

MTR Corporation Limited

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

Monthly EM&A Report No. 17

[Period from 1 to 30 September 2015]

(October 2015)

Verified by: Fredrick Leong



Position: Independent Environmental Checker

Date: 12 October 2015

MTR Corporation Limited

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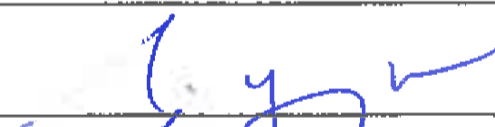

Certified by: Richard Kwan 

Position: Environmental Team Leader

Date: 12 October 2015

**MTR Corporation Limited****Consultancy Agreements  
No. C11033B****Shatin to Central Link - Hung Hom to  
Admiralty Section****Monthly EM&A Report No. 17**

[Period from 1 to 30 September 2015]

	Name	Signature
Prepared & Checked:	Joanne Tsoi	
Reviewed & Approved:	Josh Lam	

Version: A

Date: 12 October 2015

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AECOM Asia Co. Ltd.

8/F, Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong  
Tel: (852) 3922 9000 Fax: (852) 3922 9797 www.aecom.com

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## 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/B) was issued by Director of Environmental Protection (DEP) on 19 March 2015.

### 1.2 Project Programme

- 1.2.1 Six 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 2021<sup>1</sup>. 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
1121	NSL Cross Harbour Tunnels	March 2015	Penta-Ocean – China State JV	Cinotech Consultants Ltd. (Cinotech)
1123	Exhibition Station and Western Approach Tunnels	June 2015	Leighton – China State JV	AECOM Asia Co. Ltd.
1126 <sup>(1)</sup>	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	November 2014	Dragages Bouygues J.V.	AECOM Asia Co. Ltd.
1129 <sup>(2)</sup>	SCL – Advance Works for NSL	May 2014	Hsin Chong Construction Co. Ltd.	AECOM Asia Co. Ltd.
11227 <sup>(3)</sup>	Advance Works for NSL Cross Harbour Tunnels	August 2014	Concentric-Hong Kong River Joint Venture	Cinotech Consultants Ltd. (Cinotech)

Note:

- (1) Construction works under Works Contract 1126 was completed on 17 May 2015.  
 (2) Construction works under Works Contract 1129 was completed on 20 July 2015.  
 (3) Construction works in Victoria Harbour and Shek O Casting Basin under Works Contract 11227 were completed on 15 and 20 December 2014 respectively.

<sup>1</sup> The commissioning date of SCL(HUH-ADM) will very likely be deferred to 2021 to allow flexibility for the topside development of the Exhibition Station, and to cater for the construction works under other infrastructure projects on Hong Kong Island.

### **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 seventeenth 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 30 September 2015.

## 2 ENVIRONMENTAL MONITORING AND AUDIT

### 2.1 EM&A Results

2.1.1 The EM&A Report for Works Contracts 1128, 1121 and 1123 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
1121	Shek O	<ul style="list-style-type: none"> <li>• Site Formation in Shek O Casting Basin;</li> <li>• Construction of Shek O Barging Point;</li> <li>• Construction of Shek O Concrete Batching Plant;</li> <li>• Construction of IMT Bottom Plate at Shek O; and</li> <li>• Steel Formwork Erection.</li> </ul>
	Hung Hom Landfall	<ul style="list-style-type: none"> <li>• Installation of Pipe Pile Wall for Cofferdam; and</li> <li>• Ground Improvement Work ; and</li> <li>• Rock Breaking at IMT Element E1 Location.</li> </ul>
1123	Exhibition Station (PTI Area)	<ul style="list-style-type: none"> <li>• Utilities Diversion/ Protection</li> <li>• Provision of Temporary Footbridge</li> <li>• Demolition of Ferry Pier Footbridge</li> <li>• Prebored socket H-Piles (PBSH) &amp; King Post</li> <li>• Pipe Pile Wall Works</li> <li>• Diaphragm Wall Works</li> </ul>
	Western Approach Tunnel (WAT) Area A	<ul style="list-style-type: none"> <li>• Temporary Fire Escape Access for Hong Kong Convention and Exhibition Centre (HKCEC); and</li> <li>• Diaphragm Wall Works.</li> </ul>
1128	Area W1 (Reclamation Works Area)	<ul style="list-style-type: none"> <li>• ELS Works.</li> </ul>
	Area W2	<ul style="list-style-type: none"> <li>• Demolition, covered walkway, pre-drill, site setup</li> </ul>
	Area W3	<ul style="list-style-type: none"> <li>• Concrete cap for underpinning Hung Hing Flyover</li> <li>• Void filling for Causeway Flyover</li> <li>• High mast foundation</li> <li>• Pile removal setup</li> </ul>
	Area W4a (Canal Road box culvert)	<ul style="list-style-type: none"> <li>• Cutting for concrete slab</li> <li>• Underwater wire cutting for diversion</li> </ul>
	Area W4b (Canal Road flyover)	<ul style="list-style-type: none"> <li>• Column cutting and demolition of existing pile cap</li> </ul>
	Area W6 (Wan Shing Street)	<ul style="list-style-type: none"> <li>• Drilling for pile detection and future grouting.</li> </ul>
	Wan Chai Sports Ground (WCSG)	<ul style="list-style-type: none"> <li>• ABWF &amp; E&amp;M works of store and pump room</li> <li>• Rock Fissure Grouting</li> </ul>
	Area W8	<ul style="list-style-type: none"> <li>• Guide wall and Diaphragm wall construction</li> <li>• A/C pipe replacement work along Convention Avenue.</li> </ul>
	Area 14a & 14b	<ul style="list-style-type: none"> <li>• Setup site office</li> </ul>
	Lung King Street	<ul style="list-style-type: none"> <li>• Expose water main to study further diversion work for grouting</li> </ul>
Fleet Arcade	<ul style="list-style-type: none"> <li>• Handover and site formation</li> <li>• Demolition of part of tie beam</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. 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 1121<sup>(1)</sup></b>					
<b>Works Contract 1123</b>					
AM3	Existing Harbour Road Sports Centre <sup>(2)</sup>	10.9 – 37.0	169	260	No
<b>Works Contract 1123 and 1128</b>					
AM2	Wan Chai Sports Ground <sup>(3)(4)</sup>	20.3 – 51.4	160	260	No
<b>Works Contract 1128</b>					
AM4	Pedestrian Plaza	72.0 – 110.7	198	260	No

Note:

- (1) The setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out under Works Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by Works Contract 1121.
- (2) Dust monitoring at AM3 (Existing Harbour Road Sports Centre) was handed over from Works Contract 1126 to Works Contract 1123 in June 2015.
- (3) 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.
- (4) Dust monitoring at AM2 (Wan Chai Sports Ground) was handed over from Works Contract 1126 to Works Contract 1128 in April 2015. Upon the works area within Wanchai Sports Ground handed over to Works Contract 1123, the impact monitoring works would be taken up by Works Contract 1123.

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

Monitoring Station ID	Location	Noise Level ( $L_{Aeq,30mins}$ , dB(A))			Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
		Measured	Baseline	Corrected <sup>(1)</sup>		
<b>Works Contract 1121<sup>(2)</sup></b>						
<b>Works Contract 1123</b>						
NM2 <sup>(3)(4)(5)</sup>	Harbour Centre	63.8 – 69.5	69.6	< Baseline	75	No
<b>Work Contract 1128<sup>(6)</sup></b>						
NM1	Hoi Kung Court	69.2 – 71.0	71	< Baseline	75	No

Note:

- (1) The measured noise levels are corrected against the corresponding baseline noise levels.
- (2) No construction noise monitoring is required under Works Contract 1121.
- (3) The impact monitoring at NM2 was handed over from Works Contract 1126 to Works Contract 1123 in June 2015.
- (4) Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. Alternative noise monitoring location proposed at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014. Impact noise monitoring was carried out at Harbour Centre from 20 August 2014 onwards.
- (5) Impact noise monitoring has been carrying out on 7/F of Harbour Centre between 20 August and 15 December 2014, and on 8/F from 19 December 2014 onwards.



- (6) Noise monitoring at NM1 (Hoi Kung Court) was handed over from Works Contract 1129 to Works Contract 1128 in August 2015.

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

Locations	Parameters			
	Depth-averaged Dissolved Oxygen (mg/L)	Depth-averaged Turbidity (NTU)	Depth-averaged Suspended Solids (mg/L)	
<b>Shek O Casting Basin<sup>(2)</sup></b>				
<b>Victoria Harbour (Wet Season)<sup>(3)</sup></b>				
21	Mean	4.9	4.8	5.5
	Range	4.3 – 6.4	2.9 – 7.6	3.5 – 6.7
34	Mean	4.9	5.0	5.5
	Range	4.3 – 6.4	1.1 – 8.6	3.0 – 6.8
9	Mean	6.2	3.0	5.1
	Range	4.7 – 7.5	1.0 – 6.8	3.0 – 6.5
Action Level		2.8	11.3	6.9
Limit Level		2.7	17.2	9.1
Exceedance (Yes/No)		No	No	No
A	Mean	4.8	3.6	5.4
	Range	4.1 – 6.3	1.9 – 4.6	4.0 – 5.8
WSD17	Mean	5.0	3.9	4.9
	Range	3.9 – 6.9	2.4 – 4.5	3.3 – 5.8
WSD9	Mean	5.3	3.5	5.3
	Range	4.8 – 6.5	1.6 – 4.6	4.2 – 5.8
Action Level		<2.1	4.7	6.0
Limit Level		<2	6.5	6.0
Exceedance (Yes/No)		No	No	No
C1	Mean	5.1	3.9	4.9
	Range	4.2 – 6.7	0.9 – 4.6	3.3 – 5.7
C2	Mean	5.2	3.5	5.4
	Range	4.5 – 6.5	1.7 – 4.6	4.2 – 7.2

Notes:

- (1) Marine water quality monitoring was conducted in the reporting period under Works Contract 1121.  
(2) Removal of earth bunds at Shek O Casting Basin under Works Contract 1121 has not yet commenced in the reporting month, and thus no water quality monitoring was conducted during the reporting period.  
(3) Dredging / filling works within the Victoria Harbour commenced on 22 April 2015. Water Quality Monitoring at Station 8 and 14 is suspended as these water intakes are not in use.

2.1.4 One environmental complaint under Works Contract 1121 was received on 21 September 2015, concerning the marine organism and blocking particles found in the central air-conditioning system of a commercial building in Tsim Sha Tsui East. No notification of summons and successful prosecutions were received in the reporting period. Log for environmental complaints, notification of summons and successful prosecutions is provided in **Table 2.5**.

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

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions
	Reporting Month	Reporting Month	Reporting Month

<b>Works Contract</b>	<b>Environmental Complaints</b>	<b>Notification of Summons</b>	<b>Successful Prosecutions</b>
	<b>Reporting Month</b>	<b>Reporting Month</b>	<b>Reporting Month</b>
1121	1	0	0
1123	0	0	0
1128	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/B). 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/B)	Submission	Submission date
Condition 1.11	Notification of Commencement Date of Construction of the Project	19 Dec 2012
Condition 2.3	Notification of Setup of Community Liaison Group	3 Feb 2015
Condition 2.5	Management Organisation of Main Construction Companies	15 Apr 2015
Condition 2.6	Construction Programme and EP Submission Schedule	15 Apr 2015
Condition 2.7	Construction Noise Mitigation Measures Plan (CNMMP)	9 Jun 2014 (1 <sup>st</sup> Submission)
	Works Contract 1126: Construction Noise Mitigation Measures Plan (CNMMP)	24 Apr 2015 (1 <sup>st</sup> Submission) 7 Jul 2015 (2 <sup>nd</sup> Submission)
	Works Contract 1123: Construction Noise Mitigation Measures Plan (CNMMP)	
Condition 2.8	Continuous Noise Monitoring Plan (CNMP)	9 Jun 2014 (1 <sup>st</sup> Submission)
	Works Contract 1126: Continuous Noise Monitoring Plan (CNMP)	24 Apr 2015 (1 <sup>st</sup> Submission) 7 Jul 2015 (2 <sup>nd</sup> Submission)
	Works Contract 1123: Continuous Noise Monitoring Plan (CNMP)	
Condition 2.9	Construction and Demolition Materials Management Plan (C&DMMP)	6 Jul 2012 (1 <sup>st</sup> Submission) 12 Sep 2012 (2 <sup>nd</sup> Submission) 15 Oct 2012 (approved)
Condition 2.10	Works Contract 11227: Silt Curtain Deployment Plan for Trial Trenching in Victoria Harbour	11 Jul 2014
	Works Contract 1121: Silt Curtain Deployment Plan for Hung Hom Landfall and Trial Trench in Victoria Harbour	17 Feb 2015 (1 <sup>st</sup> Submission) 2 Apr 2015 (2 <sup>nd</sup> Submission)
Condition 2.11	Works Contract 11227: Silt Screen Deployment Plan	11 Jul 2014
	Works Contract 1121: Silt Screen Deployment Plan	13 Feb 2015
Condition 2.12	Sediment Management Plan	6 Jul 2012 (1 <sup>st</sup> Submission) 12 Sep 2012 (2 <sup>nd</sup> Submission) 5 Oct 2012 (3 <sup>rd</sup> Submission) 15 Oct 2012 (approved) 3 Jul 2014 (4 <sup>th</sup> Submission)
Condition 2.14	Visual, Landscape, Tree Planting & Tree Protection Plan	14 Nov 2012 (1 <sup>st</sup> Submission) 3 Dec 2013 (2 <sup>nd</sup> Submission) 21 Aug 2014 (3 <sup>rd</sup> Submission) 9 Feb 2015 (4 <sup>th</sup> Submission)
Condition 2.23.1	Works Contract 11227: Silt Curtain Deployment Plan for Shek O	23 Jul 2014 (1 <sup>st</sup> Submission) 31 Jul 2014 (approved)
	Works Contract 1121:	4 Feb 2015 (1 <sup>st</sup> Submission)

EP Condition (EP-436/2012/B)	Submission	Submission date
	Silt Curtain Deployment Plan for Shek O	4 Mar 2015 (2 <sup>nd</sup> Submission) 9 Mar 2015 (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 Sep 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 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 Sep 2014 (1 <sup>st</sup> Submission) 18 Dec 2014 (2 <sup>nd</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 - 15	Reported in previous Monthly EM&A Reports
	Final EM&A Review Report for Works Contract 11227	12 Feb 2015
	Final EM&A Review Report for Works Contract 1126	25 Jun 2015 (1 <sup>st</sup> Submission) 4 Sep 2015 (2 <sup>nd</sup> Submission)
	Monthly EM&A Report No.16	14 Sep 2015

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**Appendix A**

**Monthly EM&A Report for September 2015 – SCL Works  
Contract 1128 South Ventilation Building to Admiralty Tunnels**

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**Dragages Bouygues J.V.****Shatin to Central Link -  
Hung Hom to Admiralty Section****Works Contract 1128 -  
South Ventilation Building (SOV) to Admiralty Tunnels****Monthly EM&A Report for  
September 2015**

[October 2015]

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

Version: 0

Date: 9 October 2015

**Disclaimer**

This Environmental Monitoring and Audit Report is prepared for Dragages Bouygues J.V. and is given for its sole benefit in relation to and pursuant to SCL1128 and may not be disclosed to, quoted to or relied upon by any person other than Dragages Bouygues J.V. without our prior written consent. No person (other than Dragages Bouygues J.V. into whose possession a copy of this Manual comes may rely on this plan without our express written consent and Dragages Bouygues J.V. may not rely on it for any purpose other than as described above.

AECOM Asia Co. Ltd.

15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong  
Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com

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## EXECUTIVE SUMMARY

Shatin to Central Link Contract 1128 – South Ventilation Building (SOV) to Admiralty Tunnels (hereafter called “the Project”) covers part of the construction of the Shatin to Central Link (SCL).

The Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities.

The EM&A programme commenced on 17 November 2014. The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 30 September 2015. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> <li>• ELS Works</li> </ul>
Area W2	<ul style="list-style-type: none"> <li>• Demolition, covered walkway, pre-drill, site setup</li> </ul>
Area W3	<ul style="list-style-type: none"> <li>• Concrete cap for underpinning Hung Hing Flyover</li> <li>• Void filling for Causeway Flyover</li> <li>• High mast foundation</li> <li>• Pile removal setup</li> </ul>
Area W4a	<ul style="list-style-type: none"> <li>• Cutting for concrete slab</li> <li>• Underwater wire cutting for diversion</li> </ul>
Area W4b	<ul style="list-style-type: none"> <li>• Column cutting and demolition of existing pile cap</li> </ul>
Area W6	<ul style="list-style-type: none"> <li>• Drilling for pile detection and future grouting</li> </ul>
Wan Chai Sports Ground (WCSG)	<ul style="list-style-type: none"> <li>• ABWF &amp; E&amp;M works of store and pump room</li> <li>• Rock Fissure Grouting</li> </ul>
Area W8	<ul style="list-style-type: none"> <li>• Guide wall and Diaphragm wall construction</li> <li>• A/C pipe replacement work along Convention Avenue</li> </ul>
Area 14a & 14b	<ul style="list-style-type: none"> <li>• Setup site office</li> </ul>
Lung King Street	<ul style="list-style-type: none"> <li>• Expose water main to study further diversion work for grouting</li> </ul>
Fleet Arcade	<ul style="list-style-type: none"> <li>• Handover and site formation</li> <li>• Demolition of part of tie beam</li> </ul>

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

No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

### Breaches of Action and Limit Levels for Noise

Noise monitoring was handed-over from SCL Contract 1129 in August 2015.

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:-

<b>Location</b>	<b>Site Activities</b>
Area W1	<ul style="list-style-type: none"> <li>• Shaft Construction</li> <li>• Shaft Excavation,</li> <li>• Ground Treatment</li> </ul>
Area W2	<ul style="list-style-type: none"> <li>• Site Clearance</li> <li>• Demolition</li> <li>• Hoarding Erection</li> </ul>
Area W3	<ul style="list-style-type: none"> <li>• Preparation Work for the Underpinning of Hung Hing Flyover/ Causeway Flyover</li> <li>• Advance Work for Pile Removal</li> <li>• High Mast Construction</li> <li>• Void Filling</li> </ul>
Area W4a	<ul style="list-style-type: none"> <li>• Culvert Diversion Works</li> <li>• Wall Panel Removal</li> </ul>
Area W4b	<ul style="list-style-type: none"> <li>• Underpinning of Canal Road Flyover</li> <li>• Erection of steel frame</li> <li>• Load Transfer</li> <li>• Cutting of Columns</li> </ul>
Area W6	<ul style="list-style-type: none"> <li>• Trial Pit for left in Sheetpile</li> <li>• TTMS implementation</li> <li>• Drilling Work for pile detection</li> </ul>
Wan Chai Sports Ground (WCSG)	<ul style="list-style-type: none"> <li>• Fissure Grouting</li> <li>• Demolition of Existing Pump room &amp; Store Room</li> </ul>
Area W8	<ul style="list-style-type: none"> <li>• Utilities Expose/ Diversion</li> <li>• D-Wall Construction</li> <li>• SVB Vertical Grouting</li> <li>• D-wall Stage 2</li> <li>• Predrilling of D-wall</li> </ul>
Area 14a & 14b	<ul style="list-style-type: none"> <li>• Pedestrian Walkway &amp; Trial Pit</li> <li>• Site Facilities Erection</li> </ul>
Lung King Street	<ul style="list-style-type: none"> <li>• Expose existing utilities above the culvert</li> </ul>
Area W17	<ul style="list-style-type: none"> <li>• GI Work</li> <li>• Pile Detection</li> </ul>

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

## **1 INTRODUCTION**

Dragages Bouygues J.V. (JV) was commissioned by MTR as the Civil Contractor for Works Contract 1128. AECOM Asia Company Limited (AECOM) was appointed by JV 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 eleventh monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period from 1 to 30 September 2015.

