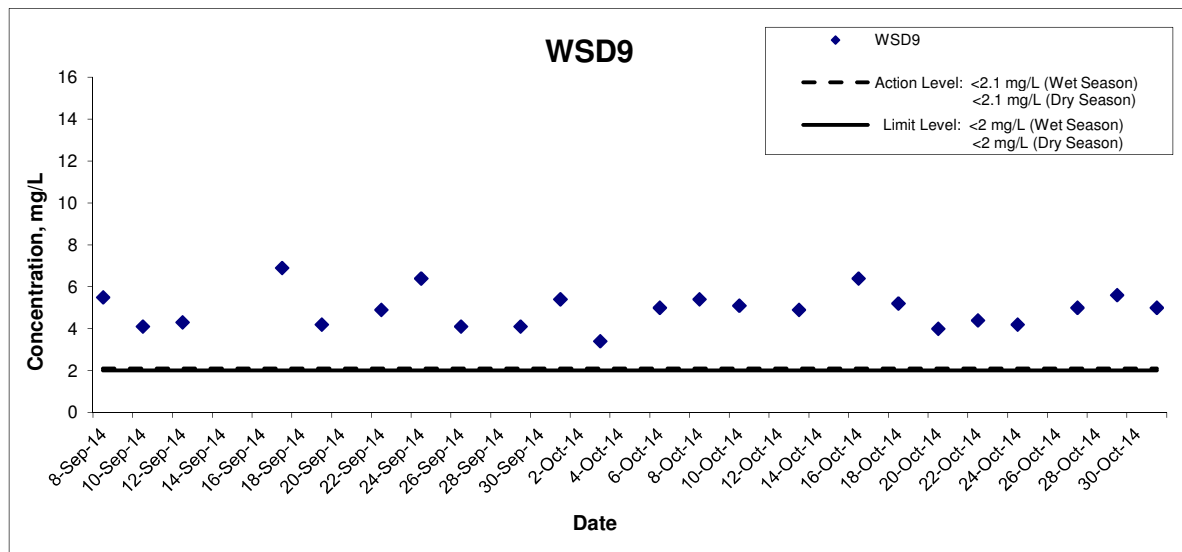
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	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Middle) at Mid-Ebb Tide



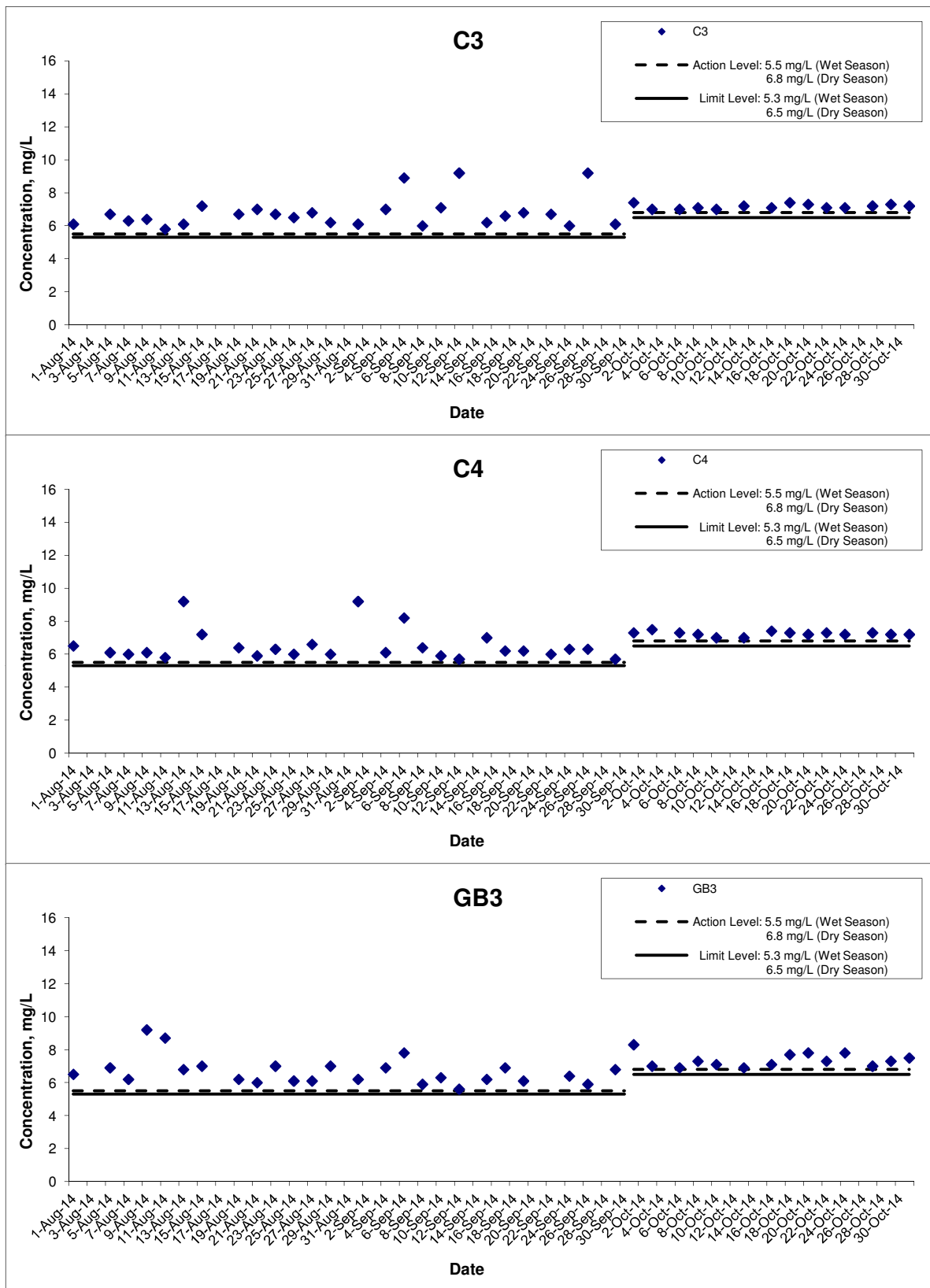
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		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Middle) at Mid-Ebb Tide



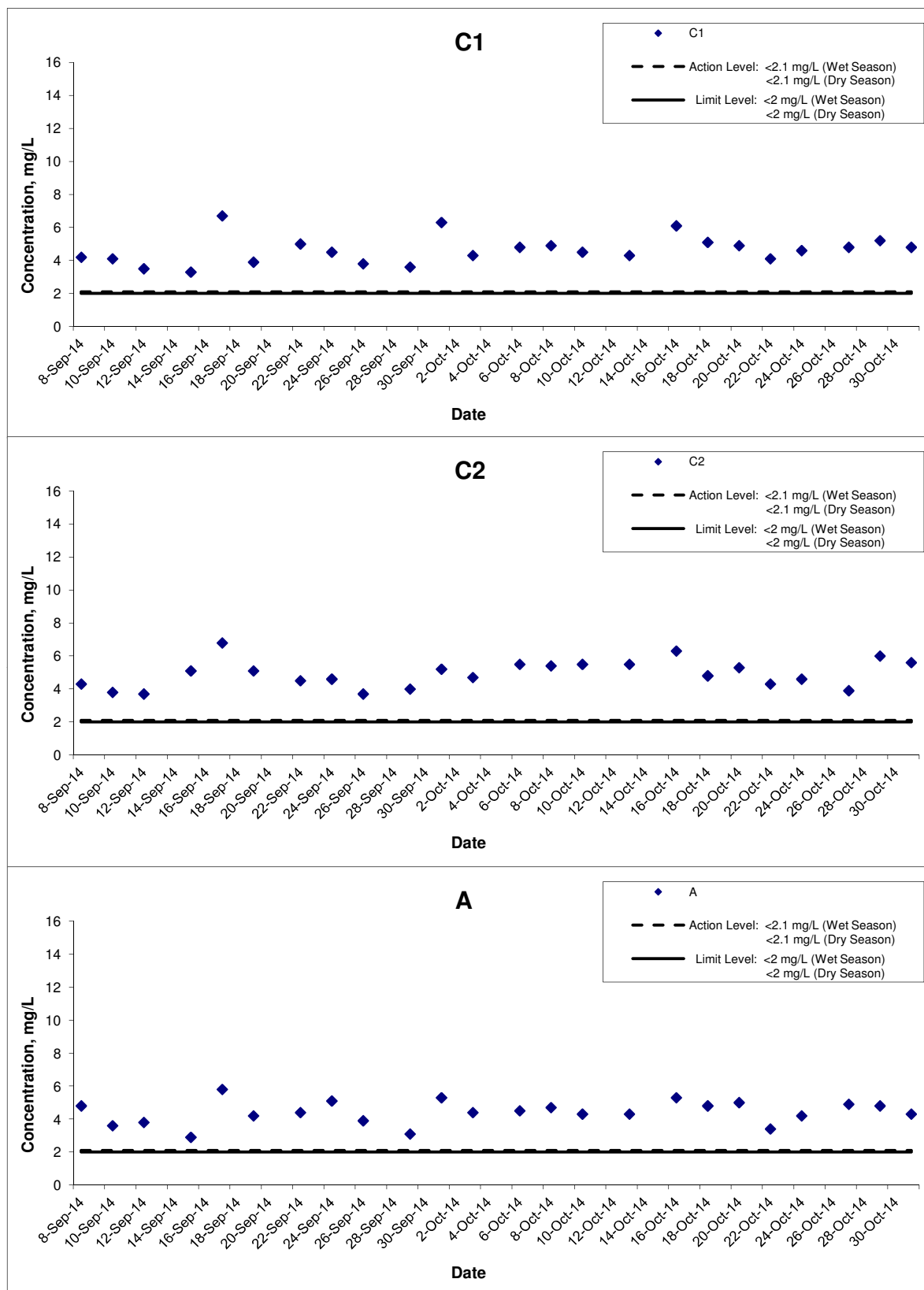
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	

## Dissolved Oxygen (Middle) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 11227	Scale	N.T.S	Project No.	MA14028	CINOTECH
	Advance Works for NSL Cross Harbour Tunnels					
	Graphical Presentation of Water Quality Monitoring Results (Shek O)	Date	Oct 14	Appendix	D	

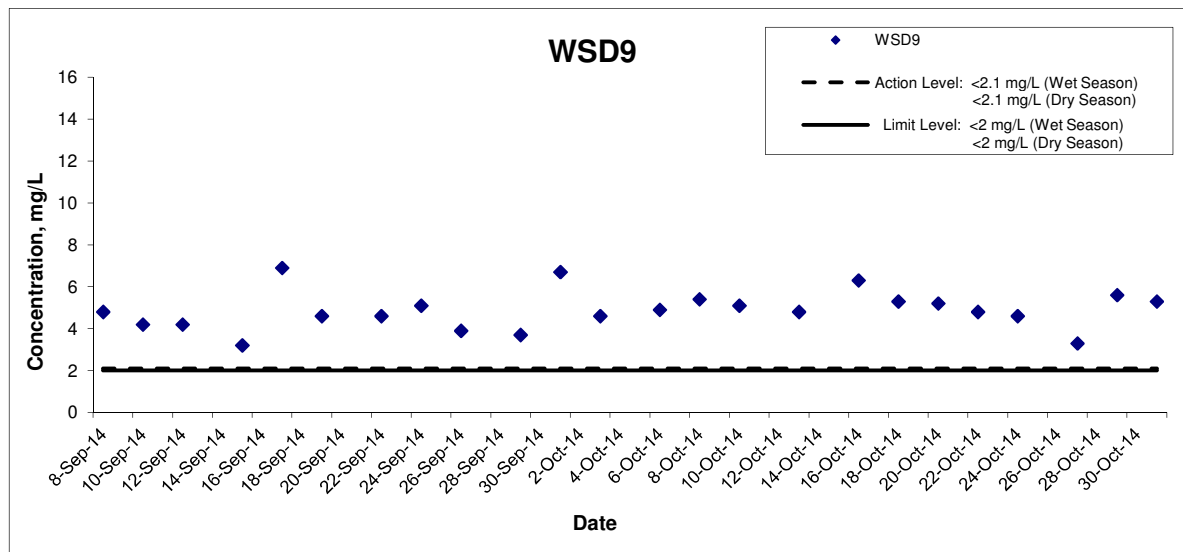
## Dissolved Oxygen (Middle) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	