### **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) was subsequently applied and the latest EP (EP No. EP-436/2012/B) was issued by the Director of Environmental Protection (DEP) on 19 March 2015.
- 2.1.3 The construction of the SCL is divided into different civil construction works contracts and the Project comprises the Permanent Works and the associated temporary works necessary for TBM tunnels between SOV and Admiralty Tunnels, short sections of cut and cover tunnels near SOV and Fenwick Pier Emergency Egress Point (FPP), Re-provisioning, Remedial and Improvement Works (RRIW) for government and public bodies facilities under the EP.
- 2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

### 2.2 Site Description

- 2.2.1 The major construction activities under Works Contract 1128 include:
- (a) Taking over the 160m section of the SCL tunnels (ME4 Tunnel) constructed under the Central Wan Chai Bypass (CWB) project and construction of walkways, sealing, connection and various finishing works inside the tunnels;
  - (b) Construction of cut and cover tunnels connecting from South Ventilation Building (SOV) to the ME4 Tunnel;
  - (c) Removal of temporary reclamation and reinstatement of seawall;
  - (d) Construction of SOV;
  - (e) Bored tunnels between SOV and Exhibition Station (EXH);
  - (f) Construction of cut and cover tunnels connecting from the SCL tunnels under Convention Avenue by Contract 1123 to the bored tunnels as stated in sub-clause
  - (g) Construction of Fenwick Pier Emergency Egress Point (FPP);
  - (h) Bored tunnels between Fenwick Pier Emergency Egress Point (FPP) and Admiralty Station (ADM);
  - (i) Pile/obstruction detections and removals for construction of SCL running tunnels and for future North Island Line (NIL) running tunnels;
  - (j) Demolition of existing Police Officer's Club (POC);
  - (k) Re-provisioning of new POC;
  - (l) Other RRIW;
  - (m) Essential piling works at future Government, Institution and Community (GIC) site
  - (n) Diversion and modification of utilities and services;
  - (o) Modification, re-provisioning or reinstatement of footpath, carriageway or road features;
  - (p) Provisions for Designated and Interfacing Contracts;
  - (q) Tree felling, tree compensation, transplanting works and landscaping works;
  - (r) Permanent re-provisioning works at the Fleet Arcade;
  - (s) Miscellaneous signage; and
  - (t) External works comprising new and reinstated roads, footpaths, drains, landscaping, staircase, street furniture and the like.

## 2.3 Construction Programme and Activities

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

Location	Site Activities
Area W1	<ul style="list-style-type: none"> <li>• ELS Works</li> </ul>
Area W2	<ul style="list-style-type: none"> <li>• Demolition, covered walkway, pre-drill, site setup</li> </ul>
Area W3	<ul style="list-style-type: none"> <li>• Concrete cap for underpinning Hung Hing Flyover</li> <li>• Void filling for Causeway Flyover</li> <li>• High mast foundation</li> <li>• Pile removal setup</li> </ul>
Area W4a	<ul style="list-style-type: none"> <li>• Cutting for concrete slab</li> <li>• Underwater wire cutting for diversion</li> </ul>
Area W4b	<ul style="list-style-type: none"> <li>• Column cutting and demolition of existing pile cap</li> </ul>
Area W6	<ul style="list-style-type: none"> <li>• Drilling for pile detection and future grouting</li> </ul>
Wan Chai Sports Ground (WCSG)	<ul style="list-style-type: none"> <li>• ABWF &amp; E&amp;M works of store and pump room</li> <li>• Rock Fissure Grouting</li> </ul>
Area W8	<ul style="list-style-type: none"> <li>• Guide wall and Diaphragm wall construction</li> <li>• A/C pipe replacement work along Convention Avenue</li> </ul>
Area 14a & 14b	<ul style="list-style-type: none"> <li>• Setup site office</li> </ul>
Lung King Street	<ul style="list-style-type: none"> <li>• Expose water main to study further diversion work for grouting</li> </ul>
Fleet Arcade	<ul style="list-style-type: none"> <li>• Handover and site formation</li> <li>• Demolition of part of tie beam</li> </ul>

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
JV	Contractor	Project Director	Mr. Alain Hervio	6112 9197	2171 3715
		Environmental Manager	Mr. Marcus Cheung	6628 2685	
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		
<b>Environmental Permit</b>				
EP-436/2012/B	19-Mar-15	-	Valid	-
<b>Construction Noise Permit</b>				
GW-RS0210-15	09-Mar-15	08-Sep-15	Valid	Lung King Street near DSD Screening Plant (W14)
GW-RS0211-15	02-Mar-15	01-Sep-15	Valid	An area near Lung King Street and Convention Avenue (W8)
GW-RS0263-15	16-Mar-15	15-Sep-15	Valid	Works Area at Junction of Tonnochy Road (WCSG)
GW-RS0392-15	12-Apr-15	11-Oct-15	Valid	An area near Lung King Street and Convention Avenue (W8) – Grouting
GW-RS0557-15	29-May-15	15-Oct-15	Valid	Victoria Park Road near Police Officer Club (W1) – PME change for the working area
GW-RS0519-15	01-Jun-15	30-Nov-15	Valid	Former Tunnel Approach Rest Garden (W4)
GW-RS0582-15	01-Jun-15	01-Sep-15	Valid	Works Area at Junction of Tonnochy Road (WCSG) – Track Grouting
GW-RS0616-15	14-Jun-15	15-Oct-15	Valid	Victoria Park Road near Police Officer Club (W1) – Soft Excavation
GW-RS0708-15	1-Jul-15	30-Sep-15	Valid	An area near Lung King Street and Convention Avenue (W8) – Trial Grouting
GW-RS0766-15	10-Jul-15	7-Jan-16	Valid	An area near Lung King Street and Convention Avenue (W8) – Grouting (Renewal for CNP GW-RS0497-15)
GW-RS0788-15	24-Jul-15	18-Sep-15	Valid until superseded by GW-RS0953-15 on 3-Sep-15	Section of Wan Shing Street between Wan Ying Street and Hung Hing Road (W6) – Ground Investigation
GW-RS0798-15	24-Jul-15	30-Sep-15	Valid	Works Area at Junction of Tonnochy Road (WCSG) - E&M Storage Room
GW-RS0810-15	1-Aug-15	1-Jan-16	Valid	An area of Tunnel Approach Rest Garden near Hung Hing Road Flyover (W3)
GW-RS0746-15	3-Aug-15	3-Nov-15	Valid	Victoria Park Road near Police Officer Club (W2)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
GW-RS0860-15	17-Aug-15	30-Sep-15	Valid until superseded by GW-RS0993-15 on 17- Sep-15	Gloucester Road near Hung Hing Road (W4) – Special Case for night-time work for Pier Cutting Works at Canal Road Flyover
GW-RS0953-15	3-Sep-15	14-Nov-15	Valid until superseded by GW-RS0991-15 on 11-Sep-15	Section of Wan Shing Street between Wan Ying Street and Hung Hing Road (W6) – Ground Investigation
GW-RS0930-15	8-Sep-15	7-Mar-16	Valid	An Area near Lung King Street
GW-RS0991-15	11-Sep-15	14-Nov-15	Valid	Section of Wan Shing Street between Wan Ying Street and Hung Hing Road (W6) – Ground Investigation
GW-RS0993-15	17-Sep -15	31-Oct-15	Valid	Gloucester Road near Hung Hing Road (W4) – Special Case for night-time work for Pier Cutting Works at Canal Road Flyover
GW-RS0996-15	17-Sep-15	14-Mar-16	Valid	Lung King Street near DSD Screening Plant (W14)
GW-RS1029-15	23-Sep-15	20-Mar-16	Valid	Works Area at Junction of Tonnochy Road (WCSG)
GW-RS1026-15	24-Sep-15	7-Oct-15	Valid	Works Area at Convention Avenue near HK Convention & Exhibition Centre – Reinstatement of cooling main
<b>Wastewater Discharge License</b>				
WT00020512-2014	09-Dec-14	31-Dec-19	Valid	Victoria Park Road near Police Officer Club (POC) (W1)
WT00020473-2014	09-Dec-14	31-Dec-19	Valid	Gloucester Road near Hung Hing Road (W4)
WT00020474-2014	09-Dec-14	31-Dec-19	Valid	Wang Shing Street (W6)
WT00020595-2014	22-Dec-14	31-Dec-19	Valid	Junction of Tonnochy Road and Hung Hing Road near Wan Chai Sports Ground
WT00020896-2015	24-Mar-15	31-Mar-20	Valid	Junction of Lung King Street and Convention Avenue (W8)
WT00021519-2015	04-May-15	31-May-20	Valid	Between Percival Street Footbridge and Hung Hing Road Flyover (W3)
WT00021896-2015	18-Jun-15	31-Dec-19	Valid	Lung King Street near DSD Screening Plant (W14) Works area divided into two area
WT00022596-2015	22-Sep-15	30-Sep-20	Valid	Gloucester Road near Marsh Road Station Building (W5)
<b>Chemical Waste Producer Registration</b>				
5213-135-D2551-01	16-Dec-14	End of the Project	Valid	Gloucester Road near Hung Hing Road (W4)

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
5213-134-D2552-01	16-Dec-14	End of the Project	Valid	Lung King Street near DSD Screening Plant (W14)
5111-151-D2552-02	05-Jan-15	End of the Project	Valid	Victoria Park Road near POC (W1)
<b><i>Billing Account for Construction Waste Disposal</i></b>				
7020686	15-Sep-14	End of Contract	Valid	For disposal of C&D waste to public fills and landfills
<b><i>Notification Under Air Pollution Control (Construction Dust) Regulation</i></b>				
378806	02-Sep-14	End of Contract	Valid	For Wan Chai, Causeway Bay, Hong Kong Island
380227	07-Oct-14	End of Contract	Valid	For Gloucester Road near Cross Harbour Tunnel
380228	07-Oct-14	End of Contract	Valid	Near Convention Avenue and Fenwick Pier Street, HK Island



**3 ENVIRONMENTAL MONITORING REQUIREMENTS**

**3.1 Construction Dust Monitoring**

**Monitoring Requirements**

3.1.1 In accordance with the approved EM&A Manuals, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

**Monitoring Equipment**

3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual. Brand and model of the equipment is given in **Table 3.1**.

**Table 3.1 Air Quality Monitoring Equipment**

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10273 and S/N:809))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0843))

**Monitoring Locations**

3.1.3 Two monitoring station were set up at the proposed location in accordance with the approved EM&A Manuals for SCL(HUH-ADM) as well as the works areas of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

**Table 3.2 Locations of Construction Dust Monitoring Station**

ID	Air Sensitive Receiver (ASR) ID in EIA Report	Dust Monitoring Station
AM2*	EXA6	Wanchai Sports Ground
AM4	EXA4	Pedestrian Plaza

\* The monitoring station at AM2 was handed-over from Contract SCL1126 in April 2015.

**Monitoring Methodology**

3.1.4 24-hour TSP Monitoring

- (a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable:-
  - (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
  - (ii) Two samplers should not be placed less than 2m apart from each others;
  - (iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
  - (iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
  - (v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
  - (vi) No furnace or incinerator flues nearby.
  - (vii) Airflow around the sampler was unrestricted.
  - (viii) The sampler was located more than 20 meters from any dripline.
  - (ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.

- (x) Permission was obtained to set up the samplers and access to the monitoring station.
  - (xi) A secured supply of electricity was obtained to operate the sampler.
- (b) Preparation of Filter Papers
- (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
  - (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than  $\pm 3$  °C; the relative humidity (RH) was < 50% and not variable by more than  $\pm 5$ %. A convenient working RH was 40%.
  - (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.
- (c) Field Monitoring
- (i) The power supply was checked to ensure the HVS works properly.
  - (ii) The filter holder and the area surrounding the filter were cleaned.
  - (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
  - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
  - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
  - (vi) Then the shelter lid was closed and was secured with the aluminium strip.
  - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
  - (viii) A new flow rate record sheet was set into the flow recorder.
  - (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m<sup>3</sup>/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m<sup>3</sup>/min).
  - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
  - (xi) The initial elapsed time was recorded.
  - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
  - (xiii) The final elapsed time was recorded.
  - (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
  - (xv) It was then placed in a clean envelope and sealed.
  - (xvi) All monitoring information was recorded on a standard data sheet.
  - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
  - (ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
  - (iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

### ***Monitoring Schedule for the Reporting Month***

3.1.5 The schedule for environmental monitoring in September 2015 is provided in **Appendix F**.

### 3.2 Construction Noise Monitoring

#### **Monitoring Requirements**

- 3.2.1 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 3.3** 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 3.3 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**

- 3.2.2 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 3.4 Noise Monitoring Equipment for Regular Noise Monitoring**

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. B&K2238 (S/N: 2285692), (S/N: 2800927))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223))

#### **Monitoring Locations**

- 3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.4** and shown in **Figure 3.1**.

**Table 3.5 Noise Monitoring Station during Construction Phase**

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

\* The noise monitoring at NM1 was handed-over from SCL Contract 1129 in August 2015.

#### **Monitoring Methodology**

##### 3.2.4 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<sub>eq(30-minutes)</sub> 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.

### 3.2.5 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***

3.2.6 The schedule for environmental monitoring in September 2015 is provided in **Appendix F**.

## **3.3 Landscape and Visual**

3.3.1 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/B)	Monthly EM&A Report for August 2015	14 September 2015

## 5 MONITORING RESULTS

### 5.1 Construction Dust Monitoring

5.1.1 The monitoring results for 24-hour TSP are summarised in **Table 5.1**. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

**Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period**

ID	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
AM2	31.3	20.3 – 51.4	160	260
AM4	94.6	72.0 – 110.7	198	260

5.1.2 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring location in the reporting month.

5.1.3 The event and action plan is annexed in **Appendix H**.

5.1.4 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

### 5.2 Construction Noise Monitoring

5.2.1 Noise monitoring at NM1 was handed over from SCL Contract 1129 in August 2015.

5.2.2 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

**Table 5.2 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	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.

5.2.3 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.

5.2.4 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

5.2.5 The event and action plan is annexed in **Appendix I**.

5.2.6 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

### 5.3 Waste Management

- 5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.
- 5.3.2 As advised by the Contractor 4,342.9m<sup>3</sup> of inert C&D material was generated (3,220m<sup>3</sup> was disposed of as fill bank at TKO137, 2.8m<sup>3</sup> disposed of at TKO137SF, 8.0m<sup>3</sup> disposed of fill bank at TM38 and 1112.0m<sup>3</sup> disposed of as public fill at CWPFBP) in the reporting month. 90.6m<sup>3</sup> 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 K**.
- 5.3.3 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.
- 5.3.4 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 Practise on the Packaging, Labelling and Storage of Chemical Wastes.

### 5.4 Landscape and Visual

- 5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 14 and 29 September 2015. 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, 4 site inspections were carried out on 7, 14, 21 and 29 September 2015. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 14 September 2015. 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
Air Quality	31 Aug 15	<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to cover the cement mixing facility on the top and the 3-sides by impervious sheeting entirely during operation at W1.</li> </ul>	The item was rectified by the Contractor on 2 Sep 15.
	14 Sep 15	<ul style="list-style-type: none"> <li>The exposed surface of works area W1 and W8 was observed dry. The Contractor should water the exposed works area timely for dust suppression.</li> <li>Reminder: White smoke was emitted from the water pump of the drill at W1. The Contractor was reminded to properly maintain the machine.</li> </ul>	The item was rectified by the Contractor on 18 Sep 15.
Noise	Nil	Nil	Nil
Water Quality	Nil	Nil	Nil
Waste/ Chemical Management	31 Aug 15	<ul style="list-style-type: none"> <li>Oil drum placed on ground without drip tray was observed at W4. The Contractor should store the oil drum with drip tray to retain leakage, if any.</li> </ul>	The item was rectified by the Contractor on 2 Sep 15.
	7 Sep 15	<ul style="list-style-type: none"> <li>Chemical containers placed on ground without drip tray was observed at WCSG and W14. The Contractor should store the chemical containers with drip tray to retain leakage, if any.</li> <li>Reminder: The Contractor was reminded to remove the water mixture which accumulated inside the drip tray at W8 and dispose of as chemical waste properly.</li> </ul>	The item was rectified by the Contractor on 11 Sep 15.
	14 Sep 15	<ul style="list-style-type: none"> <li>Chemical containers were observed on ground at W2 and WCSG. The Contractor should store the chemical containers with drip tray to retain leakage, if any.</li> </ul>	The item was rectified by the Contractor on 18 Sep 15.
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

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 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.
- 7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 7.1.3 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 J**.

### **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 J**.

## 8 FUTURE KEY ISSUES

### 8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between October 2015 and December 2015 will be:

Location	Site Activities
Area W1	<ul style="list-style-type: none"> <li>• Shaft Construction</li> <li>• Shaft Excavation,</li> <li>• Ground Treatment</li> </ul>
Area W2	<ul style="list-style-type: none"> <li>• Site Clearance</li> <li>• Demolition</li> <li>• Hoarding Erection</li> </ul>
Area W3	<ul style="list-style-type: none"> <li>• Preparation Work for the Underpinning of Hung Hing Flyover/ Causeway Flyover</li> <li>• Advance Work for Pile Removal</li> <li>• High Mast Construction</li> <li>• Void Filling</li> </ul>
Area W4a	<ul style="list-style-type: none"> <li>• Culvert Diversion Works</li> <li>• Wall Panel Removal</li> </ul>
Area W4b	<ul style="list-style-type: none"> <li>• Underpinning of Canal Road Flyover</li> <li>• Erection of steel frame</li> <li>• Load Transfer</li> <li>• Cutting of Columns</li> </ul>
Area W6	<ul style="list-style-type: none"> <li>• Trial Pit for left in Sheetpile</li> <li>• TTMS implementation</li> <li>• Drilling Work for pile detection</li> </ul>
Wan Chai Sports Ground (WCSG)	<ul style="list-style-type: none"> <li>• Fissure Grouting</li> <li>• Demolition of Existing Pump room &amp; Store Room</li> </ul>
Area W8	<ul style="list-style-type: none"> <li>• Utilities Expose/ Diversion</li> <li>• D-Wall Construction</li> <li>• SVB Vertical Grouting</li> <li>• D-wall Stage 2</li> <li>• Predrilling of D-wall</li> </ul>
Area 14a & 14b	<ul style="list-style-type: none"> <li>• Pedestrian Walkway &amp; Trial Pit</li> <li>• Site Facilities Erection</li> </ul>
Lung King Street	<ul style="list-style-type: none"> <li>• Expose existing utilities above the culvert</li> </ul>
Area W17	<ul style="list-style-type: none"> <li>• GI Work</li> <li>• Pile Detection</li> </ul>

### 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 Three Month

8.3.1 The tentative schedules for environmental monitoring in between October 2015 and December 2015 are provided in **Appendix F**.

## 9 CONCLUSIONS AND RECOMMENDATIONS

### 9.1 Conclusions

- 9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.
- 9.1.2 All 24-hour TSP monitoring result complied with the Action / Limit Level at in the reporting month.
- 9.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.5 4 nos. of environmental site inspections were carried out in September 2015. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 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

- No specific observation was identified in the reporting month.

#### Chemical and Waste Management

- Provide proper chemical and waste handling management.

#### Landscape & Visual Impact

- No specific observation was identified in the reporting month.

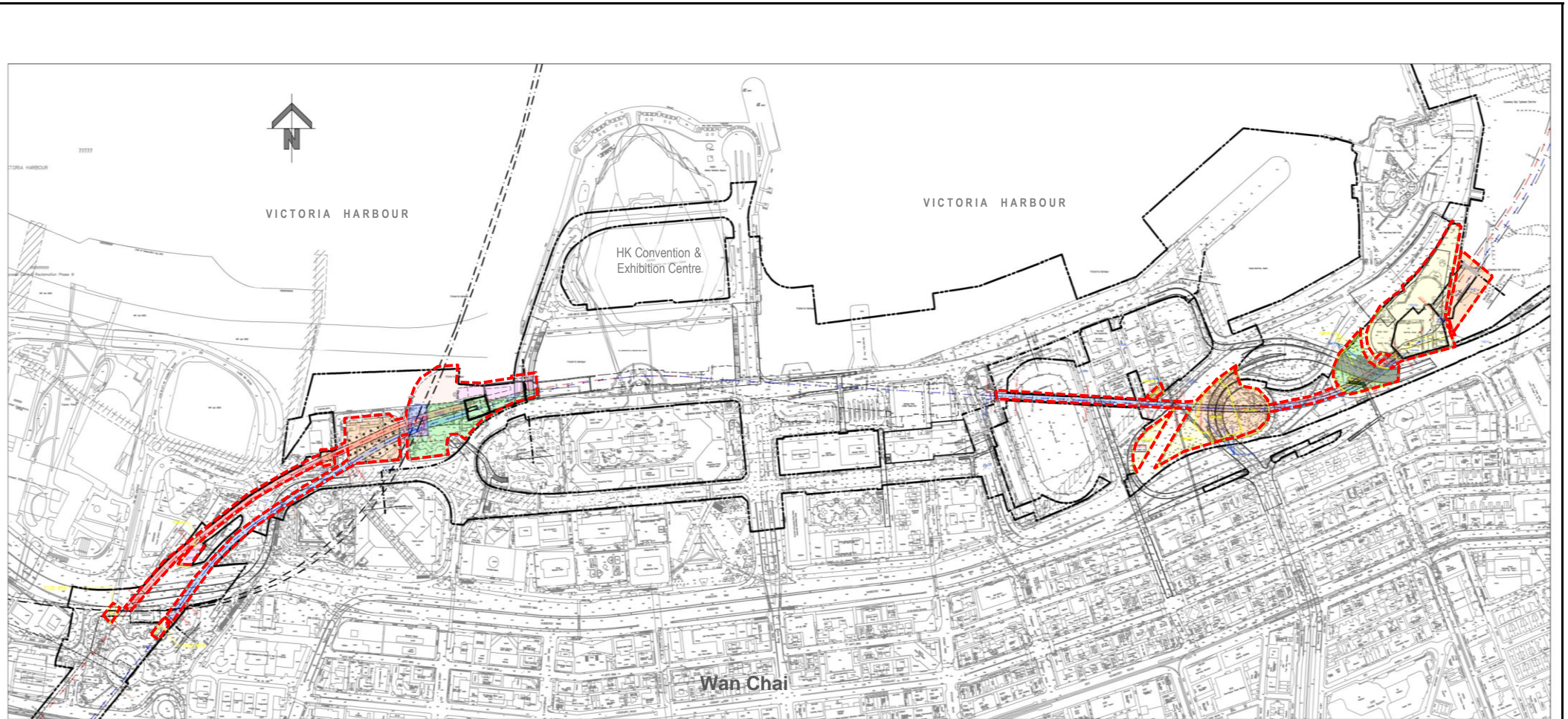
#### Permits/licenses

- No specific observation was identified in the reporting month.

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## FIGURES

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 Site Alignment

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**SCL Contract 1128**  
**South Ventilation Building to Admiralty Tunnels**

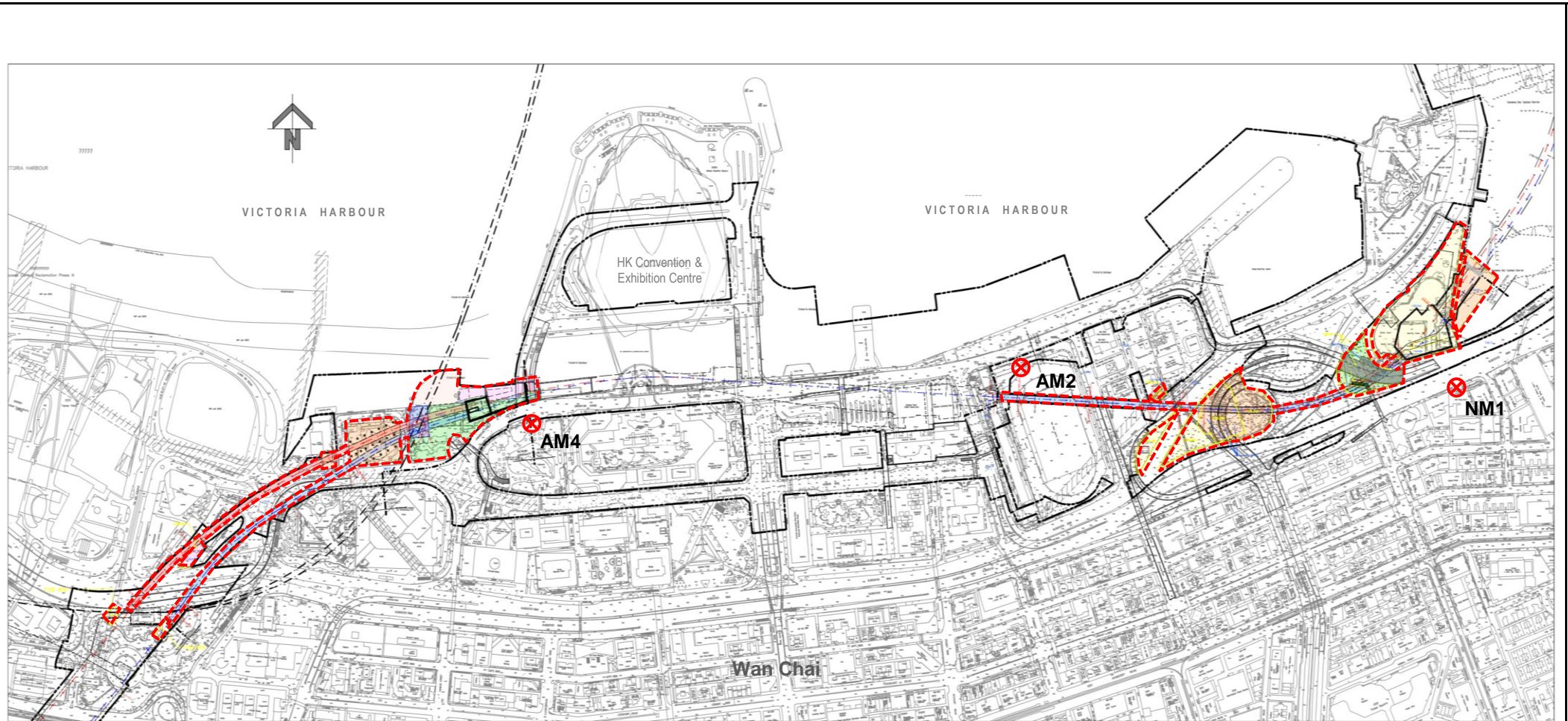


**SITE LAYOUT PLAN of SCL1128**

Project No.: 60331173

Date: December 2014

Figure 1.1



- Site Alignment
- ⊗ Monitoring Location

\* The noise monitoring at NM1 was handed-over from SCL1129 in August 2015.

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**SCL Contract 1128**  
**South Ventilation Building to Admiralty Tunnels**

**Air Quality and Noise Monitoring Locations**



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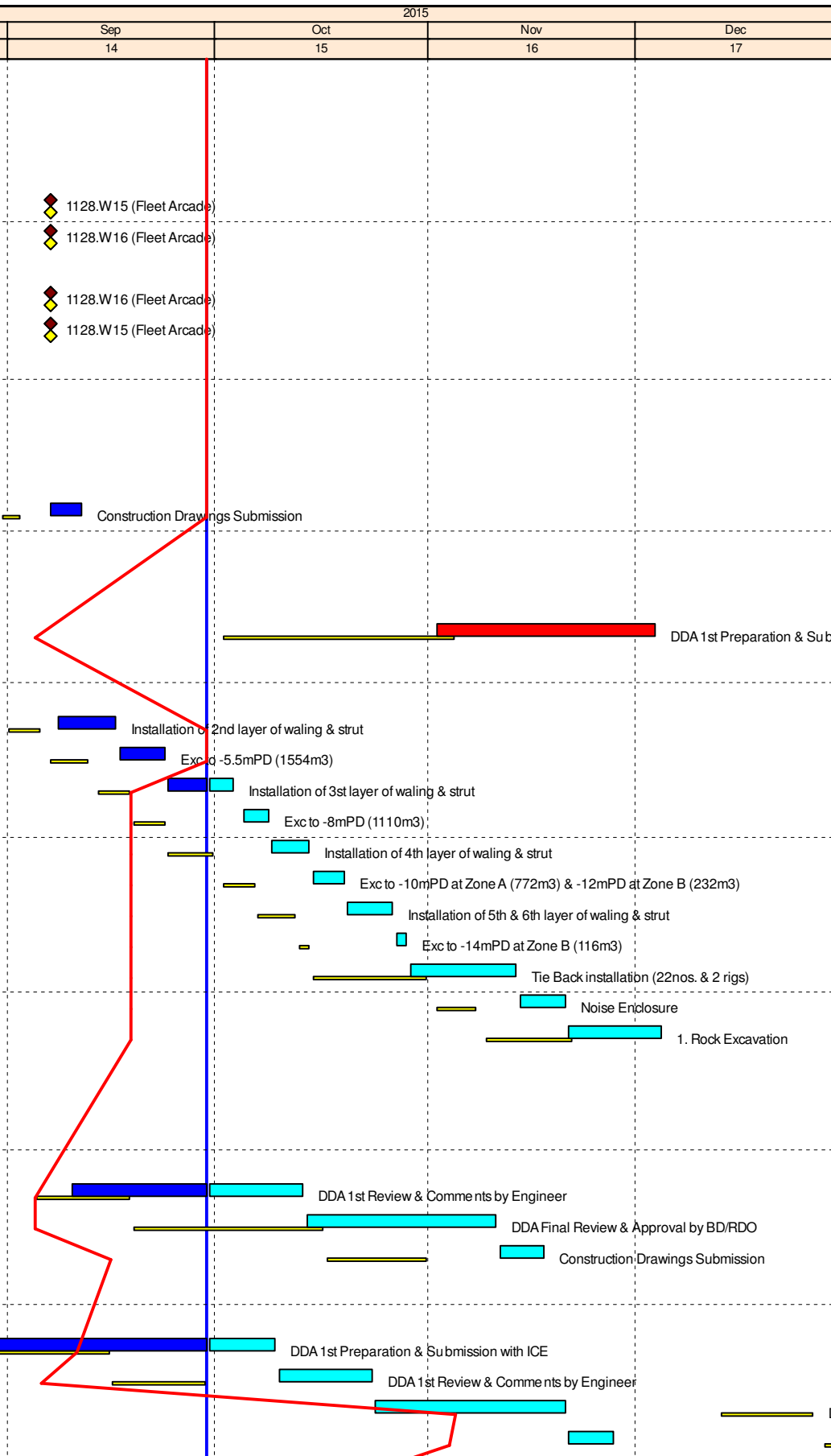
**APPENDIX A**

**Construction Programme**

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DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2015				
							Sep 14	Oct 15	Nov 16	Dec 17	
<b>SCL 1128 - SOV to Admiralty Tunnel_3 Month Rolling Programme (Sep-15)</b>											
<b>Contract Dates</b>											
<b>Schedule of Access Dates for Works Areas</b>											
<b>Early Possession Date/ Access Date</b>											
01128.EAD310	1128.W15 (Fleet Arcade)	0	07-Sep-15A		100%	0					
01128.EAD320	1128.W16 (Fleet Arcade)	0	07-Sep-15A		100%	0					
<b>Late Possession Date/ Access Date</b>											
01128.LAD320	1128.W16 (Fleet Arcade)	0	07-Sep-15A		100%	0					
01128.LAD310	1128.W15 (Fleet Arcade)	0	07-Sep-15A		100%	0					
<b>Cost Centre B - Cut &amp; Cover Tunnel to SOV (Advance Shaft)</b>											
<b>Design Submission</b>											
<b>Advance Launch Shaft at Area W1 (Alternative Scheme)</b>											
<b>Temporary ELS - Part 2 Strutting Design</b>											
<b>DDA</b>											
01128.BDS00240	Construction Drawings Submission	3	07-Sep-15A	11-Sep-15 A	100%	0					
<b>C&amp;C Tunnel in Advance Launch Shaft at Area W1 (Alternative Scheme)</b>											
<b>Vent. Duct</b>											
<b>DDA</b>											
01128.BDS00380	DDA 1st Preparation & Submission with ICE	28	02-Nov-15*	03-Dec-15	0%	28					
<b>D.Wall &amp; Excavation</b>											
<b>Excavation</b>											
01128.CCB00230	Installation of 2nd layer of waling & strut	5	08-Sep-15A	16-Sep-15 A	100%	0					
01128.CCB00240	Exc to -5.5mPD (1554m3)	5	17-Sep-15A	23-Sep-15 A	100%	0					
01128.CCB00250	Installation of 3rd layer of waling & strut	5	24-Sep-15A	03-Oct-15	80%	3					
01128.CCB00260	Exc to -8mPD (1110m3)	4	05-Oct-15	08-Oct-15	0%	4					
01128.CCB00270	Installation of 4th layer of waling & strut	5	09-Oct-15	14-Oct-15	0%	5					
01128.CCB00280	Exc to -10mPD at Zone A (772m3) & -12mPD at Zone B (232m3)	4	15-Oct-15	19-Oct-15	0%	4					
01128.CCB00290	Installation of 5th & 6th layer of waling & strut	5	20-Oct-15	26-Oct-15	0%	5					
01128.CCB00450	Exc to -14mPD at Zone B (116m3)	2	27-Oct-15	28-Oct-15	0%	2					
01128.CCB00300	Tie Back installation (22nos. & 2 rigs)	14	29-Oct-15	13-Nov-15	0%	14					
01128.CCB00310	Noise Enclosure	6	14-Nov-15	20-Nov-15	0%	6					
01128.CCB00320	1. Rock Excavation	12	21-Nov-15	04-Dec-15	0%	12					
<b>Cost Centre C - South Ventilation Building (SOV)</b>											
<b>Design Submission</b>											
<b>Temporary ELS - Part 1 D.Wall</b>											
<b>DDA</b>											
01128.CDS00050	DDA 1st Review & Comments by Engineer	14	10-Sep-15A	13-Oct-15	50%	14					
01128.CDS00110	DDA Final Review & Approval by BD/RDO	28	14-Oct-15	10-Nov-15	0%	28					
01128.CDS00120	Construction Drawings Submission	6	11-Nov-15	17-Nov-15	0%	6					
<b>Temporary ELS - Part 2 Strutting Design</b>											
<b>DDA</b>											
01128.CDS00160	DDA 1st Preparation & Submission with ICE	28	14-Aug-15A	09-Oct-15	50%	8					
01128.CDS00170	DDA 1st Review & Comments by Engineer	14	10-Oct-15	23-Oct-15	0%	14					
01128.CDS00230	DDA Final Review & Approval by BD/RDO	28	24-Oct-15	20-Nov-15	0%	28					
01128.CDS00240	Construction Drawings Submission	6	21-Nov-15	27-Nov-15	0%	6					



- Last month's forecast
- Critical Activity
- Actual Work
- ◆ Baseline Milestone
- Non Critical Activity
- ◆ Milestone

11283MRP150930

SCL 1128 - SOV to Admiralty Tunnels  
3 Month Rolling Programme (Data Date: 30-Sep-15)

1128			
Date	Revision	Checked	Approved
30-Sep-15	1128 - 3MRP		



DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2015			
							Sep 14	Oct 15	Nov 16	Dec 17
<b>Foundation, Excavation &amp; Structure</b>										
<b>Piling works for SOV</b>										
<b>Bowling Green area</b>										
01128.CCC00050	Pre-drilling (8nos, 4d/rig x 2) (24nos piles)	16	14-Sep-15A	19-Oct-15	8%	16	Pre-drilling (8nos, 4d/rig x 2) (24nos piles)			
01128.CCC00060	1. Pre-bored H-pile	12	09-Nov-15*	21-Nov-15	0%	12	1. Pre-bored H-pile			
01128.CCC000100	2. Pre-bored H-pile	12	23-Nov-15	05-Dec-15	0%	12	2. Pre-bored H-pile			
<b>POC Lower Level area (GL1-7/T-W)</b>										
01128.CCC00070	Pre-drilling (8nos, 4d/rig x 2) (23nos piles) (after Lower level demolish)	16	03-Nov-15	20-Nov-15	0%	16	Pre-drilling (8nos, 4d/rig x 2) (23nos piles)			
01128.CCC00080	Pre-bored H-pile (23nos, 3d/rig x 3)	23	23-Nov-15	18-Dec-15	0%	23	Pre-bored H-pile (23nos, 3d/rig x 3)			
<b>POC Main area</b>										
01128.CCC00090	Pre-drilling (14nos, 4d/rig x 3) (43nos piles) (after POC demolish)	19	21-Nov-15	12-Dec-15	0%	19	Pre-drilling (14nos, 4d/rig x 3) (43nos piles)			
<b>Cofferdam</b>										
<b>Bowling Green &amp; Swimming Pool area</b>										
01128.CCC00130	Pre-drilling (14nos, 4d/rig x 3)	12	14-Aug-15A	30-Oct-15	14%	25	Pre-drilling (14nos, 4d/rig x 3)			
01128.CCC00140	Pretreatment Seawall/Guide Wall (10m/d)	12	26-Oct-15*	09-Nov-15	0%	12	Pretreatment Seawall/Guide Wall (10m/d)			
<b>Cost Centre D - SOV to EXH TBM Tunnels</b>										
<b>Design Submission</b>										
<b>Thrust Frame and Base Slab Design for Launching</b>										
<b>DDA</b>										
01128.DDS00400	DDA 1st Preparation & Submission with ICE	28	03-Aug-15A	09-Oct-15	90%	8	DDA 1st Preparation & Submission with ICE			
01128.DDS00410	DDA 1st Review & Comments by Engineer	14	10-Oct-15	23-Oct-15	0%	14	DDA 1st Review & Comments by Engineer			
01128.DDS00470	DDA Final Review & Approval by BD/RDO	28	24-Oct-15	20-Nov-15	0%	28	DDA Final Review & Approval by BD/RDO			
01128.DDS00480	Construction Drawings Submission	6	21-Nov-15	27-Nov-15	0%	6	Construction Drawings Submission			
<b>TBM Excavation Confinement Pressure Design</b>										
<b>DDA</b>										
01128.DDS00520	DDA 1st Preparation & Submission with ICE	28	09-Nov-15*	10-Dec-15	0%	28	DDA 1st Preparation & Submission with ICE			
<b>Eastern TBM Tunnel Lining Design</b>										
<b>DDA</b>										
01128.DDS00720	Construction Drawings Submission	6	05-Oct-15*	10-Oct-15	0%	6	Construction Drawings Submission			
<b>Sump Pit (SP5) Submission</b>										
<b>Temporary Support and Strengthening Structures</b>										
<b>DDA</b>										
01128.DDS01120	DDA 1st Preparation & Submission with ICE	28	02-Feb-15A	16-Oct-15	90%	14	DDA 1st Preparation & Submission with ICE			
01128.DDS01130	DDA 1st Review & Comments by Engineer	14	17-Oct-15	30-Oct-15	0%	14	DDA 1st Review & Comments by Engineer			
01128.DDS01160	DDA Review & Approval by BD/RDO	28	31-Oct-15	27-Nov-15	0%	28	DDA Review & Approval by BD/RDO			
01128.DDS01200	Construction Drawings Submission	6	28-Nov-15	04-Dec-15	0%	6	Construction Drawings Submission			
<b>TBM (Slurry) Procurement, Manufacture &amp; Delivery</b>										
01128.CCD00030	TBM (Slurry) Manufacture & Delivery to Site	259	05-Mar-15A	29-Jan-16	61%	91	TBM (Slurry) Manufacture & Delivery to Site			
<b>TBM (VD) Procurement, Manufacture &amp; Delivery</b>										
01128.CCD00033	TBM (VD) Manufacture & Delivery to Site	352	05-Mar-15A	06-Jul-16	36%	217	TBM (VD) Manufacture & Delivery to Site			
<b>Pre-cast Segment Fabrication</b>										
01128.CCD00042	Segment Mould Design & Fabrication	102	04-May-15A	14-Nov-15	70%	29	Segment Mould Design & Fabrication			
01128.CCD00043	Fabrication of Precast Segments - 1st batch	120	15-Oct-15*	10-Mar-16	0%	120	Fabrication of Precast Segments - 1st batch			
<b>Associated Works</b>										
<b>Grouting - Mid-tunnel Sump (SP5)</b>										