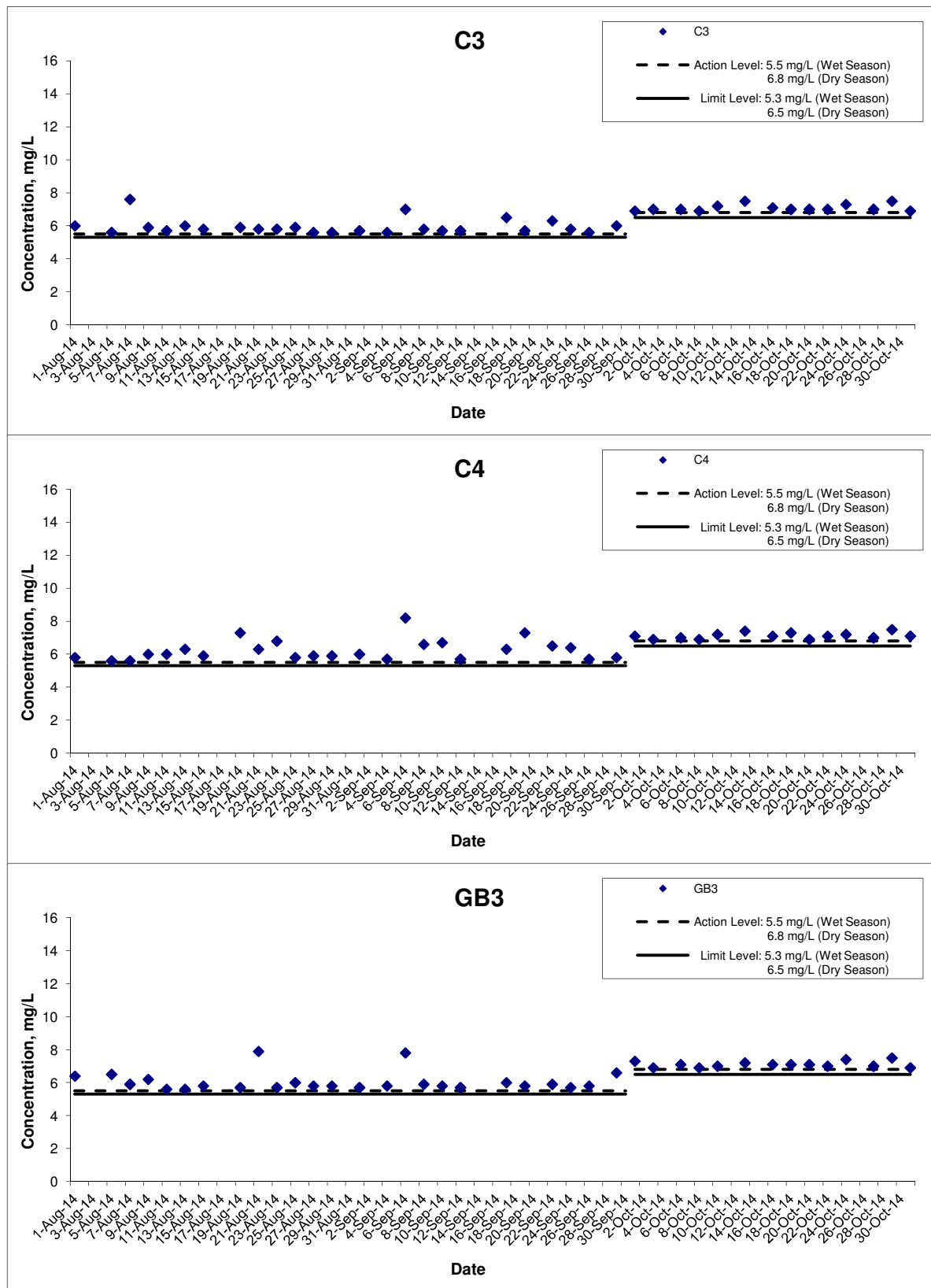


## Dissolved Oxygen (Middle) at Mid-Flood Tide



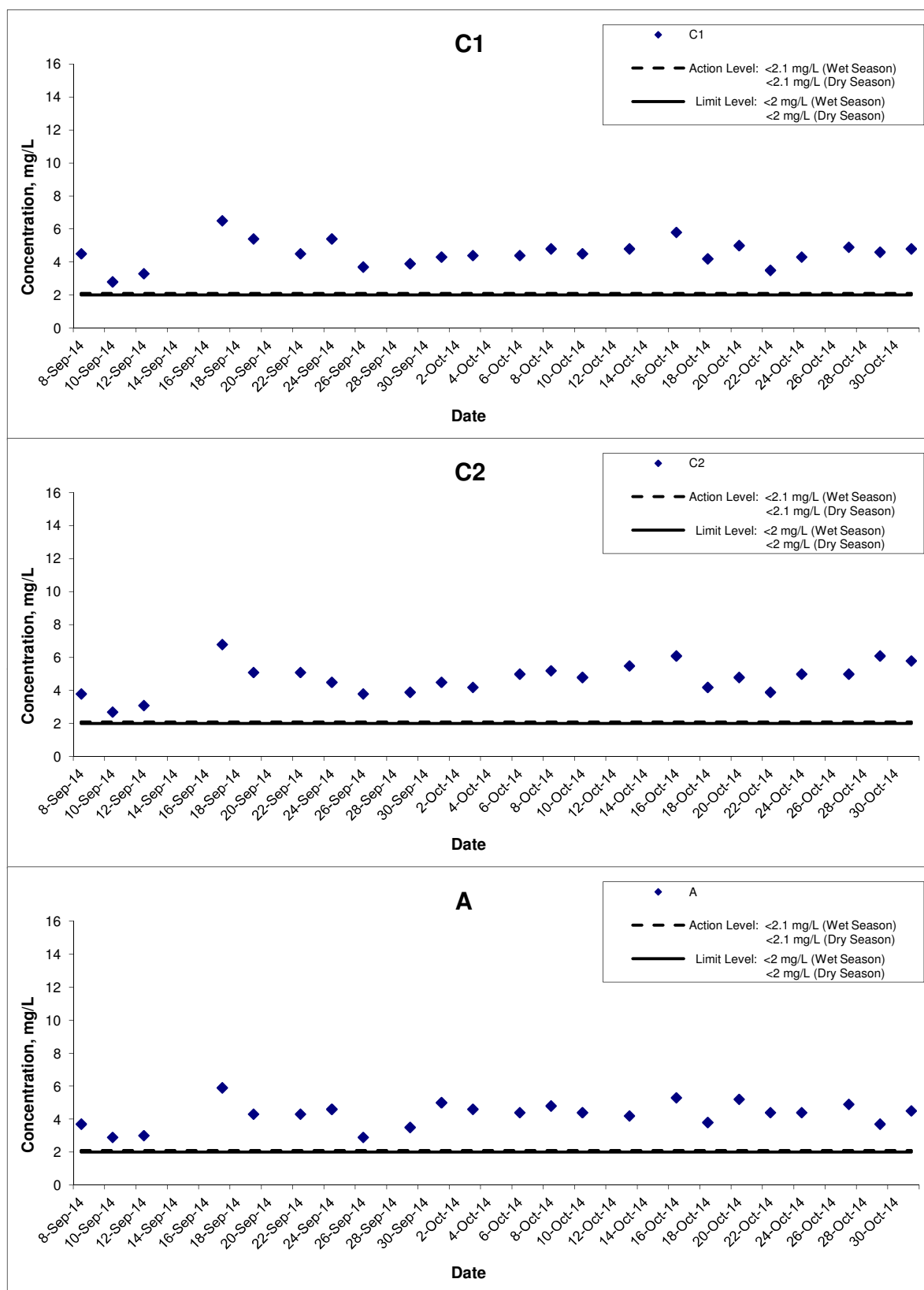
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	


## Dissolved Oxygen (Bottom) at Mid-Ebb Tide



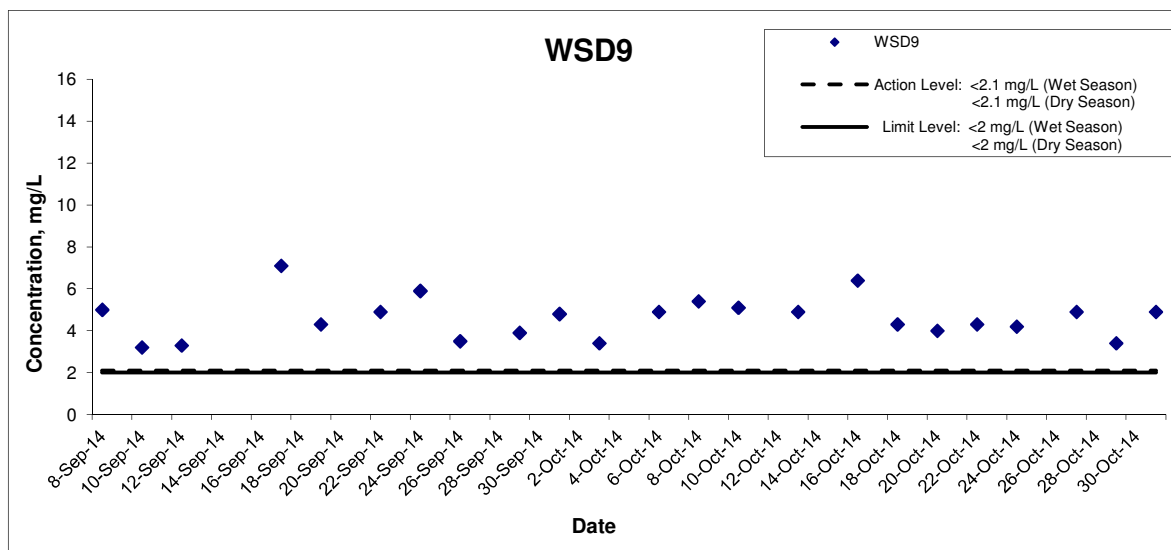
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

### Dissolved Oxygen (Bottom) at Mid-Ebb Tide



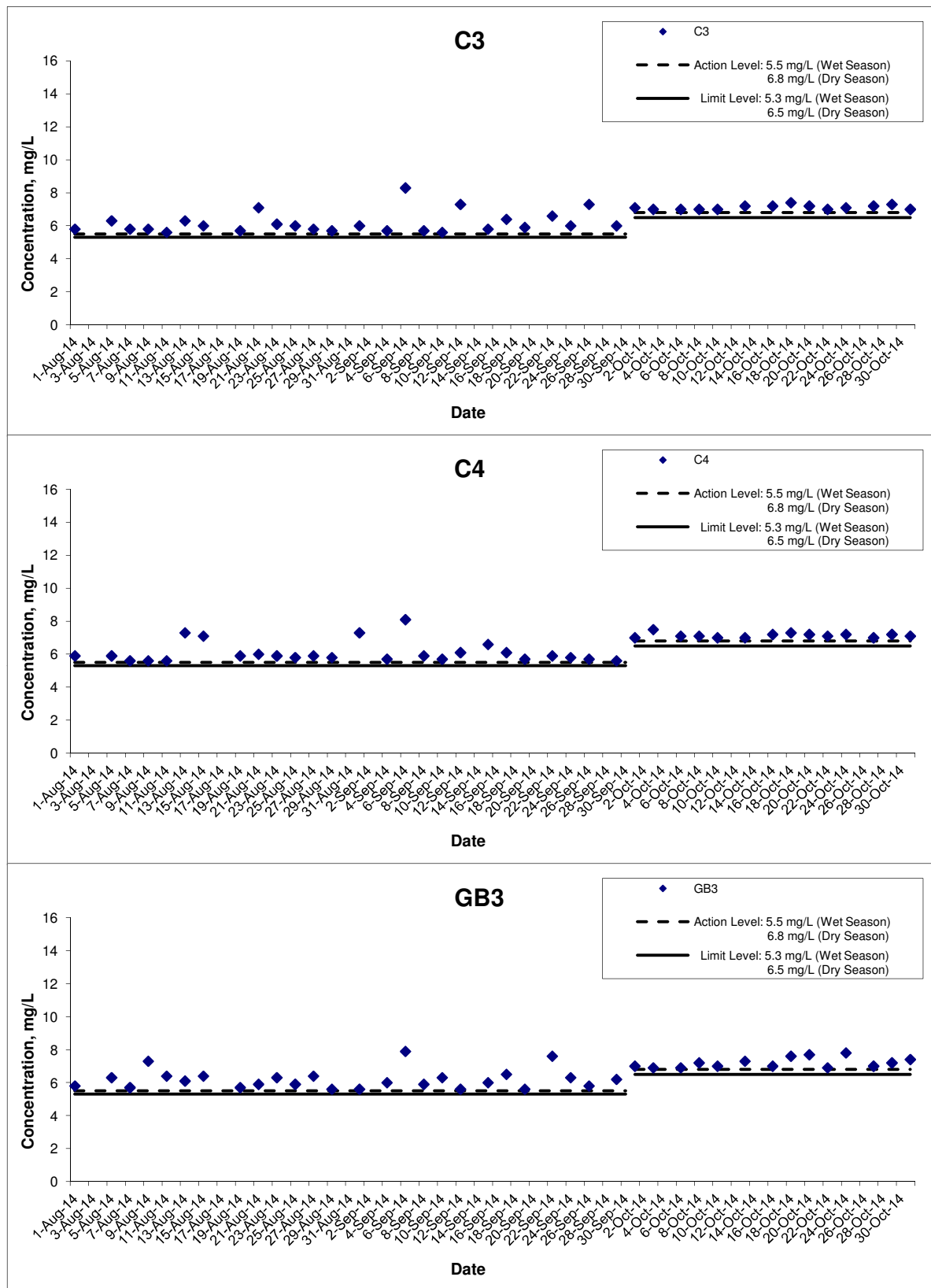
Title Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale N.T.S	Project No. MA14028	
	Date Oct 14	Appendix D	

## Dissolved Oxygen (Bottom) at Mid-Ebb Tide



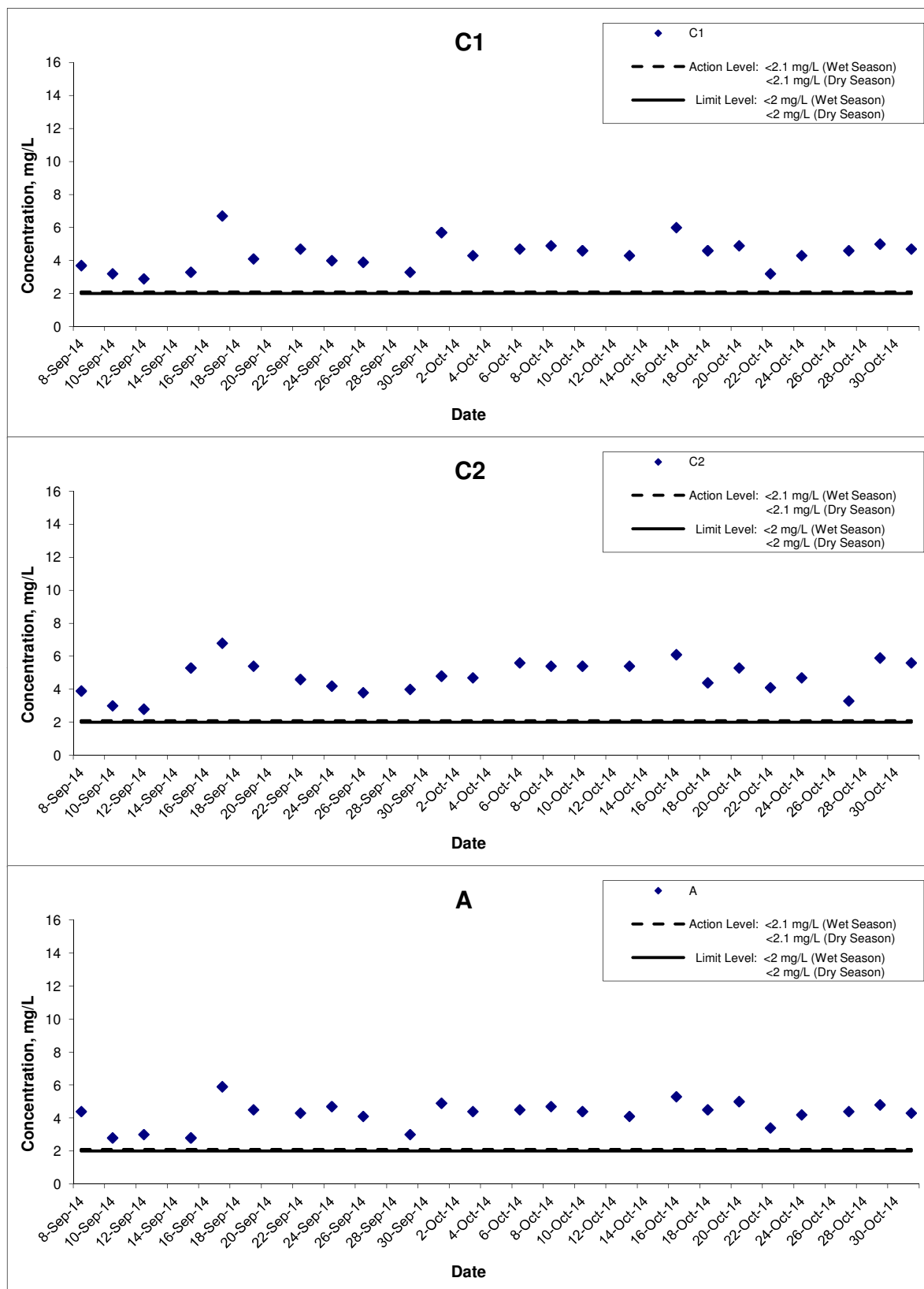
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	