- Last month's forecast
- Critical Activity
- Actual Work
- ◆ Baseline Milestone
- Non Critical Activity
- ◆ Milestone

11283MRP150930

SCL 1128 - SOV to Admiralty Tunnels  
3 Month Rolling Programme (Data Date: 30-Sep-15)

1128			
Date	Revision	Checked	Approved
30-Sep-15	1128 - 3MRP		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2015						
							Sep 14	Oct 15	Nov 16	Dec 17			
01128.CCD00495	Trial Trench	12	16-Nov-15*	28-Nov-15	0%	12							
<b>Grouting - Western Trunk Sewer</b>													
01128.CCD00595	TTMs Implementation & Traffic Diversion for Western Trunk Sewer - Stage 1	18	15-Oct-15*	05-Nov-15	0%	18							
01128.CCD00600	Mobilization for Ground Treatment for Western Trunk Sewer	12	06-Nov-15	19-Nov-15	0%	12							
01128.CCD00610	Grouting 18% Complete for Western Trunk Sewer - Stage 1 (UT 97+465)	23	20-Nov-15	16-Dec-15	0%	23							
<b>Cost Centre E - Tunnel Boring Machine Launching Shaft (FPP)</b>													
<b>Area 1</b>													
<b>Cofferdam</b>													
01128.CCE001250	14. Diaphragm Wall - W11	12	02-Sep-15A	12-Sep-15A	100%	0							
01128.CCE001270	16. Diaphragm Wall - W24	12	09-Sep-15A	15-Sep-15A	100%	0							
01128.CCE001260	15. Diaphragm Wall - W15	12	07-Sep-15A	17-Sep-15A	100%	0							
01128.CCE001280	17. Diaphragm Wall - W8	12	12-Sep-15A	22-Sep-15A	100%	0							
01128.CCE001310	18. Diaphragm Wall - W1	12	16-Sep-15A	25-Sep-15A	100%	0							
01128.CCE001330	20. Diaphragm Wall - W9	12	24-Sep-15A	03-Oct-15	70%	3							
01128.CCE001320	19. Diaphragm Wall - W13	12	19-Sep-15A	09-Oct-15	20%	8							
01128.CCE001340	21. Diaphragm Wall	12	05-Oct-15	17-Oct-15	0%	12							
01128.CCE001350	22. Diaphragm Wall	12	10-Oct-15	24-Oct-15	0%	12							
01128.CCE001360	23. Diaphragm Wall	12	16-Oct-15	30-Oct-15	0%	12							
01128.CCE001370	24. Diaphragm Wall	12	23-Oct-15	05-Nov-15	0%	12							
01128.CCE001380	25. Diaphragm Wall	12	29-Oct-15	11-Nov-15	0%	12							
01128.CCE001390	26. Diaphragm Wall	12	04-Nov-15	17-Nov-15	0%	12							
01128.CCE001400	27. Diaphragm Wall	12	10-Nov-15	23-Nov-15	0%	12							
01128.CCE001410	28. Diaphragm Wall	12	16-Nov-15	28-Nov-15	0%	12							
<b>Area 2 &amp; B</b>													
<b>Cofferdam</b>													
<b>Works Area W8</b>													
01128.CCE001130	Utilities diversion	12	01-Aug-15A	12-Aug-15A	100%	0							
01128.CCE001140	Utilities diversion	12	13-Aug-15A	27-Aug-15A	100%	0							
01128.CCE001150	Utilities diversion	12	28-Aug-15A	11-Sep-15A	100%	0							
01128.CCE001160	Utilities diversion	12	12-Sep-15A	25-Sep-15A	100%	0							
01128.CCE001290	Utilities diversion	12	30-Sep-15	14-Oct-15	0%	12							
01128.CCE001300	Utilities diversion	12	15-Oct-15	29-Oct-15	0%	12							
<b>Cost Centre F - FPP to ADM TBM Tunnels</b>													
<b>Associated Works</b>													
<b>Grouting - Lung King St. (TWL Crossing at SVB)</b>													
<b>Design Submission</b>													
<b>SVB Working Shaft - Temporary ELS</b>													
<b>DDA</b>													
01128.FDS01560	DDA Final Review & Approval by BD/RDO/Engineer	28	03-Jul-15A	11-Oct-15	80%	12							
01128.FDS01570	Construction Drawings Submission	3	12-Oct-15	14-Oct-15	0%	3							
<b>Grouting - TWL Crossing at SVB</b>													
<b>Vertical grouting</b>													
01128.CCF00930	4. Vertical Grouting (East & West)	14	27-Jul-15A	11-Aug-15A	100%	0							
01128.CCF001020	5. Vertical Grouting (East & West)	14	12-Aug-15A	26-Aug-15A	100%	0							
01128.CCF001030	6. Vertical Grouting (East)	4	27-Aug-15A	31-Aug-15A	100%	0							

Last month's forecast    
  Critical Activity  
 Actual Work    
 ◆ Baseline Milestone  
 Non Critical Activity    
 ◆ Milestone

11283MRP150930

SCL 1128 - SOV to Admiralty Tunnels  
 3 Month Rolling Programme (Data Date: 30-Sep-15)

1128			
Date	Revision	Checked	Approved
30-Sep-15	1128 - 3MRP		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2015			
							Sep 14	Oct 15	Nov 16	Dec 17
01128.CCF001040	7. Vertical Grouting (East)	10	01-Sep-15A	14-Sep-15A	100%	0	7. Vertical Grouting (East)			
<b>Vertical Shaft</b>										
01128.CCF00630	1. Formation of concrete plug (1nos. x 10day)	10	15-Oct-15*	27-Oct-15	0%	10	1. Formation of concrete plug (1nos. x 10day)			
01128.CCF00940	2. Formation of concrete plug (1nos. x 10day)	10	28-Oct-15	07-Nov-15	0%	10	2. Formation of concrete plug (1nos. x 10day)			
01128.CCF00950	3. Formation of concrete plug (1nos. x 10day)	10	09-Nov-15	19-Nov-15	0%	10	3. Formation of concrete plug (1nos. x 10day)			
01128.CCF00960	4. Formation of concrete plug (1nos. x 10day)	10	20-Nov-15	01-Dec-15	0%	10	4. Formation of concrete plug (1nos. x 10day)			
<b>Cost Centre G - Police Officers' Club (RRIW)</b>										
<b>Site Preparation</b>										
<b>Demolition of POC</b>										
<b>POC - Demolition</b>										
01128.CCG001010	2. Site Steel Hoarding with Coverd walkway & Catch platform	14	01-Sep-15A	17-Sep-15A	100%	0	2. Site Steel Hoarding with Coverd walkway & Catch platform			
01128.CCG001000	2. Precautionary works for POC Demolition	12	14-Sep-15A	26-Sep-15A	100%	0	2. Precautionary works for POC Demolition			
01128.CCG001020	3. Site Steel Hoarding with Coverd walkway & Catch platform	14	18-Sep-15A	30-Sep-15A	100%	0	3. Site Steel Hoarding with Coverd walkway & Catch platform			
01128.CCG001040	4. Site Steel Hoarding with Coverd walkway & Catch platform	14	02-Oct-15*	17-Oct-15	0%	14	4. Site Steel Hoarding with Coverd walkway & Catch platform			
01128.CCG00200	1. Demolish Main POC (5 Storeys)	12	19-Oct-15	02-Nov-15	0%	12	1. Demolish Main POC (5 Storeys)			
01128.CCG00190	1. Demolish Lower level POC (GL1-7/T-W)	12	19-Oct-15	02-Nov-15	0%	12	1. Demolish Lower level POC (GL1-7/T-W)			
01128.CCG001030	2. Demolish Lower level POC (GL1-7/T-W)	12	03-Nov-15	16-Nov-15	0%	12	2. Demolish Lower level POC (GL1-7/T-W)			
01128.CCG001050	2. Demolish Main POC (5 Storeys)	12	03-Nov-15	16-Nov-15	0%	12	2. Demolish Main POC (5 Storeys)			
01128.CCG001090	2. Demolish Main POC (5 Storeys)	12	03-Nov-15	16-Nov-15	0%	12	2. Demolish Main POC (5 Storeys)			
01128.CCG001130	2. Demolish Lower level POC (GL1-7/T-W)	12	03-Nov-15	16-Nov-15	0%	12	2. Demolish Lower level POC (GL1-7/T-W)			
01128.CCG001060	3. Demolish Main POC (5 Storeys)	12	17-Nov-15	30-Nov-15	0%	12	3. Demolish Main POC (5 Storeys)			
01128.CCG001100	3. Demolish Main POC (5 Storeys)	12	17-Nov-15	30-Nov-15	0%	12	3. Demolish Main POC (5 Storeys)			
01128.CCG001140	3. Demolish Lower level POC (GL1-7/T-W)	12	17-Nov-15	30-Nov-15	0%	12	3. Demolish Lower level POC (GL1-7/T-W)			
<b>Cost Centre H - Other RRIW Works</b>										
<b>CHT Slip Road Footbridge Diversion</b>										
<b>Pile Removal - Percival Street Footbridge (H16)</b>										
<b>Removal of 9 nos.of Dia.600mm Bored Pile (5mPD to -24mPD)</b>										
01128.CCH00260	Site Setup for Pile Removal Plant & Equipment	11	02-Oct-15*	14-Oct-15	0%	11	Site Setup for Pile Removal Plant & Equipment			
01128.CCH00251	1. Remove 1 nos.of Dia.600mm Bored Pile (5mPD to -24mPD) @pile/13d (Ch UT 97+740)	13	15-Oct-15	30-Oct-15	0%	13	1. Remove 1 nos.of Dia.600mm Bored Pile (5mPD to -24mPD) @pile			
01128.CCH00252	2. Remove 1 nos.of Dia.600mm Bored Pile (5mPD to -24mPD) @pile/13d (Ch UT 97+740)	13	31-Oct-15	14-Nov-15	0%	13	2. Remove 1 nos.of Dia.600mm Bored Pile (5mPD			
01128.CCH00253	3. Remove 1 nos.of Dia.600mm Bored Pile (5mPD to -24mPD) @pile/13d (Ch UT 97+740)	13	16-Nov-15	30-Nov-15	0%	13	3. Remove 1 nos.of Dia.600mm			
<b>Causeway/Hung Hing Flyover (Underpinning)</b>										
<b>Design Submission</b>										
<b>Temporary Steel Frame to Support the Jacks</b>										
<b>DDA</b>										
01128.HDS00460	DDA 1st Preparation & Submission with ICE	28	31-Jul-15A	02-Oct-15	90%	2	DDA 1st Preparation & Submission with ICE			
01128.HDS00470	DDA 1st Review & Comments by Engineer	14	03-Oct-15	16-Oct-15	0%	14	DDA 1st Review & Comments by Engineer			
01128.HDS00500	DDA Review & Approval by BD/RDO	28	17-Oct-15	13-Nov-15	0%	28	DDA Review & Approval by BD/RDO			
01128.HDS00540	Construction Drawings Submission	6	14-Nov-15	20-Nov-15	0%	6	Construction Drawings Submission			
<b>Stage 1</b>										
01128.CCH001090	1. Grouting works atA6	12	25-Aug-15A	05-Sep-15A	100%	0	1. Grouting works atA6			
01128.CCH001100	2. Grouting works atA6	12	07-Sep-15A	21-Sep-15A	100%	0	2. Grouting works atA6			
01128.CCH001110	3. Grouting works atA6	6	22-Sep-15A	23-Sep-15A	100%	0	3. Grouting works atA6			
01128.CCH001040	1. Underpinning works	12	15-Oct-15*	29-Oct-15	0%	12	1. Underpinning works			
01128.CCH001050	2. Underpinning works	12	30-Oct-15	12-Nov-15	0%	12	2. Underpinning works			

— Last month's forecast    ■ Critical Activity  
■ Actual Work    ◆ Baseline Milestone  
■ Non Critical Activity    ◆ Milestone

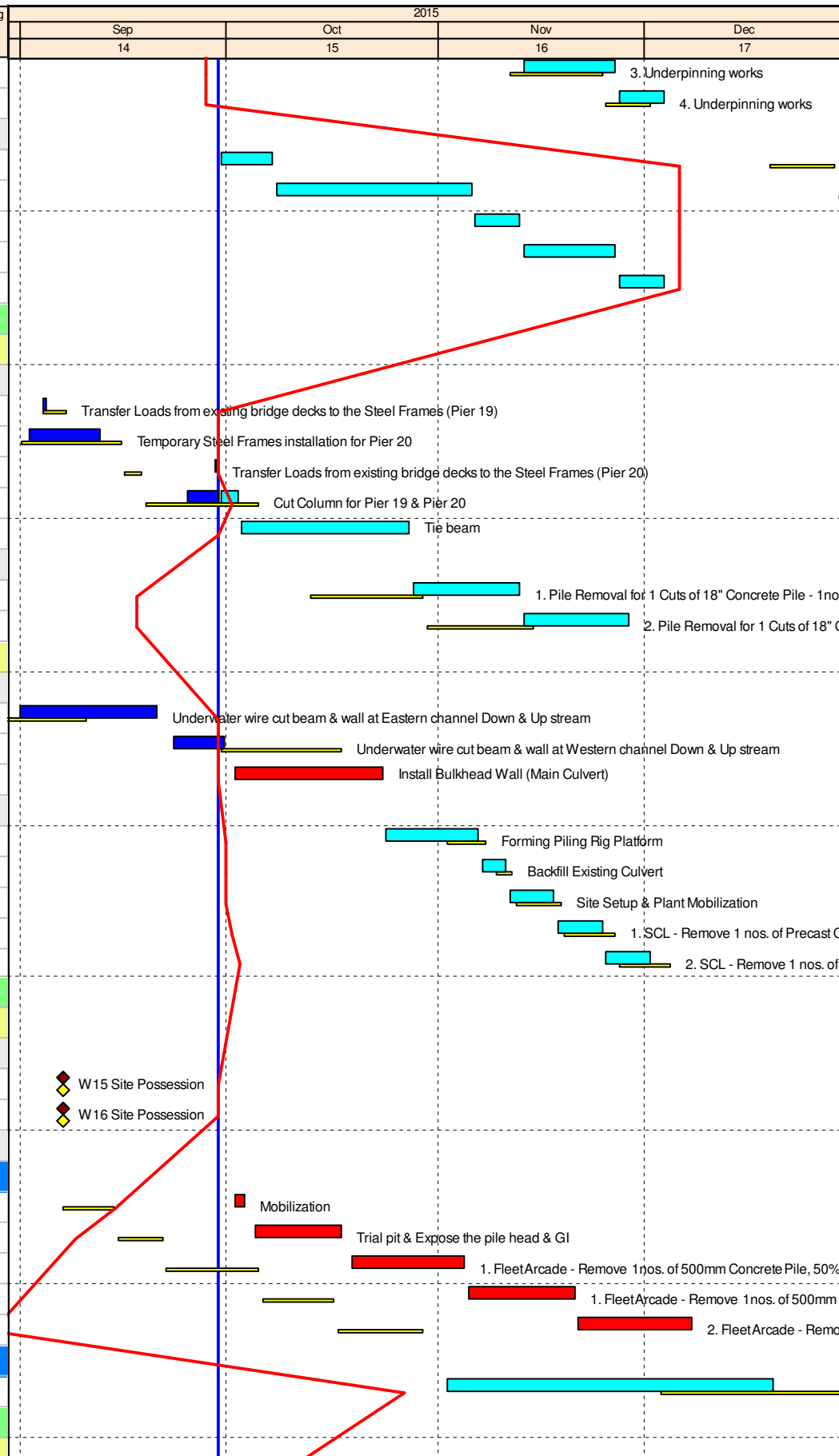
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SCL 1128 - SOV to Admiralty Tunnels  
 3 Month Rolling Programme (Data Date: 30-Sep-15)

1128			
Date	Revision	Checked	Approved
30-Sep-15	1128 - 3MRP		

DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2015					
							Sep 14	Oct 15	Nov 16	Dec 17		
01128.CCH001060	3. Underpinning works	12	13-Nov-15	26-Nov-15	0%	12						
01128.CCH001070	4. Underpinning works	6	27-Nov-15	03-Dec-15	0%	6						
<b>Stage 3</b>												
01128.CCH00770	Excavation at A7	6	30-Sep-15	07-Oct-15	0%	6						
01128.CCH00780	Install temporary footing & block to strenght A7 by Jacking	24	08-Oct-15	05-Nov-15	0%	24						
01128.CCH00790	Detach the affect piles at A7	6	06-Nov-15	12-Nov-15	0%	6						
01128.CCH00800	Install Steel Frame at A6 & Load transfer	12	13-Nov-15	26-Nov-15	0%	12						
01128.CCH00810	Detach existing pies (UT Ch 97+772)	6	27-Nov-15	03-Dec-15	0%	6						
<b>TARG (Pile Removal: D03, H13, D04 &amp; Trunk Sewers)</b>												
<b>Canal Rd. Flyover (H13) - Pile Removal &amp; Underpinning (Alternative scheme - 16nos. Pre-bored H-pile )</b>												
<b>Stage 4</b>												
01128.CCH04140	Transfer Loads from existing bridge decks to the Steel Frames (Pier 19)	3	04-Sep-15A	04-Sep-15 A	100%	0						
01128.CCH04130	Temporary Steel Frames installation for Pier 20	12	02-Sep-15A	12-Sep-15 A	100%	0						
01128.CCH01280	Transfer Loads from existing bridge decks to the Steel Frames (Pier 20)	3	29-Sep-15A	29-Sep-15 A	100%	0						
01128.CCH01290	Cut Column for Pier 19 & Pier 20	6	25-Sep-15A	02-Oct-15	50%	2						
01128.CCH04190	Tie beam	20	03-Oct-15	27-Oct-15	0%	20						
<b>Stage 5 - Pile Removal</b>												
01128.CCH01331	1. Pile Removal for 1 Cuts of 18" Concrete Pile - 1nos. (-0.3mPD to -25mPD) (U Ch97+560)	14	28-Oct-15	12-Nov-15	0%	14						
01128.CCH01332	2. Pile Removal for 1 Cuts of 18" Concrete Pile - 1nos. (-0.3mPD to -25mPD) (U Ch97+560)	14	13-Nov-15	28-Nov-15	0%	14						
<b>Canal Rd. Box Culvert &amp; Pile Removal (D03) - Twin Channel Scheme</b>												
<b>Stage 2</b>												
01128.CCH01460	Underwater wire cut beam & wall at Eastern channel Down & Up stream	14	01-Sep-15A	21-Sep-15 A	100%	0						
01128.CCH01440	Underwater wire cut beam & wall at Western channel Down & Up stream	8	23-Sep-15A	30-Sep-15 A	100%	0						
01128.CCH04200	Install Bulkhead Wall (Main Culvert)	18	02-Oct-15*	23-Oct-15	0%	18						
<b>Stage 3</b>												
01128.CCH01520	Forming Piling Rig Platform	12	24-Oct-15	06-Nov-15	0%	12						
01128.CCH01530	Backfill Existing Culvert	3	07-Nov-15	10-Nov-15	0%	3						
01128.CCH01540	Site Setup & Plant Mobilization	6	11-Nov-15	17-Nov-15	0%	6						
01128.CCH03160	1. SCL - Remove 1 nos. of Precast Concrete Pile for Downtrack (11 nos.) (U 97+595)	6	18-Nov-15	24-Nov-15	0%	6						
01128.CCH03170	2. SCL - Remove 1 nos. of Precast Concrete Pile for Downtrack (11 nos.) (U 97+595)	6	25-Nov-15	01-Dec-15	0%	6						
<b>DSD Wan Chai West Sewage Screening Plant (B13), Lung King St. Box Culvert (D01) &amp; Fleet Arcade (B11)</b>												
<b>Fenwick Pier Street</b>												
<b>Site Possession</b>												
01128.CCH01760	W15 Site Possession	0	07-Sep-15A		100%	0						
01128.CCH01770	W16 Site Possession	0	07-Sep-15A		100%	0						
<b>Pile Removal - Lung King St. Box Culvert (D01) &amp; Fleet Arcade (B11)</b>												
<b>Fleet Arcade</b>												
01128.CCH01990	Mobilization	2	02-Oct-15*	03-Oct-15	0%	2						
01128.CCH02000	Trial pit & Expose the pile head & GI	12	05-Oct-15	17-Oct-15	0%	12						
01128.CCH02010	1. FleetArcade - Remove 1nos. of 500mm Concrete Pile, 50% complete	14	19-Oct-15	04-Nov-15	0%	14						
01128.CCH04160	1. FleetArcade - Remove 1nos. of 500mm Concrete Pile, 100% complete	14	05-Nov-15	20-Nov-15	0%	14						
01128.CCH04170	2. FleetArcade - Remove 1nos. of 500mm Concrete Piles, 50% complete	14	21-Nov-15	07-Dec-15	0%	14						
<b>Stage 2c - 2015/ 16 (Dry Season)</b>												
01128.CCH02160	Remove 6 nos. of 18" Precast Concrete Pile at Uptrack (Lung King St.) (UT Ch 96+416)	42	02-Nov-15	19-Dec-15	0%	42						
<b>Works at Marsh Road (Left-in Sheet piles)</b>												
<b>Works at Marsh Rd. (Left-in piles)</b>												



█ Last month's forecast    █ Critical Activity  
█ Actual Work    ◆ Baseline Milestone  
█ Non Critical Activity    ◆ Milestone

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1128			
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30-Sep-15	1128 - 3MRP		

# DRAGAGES - BOUYGUES JOINT VENTURE

Activity ID	Activity Name	Original Duration	Start	Finish	Activity % Complete	Remaining Duration	2015				
							Sep 14	Oct 15	Nov 16	Dec 17	
<b>Stage 2</b>											
01128.CCH02540	Reinstatement	6	21-Sep-15A	24-Sep-15 A	100%	0	Reinstatement				
<b>Stage 3</b>											
01128.CCH02550	TTMs Implementation	6	30-Sep-15	07-Oct-15	0%	6	TTMs Implementation				
01128.CCH02560	Trial Trench	12	08-Oct-15	22-Oct-15	0%	12	Trial Trench				
01128.CCH02580	Reinstatement	6	23-Oct-15	29-Oct-15	0%	6	Reinstatement				
<b>Stage 4</b>											
01128.CCH02590	TTMs Implementation	6	30-Oct-15	05-Nov-15	0%	6	TTMs Implementation				
01128.CCH02600	Trial Trench, Mobilization & Plant set-up	12	06-Nov-15	19-Nov-15	0%	12	Trial Trench, Mobilization & Plant set-up				
01128.CCH02610	Drilling for TAM Grouting at HK Electric Bldg (West) (D97+380)	20	20-Nov-15	12-Dec-15	0%	20	Drilling for TAM Gr				

- Last month's forecast
- Actual Work
- Non Critical Activity
- Critical Activity
- Baseline Milestone
- Milestone

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1128			
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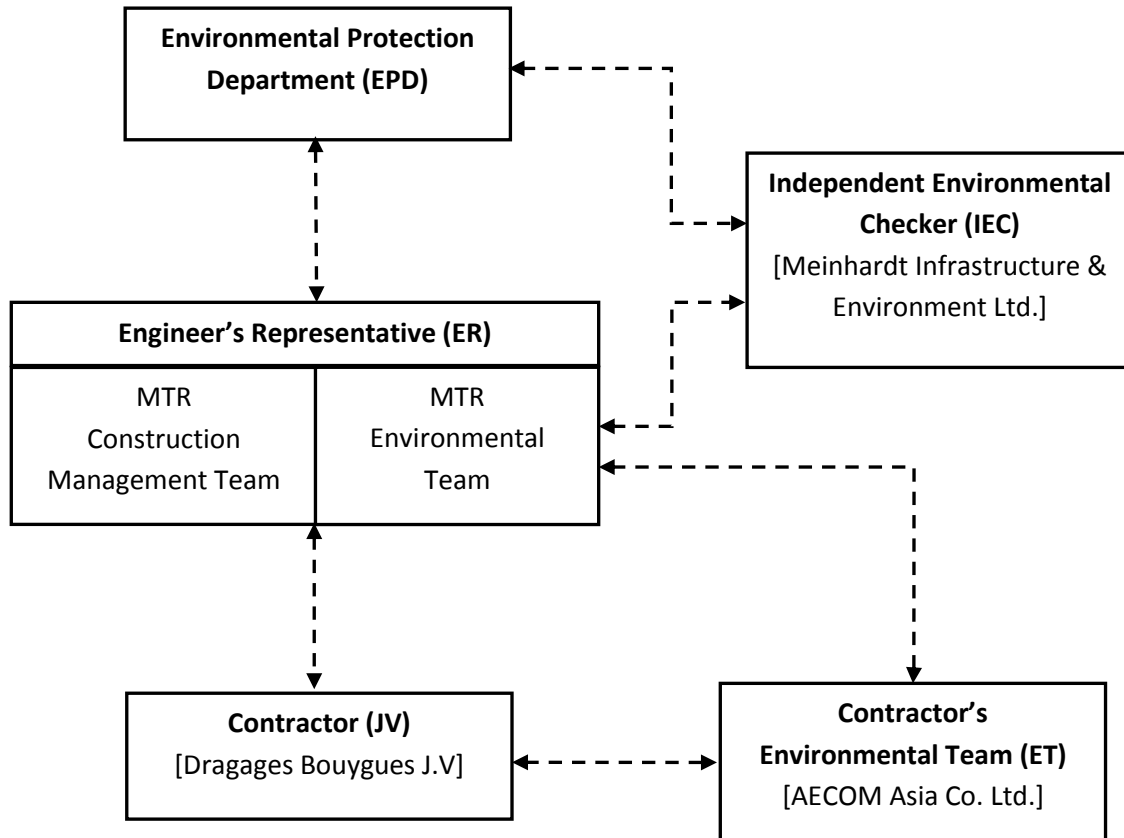
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**APPENDIX B**

**Project Organization Structure**

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## Appendix B Project Organisation Structure



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**APPENDIX C**

**Implementation Schedule of Environmental Mitigation  
Measures**

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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	N/A
<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
<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

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>Construction Dust Impact</b>						
Table 8.5	<p>Barging facilities:</p> <p>(i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours 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 1.0 L/m<sup>2</sup> 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 1.0L/m<sup>2</sup> to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&amp;A programme as specified in the EM&amp;A Manual.</p> <p>(ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression.</p> <p>(iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.</p>	To minimize dust impacts	Contractor	All barging points	Construction phase	N/A
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the <i>Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</i> shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	<p>During operation of concrete batching plant:</p> <p>(i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system.</p> <p>(ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos.</p> <p>(iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins.</p> <p>(iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors.</p> <p>(v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in “wet form”.</p> <p>(vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant.</p> <p>(vii) Transportation of materials within the plant – Provide watering twice a day would be provided.</p>	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
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	@

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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
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	Construction phase	N/A
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 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>	To minimize dust impacts	Contractor	Works areas	Construction phase	@ @ V  V N/A V N/A  V  V V V V
/	<b>Dust suppression measures (con't)</b> <ul style="list-style-type: none"> <li>• De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement</li> </ul>					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 N/A V V V N/A

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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
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> <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>	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <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 to north of ADM</li> <li>• South of ADM to Overrun Tunnel</li> </ul>	Construction phase	<p>N/A √ N/A √ N/A N/A N/A N/A N/A N/A √ √ √ N/A N/A N/A</p>
S9.58 – S9.59 & Table 9.17	<p>Movable noise barrier shall be used for the following PME:</p> <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	<p>Works areas at:</p> <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	<p>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 N/A</p>
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>	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <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	<p>N/A N/A N/A N/A N/A N/A N/A</p>

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<b>Water Quality Impact</b>						
<b>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 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 nearby receiving waters.</li> </ul>	To 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	V  V  N/A
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 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 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>	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	V  V  N/A  V  V  V

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	<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 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>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 style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S11.246 & 11.247	<p>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.</p>	<p>To minimize water quality impacts due to sewage generated from construction workforce</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p style="text-align: center;">N/A</p>
S11.248	<p>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.</p>	<p>To minimize impact from discharge of uncontaminated groundwater</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p style="text-align: center;">N/A</p>

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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 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.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
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 Sections 11.189 to 11.192 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
S11.252	The following good site practices shall be adopted for the proposed barging points: <ul style="list-style-type: none"> <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 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</li> <li>• loading of barges and hoppers shall be controlled to prevent splashing of 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</li> </ul>	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	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 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.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	Construction Phase	V

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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	N/A
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	N/A N/A N/A
<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 N/A N/A N/A
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	N/A V N/A 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.	To achieve waste reduction	Contractor	All Work Sites	Construction Phase	V



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	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.					
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	N/A N/A N/A
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 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>	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	N/A N/A N/A N/A N/A
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 N/A
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

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S12.89	<p><b>Sediments (con't)</b></p> <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 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.</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
S12.91 – 12.94	<p><b>Sediments (con't)</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 / 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	<p><b>Sediments (con't)</b></p> <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 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.</li> </ul>	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
/	<p><b>Accidental spillage</b></p> <p>To prevent accidental spillage of chemicals, the following is recommended:</p> <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 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
S12.97	<p><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:</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 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 N/A N/A
S12.98	<p><b>Chemical Waste Storage Area</b></p> <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	N/A N/A N/A N/A N/A
S12.99	<p><b>Chemical Waste</b></p> <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	N/A
S12.100	<p><b>Collection and Disposal of Chemical Waste</b> <i>A trip-ticket system shall be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</i> 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>.</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	<p><b>General Refuse</b> 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>	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	<p><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.</p>	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	N/A
S12.103	<p><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.</p>	To raise workers' awareness on recycling issue	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
<b>Land Contamination Impact</b>						
S13.23–13.24	<p>For construction works at sites under the current stage of site investigation (Stage 1 SI):</p> <ul style="list-style-type: none"> <li>• Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination.</li> <li>• If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut &amp; cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).</li> </ul>	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	N/A
S13.30	<p>For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut &amp; cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.</p>	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	<p>For areas inaccessible for proper site appraisal and investigation (Stage 2 SI)</p> <p>(i) Site 2-15</p> <ul style="list-style-type: none"> <li>• Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation</li> <li>• A supplementary CAP shall then be submitted to EPD for endorsement.</li> <li>• A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing.</li> <li>• Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR.</li> <li>• No construction work shall be carried out prior to the endorsement of the RR by EPD.</li> </ul>	<p>To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary.</p> <p>To ensure remediation works have been undertaken to before the commencement of any construction works of the Project.</p>	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	<p>Potential Remediation of Contaminated Soil</p> <ul style="list-style-type: none"> <li>• Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety;</li> <li>• Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils;</li> <li>• Supply of suitable clean backfill material is needed after excavation;</li> <li>• If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE).</li> <li>• Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions;</li> <li>• Speed control for the trucks carrying contaminated materials shall be enforced;</li> <li>• Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and</li> <li>• Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.</li> </ul>	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A

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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
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: <ul style="list-style-type: none"> <li>• Set up a list of safety measures for site workers;</li> <li>• Provide written information and training on safety for site workers;</li> <li>• Keep a log-book and plan showing the contaminated zones and clean zones;</li> <li>• Maintain a hygienic working environment;</li> <li>• Avoid dust generation;</li> <li>• Provide face and respiratory protection gear to site workers;</li> <li>• Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and</li> <li>• Provide first aid training and materials to site workers.</li> </ul>	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

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****Table 1 Action and Limit Levels for 24-hour TSP**

<b>ID</b>	<b>Location</b>	<b>Action Level</b>	<b>Limit Level</b>
AM2	Wan Chai Sports Ground	160 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$
AM4	Pedestrian Plaza	198 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$

**Table 2 Action and Limit Levels for Construction Noise  
(0700 – 1900 hrs of normal weekdays)**

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

\* The noise monitoring at NM1 was handed-over from SCL Contract 1129 in August 2015.

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**APPENDIX E**

**Calibration Certificates of Equipments**

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# AECOM Asia Company Limited

## TSP High Volume Sampler

### Field Calibration Report

Station: Pedestrian Plaza Operator: Shum Kam Yuen  
 Cal. Date: 22-Jul-15 Next Due Date: 22-Sep-15  
 Equipment No.: A-001-70T Serial No.: 10273

Ambient Condition			
Temperature, Ta (K)	301	Pressure, Pa (mmHg)	755.1

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99924	Intercept, bc	-0.01238
Last Calibration Date:	9-Dec-14	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Dec-15				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] <sup>1/2</sup>	Qstd (m <sup>3</sup> /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.4	2.70	1.36	47.0	46.61
13	6.2	2.47	1.24	42.0	41.66
10	4.4	2.08	1.05	34.0	33.72
7	3.1	1.75	0.88	25.0	24.79
5	2.3	1.50	0.76	21.0	20.83

**By Linear Regression of Y on X**

Slope, mw = 44.0614 Intercept, bw = -13.0246  
 Correlation Coefficient\* = 0.9969

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

**Set Point Calculation**

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 44.62

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

QC Reviewer: WS CHAN Signature: [Signature] Date: 22/7/15

# AECOM Asia Company Limited

## TSP High Volume Sampler

### Field Calibration Report

Station: Pedestrian Plaza Operator: Shum Kam Yuen  
 Cal. Date: 21-Sep-15 Next Due Date: 21-Nov-15  
 Equipment No.: A-001-70T Serial No.: 10273

Ambient Condition			
Temperature, Ta (K)	301.5	Pressure, Pa (mmHg)	762.0

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99924	Intercept, bc	-0.01238
Last Calibration Date:	9-Dec-14	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Dec-15				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] <sup>1/2</sup>	Qstd (m <sup>3</sup> /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.3	2.69	1.35	48.0	47.78
13	6.0	2.44	1.23	42.0	41.81
10	4.4	2.09	1.05	34.0	33.85
7	3.2	1.78	0.90	27.0	26.88
5	2.3	1.51	0.76	21.0	20.91

**By Linear Regression of Y on X**  
 Slope, mw = 45.5052 Intercept, bw = -13.8664  
 Correlation Coefficient\* = 0.9999  
 \*If Correlation Coefficient < 0.990, check and recalibrate.

**Set Point Calculation**

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min  
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 45.50

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

QC Reviewer: T Leung Signature: [Signature] Date: 23-9-15

# AECOM Asia Company Limited

## TSP High Volume Sampler

### Field Calibration Report

Station: Wanchai Sports Ground Operator: Leung Yiu Ting  
 Cal. Date: 30-Jul-15 Next Due Date: 30-Sep-15  
 Equipment No.: A-001-72T Serial No.: 809

Ambient Condition			
Temperature, Ta (K)	302	Pressure, Pa (mmHg)	757.1

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99924	Intercept, bc	-0.01238
Last Calibration Date:	9-Dec-14	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Dec-15				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] <sup>1/2</sup>	Qstd (m <sup>3</sup> /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.3	2.68	1.35	47.0	46.60
13	6.2	2.47	1.24	41.0	40.65
10	4.8	2.17	1.09	35.0	34.70
7	3.5	1.85	0.93	26.0	25.78
5	2.5	1.57	0.79	20.0	19.83

**By Linear Regression of Y on X**

Slope, mw = 48.1849 Intercept, bw = -18.5676  
 Correlation Coefficient\* = 0.9971

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

**Set Point Calculation**

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 44.45

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

QC Reviewer: WS CHAN

Signature: 

Date: 30/7/15



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE  
 VILLAGE OF CLEVELAND, OH  
 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Dec 09, 2014 Rootmeter S/N 0438320 Ta (K) - 293  
 Operator Tisch Orifice I.D. - 0843 Pa (mm) - 755.65

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORIFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.4010	3.2	2.00
2	NA	NA	1.00	0.9950	6.4	4.00
3	NA	NA	1.00	0.8830	7.9	5.00
4	NA	NA	1.00	0.8420	8.8	5.50
5	NA	NA	1.00	0.6960	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0069	0.7187	1.4221	0.9957	0.7107	0.8806
1.0027	1.0077	2.0112	0.9915	0.9965	1.2454
1.0006	1.1332	2.2486	0.9894	1.1206	1.3924
0.9994	1.1870	2.3584	0.9883	1.1738	1.4603
0.9942	1.4285	2.8443	0.9831	1.4126	1.7612
Qstd slope (m) = 1.99924			Qa slope (m) = 1.25189		
intercept (b) = -0.01238			intercept (b) = -0.00766		
coefficient (r) = 0.99990			coefficient (r) = 0.99990		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)  
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]  
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}  
 Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}



## CERTIFICATE OF CALIBRATION

Certificate No.: 15CA0317 03 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.:	2285692	,	2791211
Adaptors used:	-	,	-

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 17-Mar-2015

Date of test: 18-Mar-2015

### 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 ± 1 °C  
Relative humidity: 60 ± 10 %  
Air pressure: 1010 ± 5 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 ±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 responses 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.