## Dissolved Oxygen (Bottom) at Mid-Flood Tide



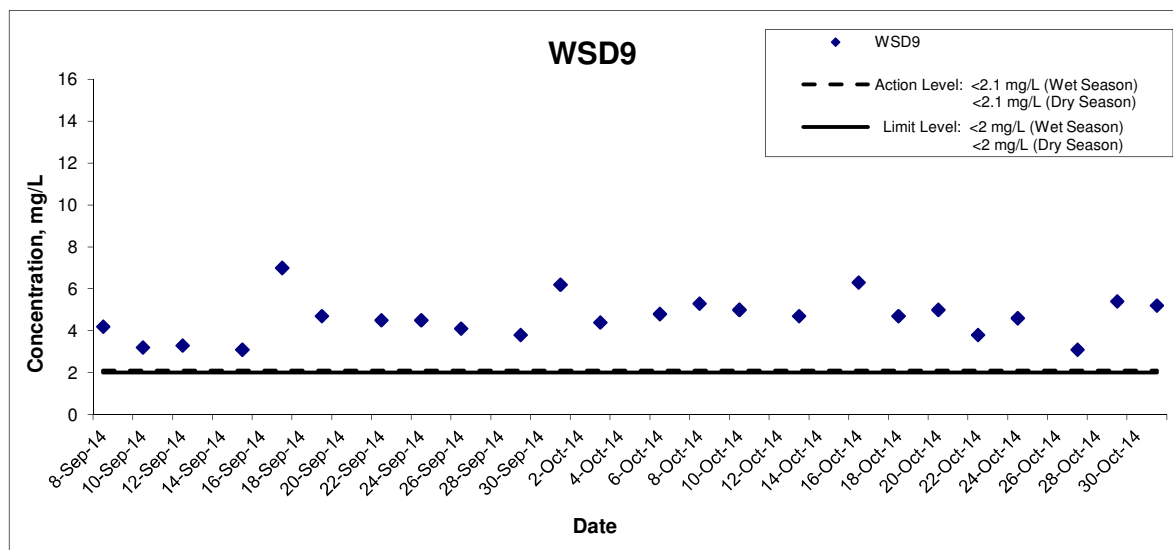
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

### Dissolved Oxygen (Bottom) at Mid-Flood Tide



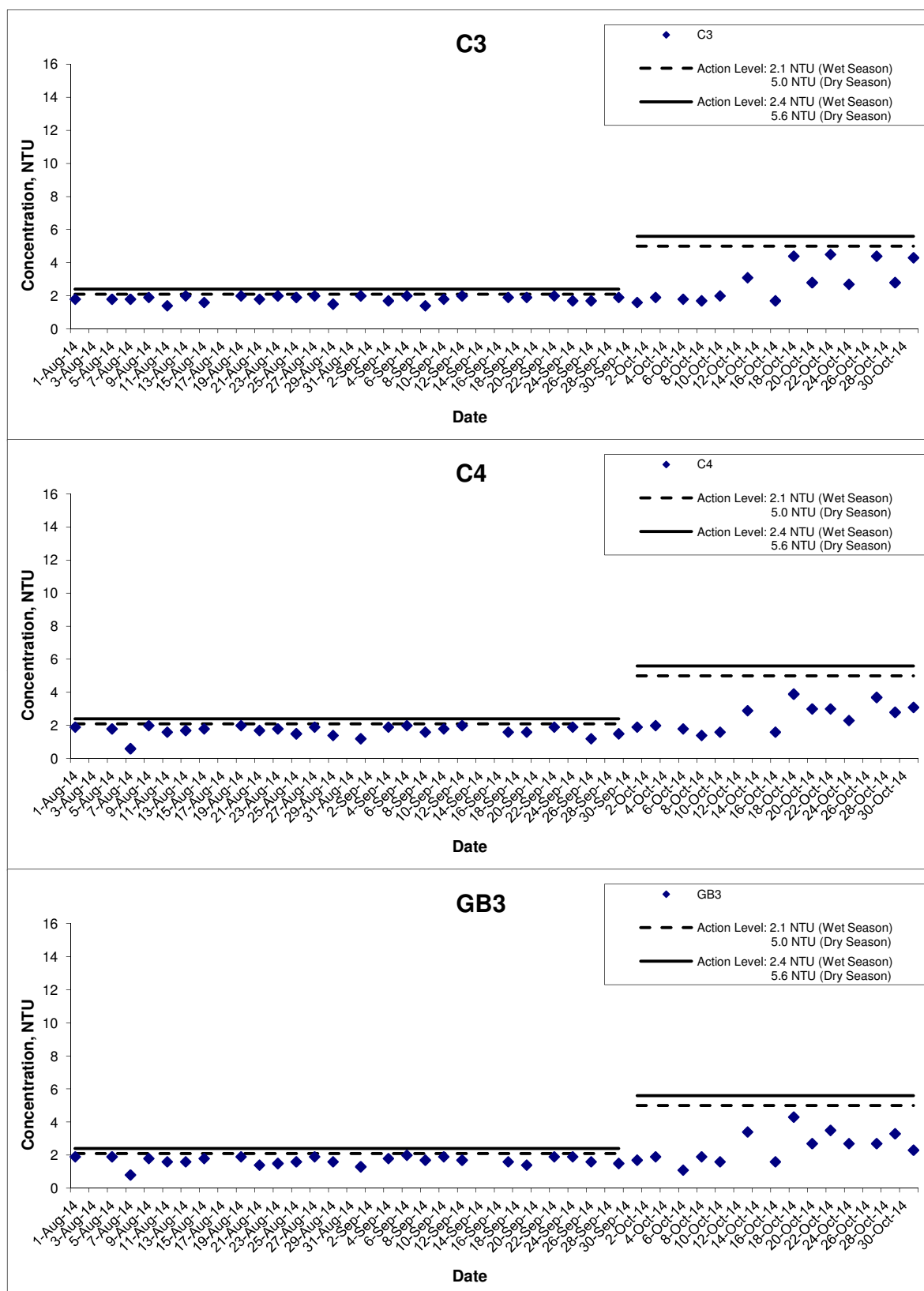
Title Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale N.T.S	Project No. MA14028	
	Date Oct 14	Appendix D	


## Dissolved Oxygen (Bottom) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	

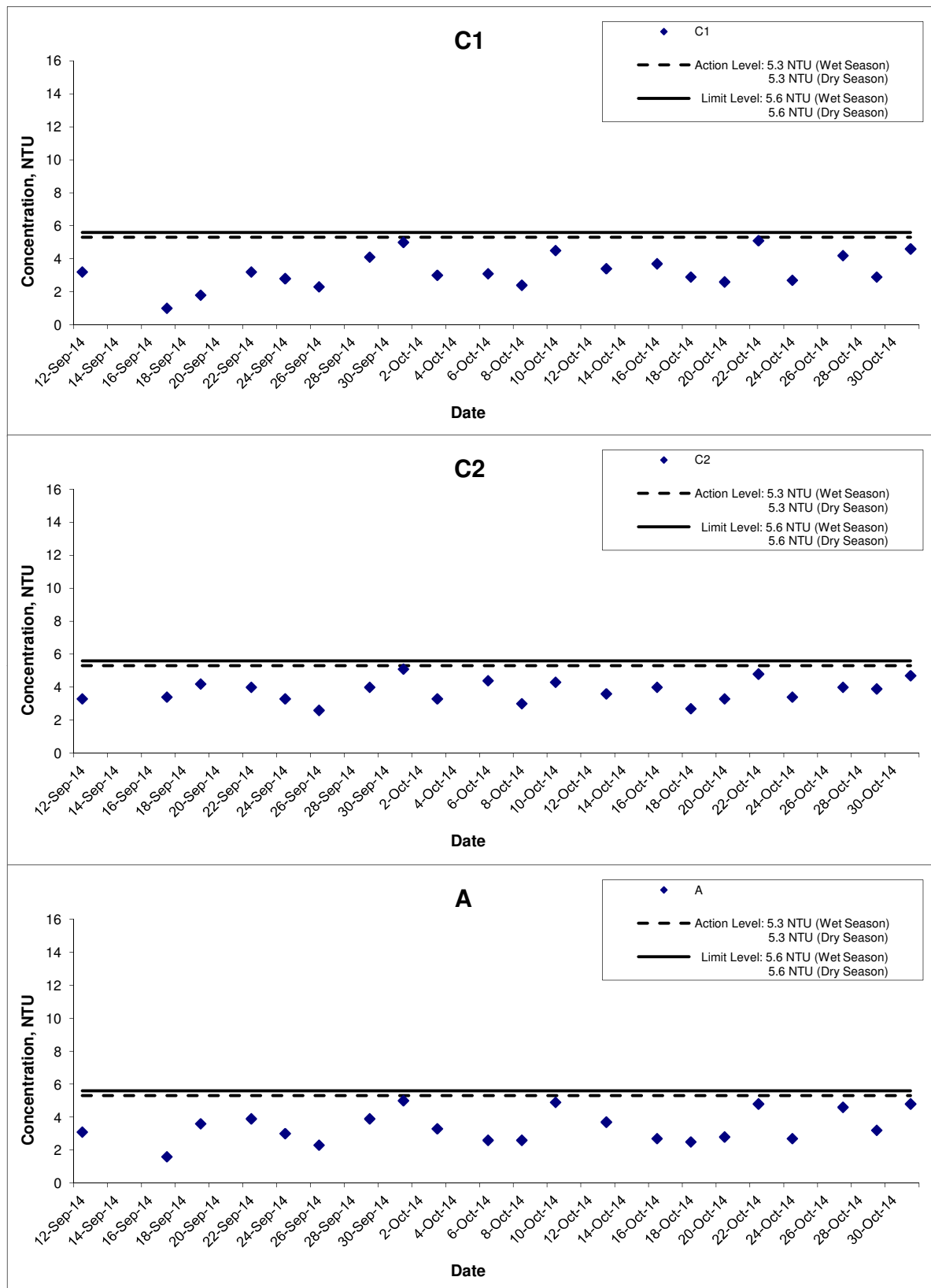
### Turbidity (Depth-averaged) at Mid-Ebb Tide



Title Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Shek O)	Scale N.T.S	Project No. MA14028	
	Date Oct 14	Appendix D	

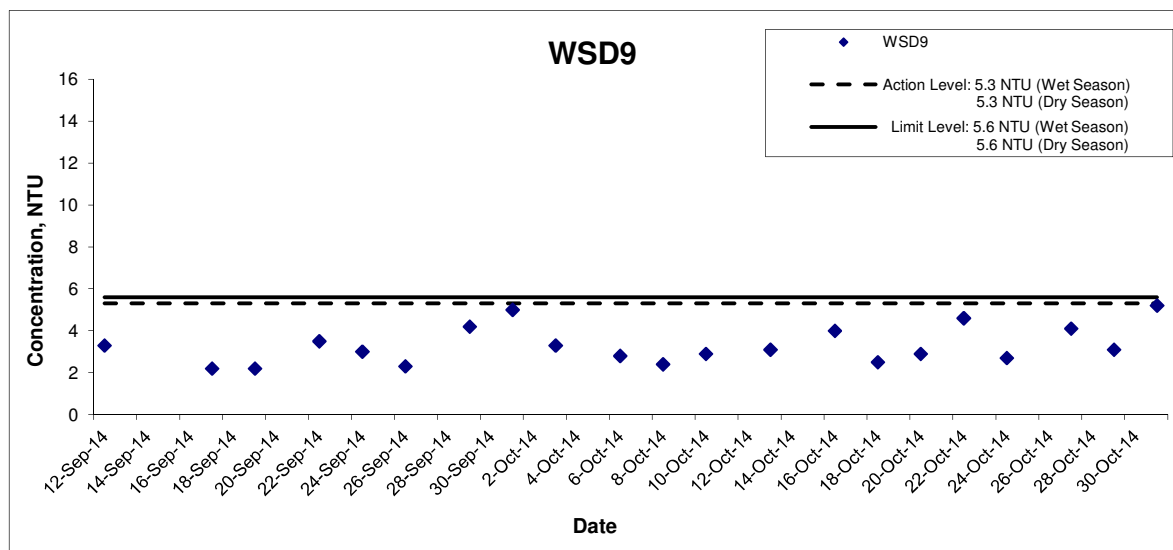


## Turbidity (Depth-averaged) at Mid-Ebb Tide



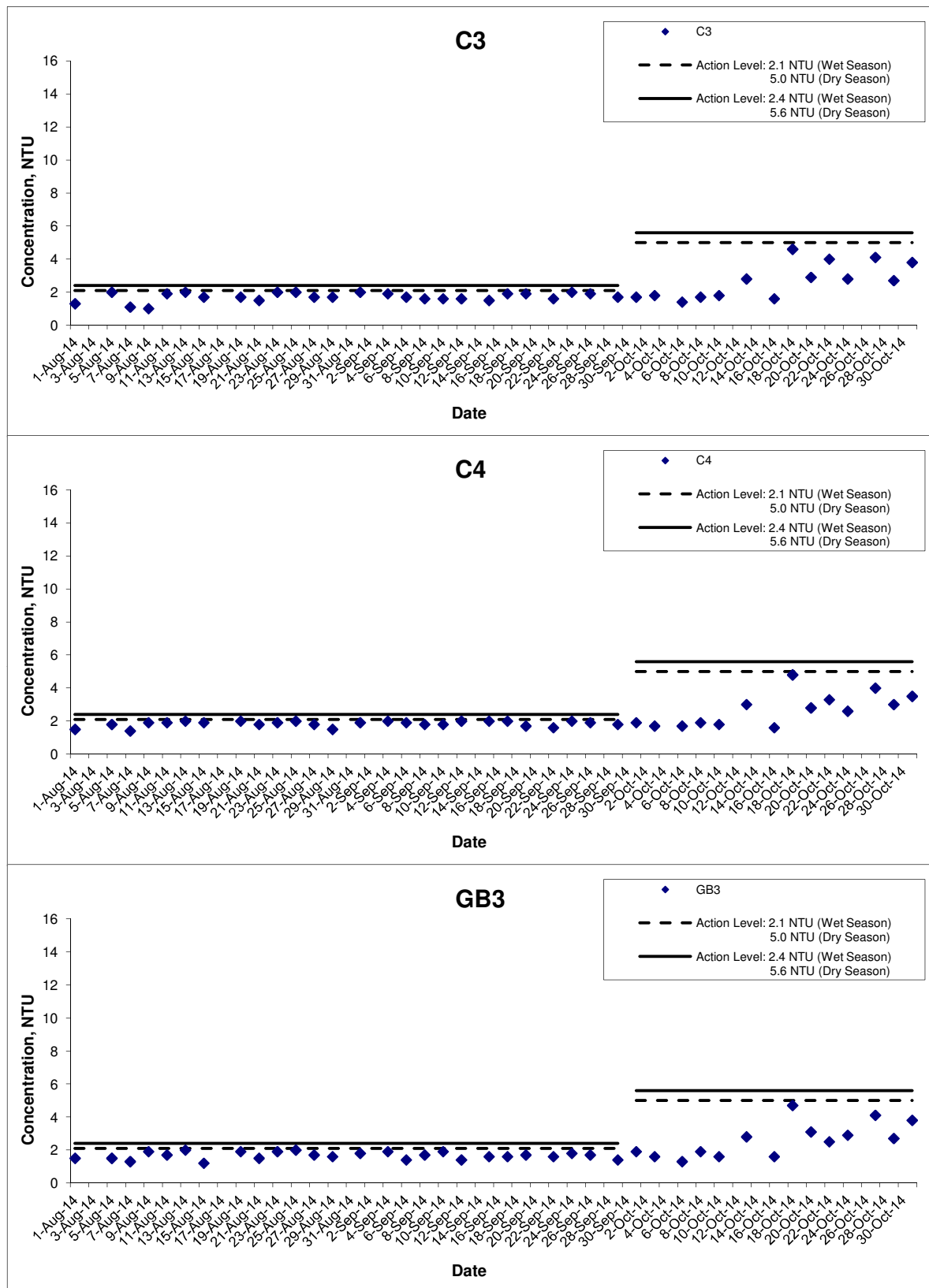
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)		Date	Oct 14	Appendix	D	