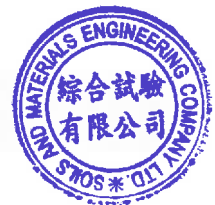
Actual Measurement data are documented on worksheets.

Approved Signatory:

Huang Jian Min/Feng Jun Qi

Date: 19-Mar-2015

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.: 15CA0317 03 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	
Frequency weightings	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

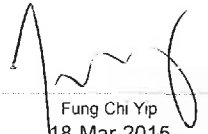
The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

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	

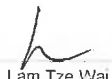
### 3, Response to associated sound calibrator

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: 18-Mar-2015

- End -

Checked by:   
Date: 19-Mar-2015

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.: 15CA0703 02-02 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.:	2800927	,	2791214
Adaptors used:	-	,	-

### Item submitted by

N-009 06  
Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 03-Jul-2015

Date of test: 04-Jul-2015

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI

### Ambient conditions

Temperature: 21 ± 1 °C  
Relative humidity: 60 ± 10 %  
Air pressure: 1000 ± 5 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 ±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 Jianming/Feng Jun Qi

Date: 06-Jul-2015

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.: 15CA0703 02-02 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	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
Frequency weightings	Lin	Pass	0.3	
	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Time weightings	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
Peak response	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
R.M.S. accuracy	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	
Time averaging	Single burst 10 ms at 4 kHz	Pass	0.4	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Pulse range	SPL	Pass	0.3	
	Leq	Pass	0.4	
Sound exposure level				
Overload indication				

### 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: 04-Jul-2015

Fung Chi Yip

Checked by:

Date: 06-Jul-2015

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.





## CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1106 04-02

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: 06-Nov-2014

Date of test: 07-Nov-2014

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $65 \pm 10$  %  
Air pressure:  $1010 \pm 10$  hPa

### Test specifications

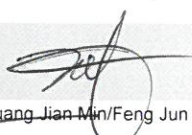
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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: 08-Nov-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.: 14CA1106 04-02

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	Estimated Expanded Uncertainty dB
1000	94.00	94.02	0.10

(Output level in dB re 20 µPa)

**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 = 988.9 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 = 1.3 %**  
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 -

<p><b>Calibrated by:</b>  Date: 07-Nov-2014</p>	<p><b>Checked by:</b>  Date: 08-Nov-2014</p>
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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 1128 - South Ventilation Building to Admiralty Tunnels  
Impact Monitoring Schedule for September 2015**

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

**Air Quality Monitoring Station**

AM2 Wan Chai Sports Ground  
AM4 Pedestrian Plaza

**Noise Monitoring Station**

NM1

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels  
Tentative Impact Monitoring Schedule for October 2015**

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

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

**Air Quality Monitoring Station**

AM2 Wan Chai Sports Ground  
AM4 Pedestrian Plaza

**Noise Monitoring Station**

NM1

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels  
Tentative Impact Monitoring Schedule for November 2015**

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

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

**Air Quality Monitoring Station**

AM2 Wan Chai Sports Ground  
AM4 Pedestrian Plaza

**Noise Monitoring Station**

NM1

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1128 - South Ventilation Building to Admiralty Tunnels  
Tentative Impact Monitoring Schedule for December 2015**

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

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

**Air Quality Monitoring Station**

AM2 Wan Chai Sports Ground  
AM4 Pedestrian Plaza

**Noise Monitoring Station**

NM1

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week

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**APPENDIX G**

**Air Quality Monitoring Results and  
their Graphical Presentations**

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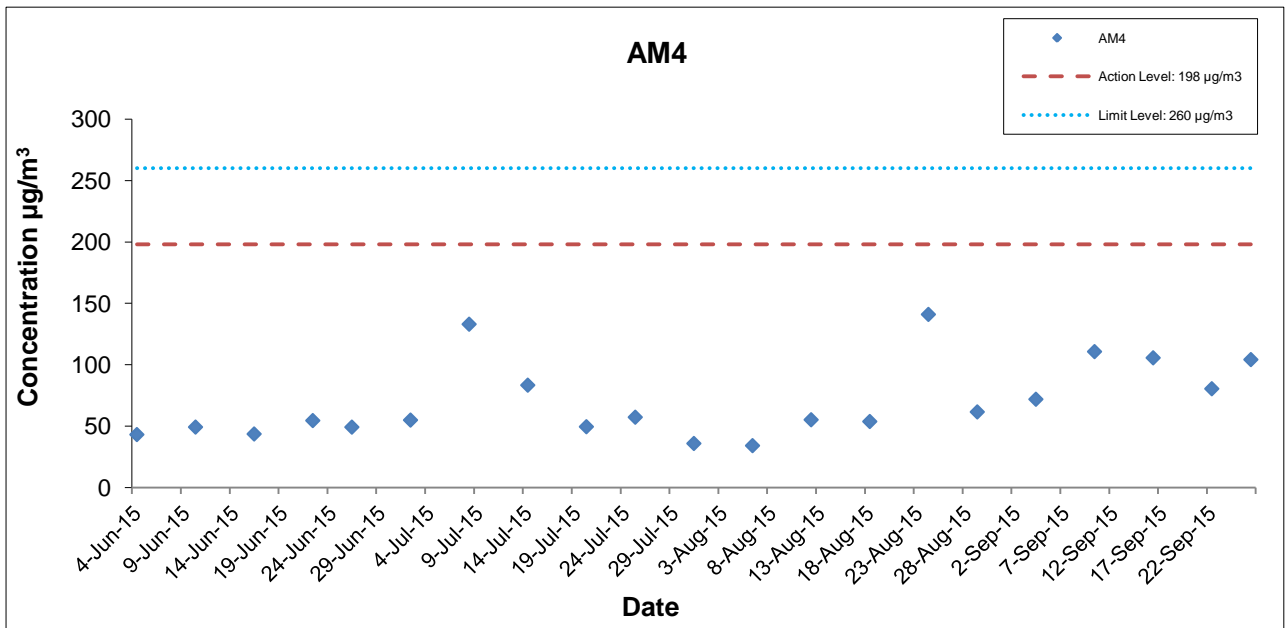
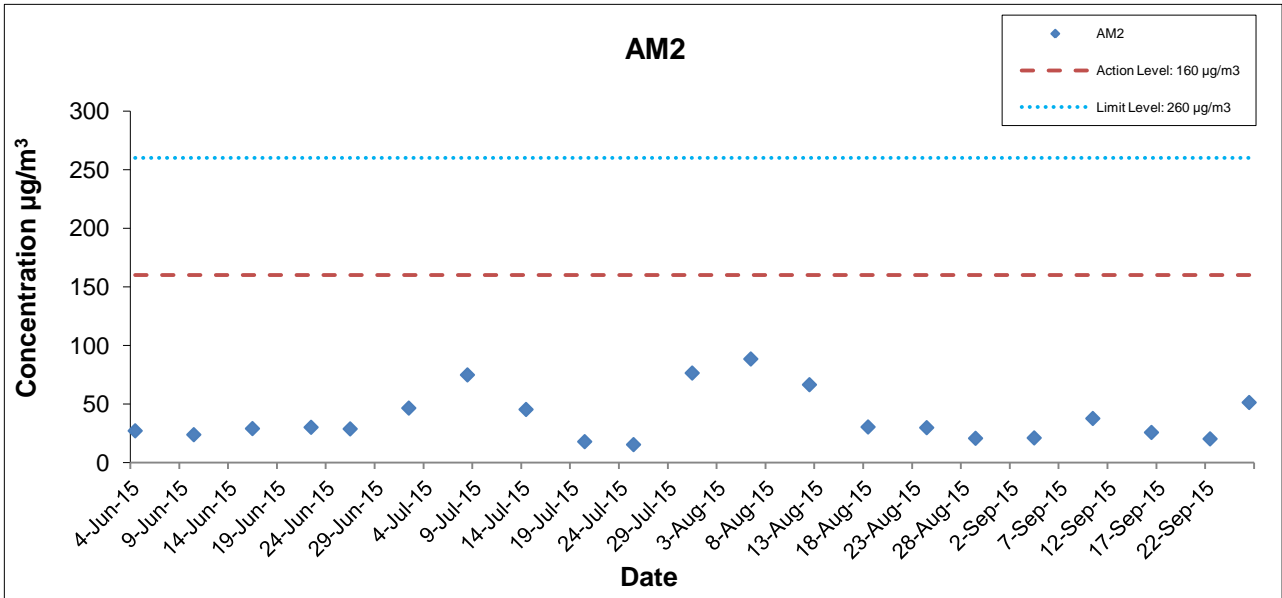
**Appendix G**  
**Air Quality Monitoring Results**

**24-hour TSP Monitoring Results at Station AM2 (Wan Chai Sports Ground)**

Start		End		Weather Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
4-Sep-15	0:00	5-Sep-15	0:00	Sunny	29.1	1013.1	1.26	1.26	1.26	1818.7	2.7871	2.8255	0.0384	17490.06	17514.06	24.00	21.1
10-Sep-15	0:00	11-Sep-15	0:00	Sunny	28.1	1012.7	1.26	1.26	1.26	1818.7	2.8351	2.9037	0.0686	17514.06	17538.06	24.00	37.7
16-Sep-15	0:00	17-Sep-15	0:00	Sunny	28.1	1011.9	1.26	1.26	1.26	1818.7	2.8215	2.8684	0.0469	17538.06	17562.06	24.00	25.8
22-Sep-15	0:00	23-Sep-15	0:00	Sunny	28.1	1009.9	1.26	1.26	1.26	1818.7	2.8245	2.8614	0.0369	17562.06	17586.06	24.00	20.3
26-Sep-15	0:00	27-Sep-15	0:00	Fine	28.7	1006.7	1.26	1.26	1.26	1818.7	2.8409	2.9343	0.0934	17586.06	17610.06	24.00	51.4
																<b>Average</b>	<b>31.3</b>
																<b>Minimum</b>	<b>20.3</b>
																<b>Maximum</b>	<b>51.4</b>

**24-hour TSP Monitoring Results at Station AM4 (Pedestrian Plaza)**

Start		End		Weather Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
4-Sep-15	0:00	5-Sep-15	0:00	Sunny	29.1	1013.1	1.27	1.27	1.27	1833.1	2.8158	2.9477	0.1319	18129.00	18153.00	24.00	72.0
10-Sep-15	0:00	11-Sep-15	0:00	Sunny	28.1	1012.7	1.27	1.27	1.27	1833.1	2.7888	2.9918	0.2030	18153.00	18177.00	24.00	110.7
16-Sep-15	0:00	17-Sep-15	0:00	Sunny	28.1	1011.9	1.27	1.27	1.27	1833.1	2.8186	3.0123	0.1937	18177.00	18201.00	24.00	105.7
22-Sep-15	0:00	23-Sep-15	0:00	Sunny	28.1	1009.9	1.27	1.27	1.27	1833.1	2.8160	2.9636	0.1476	18201.00	18225.00	24.00	80.5
26-Sep-15	0:00	27-Sep-15	0:00	Fine	28.7	1006.7	1.27	1.27	1.27	1833.1	2.8356	3.0267	0.1911	18225.00	18249.00	24.00	104.2
																<b>Average</b>	<b>94.6</b>
																<b>Minimum</b>	<b>72.0</b>
																<b>Maximum</b>	<b>110.7</b>



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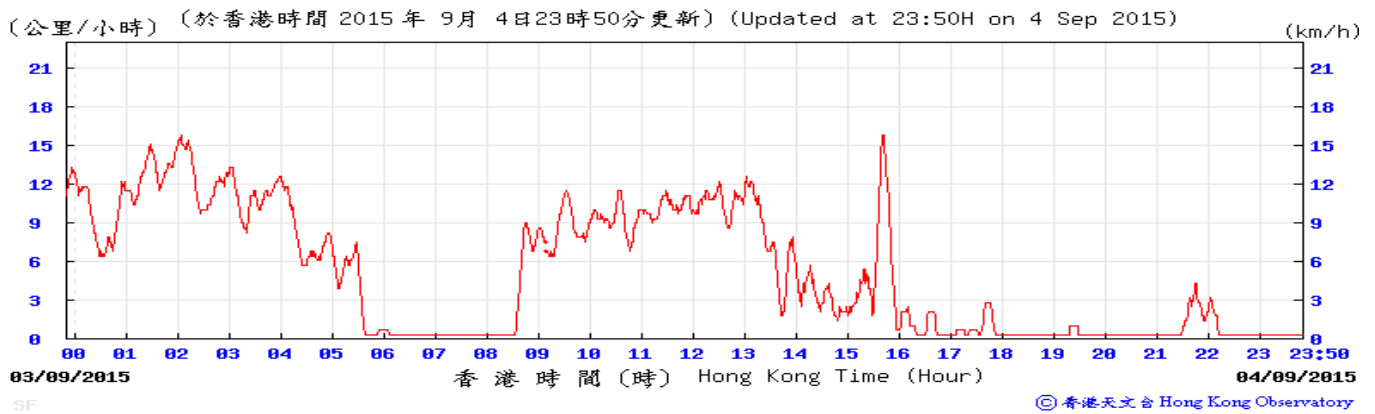
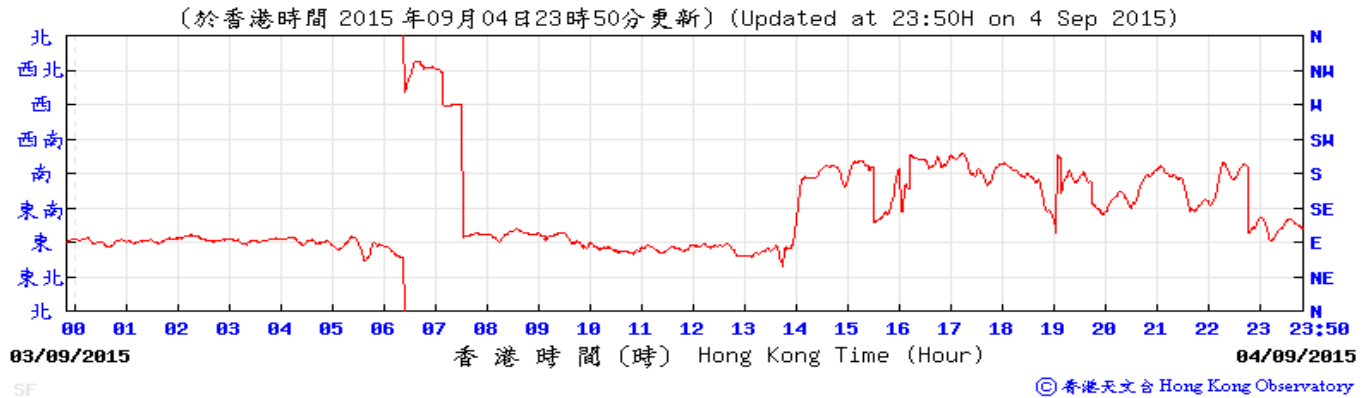
Shatin Central Link Contract No. 1128  
 South Ventilation Building to Admiralty Tunnels



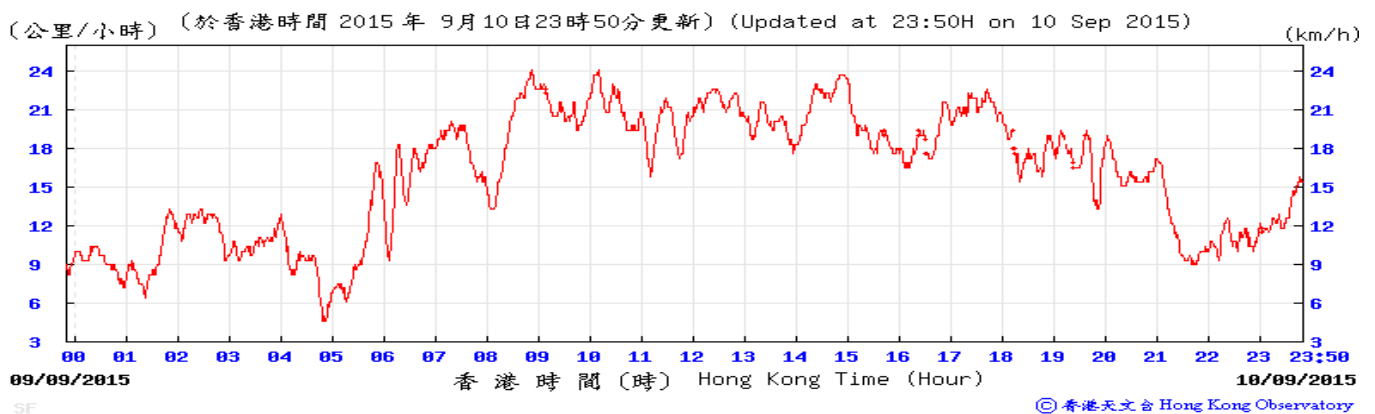
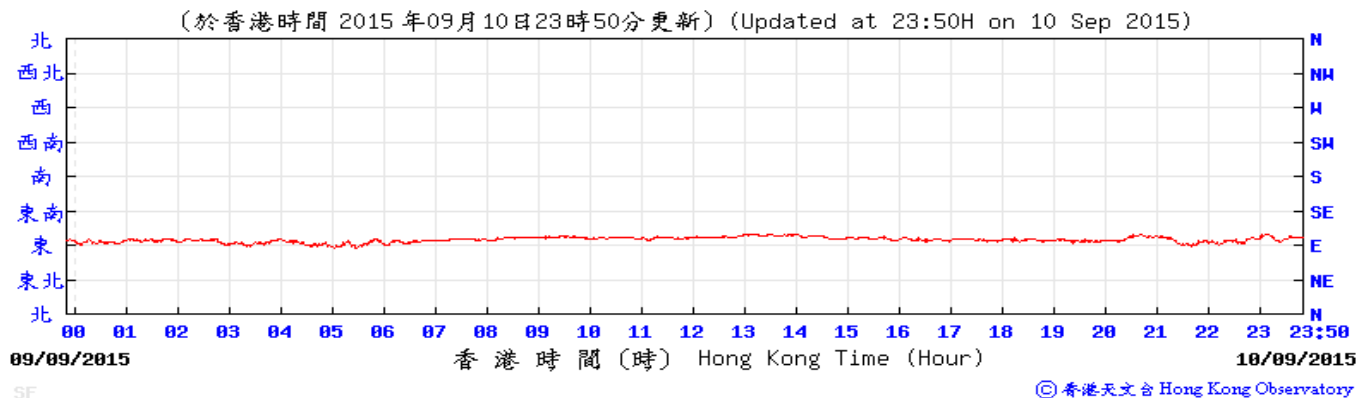
## Graphical Presentation of Impact 24-hr TSP Monitoring Results

# Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2015

4-Sep-15



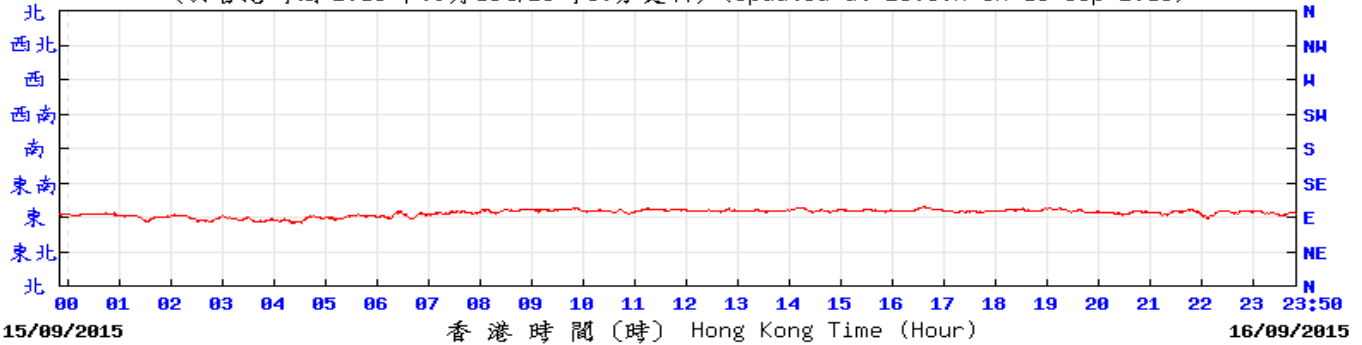
10-Sep-15



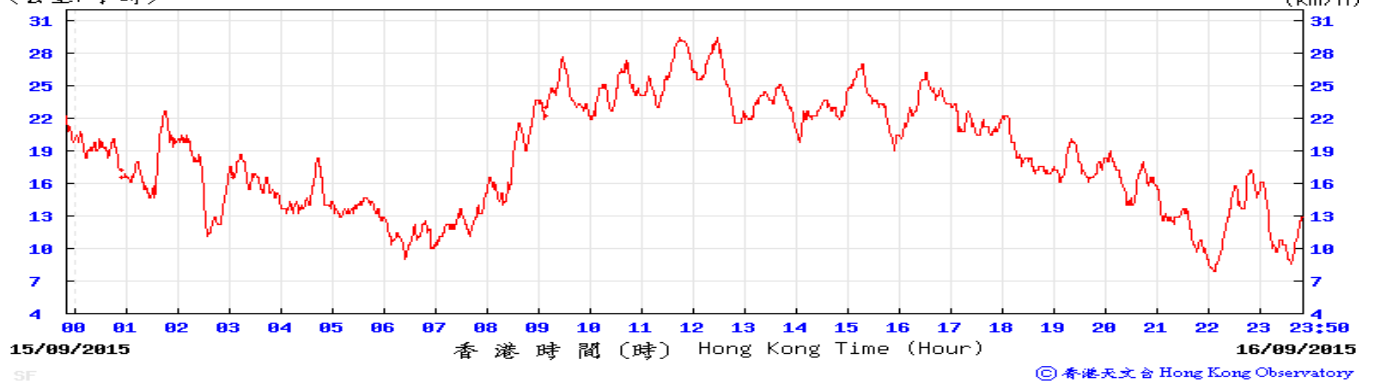
# Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2015

16-Sep-15

(於香港時間 2015 年 09 月 16 日 23 時 50 分更新) (Updated at 23:50H on 16 Sep 2015)

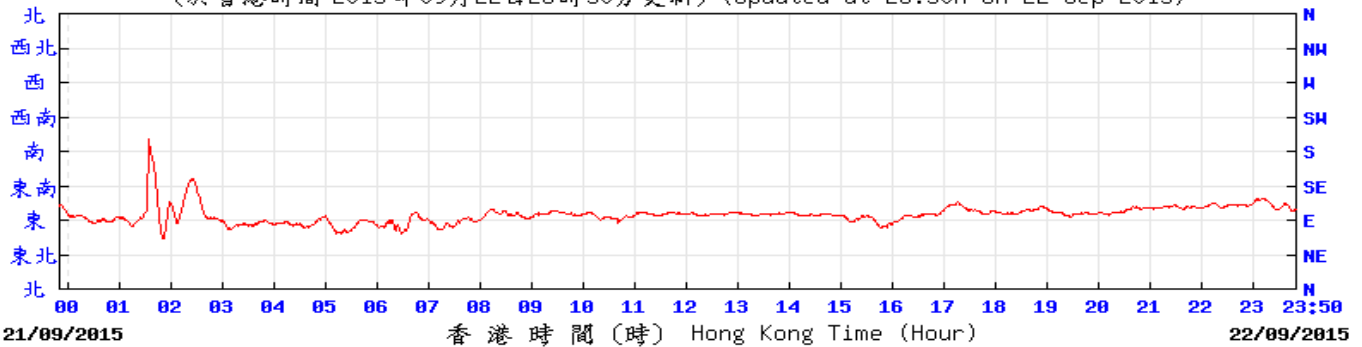


(公里/小時) (於香港時間 2015 年 9 月 16 日 23 時 50 分更新) (Updated at 23:50H on 16 Sep 2015) (km/h)

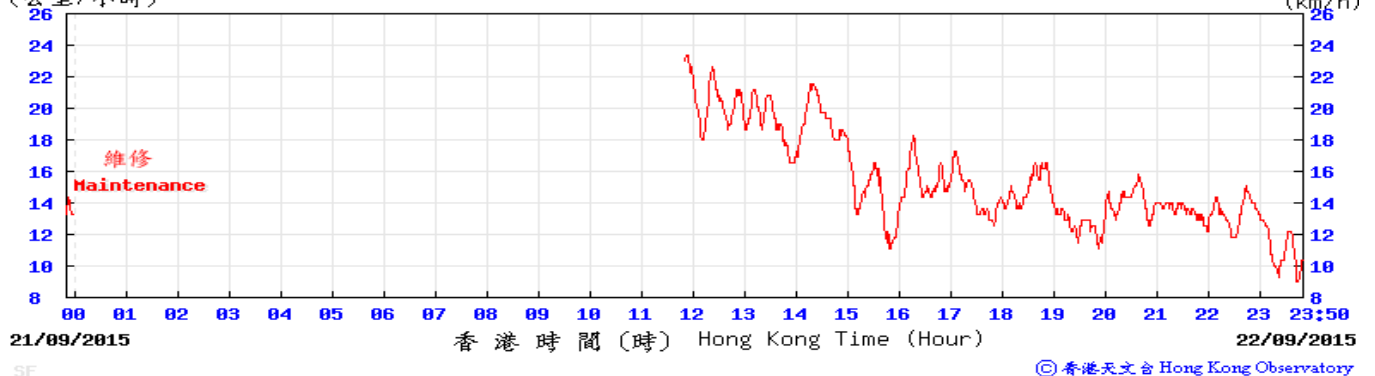


22-Sep-15

(於香港時間 2015 年 09 月 22 日 23 時 50 分更新) (Updated at 23:50H on 22 Sep 2015)

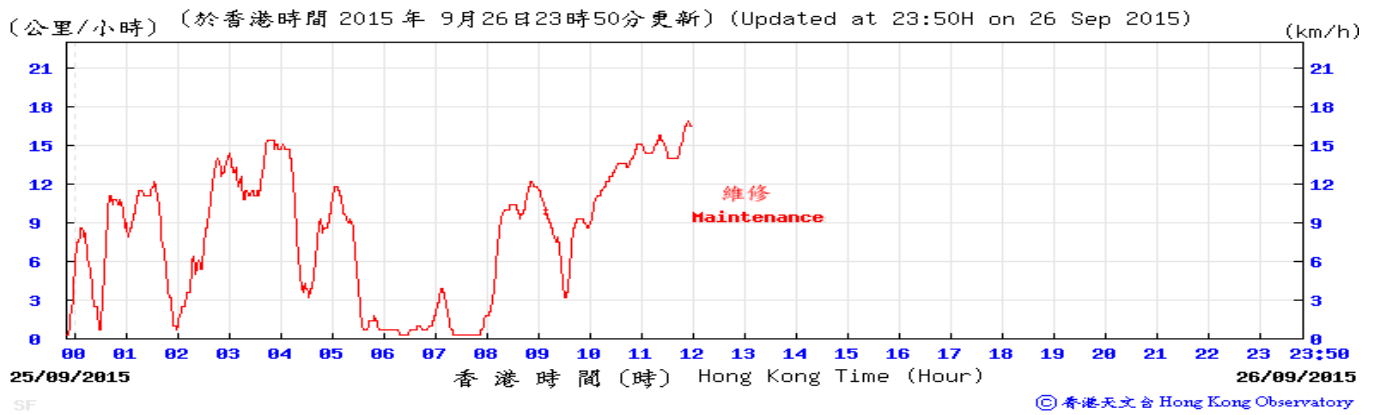
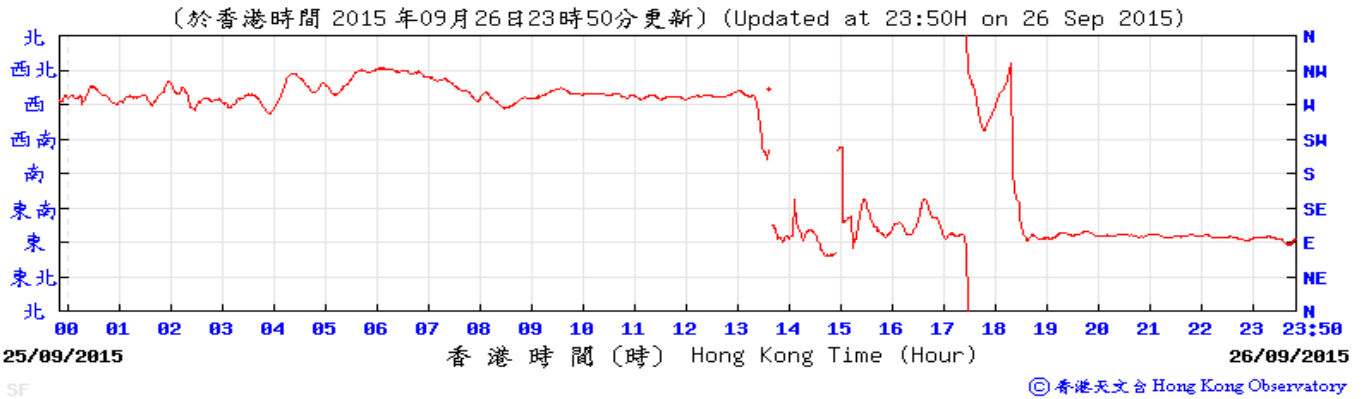


(公里/小時) (於香港時間 2015 年 9 月 22 日 23 時 50 分更新) (Updated at 23:50H on 22 Sep 2015) (km/h)



# Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2015

26-Sep-15



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**APPENDIX H**

**Noise Monitoring Results and  
their Graphical Presentations**

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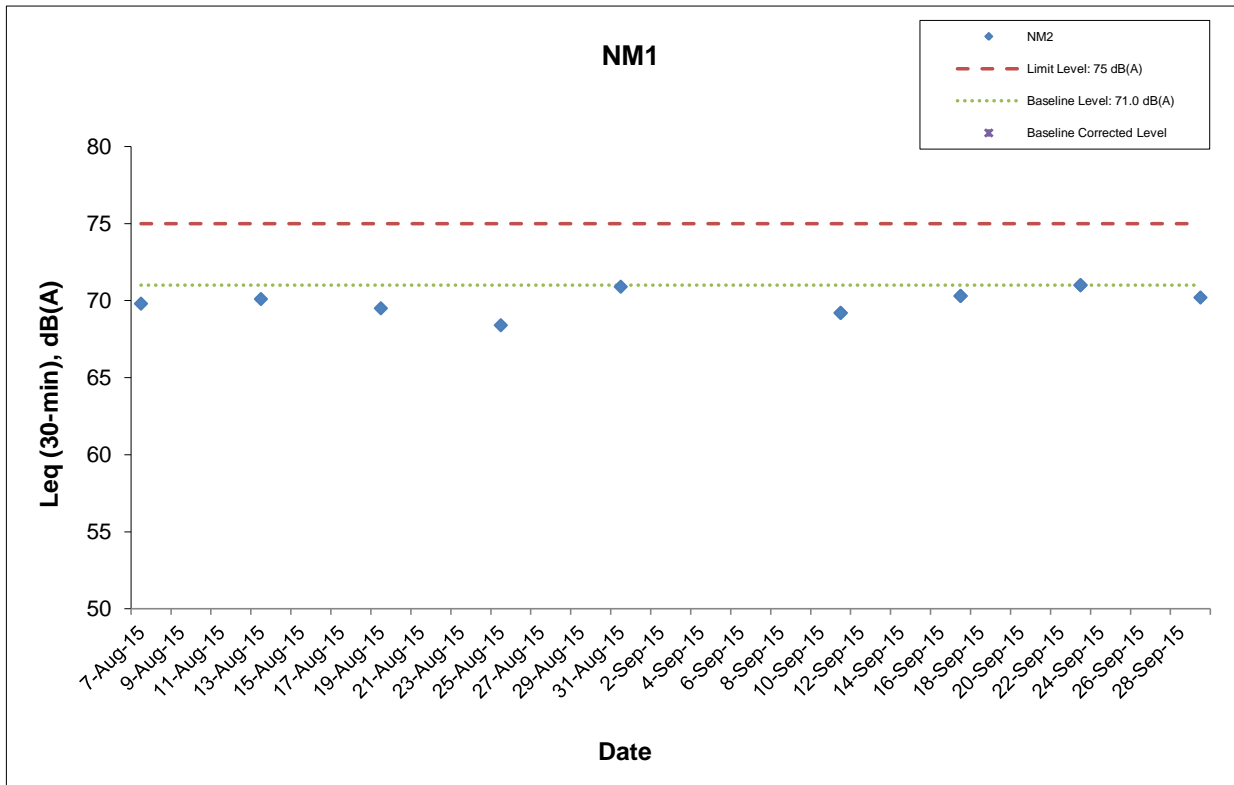
## Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM1 (Hoi Kung Court)

Date	Weather Condition	Noise Level for 30-min, dB(A) <sup>+</sup>				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
11-Sep-15	Sunny	14:27	67.3	71.1	69.2	<Baseline	71.0	75	N
17-Sep-15	Sunny	13:25	68.5	71.5	70.3	<Baseline	71.0	75	N
23-Sep-15	Sunny	13:05	69.5	73.2	71.0	=Baseline	71.0	75	N
29-Sep-15	Sunny	14:00	68.4	73.6	70.2	<Baseline	71.0	75	N

<sup>+</sup> - Façade measurement

# Appendix H Regular Construction Noise Monitoring Results



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Shatin Central Link Contract No. 1128  
 South Ventilation Building to Admiralty Tunnels

## Graphical Presentation of Impact Noise Monitoring Results

Date: October 2015

Appendix H



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**APPENDIX I**

**Event Action Plan**

---

**Appendix I Event Action Plan**

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
<b>ACTION LEVEL</b>				
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 and IEC on the remedial measures required;</li> <li>3. Repeat measurement to confirm findings;</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;</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;</li> <li>3. Amend working methods agreed with the ER as appropriate.</li> </ol>
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, IEC 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;</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;</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;</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;</li> <li>4. Amend proposal as appropriate.</li> </ol>

**Appendix I Event Action Plan**

EVENT	ACTION			
	ET	IEC	ER	Contractor
<b>LIMIT LEVEL</b>				
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;</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;</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;</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>
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;</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;</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;</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>

## Appendix I 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 J**

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

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## Appendix J Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

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

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**APPENDIX K**

**Waste Flow Table**

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**SCL Contract 1128**

**Appendix K - Monthly Summary C&D Material Flow Table**

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> )							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)	TM38FB	CWPFBP	^Other Site	Total (m <sup>3</sup> )	Total	Total	Total	Total	Total	Total
2015/01 (Actual)	0	1,499.0	0.0	0.0	0.0	0	1,499.0	0	0	0	0	5.1	0
2015/02 (Actual)	0	171.0	0.0	0.0	0.0	0	171.0	0	0	0	0	12.8	0
2015/03 (Actual)	0	1,553.1	0.0	45.9	0.0	0	1,599.0	0	0	0	0	7.5	0
2015/04 (Actual)	0	2,224.0	0.0	0.0	0.0	0	2,224.0	0	0	0	0	10.5	0
2015/05 (Actual)	0	4,496.7	0.0	3.7	0.0	0	4,500.4	0	0	0	0	11.3	0
2015/06 (Actual)	0	3,509.7	0.0	0.0	0.0	0	3,510.0	0	0	0	0	18.9	0
<b>2015 Sub-total</b>	<b>0</b>	<b>13,453.5</b>	<b>0.0</b>	<b>49.6</b>	<b>0.0</b>	<b>0</b>	<b>13,503.4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>66.2</b>	<b>0</b>
2015/07 (Actual)	0	4,450.0	0.0	0.0	0.0	0	4,450.0	0	0	0	0	13.4	0
2015/08 (Actual)	0	4,481.6	0.0	0.0	377.2	0	4,858.8	0	0	0	0	65.0	0
<b>2015/09 (Actual)</b>	<b>0</b>	<b>3,220.0</b>	<b>2.8</b>	<b>8.0</b>	<b>1,112.0</b>	<b>0</b>	<b>4,342.9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>90.6</b>	<b>0</b>
2015/10	-	-	-	-	-	-	-	-	-	-	-	-	-
2015/11	-	-	-	-	-	-	-	-	-	-	-	-	-
2015/12	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>2015 Total</b>	<b>0</b>	<b>25,605.1</b>	<b>2.8</b>	<b>57.6</b>	<b>1,489.2</b>	<b>0</b>	<b>27,155.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>235.1</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      TM38FB      Fill Bank at Tuen Mun
  - 4      TKO137SF      Sorting Facilities at Tseung Kwan O Area 137



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**Appendix B**

**Monthly EM&A Report for September 2015 – SCL Works  
Contract 1121 NSL Cross Harbour Tunnels**

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MTR Corporation Limited

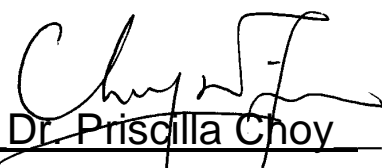
**Shatin to Central Link –  
Hung Hom to Admiralty Section**

Monthly EM&A Report No. 7

[Period from 1 to 30 September 2015]

Works Contract 1121 – NSL Cross Harbour Tunnels

(October 2015)

Certified by:   
\_\_\_\_\_ Dr. Priscilla Choy \_\_\_\_\_

Position: Environmental Team Leader

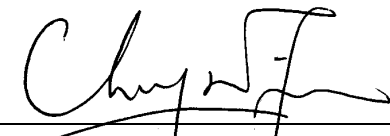
Date: 12<sup>th</sup> October 2015

**Penta Ocean – China State Joint Venture**

**Shatin to Central Link –  
Contract 1121  
NSL Cross Harbour Tunnels**

**Monthly Environmental  
Monitoring and Audit Report  
for September 2015**

(version 2.0)

Certified By	 _____ Dr. Priscilla Choy (Environmental Team Leader)
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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.