## Turbidity (Depth-averaged) at Mid-Ebb Tide



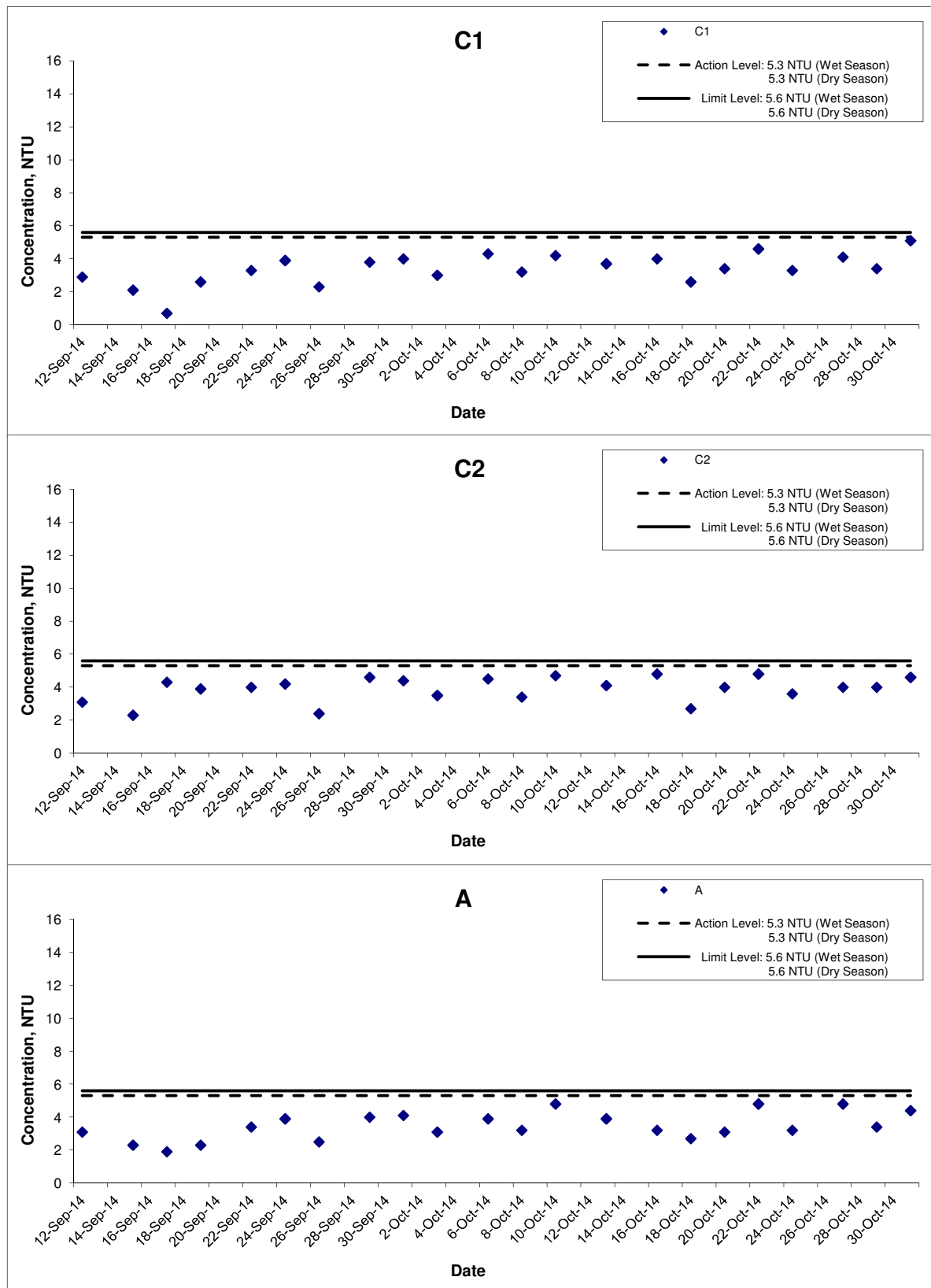
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	

### Turbidity (Depth-averaged) at Mid-Flood Tide



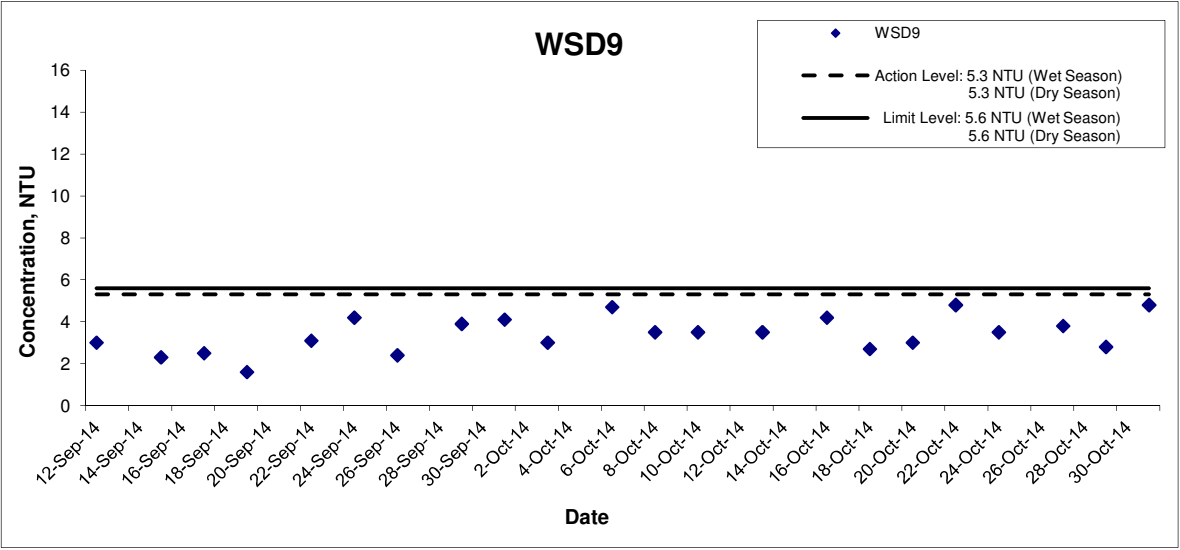
Title Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Shek O)	Scale N.T.S	Project No. MA14028	
	Date Oct 14	Appendix D	

## Turbidity (Depth-averaged) at Mid-Flood Tide



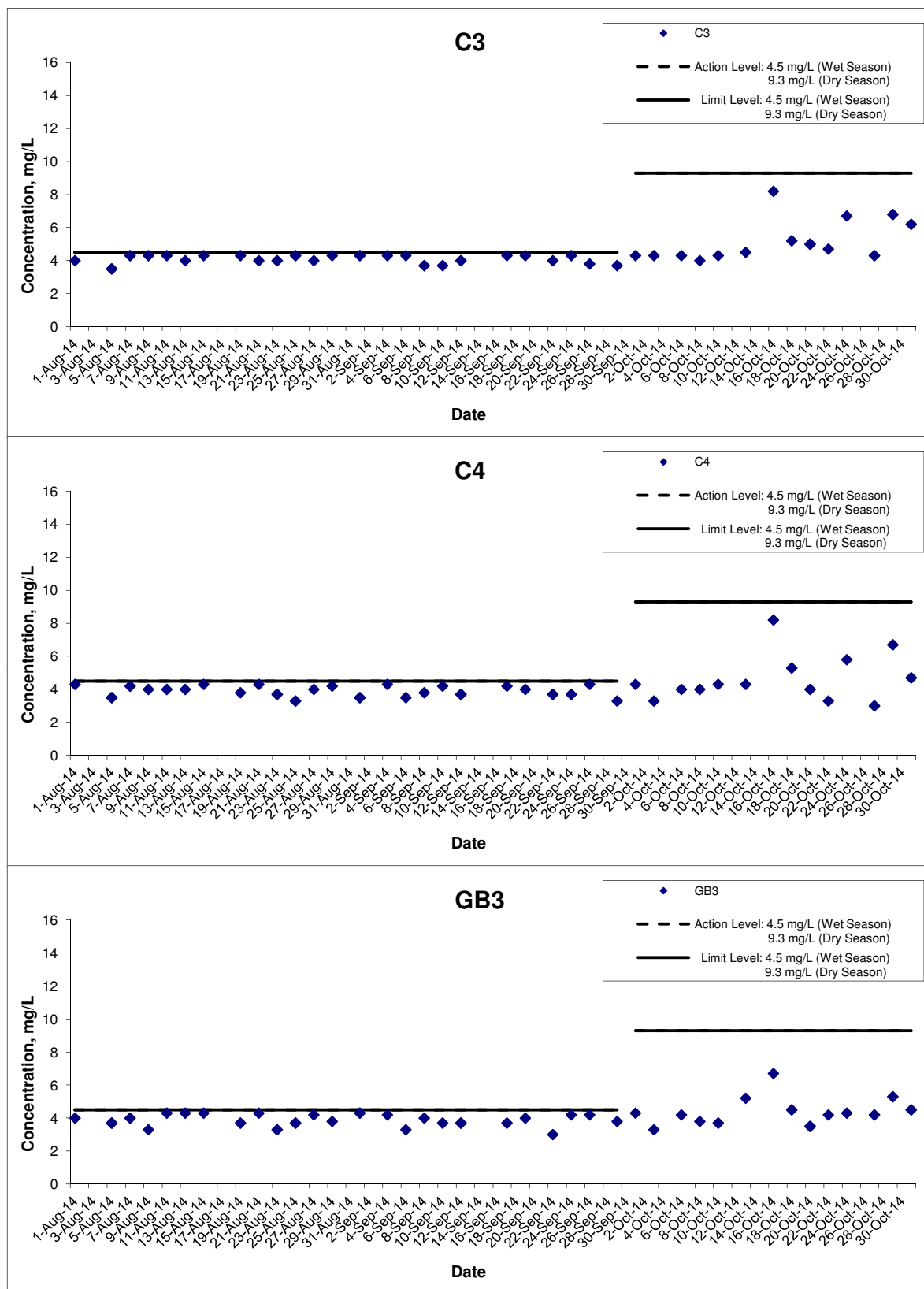
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)		Date	Oct 14	Appendix	D	

Turbidity (Depth-averaged) at Mid-Flood Tide



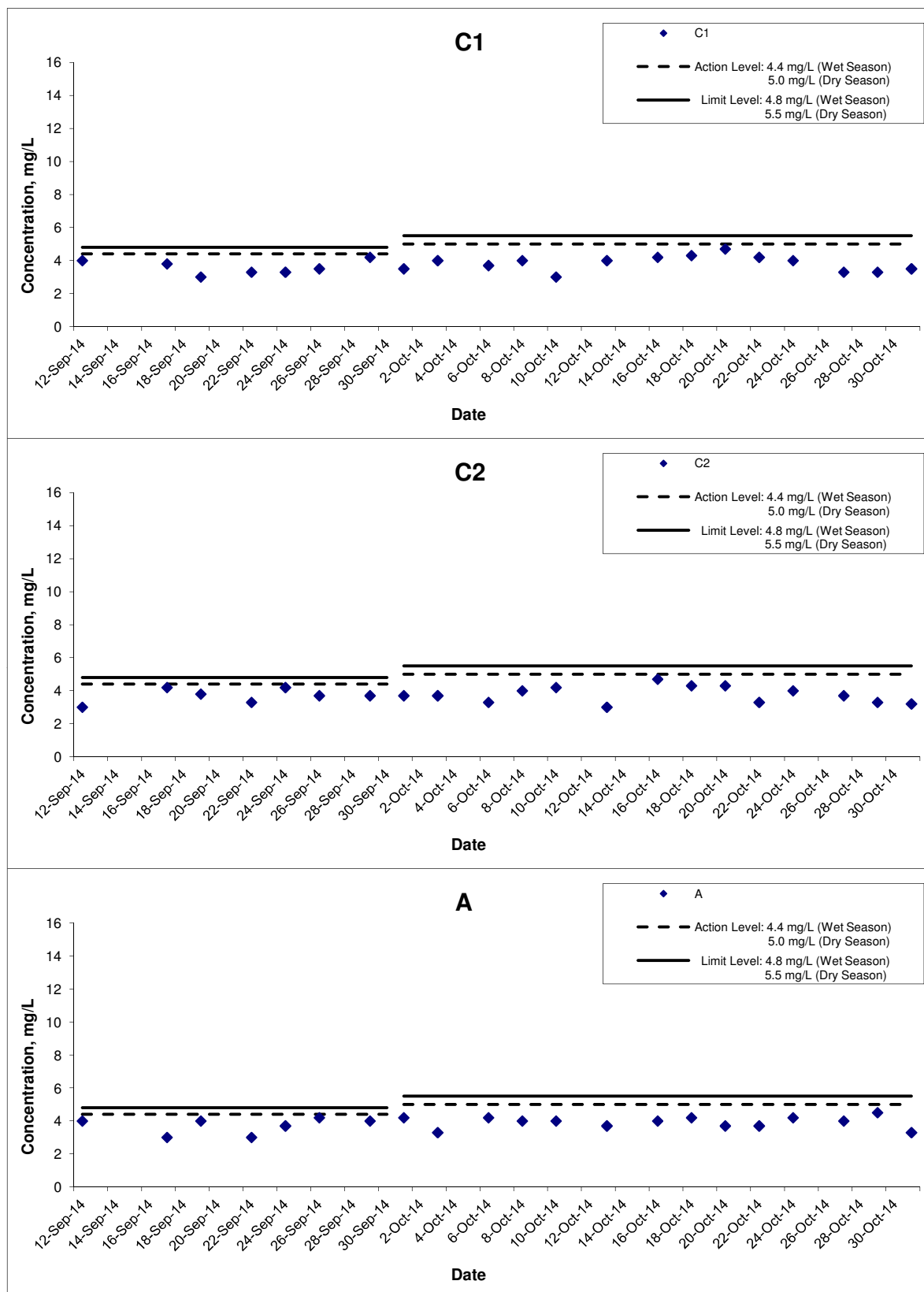
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No. MA14028	CINOTECH
		Date	Oct 14	Appendix D	

## Suspended Solids (Depth-averaged) at Mid-Ebb Tide



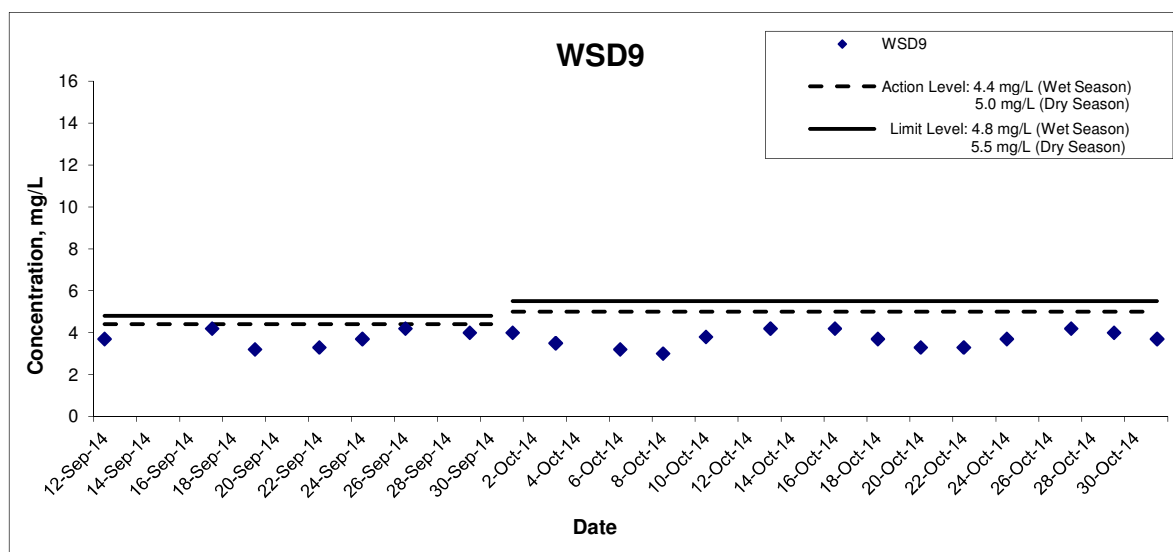
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

## Suspended Solids (Depth-averaged) at Mid-Ebb Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)		Date	Oct 14	Appendix	D	

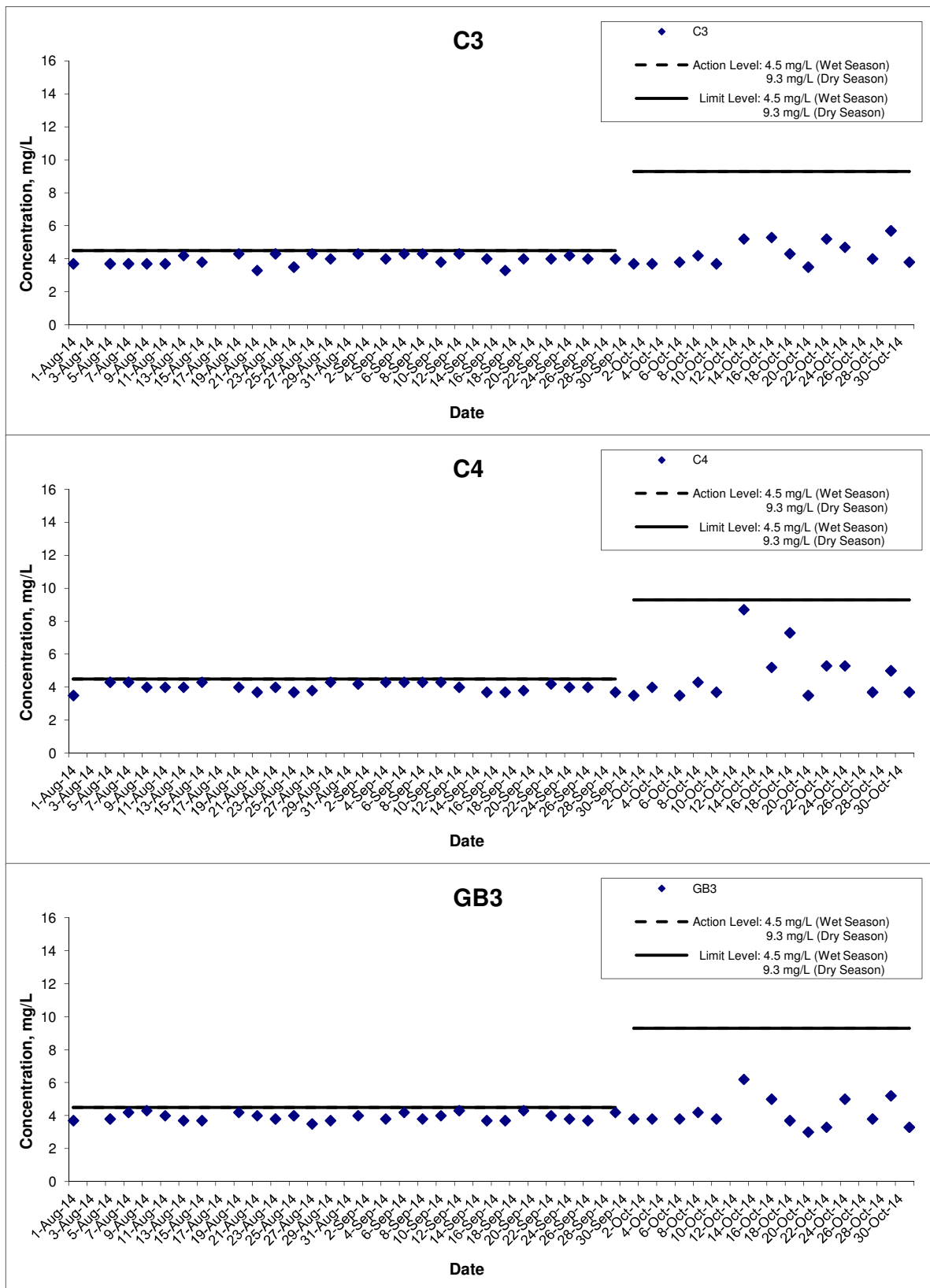
## Suspended Solids (Depth-averaged) at Mid-Ebb Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No. MA14028	CINOTECH
		Date	Oct 14	Appendix D	

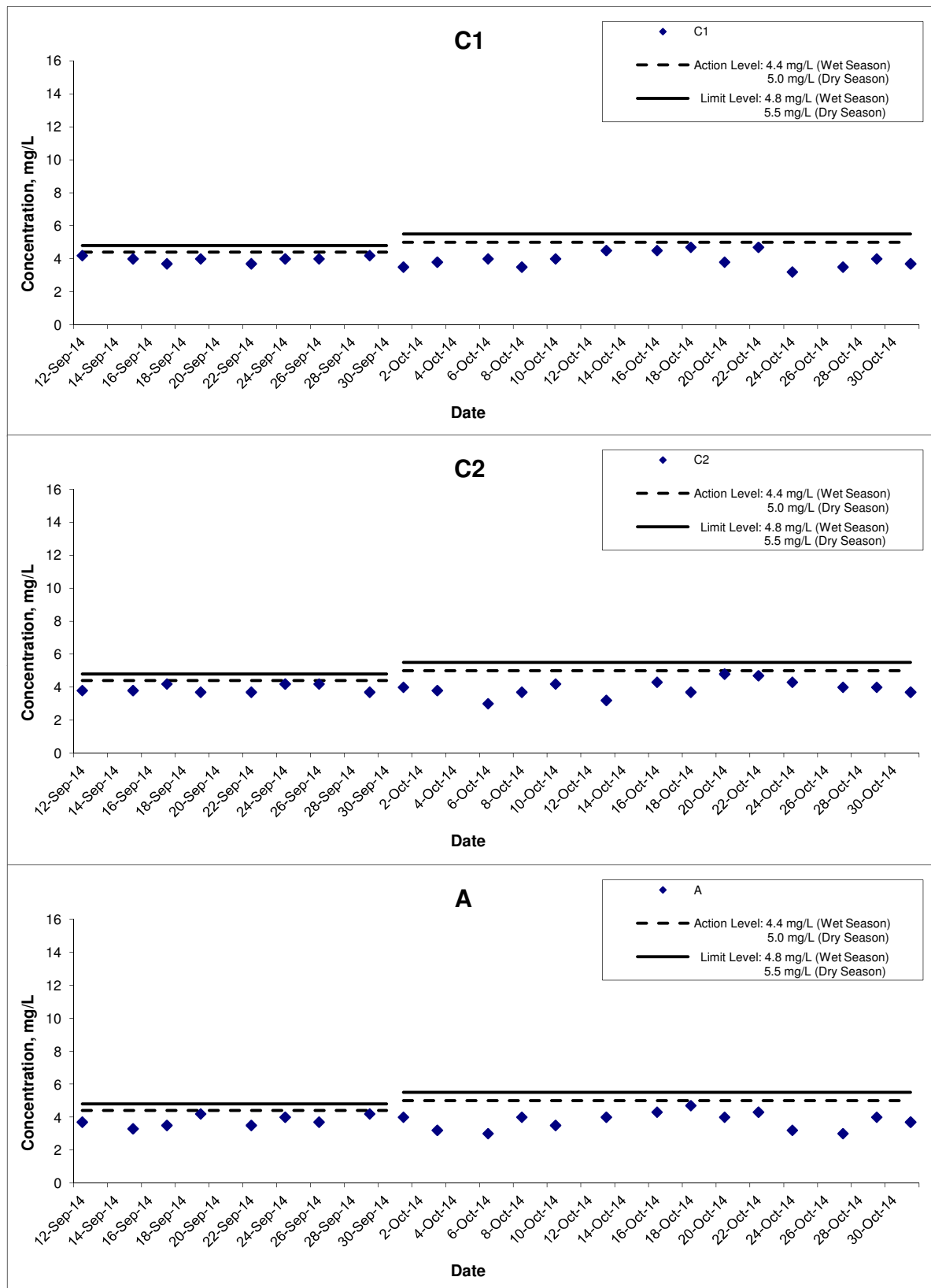


## Suspended Solids (Depth-averaged) at Mid-Flood Tide



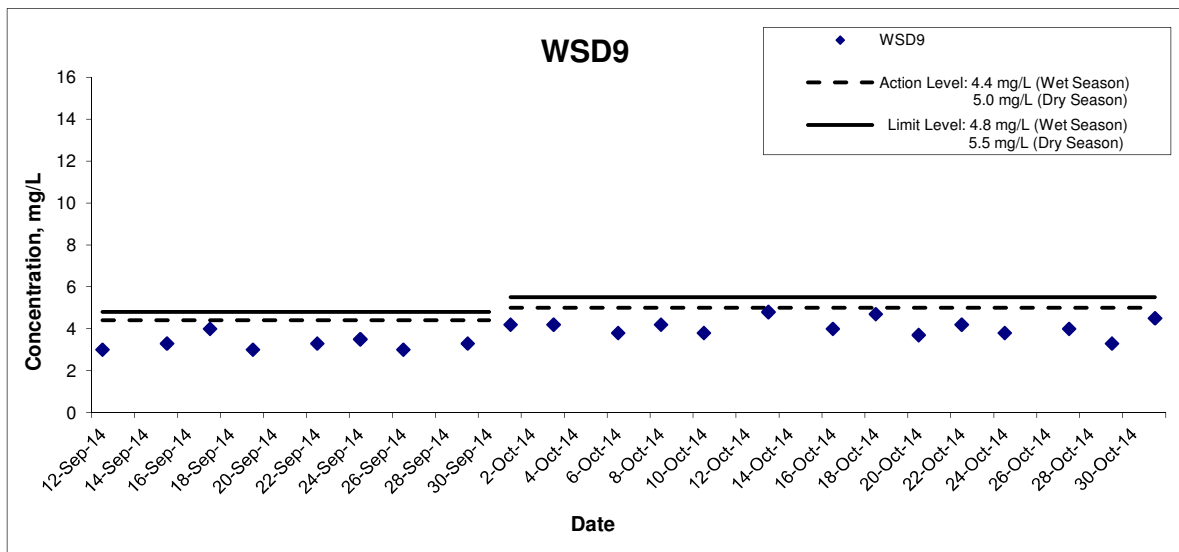
Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Shek O)		Date	Oct 14	Appendix	D	

## Suspended Solids (Depth-averaged) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels		Scale	N.T.S	Project No.	MA14028	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)		Date	Oct 14	Appendix	D	

## Suspended Solids (Depth-averaged) at Mid-Flood Tide



Title	Shatin to Central Link – Contract 11227 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results (Victoria Harbour)	Scale	N.T.S	Project No.	MA14028	CINOTECH
		Date	Oct 14	Appendix	D	

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**APPENDIX E**  
**COPIES OF CALIBRATION CERTIFICATES**

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## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/W/140802-2
Date of Issue:	2014-08-02
Date Received:	2014-08-02
Date Tested:	2014-08-02
Date Completed:	2014-08-02
Next Due Date:	2014-11-01

**ATTN:** Mr. W.K. Tang

Page: 1 of 2

### Certificate of Calibration

**Item for calibration:**

Description	: Sonde Environmental Monitoring System
Manufacturer	: YSI
Model No.	: 6920-M
Serial No.	: 03H1764AA
Equipment No.	: W.03.03

**Test conditions:**

Room Temperature	: 21 degree Celsius
Relative Humidity	: 64%

**Test Specifications:**

Conductivity & Salinity Sensor, Model: 6560, L/N: 03H1461

1. Conductivity performance check with Potassium Chloride standard solution
2. Salinity performance check with Sodium Chloride standard solution

Dissolved Oxygen Sensor, Model: 6562, L/N: 08C100610

1. Performance check against Winkler titration

Turbidity Sensor, Model: 6136, S/N: 09M100672

1. Calibration check with Formazin standard solution

pH Meter, Model: 6561, L/N: 07E

1. Calibration check with standard pH buffer

Depth Meter

1. Calibration check at 1m water level depth

**Methodologies:**

1. YSI 6-Series Sonde Environmental Monitoring System Instruction Manual
2. In-house method with reference to APHA and ISO standards

Conductivity (APHA 20ed 2510), Salinity (APHA 20ed 2520B)  
Dissolved Oxygen (APHA 20ed 4500-O C), Turbidity (APHA 19ed 2130 B),  
pH (APHA 19th 4500-H+ B)

*PREPARED AND CHECKED BY:*  
For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

Test Report No.:	C/W/140802-2
Date of Issue:	2014-08-02
Date Received:	2014-08-02
Date Tested:	2014-08-02
Date Completed:	2014-08-02
Next Due Date:	2014-11-01

Page: 2 of 2

### Results:

#### 1. Conductivity performance check

Specific Conductivity, $\mu\text{S}/\text{cm}$		Correction, $\mu\text{S}/\text{cm}$	Acceptable range
Salinity Meter (C1)	Theoretical Value (C2)	$D = C1 - C2$	
1420	1420	0	$1420 \pm 20$

#### 2. Salinity Performance check

Salinity, ppt		Correction, ppt	Acceptable range
Instrument Reading	Theoretical Value		
30.0	30.0	0.0	$30.0 \pm 3$

#### 3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg $\text{O}_2/\text{L}$		Correction, mg $\text{O}_2/\text{L}$	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.1	9.1	0.0	$\pm 0.2$
Half-saturated	5.6	5.6	0.0	$\pm 0.2$
Zero	0.0	0.0	0.0	$\pm 0.2$

#### 4. Turbidity check

Turbidity value in solution, NTU	Calibration Value, NTU	Correction, NTU	Acceptable range
0.00	0.00	0.00	$0.00 \pm 0.05$
100	100	0	$100 \pm 5$
1000	1000	0	$1000 \pm 100$

#### 5. pH Meter check

Test Parameters	Performance characteristic	Acceptable range
Liquid junction error $\Delta\text{pH}_l$ , pH unit	0.01	Less than 0.05
Shift on stirring $\Delta\text{pH}_s$ , pH unit	0.01	Less than 0.02
Noise $\Delta\text{pH}_n$ , pH unit	0.00	Less than 0.02

#### 6. Depth Meter check

Instrument Reading, m	Calibration Value, m	Correction, m	Acceptable range
1.0	1.00	0.00	$1.00 \pm 0.05$

\*\*\*\*\*END OF REPORT\*\*\*\*\*

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/W/140808-2
Date of Issue:	2014-08-08
Date Received:	2014-08-08
Date Tested:	2014-08-08
Date Completed:	2014-08-08
Next Due Date:	2014-11-07

**ATTN:** Mr. W.K. Tang

Page: 1 of 2

### Certificate of Calibration

**Item for calibration:**

Description	: Sonde Environmental Monitoring System
Manufacturer	: YSI
Model No.	: 6820-C-M
Serial No.	: 11J101089
Equipment No.	: W.03.10

**Test conditions:**

Room Temperature	: 23 degree Celsius
Relative Humidity	: 60%

**Test Specifications:**

Conductivity & Salinity Sensor, Model: 6560, L/N: 11J100023

1. Conductivity performance check with Potassium Chloride standard solution
2. Salinity performance check with Sodium Chloride standard solution

Dissolved Oxygen Sensor, Model: 6562, L/N: 11J100272

1. Performance check against Winkler titration

Turbidity Sensor, Model: 6136, S/N: 11J100474

1. Calibration check with Formazin standard solution

pH Meter, Model: 6561, L/N: 11H

1. Calibration check with standard pH buffer

Depth Meter

1. Calibration check at 1m water level depth

**Methodologies:**

1. YSI 6-Series Sonde Environmental Monitoring System Instruction Manual
2. In-house method with reference to APHA and ISO standards

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**

Laboratory Manager

## TEST REPORT

Test Report No.:	C/W/140808-2
Date of Issue:	2014-08-08
Date Received:	2014-08-08
Date Tested:	2014-08-08
Date Completed:	2014-08-08
Next Due Date:	2014-11-07

Page: 2 of 2

### Results:

#### 1. Conductivity performance check

Specific Conductivity, $\mu\text{S}/\text{cm}$		Correction, $\mu\text{S}/\text{cm}$	Acceptable range
Salinity Meter (C1)	Theoretical Value (C2)	$D = C1 - C2$	
1420	1420	0	$1420 \pm 20$

#### 2. Salinity Performance check

Salinity, ppt		Correction, ppt	Acceptable range
Instrument Reading	Theoretical Value		
30.0	30.0	0.0	$30.0 \pm 3$

#### 3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg $\text{O}_2/\text{L}$		Correction, mg $\text{O}_2/\text{L}$	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.1	9.1	0.0	$\pm 0.2$
Half-saturated	5.6	5.6	0.0	$\pm 0.2$
Zero	0.0	0.0	0.0	$\pm 0.2$

#### 4. Turbidity check

Turbidity value in solution, NTU	Calibration Value, NTU	Correction, NTU	Acceptable range
0.00	0.00	0.00	$0.00 \pm 0.05$
100	100	0	$100 \pm 5$
1000	1000	0	$1000 \pm 100$

#### 5. pH Meter check

Test Parameters	Performance characteristic	Acceptable range
Liquid junction error $\Delta\text{pH}_l$ , pH unit	0.01	Less than 0.05
Shift on stirring $\Delta\text{pH}_s$ , pH unit	0.01	Less than 0.02
Noise $\Delta\text{pH}_n$ , pH unit	0.00	Less than 0.02

#### 6. Depth Meter check

Instrument Reading, m	Calibration Value, m	Correction, m	Acceptable range
1.0	1.00	0.00	$1.00 \pm 0.05$

\*\*\*\*\*END OF REPORT\*\*\*\*\*



## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
Room 1710, Technology Park,  
18 On Lai Street,  
Shatin, NT, Hong Kong

Test Report No.:	C/W/140912-1
Date of Issue:	2014-09-12
Date Received:	2014-09-12
Date Tested:	2014-09-12
Date Completed:	2014-09-12
Next Due Date:	2014-12-11

**ATTN:** Mr. W.K. Tang

Page: 1 of 2

### Certificate of Calibration

**Item for calibration:**

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	: 122430420
Equipment No.	: W.18.05

**Test conditions:**

Room Temperature	: 21 degree Celsius
Relative Humidity	: 62%

**Test Specifications:**

Dissolved Oxygen, Conductivity & Salinity Sensor,  
1. Performance check against Winkler titration  
2. Conductivity performance check with Potassium Chloride standard solution  
3. Salinity performance check with Sodium Chloride standard solution  
Turbidity Sensor, Batch: 12213  
1. Calibration check with Formazin standard solution  
pH / ORP electrode, Batch: 11933  
1. Calibration check with standard pH buffer  
2. Redox performance check with ZoBell's standard solution  
Depth Meter  
1. Calibration check at 1m water level depth

**Methodologies:**

1. Aquaprobe AP-2000 Manual
2. In-house method with reference to APHA and ISO standards  
Conductivity (APHA 20ed 2510), Salinity (APHA 20ed 2520B)  
Dissolved Oxygen (APHA 20ed 4500-O C), Turbidity (APHA 19ed 2130 B),  
pH (ISO 10523, Section 9.1 and APHA 19ed 4500-H+ B) ,  
Redox electrode (APHA 20ed 2580)

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

Test Report No.:	C/W/140912-1
Date of Issue:	2014-09-12
Date Received:	2014-09-12
Date Tested:	2014-09-12
Date Completed:	2014-09-12
Next Due Date:	2014-12-11

Page: 2 of 2

### Results:

#### 1. Conductivity performance check

Specific Conductivity, $\mu\text{S}/\text{cm}$		Correction, $\mu\text{S}/\text{cm}$	Acceptable range
Instrument Reading	Theoretical Value		
1420	1420	0	$1420 \pm 20$

#### 2. Salinity Performance check

Salinity, ppt		Correction, ppt	Acceptable range
Instrument Reading	Theoretical Value		
30.0	30.0	0.0	$30.0 \pm 3$

#### 3. Dissolved Oxygen check

Oxygen level in water at 20°C	Dissolved Oxygen, mg $\text{O}_2/\text{L}$		Correction, mg $\text{O}_2/\text{L}$	Acceptable range
	D.O. Meter	Winkler Titration		
Saturated	9.1	9.1	0.0	$\pm 0.2$
Half-saturated	5.6	5.6	0.0	$\pm 0.2$
Zero	0.0	0.0	0.0	$\pm 0.2$

#### 4. Turbidity check

Turbidity value in solution, NTU	Calibration Value, NTU	Correction, NTU	Acceptable range
0.00	0.00	0.00	$0.00 \pm 0.05$
100	100	0	$100 \pm 5$
1000	1000	0	$1000 \pm 100$

#### 5. pH Meter check

Test Parameters	Performance characteristic	Acceptable range
Liquid junction error $\Delta\text{pH}_j$ , pH unit	0.01	Less than 0.05
Shift on stirring $\Delta\text{pH}_s$ , pH unit	0.01	Less than 0.02
Noise $\Delta\text{pH}_n$ , pH unit	0.00	Less than 0.02

#### 6. Redox Meter check

Redox, mV		Acceptable range
Instrument Reading	Theoretical Value	
228	229	$229 \pm 10$

#### 7. Depth Meter check

Instrument Reading, m	Calibration Value, m	Correction, m	Acceptable range
1.0	1.00	0.00	$1.00 \pm 0.05$

\*\*\*\*\*END OF REPORT\*\*\*\*\*

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**APPENDIX F**  
**QUALITY CONTROL REPORTS FOR SS**  
**LABORATORY ANALYSIS**

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## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21144
Date of Issue:	2014/10/03
Date Received:	2014/10/01
Date Tested:	2014/10/01
Date Completed:	2014/10/03

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/01  
Number of Sample: 104  
Custody No.: MA14028/141001

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	3	3	2	101

\*\*\*\*\*END OF REPORT\*\*\*\*\*

PREPARED AND CHECKED BY:  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21145
Date of Issue:	2014/10/06
Date Received:	2014/10/03
Date Tested:	2014/10/03
Date Completed:	2014/10/06

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/03  
Number of Sample: 104  
Custody No.: MA14028/141003

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	3	3	9	114

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**  
*Laboratory Manager*

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21164
Date of Issue:	2014/10/07
Date Received:	2014/10/06
Date Tested:	2014/10/06
Date Completed:	2014/10/07

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/06  
Number of Sample: 104  
Custody No.: MA14028/141006

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	5	5	6	94

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
*Laboratory Manager*

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21183
Date of Issue:	2014/10/09
Date Received:	2014/10/08
Date Tested:	2014/10/08
Date Completed:	2014/10/09

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/08  
Number of Sample: 104  
Custody No.: MA14028/141008

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	4	5	4	110

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
*Laboratory Manager*

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21203
Date of Issue:	2014/10/13
Date Received:	2014/10/10
Date Tested:	2014/10/10
Date Completed:	2014/10/13

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/10  
Number of Sample: 102  
Custody No.: MA14028/141010

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	3	3	10	106

\*\*\*\*\*END OF REPORT\*\*\*\*\*

PREPARED AND CHECKED BY:  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
Laboratory Manager



## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21219
Date of Issue:	2014/10/14
Date Received:	2014/10/13
Date Tested:	2014/10/13
Date Completed:	2014/10/14

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/13  
Number of Sample: 104  
Custody No.: MA14028/141013

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	5	5	3	101

\*\*\*\*\*END OF REPORT\*\*\*\*\*

PREPARED AND CHECKED BY:  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21243
Date of Issue:	2014/10/17
Date Received:	2014/10/16
Date Tested:	2014/10/16
Date Completed:	2014/10/17

**ATTN:** Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/16  
Number of Sample: 104  
Custody No.: MA14028/141016

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	8	8	2	82

\*\*\*\*\*END OF REPORT\*\*\*\*\*

PREPARED AND CHECKED BY:  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21263
Date of Issue:	2014/10/20
Date Received:	2014/10/18
Date Tested:	2014/10/18
Date Completed:	2014/10/20

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels  
Sampling Date: 2014/10/18  
Number of Sample: 104  
Custody No.: MA14028/141018

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	5	5	4	101

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
*Laboratory Manager*

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**

**RM 1710, Technology Park,**

**18 On Lai Street,**

**Shatin, N.T., Hong Kong**

Laboratory No.: 21266

Date of Issue: 2014/10/21

Date Received: 2014/10/20

Date Tested: 2014/10/20

Date Completed: 2014/10/21

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels

Sampling Date: 2014/10/20

Number of Sample: 104

Custody No.: MA14028/141020

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	3	3	2	101

\*\*\*\*\*END OF REPORT\*\*\*\*\*

PREPARED AND CHECKED BY:

For and On Behalf of WELLAB Ltd.

*Patrick Tse*

**PATRICK TSE**

Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21286
Date of Issue:	2014/10/23
Date Received:	2014/10/22
Date Tested:	2014/10/22
Date Completed:	2014/10/23

**ATTN:** Ms. Mei Ling Tang

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels

Sampling Date: 2014/10/22

Number of Sample: 104

Custody No.: MA14028/141022

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	6	6	3	101

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21299
Date of Issue:	2014/10/27
Date Received:	2014/10/24
Date Tested:	2014/10/24
Date Completed:	2014/10/27

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels

Sampling Date: 2014/10/24

Number of Sample: 104

Custody No.: MA14028/141024

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	6	5	13	114

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of WELLAB Ltd.



**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21306
Date of Issue:	2014/10/28
Date Received:	2014/10/27
Date Tested:	2014/10/27
Date Completed:	2014/10/28

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels

Sampling Date: 2014/10/27

Number of Sample: 104

Custody No.: MA14028/141027

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	3	3	3	104

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*

For and On Behalf of WELLAB Ltd.



**PATRICK TSE**

Laboratory Manager

## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**

**RM 1710, Technology Park,**

**18 On Lai Street,**

**Shatin, N.T., Hong Kong**

Laboratory No.:	21312
Date of Issue:	2014/10/30
Date Received:	2014/10/29
Date Tested:	2014/10/29
Date Completed:	2014/10/30

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels

Sampling Date: 2014/10/29

Number of Sample: 104

Custody No.: MA14028/141029

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	4	4	7	99

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*

For and On Behalf of WELLAB Ltd.



**PATRICK TSE**

*Laboratory Manager*



## TEST REPORT

### QC REPORT

**APPLICANT: Cinotech Consultants Limited**  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	21349
Date of Issue:	2014/11/03
Date Received:	2014/10/31
Date Tested:	2014/10/31
Date Completed:	2014/11/03

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.11227  
Advance Works for NSL Cross Harbour Tunnels

Sampling Date: 2014/10/31

Number of Sample: 104

Custody No.: MA14028/141031

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
C3sf	6	6	1	87

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*  
For and On Behalf of **WELLAB Ltd.**



**PATRICK TSE**  
*Laboratory Manager*

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**APPENDIX G**  
**SUMMARY OF EXCEEDANCE**

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## **APPENDIX G – SUMMARY OF EXCEEDANCE**

**Reporting Month:** October 2014

### **a) Exceedance Report for Water Quality Monitoring (NIL)**

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**APPENDIX H**  
**SITE AUDIT SUMMARY**

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**Shatin to Central Link -  
Contract 11227 Advance Works for NSL Cross Harbour Tunnels  
(Shek O Casting Basin)**



**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	141003
Date	3 October 2014 (Friday)
Time	15:30 – 16:15

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141003-R01	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>• Clear the discarded silt curtain at the shore area between Southern and Northern Gate properly.</li> </ul> <p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"> <li>• No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"> <li>• No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"> <li>• No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>• No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"> <li>• No environmental deficiency was identified during the site inspection.</li> </ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"> <li>• Follow-up on previous audit section (Ref. No.:140924), all environmental deficiencies were observed improved/rectified by the Contractor.</li> </ul>	B5

	Name	Signature	Date
Recorded by	Ivy Tam		3 October 2014
Checked by	Dr. Priscilla Choy		3 October 2014

**Shatin to Central Link -**

**Contract 11227 Advance Works for NSL Cross Harbour Tunnels**

**(Shek O Casting Basin)**

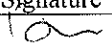

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	141008
Date	8 October 2014 (Wednesday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141008-001	<b>Part B – Water Quality</b> <ul style="list-style-type: none"><li>Some fabric of the silt curtain observed floating on the water at the Northern Gate. The Contractor is reminded to repair the silt curtain properly.</li></ul>	B8
141008-002	<ul style="list-style-type: none"><li>General refuse is deposited near the silt curtain at both Northern and Southern Gate. The Contractor is reminded to clear it properly.</li></ul>	B5
	<b>Part C – Landscape &amp; Visual</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul>	
	<b>Part D – Air Quality</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul>	
	<b>Part E – Construction Noise Impact</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul>	
141008-R03	<b>Part F – Waste/Chemical Management</b> <ul style="list-style-type: none"><li>To provide proper rubbish bin on the target barge.</li></ul> <b>Part G – Permits/Licenses</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <b>Part H – Others</b> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:141003), all environmental deficiencies were observed improved/rectified by the Contractor.</li></ul>	F1ii

	Name	Signature	Date
Recorded by	Johnny Fung		8 October 2014
Checked by	Dr. Priscilla Choy		8 October 2014

*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels*

*(Shek O Casting Basin)*



Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141015
Date	15 October 2014 (Wednesday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141015-001	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"><li>Some fabric of the silt curtain observed floating on the water at the Northern Gate. The Contractor is reminded to repair the silt curtain properly.</li></ul> <p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:141008), all environmental deficiencies were observed improved/rectified by the Contractor.</li></ul>	B8

	Name	Signature	Date
Recorded by	Johnny Fung		15 October 2014
Checked by	Dr. Priscilla Choy		15 October 2014

*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels*

*(Shek O Casting Basin)*

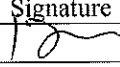

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141022
Date	22 October 2014 (Wednesday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141022-O01	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"><li>Some fabric of the silt curtain observed floating on the water at the end of Northern Gate. The Contractor is reminded to repair the silt curtain properly.</li></ul> <p><b>Part C – Ecology / Others</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:141015), follow up action is needed to be reviewed for item 141015-O01.</li></ul>	B8

	Name	Signature	Date
Recorded by	Johnny Fung		22 October 2014
Checked by	Dr. Priscilla Choy		22 October 2014



*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels*

*(Shek O Casting Basin)*

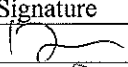

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141029
Date	29 October 2014 (Wednesday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141029-001	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"><li>Some fabric of the silt curtain observed floating on the water at the end of Northern Gate. The Contractor is reminded to repair properly.</li></ul>	B8
141029-002	<p><b>Part C – Ecology / Others</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"><li>General refuse observed near the silt curtain at Southern Gate. The Contractor is reminded to clear it regularly.</li></ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H - Others</b></p> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:141022), follow up action is needed to be reviewed for item 141022-001.</li></ul>	F1i

	Name	Signature	Date
Recorded by	Johnny Fung		29 October 2014
Checked by	Dr. Priscilla Choy		29 October 2014

*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels*

*(Victoria Harbour)*



Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141003
Date	3 October 2014 (Friday)
Time	17:15 – 17:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141003-001	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"><li>The silt curtain at grab is under maintenance. The Contractor was reminded to ensure the silt curtain can function properly before commencing the dredging works.</li></ul> <p><b>Part C – Landscape &amp; Visual</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:140924), all environmental deficiencies were observed improved/rectified by the Contractor.</li></ul>	B7

	Name	Signature	Date
Recorded by	Ivy Tam		3 October 2014
Checked by	Dr. Priscilla Choy		3 October 2014

*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels  
(Victoria Harbour)*

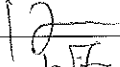

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141015
Date	15 October 2014 (Wednesday)
Time	15:00 – 16:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141015-R02	<b>Part B – Water Quality</b> <ul style="list-style-type: none"><li>To remove the dredged sediments at near the side of the barge.</li></ul>	B6
141015-O01	<b>Part C – Landscape &amp; Visual</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <b>Part D – Air Quality</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <b>Part E – Construction Noise Impact</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <b>Part F – Waste/Chemical Management</b> <ul style="list-style-type: none"><li>Chemical containers on the barge observed without secondary containment. The Contractor is reminded to provide drip tray to the containers.</li></ul> <b>Part G – Permits/Licenses</b> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <b>Part H – Others</b> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:141003), all environmental deficiencies were observed improved/rectified by the Contractor.</li></ul>	F9

	Name	Signature	Date
Recorded by	Johnny Fung		15 October 2014
Checked by	Dr. Priscilla Choy		15 October 2014

*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels  
(Victoria Harbour)*

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141022
Date	22 October 2014 (Wednesday)
Time	15:00 – 16:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part C – Ecology / Others</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H - Others</b></p> <ul style="list-style-type: none"><li>• Follow-up on previous audit section (Ref. No.:141015), all environmental deficiencies were observed improved/rectified by the Contractor.</li></ul>	

	Name	Signature	Date
Recorded by	Johnny Fung		22 October 2014
Checked by	Dr. Priscilla Choy		22 October 2014

*Shatin to Central Link -*

*Contract 11227 Advance Works for NSL Cross Harbour Tunnels*

*(Victoria Harbour)*

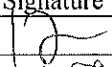
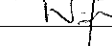
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	141029
Date	29 October 2014 (Wednesday)
Time	15:00 – 16:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
141029-001	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"><li>Some fabric of part of the frame-type silt curtain observed floating on the water at Victoria Harbour. The Contractor is reminded to repair it properly.</li></ul> <p><b>Part C – Ecology / Others</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D – Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E – Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F – Waste/Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G – Permits/Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part H – Others</b></p> <ul style="list-style-type: none"><li>Follow-up on previous audit section (Ref. No.:141022), no major environmental deficiencies were observed during the site inspection.</li></ul>	B7

	Name	Signature	Date
Recorded by	Johnny Fung		29 October 2014
Checked by	Dr. Priscilla Choy		29 October 2014

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**APPENDIX I**  
**EVENT AND ACTION PLANS**

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**Appendix I - Event and Action Plan for Marine Water Quality Monitoring**

<b>EVENT</b>	<b>ACTION</b>			
	<b>ET</b>	<b>IEC</b>	<b>ER</b>	<b>CONTRACTOR</b>
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Inform the Contractor, IEC and ER;</li> <li>2. Check monitoring data, all plant, equipment and the Contractor's working methods; and</li> <li>3. Discuss remedial measures with the IEC and Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, ER and Contractor on the implemented mitigation measures;</li> <li>2. Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and</li> <li>3. Review and advise the ET and ER the effectiveness of the implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures;</li> <li>2. Make agreement on the remedial measures to be implemented; and</li> <li>3. Supervise the implementation of agreed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>3. Rectify unacceptable practice;</li> <li>4. Check all plant and equipment;</li> <li>5. Consider changes of working methods;</li> <li>6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER; and</li> <li>7. Implement the agreed remedial measures.</li> </ol>
Action level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Inform the Contractor, IEC and ER;</li> <li>3. Check monitoring data, all plant, equipment and</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, ER and Contractor on the implemented mitigation measures;</li> <li>2. Review proposals on remedial measures submitted by the</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures;</li> <li>2. Make agreement on the remedial measures to be implemented; and</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>3. Rectify unacceptable</li> </ol>

**Appendix I - Event and Action Plan for Marine Water Quality Monitoring**

<b>EVENT</b>	<b>ACTION</b>			
	<b>ET</b>	<b>IEC</b>	<b>ER</b>	<b>CONTRACTOR</b>
	<p>the Contractor's working methods;</p> <p>4. Discuss remedial measures with the IEC and Contractor; and</p> <p>5. Ensure remedial measures are implemented.</p>	<p>Contractor and advise the ER accordingly; and</p> <p>3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.</p>	<p>3. Discuss with the ET and IEC on the effectiveness of the implemented remedial measures.</p>	<p>practice;</p> <p>4. Check all plant and equipment;</p> <p>5. Consider changes of working methods;</p> <p>6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and</p> <p>7. Implement the agreed remedial measures.</p>



**Appendix I - Event and Action Plan for Marine Water Quality Monitoring**

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurement to confirm findings;</li> <li>2. Inform the Contractor, IEC, EPD and ER;</li> <li>3. Rectify unacceptable practice;</li> <li>4. Check monitoring data, all plant, equipment and the Contractor's working methods;</li> <li>5. Discuss with the ET and IEC and propose remedial measures to the IEC, EPD and ER; and</li> <li>6. Ensure the agreed remedial measures are implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, ER and Contractor on the implemented mitigation measures;</li> <li>2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and</li> <li>3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures;</li> <li>2. Request the Contractor to critically review the working methods;</li> <li>3. Make agreement on the remedial measures to be implemented; and</li> <li>4. Assess the effectiveness of the implemented remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check all plant and equipment;</li> <li>4. Consider changes of working methods;</li> <li>5. Discuss with ET , IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and</li> <li>6. Implement the agreed remedial measures.</li> </ol>
Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>1. Inform the Contractor, IEC, EPD and ER;</li> <li>2. Check monitoring data, all plant, equipment and the Contractor's working methods;</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, ER and Contractor on the implemented measures;</li> <li>2. Review proposals on remedial measures submitted by the</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with the ET, IEC and Contractor on the implemented mitigation measures;</li> <li>2. Request the Contractor to critically review the</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify source(s) of impact;</li> <li>2. Inform the ER and confirm notification of the non-compliance in writing;</li> <li>3. Rectify unacceptable</li> </ol>

**Appendix I - Event and Action Plan for Marine Water Quality Monitoring**

<b>EVENT</b>	<b>ACTION</b>			
	<b>ET</b>	<b>IEC</b>	<b>ER</b>	<b>CONTRACTOR</b>
	<p>3. Discuss remedial measures with the the IEC, EPD, ER and Contractor;</p> <p>4. Ensure remedial measures are implemented; and</p> <p>5. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</p>	<p>Contractor and advise the ER accordingly; and</p> <p>3. Review and advise the ET and ER the effectiveness of the implemented remedial measures.</p>	<p>working methods;</p> <p>3. Make agreement on the remedial measures to be implemented;</p> <p>4. Discuss with the the ET, IEC and Contractor on the effectiveness of the implemented remedial measures; and</p> <p>5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.</p>	<p>practice;</p> <p>4. Check all plant and equipment;</p> <p>5. Consider changes of working methods;</p> <p>6. Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification;</p> <p>7. Implement the agreed remedial measures; and</p> <p>8. As directed by the ER, to slow down or to stop all or part of the marine works or construction activities.</p>

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**APPENDIX J  
UPDATED ENVIRONMENTAL  
MITIGATION IMPLEMENTATION  
SCHEDULE**

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## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
<b>Ecology (Construction Phase)</b>							
S5.134	Accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as removing the pollutants before discharge into storm drain and paving the section of construction road between the wheel washing bay and the public road as suggested in Sections 11.216 and 11.219 to 11.256 of the EIA Report shall be adopted	Minimise the contamination of wastewater discharge	Contractor	All land based works areas	Construction phase	• EIAO-TM	N/A
ERR S3.6.3	Installation of floating type silt curtains around the area of site levelling works and construction and removal of earth bund.	Minimize indirect impact to the nearby subtidal and intertidal flora and fauna	Contractor	Shek O Casting Basin	Construction phase	• EIAO-TM	^
<b>Fisheries Impact</b>							
S6.57	The size of the dredging and underwater blasting areas shall be minimized as much as possible	To minimize loss of fishing ground and fisheries resources	Contractor/ MTR	All dredging and underwater blasting works areas	Construction phase	• EIAO-TM	^
S6.57	Mitigation measures recommended in Sections 11.200 to 11.207, 11.209 to 11.211 and 11.213 to 11.256 of the EIA Report to control water quality, i.e. use of effective site drainage in land-based construction site and installation of silt curtain surrounding the dredging point, use of closed grab dredger and reduction of dredging rate shall be implemented.	To minimize change in water quality impact on fisheries resources and operation	Contractor	Works Areas	Construction phase	• EIAO-TM	^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
<b><i>Landscape &amp; Visual (Construction Phase)</i></b>							
Table 7.9	CM3 - Control of night-time lighting glare	Minimize the night time glare due to the Project during construction phase	MTR	All works sites	Construction phase	• EIAO-TM	^
Table 7.9	CM5 - Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	Control of height and deposition/arrangement of temporary facilities in works areas	MTR	All works sites	Construction phase	• EIAO-TM	^
<b><i>Construction Dust Impact</i></b>							
EP 2.25	All diesel fuelled construction plant used by the contractors within the works areas of the Project shall be powered by ultra low sulphur diesel fuel.	Mitigating Aerial Emissions from Construction Plant	Contractor	All works areas	Construction phase	• EIAO-TM	^
<b><i>Construction Noise (Airborne)</i></b>							
S9.55	The following good site practices shall be implemented: • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the	Minimize construction noise impact	Contractor	All works areas	Construction phase	• EIAO-TM	^  ^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>construction program</p> <ul style="list-style-type: none"> <li>• Mobile plant, if any, shall be sited as far from NSRs as possible</li> <li>• Machines and plant (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum</li> <li>• Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs</li> <li>• Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>						<p>^</p> <p>^</p> <p>^</p> <p>^</p>
<b>Water Quality (Construction Phase)</b>							
S11.204	No more than one closed grab dredger shall be operated outside the CBTS in the open harbor for SCL construction.	To minimize loss of fines and contaminants from dredging in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^
Table 11.23	Silt screens shall be installed at the WSD Flushing Water Intakes at Kowloon Station, Tai Wan, Quarry Bay and Wan Chai (namely Intakes 14, WSD9, WSD17 and A respectively) during any dredging / filling works outside the CBTS for	To protect the beneficial use of flushing water intakes in Victoria Harbour from dredging / filling	Contractor	Flushing water intake points in Victoria Harbour	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	temporary reclamation at SCL2 or for IMT construction	activities					
S11.210 - S11.211 & Table 11.24	<p>If the marine works for SCL are to be carried out concurrently with other dredging / filling activities in the Victoria Harbour, the production rates of any dredging / filling work to be undertaken outside the CBTS for SCL construction in the open harbour (including temporary reclamation at SCL2 and IMT construction) shall not exceed 2,500 m<sup>3</sup> per day at any time throughout the entire construction period. The hourly production rate for dredging or bulk filling within the open Victoria Harbour (outside the breakwater of CBTS) shall not exceed 156 m<sup>3</sup> per hour (if there are other concurrent marine works in Victoria Harbour) and the maximum working hour for the dredging / bulkfilling works shall be 16 hours per day.</p> <p>If the marine works for SCL are to be carried out with no other concurrent dredging / filling activities in the Victoria Harbour, the production rates of any dredging / filling work to be undertaken outside the CBTS for SCL construction in the open harbour (including temporary reclamation at SCL2 and IMT construction) shall not exceed 4,500 m<sup>3</sup> per day at any time throughout the entire construction period. The hourly</p>	To minimize loss of fines and contaminants from dredging / filling in the Victoria Harbour	Contractor	Marine works areas in Victoria Harbour	Construction phase	Construction phase	^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	production rate for dredging or bulk filling within the open Victoria Harbour (outside the breakwater of CBTS) shall not exceed 281 m <sup>3</sup> per hour (if there is no other concurrent marine works in Victoria Harbour) and the maximum working hour for the dredging / bulk filling works shall be 16 hours per day.						
S11.215	<p>The following good site practices shall be undertaken during dredging:</p> <ul style="list-style-type: none"> <li>• mechanical grabs, if used, shall be designed and maintained to avoid spillage and sealed tightly while being lifted;</li> <li>• all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</li> <li>• all hopper barges and dredgers shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material;</li> <li>• construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds;</li> <li>• loading of barges and hoppers shall be controlled to</li> </ul>	To minimize loss of fines and contaminants from dredging / filling	Contractor	Marine works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>



## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>prevent splashing of dredged material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation;</p> <ul style="list-style-type: none"> <li>• before commencement of the temporary reclamation works, the holder of the Environmental Permit shall submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.</li> </ul>						N/A
S11.216	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from the construction works at or close to the seafront:</p> <ul style="list-style-type: none"> <li>• Temporary storage of construction materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction and demolition materials shall be located well away from the seawater front and storm drainage during carrying out of the works.</li> <li>• Stockpiling of construction and demolition materials and dusty materials shall be covered and located away from the seawater front and storm drainage.</li> <li>• Construction debris and spoil shall be covered up and/or disposed of as soon as possible to avoid being washed into the</li> </ul>	<p>minimize release of construction wastes from construction works at or close to the seafront</p>	Contractor	Construction works at or close to the seafront	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	<p>*</p> <p>*</p> <p>^</p>

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	nearby receiving waters.						
S11.218	Silt screens are recommended to be deployed at the seawater intakes during the construction works period. Regular maintenance of the silt screens and refuse collection shall be performed at the silt screens at regular intervals on a daily basis. The Contractor shall be responsible for keeping the water behind the silt screen free from floating rubbish and debris during the impact monitoring period.	To avoid the pollutant and refuse entrapment problems at the silt screens to be installed at the water intakes	Contractor	Proposed silt screens at water intakes.	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^
S11.219	It is recommended that collection and removal of floating refuse shall be performed within the marine construction areas at regular intervals on a daily basis. The Contractor shall be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish during the dredging works.	To minimize water quality impacts from illegal dumping and littering from marine vessels and runoff from the coastal area	Contractor	Marine works area	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• WDO</li> </ul>	#
S11.246 & 11.247	Construction work force sewage discharges on site are expected to be discharged to the nearby existing trunk sewer or sewage treatment facilities. If disposal of sewage to public sewerage system is not feasible, appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment.	minimize water quality impacts due to sewage generated from construction workforce	Contractor	All works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>The Contractor shall also be responsible for waste disposal and maintenance practices.</p> <p>Notices shall be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment.</p>						^
S11.254	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation shall be observed and complied with for control of chemical wastes.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	N/A
S11.255	Any service shop and maintenance facilities shall be located on hard standings within a bunded area, and sumps and oil interceptors shall be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken within the areas appropriately equipped to control these discharges.	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	*
S11.256	Disposal of chemical wastes shall be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes"	minimize water quality impact from accidental spillage of chemical	Contractor	All construction works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> </ul>	

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows:</p> <ul style="list-style-type: none"> <li>• Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>• Chemical waste containers shall be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>• Storage area shall be selected at a safe location on site and adequate space shall be allocated to the storage area.the areas appropriately equipped to control these discharges.</li> </ul>					• WDO	<p>^</p> <p>^</p> <p>^</p>
ERR S 8.5.1	Floating type silt curtains would be installed around the area of site levelling works and construction and removal of earth bund during the respective works.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• WPCO	#
ERR S 8.5.1	Floating type silt curtains would be installed around the entrances of the basin during rock filling works.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• WPCO	^
EP 2.23.3	All fill materials used in marine works at the Basin shall contain no more than 5% fines (aggregates diameter smaller than 63µm) content.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• WPCO	^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
EP 2.23.4	The sea bed levelling works shall not involve any dumping of imported fill materials onto the seabed. The in-situ volume of sea bed materials to be moved during the sea bed leveling works shall not be more than 10,000m <sup>3</sup> . If sea bed materials other than coarse sand, cobble and gravel as identified in the previous marine investigation are encountered, alternative leveling methods and/or additional mitigation measures shall be proposed for the approval of the Director before the works can proceed. The silt curtain shall be properly installed prior to the commencement of sea bed leveling works, and if necessary, double silt curtains shall be deployed to ensure full enclosure of the leveling works at all times to prevent the escape of sediment to water column outside the silt curtains.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• WPCO	^
EP 2.23.5	The filling of the southern part of the Basin shall be carried out using rocks or coarse aggregates with diameters between 20mm and 200mm and with no more than 5% fines (aggregates with diameter smaller than 63µm) content, up to a level not higher than -12mPD. The maximum filling rate shall be no more than 4,500m <sup>3</sup> /day.	minimize water quality impact at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	• WPCO	^
<b>Waste Management (Construction Waste)</b>							
S12.75	<b>Good Site Practices and Waste Reduction Measures</b>	reduce waste management	Contractor	All works sites	Construction	• Waste Disposal	

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>- Prepare a Waste Management Plan (WMP) approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites;</li> <li>- Training of site personnel in, site cleanliness, proper waste management and chemical handling procedures;</li> <li>- Provision of sufficient waste disposal points and regular collection of waste;</li> <li>- Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and</li> <li>- Separation of chemical wastes for special handling and appropriate treatment.</li> </ul>	impacts			phase	Ordinance (Cap. 354) • Land (Miscellaneous Provisions)  Ordinance (Cap. 28)  • DEVB TCW No. 6/2010	^       
S12.76	<p><b><i>Good Site Practices and Waste Reduction Measures (Con't)</i></b></p> <ul style="list-style-type: none"> <li>- Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.);</li> <li>- Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or</li> </ul>	achieve waste reduction	Contractor	All works sites	Construction phase	• Waste Disposal Ordinance (Cap. 354)  • Land (Miscellaneous Provisions)  Ordinance (Cap.	^   

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>recycling of materials and their proper disposal;</p> <ul style="list-style-type: none"> <li>- Encourage collection of aluminum cans by providing separate labeled bins to enable this waste to be segregated from other general refuse generated by the workforce;</li> <li>- Proper storage and site practices to minimize the potential for damage or contamination of construction materials;</li> <li>- Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; and</li> <li>- Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.</li> </ul>					28)	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
S12.77	<p><b><i>Good Site Practices and Waste Reduction Measures (Con't)</i></b></p> <ul style="list-style-type: none"> <li>- The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWBTCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan shall</li> </ul>	achieve waste reduction	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• ETWB TCW No. 19/2005</li> </ul>	<p>^</p>

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP shall be submitted to the Engineer for approval. The Contractor shall implement the waste management practices in the EMP throughout the construction stage of the Project.</p> <p>The EMP shall be reviewed regularly and updated by the Contractor, preferably in a monthly basis.</p>						^
S12.78	C&D materials would be reused in other local concurrent projects as far as possible. If all reuse outlets are exhausted during the construction phase, the C&D materials would be disposed of at Taishan, China as a last resort.	achieve waste reduction	Contractor	All works sites	Construction phase	• ETWB TCW No. 19/2005	^
S12.79	<p><b><i>Storage, Collection and Transportation of Waste</i></b></p> <p>Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> <li>- Waste, such as soil, shall be handled and stored well to ensure secure containment, thus minimizing the potential of pollution;</li> <li>- Maintain and clean storage areas routinely;</li> <li>- Stockpiling area shall be provided with covers and water</li> </ul>	minimize potential adverse environmental impacts arising from waste storage	Contractor	All works sites	Construction phase	-	^  ^  ^



## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	spraying system to prevent materials from wind-blown or being washed away; and  - Different locations shall be designated to stockpile each material to enhance reuse						^
S12.80	<b><i>Storage, Collection and Transportation of Waste (Con't)</i></b>  Waste haulier with appropriate permits shall be employed by the Contractor for the collection and transportation of waste from works areas to respective disposal outlets. The following suggestions shall be enforced to minimize the potential adverse impacts:  - Remove waste in timely manner - Waste collectors shall only collect wastes prescribed by their permits  - Impacts during transportation, such as dust and odour, shall be mitigated by the use of covered trucks or in enclosed containers  - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28)	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	-	^  ^  ^  ^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<ul style="list-style-type: none"> <li>- Waste shall be disposed of at licensed waste disposal facilities</li> <li>- Maintain records of quantities of waste generated, recycled and disposed</li> </ul>						<p>^</p> <p>^</p>
S12.81	<p><b><i>Storage, Collection and Transportation of Waste (Con't)</i></b></p> <ul style="list-style-type: none"> <li>- Implementation of trip ticket system with reference to DevB TC(W) No.6/2010 to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) shall be proposed</li> </ul>	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• DEVB TCW No. 6/2010</li> </ul>	<p>^</p>
S12.83 – 12.86	<p><b><i>Sorting of C&amp;D Materials</i></b></p> <ul style="list-style-type: none"> <li>- Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site.</li> <li>- Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials.</li> <li>- The C&amp;D materials shall at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled as far as practicable before delivery to PFRFs as mentioned for beneficial use in other projects. While opportunities for reusing the non-inert portion shall be</li> </ul>	minimize potential adverse environmental impacts during the handling, transportation and disposal of C&D materials	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• DEVB TCW No. 6/2010</li> <li>• ETWB TCW No. 33/2002</li> <li>• ETWB TCW No. 19/2005</li> </ul>	<p>^</p> <p>^</p> <p>^</p>

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>investigated before disposal of at designated landfills.</p> <p>- Possibility of reusing the spoil in the Project will be continuously investigated in the detailed design and construction stages, it includes backfilling to cut and cover construction works for the Hung Hom south and north approach</p>						^
S12.88	<p><b>Sediments</b></p> <p><i>The basic requirements and procedures for excavated / dredged sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is managing the disposal facilities in Hong Kong for the dredged and excavated sediment, while EPD is the authority of issuing marine dumping permit under the Dumping at Sea Ordinance</i></p>	To ensure the sediment to be disposed of in an authorized and least impacted way	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^
S12.89	<p><b>Sediments</b></p> <p>The contractor for the excavation / dredging works shall apply for the site allocations of marine sediment disposal based on the prior agreement with MFC/CEDD. A request for reservation of sediment disposal space have been submitted to MFC for onward discussions of disposal approach and feasible disposal sites and the letter is attached in Appendix 12.6. The Project proponent shall also be responsible for the application of all</p>	To determine the best handling and disposal option of the sediments	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	necessary permits from relevant authorities, including the dumping permit as required under DASO from EPD, for the disposal of dredged and excavated sediment prior to the commencement of the excavation works.						
S12.91-12.94	<p><b>Sediments</b></p> <ul style="list-style-type: none"> <li>- Stockpiling of contaminated sediments shall be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment shall be covered by tarpaulin and the area shall be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and/or surrounding water bodies. The stockpiling areas shall be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas shall be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO).</li> <li>- In order to minimise the potential odour / dust emissions during excavation and transportation of the sediment, the excavated sediments shall be wetted during excavation /</li> </ul>	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	<p>^</p> <p>^</p>

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	<p>material handling and shall be properly covered when placed on trucks or barges. Loading of the excavated sediment to the barge shall be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water.</p> <ul style="list-style-type: none"> <li>- The barge transporting the sediments to the designated disposal sites shall be equipped with tight fitting seals to prevent leakage and shall not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, 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 selfmonitoring devices as specified by the DEP.</li> <li>- In order to minimise the exposure to contaminated materials, workers shall, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.</li> </ul>						<p>^</p> <p>^</p>
S12.95	<p><b>Sediments</b></p> <p>A possible arrangement for Type 3 disposal is by geosynthetic</p>	To ensure handling of sediments are in	Contractor	Work Sites, Sediment	Construction Phase	ETWB TC(W) No. 34/2002 &	N/A

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal. The technology is readily available for the manufacture of the geosynthetic containers to the project-specific requirements. Similar disposal methods have been used for projects in Europe, the USA and Japan and the issues of fill retention by the geosynthetic fabrics, possible rupture of the containers and sediment loss due to impact of the container on the seabed have been addressed.	accordance to statutory requirements		disposal sites		Dumping at Sea Ordinance	
S12.97	<p><b>Containers for Storage of Chemical Waste</b></p> <p>The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Containers used for storage of chemical waste shall:</p> <ul style="list-style-type: none"> <li>- Be compatible with the chemical wastes being stored, maintained in good condition and securely sealed;</li> <li>- Have a capacity of less than 450 liters unless the</li> </ul>	register with EPD as a Chemical waste producer and store chemical waste in appropriate containers	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^  ^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	specifications have been approved by EPD; and  - Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation						^
S12.98	<b><i>Chemical Waste Storage Area</i></b>  - Be clearly labeled to indicate corresponding chemical characteristics of the chemical waste and used for storage of chemical waste only;  - Be enclosed on at least 3 sides;  - Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;  - Have adequate ventilation;  - Be covered to prevent rainfall from entering; and  - Be properly arranged so that incompatible materials are adequately separated.	prepare appropriate storage areas for chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	N/A          N/A N/A N/A
S12.98	<b><i>Chemical Waste</i></b>  - Lubricants, waste oils and other chemical wastes would be generated during the maintenance of vehicles and mechanical equipments. Used lubricants shall be collected and stored in	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and	^

## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	individual containers which are fully labelled in English and Chinese and stored in a designated secure place.					Storage of Chemical Wastes	
S12.100	<b><i>Collection and Disposal of Chemical Waste</i></b> A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical waste. The Contractor shall employ a licensed collector to transport and dispose of the chemical wastes, to either the approved CWTC at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation	To monitor the generation, reuse and disposal of chemical waste	Contractor	All works sites	Construction phase	• Waste Disposal (Chemical Waste) (General) Regulation	N/A
S12.101	<b><i>General Refuse</i></b> General refuse shall be stored in enclosed bins or compaction units separate from C&D materials and chemical waste. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D materials and chemical wastes. Preferably, an enclosed and covered area shall be provided to reduce the occurrence of wind-blown light material.	properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	All works sites	Construction phase	-	*
S12.102	The recyclable component of general refuse, such as aluminum cans, paper and cleansed plastic containers shall be separated from other waste. Provision and collection of	facilitate recycling of recyclable portions of refuse	Contractor	All works sites	Construction phase	-	^



## SCL Works Contract 11227 - Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.						
S12.102	The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of materials generation. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders	raise workers' awareness on recycling issue	Contractor	All works sites	Construction phase	-	^

Remarks:    ^    Compliance of mitigation measure                      X    Non-compliance of mitigation measure

- Non-compliance but rectified by the contractor
- \*    Observation/reminder was made during site audit but improved/rectified by the contractor.
- #    Observation/reminder was made during site audit but not yet improved/rectified by the contractor.

N/A    Not Applicable

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**APPENDIX K  
WASTE GENERATION IN THE  
REPORTING MONTH**

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## Monthly Summary Waste Flow Table for Year 2014

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000m <sup>3</sup> )	('000kg)	('000kg)	('000kg)	('000kg)	('000m <sup>3</sup> )
August	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
September	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>October</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
November	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
December	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Total</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>

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**APPENDIX L  
CUMULATIVE LOG FOR COMPLAINT  
LOGS, NOTIFICATION OF SUMMONS  
AND SUCCESSFUL PROSECUTIONS**

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**Appendix L - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions****Cumulative Complaint Log**

Log Ref.	Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/ Mitigation Action	File Closed
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**Cumulative Log for Notifications of Summons**

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
--	--	--	--	--	--

**Cumulative Log for Successful Prosecutions**

Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since the commencement of the project
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