**CINOTECH CONSULTANTS LTD**

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Tel: (852) 2151 2083 Fax: (852) 3107 1388

Email: [info@cinotech.com.hk](mailto:info@cinotech.com.hk)

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## EXECUTIVE SUMMARY

### Introduction

1. This is the 7<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 1121 – NSL Cross Harbour Tunnels**. This report documents the findings of EM&A Works conducted from 1 to 30 September 2015.

### Summary of Construction Works undertaken during Reporting Month

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

#### Shek O

- Site Formation in Shek O Casting Basin;
- Construction of Shek O Barging Point;
- Construction of Shek O Concrete Batching Plant;
- Construction of IMT Bottom Plate at Shek O; and
- Steel Formwork Erection.

#### Hung Hom Landfall

- Installation of Pipe Pile Wall for Cofferdam;
- Ground Improvement Work; and
- Rock breaking at IMT Element E1 Location.

### 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)<sup>(1)</sup> 0 times
- Water Quality Monitoring at each monitoring station (Victoria Harbour) 13 times

Remarks:

(1) Removal of earth bunds at Shek O Casting Basin under this Project has not yet commenced in the reporting month.

#### 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 14 and 29 September 2015. 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 7, 14, 21 and 29 September 2015. The representative of the IEC joined the site inspection on 21 September 2015. 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. One environmental complaint and no notification of summons/successful prosecutions were received in this reporting period.

#### **Reporting Changes**

10. No reporting changes in this reporting period.

#### **Future Key Issues**

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

##### Shek O

- Base Slab Rebar Fixing & concreting;
- Wall & Roof Rebar fixing & concreting;
- IMT element cast-in items installation; and
- Tower Crane Construction.

##### Hung Hom Landfall

- Construction of Marine Platform;
- Installation of Pipe Pile Wall for Cofferdam;
- Ground Improvement Work; and
- Rock Breaking at IMT Element E1 Location.

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

## 1 INTRODUCTION

- 1.1 Cinotech Consultants Limited (Cinotech) was appointed by Penta Ocean – China State Joint Venture (PCJV) 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 1121 – NSL Cross Harbour Tunnels (hereafter referred to as the Project).

### **Purpose of the Report**

- 1.2 This is the 7<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 30 September 2015. The major construction works for Contract 1121 commenced on 2 March 2015.

### **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 The “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.
- 2.4 The “Environmental Review Report – Variation for IMT Extension” (ERR) was submitted to the EPD in February 2015 to identify and assess the likely environmental issues pertinent to the proposed alternative scheme of IMT extension. Variation of environmental permit (VEP) was subsequently applied for EP-436/2012 and the latest Environmental Permit (EP No: EP-436/2012/B) was issued by Director of Environmental Protection (DEP) on 19 March 2015.
- 2.5 The construction of the SCL (HUH-ADM) has been divided into a series of civil construction Works Contracts and this Works Contract 1121 comprises of the Permanent Works and the associated Temporary works required for the construction of the North Ventilation Building (NOV) at the Hung Hom Landfall, and construction of cut & cover tunnel and Immersed Tunnel (IMT) sections extending across the harbour from the NOV to the Causeway Bay Typhoon Shelter (CBTS). This construction contract was awarded to Penta Ocean – China State Joint Venture (PCJV) in December 2014.

### General Site Description

- 2.6 The site layout plans for the Works Contract 1121 are shown in **Figure 1a-1b**.

### Construction Programme and Activities

- 2.7 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

- Site Formation in Shek O Casting Basin;
- Construction of Shek O Barging Point;
- Construction of Shek O Concrete Batching Plant;

- Construction of IMT Bottom Plate at Shek O; and
- Steel Formwork Erection.

#### Hung Hom Landfall

- Installation of Pipe Pile Wall for Cofferdam;
- Ground Improvement Work; and
- Rock Breaking at IMT Element E1 Location.

### **Project Organisation**

2.8 The project organizational chart and contact details are shown in **Figure 2**.

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

2.9 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	
<b>Environmental Permit (EP)</b>			
EP-436/2012/B	19/03/2015	N/A	Valid
<b>SP License</b>			
Application in progress			
<b>Notification pursuant to Air Pollution Control (Construction Dust) Regulation</b>			
EPD Ref no.: 384777	28/01/2015	N/A	Valid
EPD Ref no.: 384550	21/01/2015	N/A	Valid
EPD Ref no.: 384281	14/01/2015	N/A	Valid
<b>Billing Account for Construction Waste Disposal</b>			
Account No. 7021499	20/01/2015	N/A	Valid
<b>Registration of Chemical Waste Producer</b>			
Waste Producer No. 5213-147-P3174-03	02/03/2015	N/A	Valid
Waste Producer No. 5213-213-P3172-01	09/02/2015	N/A	Valid
Waste Producer No. 5111-197-P3174-01	27/02/2015	N/A	Valid
<b>Marine Dumping Permit</b>			
EP/MD/15-252	13/04/2015	12/10/2015	Valid
EP/MD/16-026	03/08/2015	02/09/2015	Expired on 2 Sep 2015

Permit / License No.	Valid Period		Status
	From	To	
EP/MD/16-027	03/08/2015	02/09/2015	Expired on 2 Sep 2015
EP/MD/16-029	03/08/2015	02/09/2015	Expired on 2 Sep 2015
EP/MD/16-068	03/09/2015	02/10/2015	Valid
<b>Effluent Discharge License under Water Pollution Control Ordinance</b>			
WT00021844-2015	25/06/2015	30/06/2020	Valid
WT00021891-2015	18/08/2015	31/08/2020	Valid
<b>Construction Noise Permit (CNP)</b>			
PP-RE0004-15	16/03/2015	15/12/2015	Valid
GW-RS0506-15	15/05/2015	14/11/2015	Valid
GW-RS0785-15	18/07/2015	16/01/2016	Superseded by GW-RS0995-15
GW-RE0848-15	26/08/2015	25/02/2016	Superseded by GW-RE0914-15
GW-RE0914-15	15/09/2015	14/03/2016	Valid
GW-RS0995-15	11/09/2015	10/03/2016	Valid

### Summary of EM&A Requirements

- 2.10 The EM&A programme under Works Contract 1121 requires regular dust and 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.
- 2.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.
- 2.12 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 Construction Dust Monitoring

- 3.1 In accordance with the EM&A Manual, the setup of the impact dust monitoring station at Harbourfront Horizon and the impact monitoring is currently carried out by the MTR Contract 1112. Upon termination of their EM&A programmes, the impact monitoring works would be taken up by this Project.

#### Regular Water Quality Monitoring

- 3.2 In accordance with the EM&A Manual and the ERR, marine water quality monitoring should be carried out during the dredging and filling operation, and IMT construction within CBTS (for Station 9 only); and throughout the construction period of removal of earth bunds at Northern and Southern gates.
- 3.3 Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use. The statuses of the intakes will be kept in view such that once the water intakes are occupied, water quality monitoring will resume. In the presence of temporary reclamation in the Causeway Bay Typhoon Shelter (CBTS) under this Project, only Dissolved Oxygen (DO) level monitoring would be maintained at Station 8 for checking of potential odour concern.
- 3.4 The water quality monitoring stations and control stations of Project are shown in **Figure 3**. The co-ordinates of the monitoring stations are listed in **Table 3.1**. As shown in **Table 3.1**, the locations are classified as Impact Station and Control Station according to their functions.

**Table 3.1 Water Quality Monitoring Stations**

Station	Description	Coordinates	
		Easting	North
<i>Shek O Casting Basin</i>			
GB3	Turtle Cove Beach	841120	810280
C3	Control Station for ebb tide	841200	806210
C4	Control Station for flood tide	843330	807320
<i>Victoria Harbour</i>			
8	Cooling Water Intake for Excelsior Hotel and World Trade Centre / No. 27 – 63 Paterson Street	837036	816008
9	Cooling Water Intake for Windsor House	837223	816150
14	Flushing Water Intake for Kowloon Station	834477	817891
21	Cooling Water Intake for East Rail Extension	836484	817642
34	Cooling Water Intake for Metropolis	836828	817844
A	Wan Chai WSD Flushing Water Intake (Reprovisioned) <sup>(1)</sup>	836268	816045
WSD9	Tai Wan WSD Flushing Water Intake <sup>(2)</sup>	837930	818357
WSD17	Quarry Bay WSD Flushing Water Intake	839863	817077
C1	Control Station 1	833977	817442
C2	Control Station 2	841088	817223

Note:

- (1) According to the Baseline Water Quality Monitoring Report for SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location A (Easting: 836286, Northing: 816024) is the exact location taken from the design of reprovisioned 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 SCL (MKK-HUH & HUH-ADM), the original coordinates of monitoring location WSD9 (Easting: 838133, Northing: 817790) as proposed in WQMP were moved closer to sensitive receiver according to the actual site condition.

### Monitoring Parameter, Frequency and Programme

- 3.5 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	<u>Victoria Harbour</u> During the dredging and filling operation  <u>CBTS (Station 9 only)</u> During IMT construction within CBTS  <u>Shek O Casting Basin</u> Throughout the construction period of removal of earth bunds at Northern and Southern gates.
Monitoring Frequency <sup>(1)</sup>	3 Days in a Week, at mid-flood and mid-ebb tides
Monitoring Locations <sup>(3)</sup>	GB3, C3, C4, 8, 9, 14, 21, 34, A, WSD9, WSD17, C1 and C2
Monitoring Parameters <sup>(2)</sup>	DO, temperature, turbidity, pH, salinity and SS
Intervals between 2 Sets of Monitoring	Not less than 36 hours
Tidal Range	Individual flood and ebb tides not less than 0.5m

Notes:

1. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5 m.
2. Turbidity, DO, pH, temperature and salinity should be measured in situ whereas SS should be determined by laboratory.
3. Water Quality Monitoring at Station 8 and 14 is suspended as the water intakes are not in use.

### Monitoring Equipment and Methodology

#### *pH Measurement Instrument*

- 3.6 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*

- 3.7 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).

3.8 It should have a membrane electrode with automatic temperature compensation complete with a cable.

3.9 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***

3.10 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***

3.11 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***

3.12 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***

3.13 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***

3.14 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***

3.15 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***

- 3.16 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.
- 3.17 **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**

<b>Equipment</b>	<b>Model and Make</b>	<b>Qty.</b>
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Multi-parameter Water Quality System	Aquaread AP-2000-D	2
Monitoring Position Equipment	“Magellan” Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

- 3.18 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.

#### **Laboratory Measurement / Analysis for Marine Water**

- 3.19 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 3.4** 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**

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

- 3.20 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**

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

#### **Event and Action Plan**

- 3.22 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**

- 3.23 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**

<b>EP Condition</b>	<b>Submission</b>	<b>Submission Date</b>
Condition 3.4	Monthly EM&A Report (August 2015)	14 September 2015

## 5 MONITORING RESULTS

### Water Quality Monitoring

- 5.1 13 sets of water quality monitoring were carried out at the designated monitoring stations in Victoria Harbour 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 Removal of earth bunds at Northern and Southern Gates has not yet commenced in Shek O Casting Basin. Therefore, no water quality monitoring in Shek O was carried out during this reporting period under this Project.
- 5.3 The monitoring results together with graphical presentations are shown in **Appendix D**.
- 5.4 Under consultancy agreement no. C11033B, Action and Limit Levels for water quality monitoring at the monitoring stations in **Table 3.2** were established in the baseline water quality monitoring conducted by AECOM during June and July 2014. Action and Limit Levels for water quality is summarised in **Appendix B**.
- 5.5 No exceedance of Action and Limit Levels of water quality was recorded during the reporting period.

### Waste Management

- 5.6 Waste generated from this Project includes inert construction and demolition (C&D) materials, non-inert C&D materials and marine sediments. Non-inert C&D materials are made up of C&D waste which cannot be reused or recycled and has to be disposed of at the designated landfill sites. With reference to relevant handling records of this Project, the quantities of different types of waste generated in the reporting month are summarised in **Table 5.1**. Details of waste management data is presented in **Appendix K**.
- 5.7 981 m<sup>3</sup> inert C&D materials were generated during the reporting month by this Project. 5,748 m<sup>3</sup> and 13,163 m<sup>3</sup> inert C&D materials were received from SCL Contract 1111 and 1112 respectively. 18,842 m<sup>3</sup> of these inert C&D materials were reused in the other Projects. No chemical waste was collected by licensed collector during the reporting month. No plastics, metal and paper/cardboard packaging were generated during the reporting month.
- 5.8 No Type 1 sediments (Category L) were generated from construction activities of this Project during this reporting period. 5,542 m<sup>3</sup> and 0 m<sup>3</sup> Type 1 sediments (Category L) were received from SCL Contract 1111 and 1112 respectively. 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).
- 5.9 No contaminated materials - Type 1 (dedicated sites) and Type 2 - Confined Marine Disposal (Category M) sediments were generated from construction activities of this Project during this reporting period. 0 m<sup>3</sup> and 1,942 m<sup>3</sup> Type 2 - Confined Marine Disposal (Category M) sediments were received from SCL Contract 1111 and 1112 respectively. Such materials were collected and 1,542 m<sup>3</sup> of it were disposed at Mud Pits CMP1 or CMP2 of the exhausted Confined Marine Disposal Facility at South of The Brothers (or East of Sha Chau). 400 m<sup>3</sup> of Type 2 - Confined Marine Disposal (Category M) sediments were stockpiled on site.

**Table 5.1 Quantities of Waste Generated from the Project**

Reporting Month	Quantity						
	C&D Materials (inert) <sup>(a)</sup>	Sediments (in bulk volume)	C&D Materials (non-inert) <sup>(b)</sup>				
			General Refuse	Chemical Waste	Recycled materials		
					Paper/cardboard	Plastics	Metals
September 2015	981 m <sup>3</sup>	0 m <sup>3</sup>	25 tonne	0 kg	0 kg	0 kg	0 kg
Notes:							
(a) Inert C&D materials include soft materials, rocks and artificial hard materials to be delivered to TKO 137 and TM 38 public fill reception sites or, alternatively, receptor sites to be identified for beneficial reuse as proposed by the Contractor.							
(b) Non-inert C&D materials include C&D waste which cannot be reused or recycled and has to be disposed of at North East New Territories (NENT) Landfill. It also includes steel, paper/cardboard packaging waste, plastics. 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 14 and 29 September 2015. 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 7, 14, 21 and 29 September 2015 by ET. A joint site audit with the representative with IEC, ER, the Contractor and the ET was carried out on 21 September 2015. Site inspection was conducted by the EPD on 24 September 2015 and no adverse comments were raised. 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>	31 Aug 2015	<u>Observation:</u> General refuse was observed on the sea near the Northern Dock Gate. The Contractor was reminded to clear the general refuse to keep the sea clean and avoid any possible negative visual impact.	The observation was observed to be improved/rectified by the Contractor during the audit session on 7 September 2015.
	7 Sep 2015	<u>Reminder:</u> To remove the floating rubbish near the water intakes at Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 September 2015.
	14 Sep 2015	<u>Reminder:</u> To remove the floating rubbish near the silt curtain at Northern Dock Gate at Shek O.	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 September 2015.
	14 Sep 2015	<u>Reminder:</u> To clear the sand at the U-channel near Concrete Batching Plant in Shek O.	The observation was observed to be improved/rectified by the Contractor during the audit session on 21 September 2015.
	21 Sep 2015	<u>Reminder:</u> The contractor is reminded to remove the floating rubbish near the silt curtain at Northern Dock Gate at Shek O and near the seawater intake at Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 September 2015.
	29 Sep 2015	<u>Reminder:</u> The Contractor was reminded to clear the accumulated sand in the U-channel near the Concrete Batching Plant in Shek O.	Follow up action will be reported in next reporting month.

Parameters	Date	Observations and Recommendations	Follow-up
<i>Noise</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Air Quality</i>	24 Aug 2015 & 31 Aug 2015	<u>Reminder:</u> To repair the dust curtain properly at the discharge point of Hung Hom barging point.	The observation was observed to be improved/rectified by the Contractor during the audit session on 7 September 2015.
	7 Sep 2015	<u>Reminder:</u> Provide proper top and 3 sides enclosure for cement grouting machine in Hung Hom NOV area.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 September 2015.
	14 Sep 2015	<u>Observation:</u> Unpaved area observed dusty at Shek O Casting Basin. The contractor is reminded to provide frequent water spray to avoid dust generation.	The observation was observed to be improved/rectified by the Contractor during the audit session on 21 September 2015.
	21 Sep 2015	<u>Reminder:</u> To properly repair the dust curtain at the discharge point of Barging Facility in Hung Hom.	Follow up action will be reported in next reporting month.
	29 Sep 2015	<u>Reminder:</u> The Contractor was reminded to repair the dust curtain at the discharging point of Hung Hom Barging Point.	Follow up action will be reported in next reporting month.
<i>Waste / Chemical Management</i>	7 Sep 2015	<u>Reminder:</u> To provide drip tray for chemical containers on paved area at the Shek O Casting Basin.	The observation was observed to be improved/rectified by the Contractor during the audit session on 14 September 2015.
	14 Sep 2015	<u>Reminder:</u> To clear properly the oil leakage in Hung Hom and provide tarpaulin sheets to the maintenance work of plants on unpaved area.	The observation was observed to be improved/rectified by the Contractor during the audit session on 21 September 2015.
	21 Sep 2015	<u>Reminder:</u> To provide a plug for drip tray of generator-set in Hung Hom.	The observation was observed to be improved/rectified by the Contractor during the audit session on 29 September 2015.
	29 Sep 2015	<u>Observation:</u> Stagnant water was observed in the drip trays in the Shek O Casting Basin. The Contractor was reminded to clear the accumulated water in the drip trays to prevent overflow.	Follow up action will be reported in next reporting month.
<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 One environmental complaint was received in the reporting month. The Cumulative Complaint Log since the commencement of the Project is presented in **Appendix L**. The investigation status and result will be reported in the next Monthly EM&A Report.

### 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:

#### Shek O

- Base Slab Rebar Fixing & concreting;
- Wall & Roof Rebar fixing & concreting;
- IMT element cast-in items installation; and
- Tower Crane Construction.

#### Hung Hom Landfall

- Construction of Marine Platform;
- Installation of Pipe Pile Wall for Cofferdam;
- Ground Improvement Work; and
- Rock breaking at IMT Element E1 Location.

### Key Issues in the Next Month

8.2 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, noise, water quality and waste management in both Shek O and Hung Hom.

### 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 30 September 2015 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 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 One environmental complaint was received during the reporting month. A Complaint Investigation Report will be submitted to EPD accordingly. No successful prosecution or notification of summons were received during the reporting month. The investigation status and result will be reported in the next Monthly EM&A Report.
- 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

- Clear the general refuse observed in Shek O Casting Basin and Hung Hom Landfall regularly.
- To clear the sand accumulated in the U-channel near the concrete batching point at Shek O.

#### Landscape and Visual

- N/A

#### Noise

- N/A

#### Air Quality

- The Contractor is reminded to provide more water spray to avoid dust generation in Shek O and Hung Hom respectively.
- Provide proper top and 3 sides enclosure for cement grouting machine.
- To repair the dust curtain properly at the discharge point of Hung Hom barging point.

#### Waste/Chemical Management

- Drip trays should be provided to chemical containers on site.
- Oil leakage on unpaved area should be properly cleared.
- Plugs should be provided to drip trays.

#### Permits/Licenses

- N/A



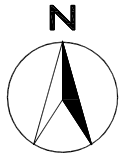
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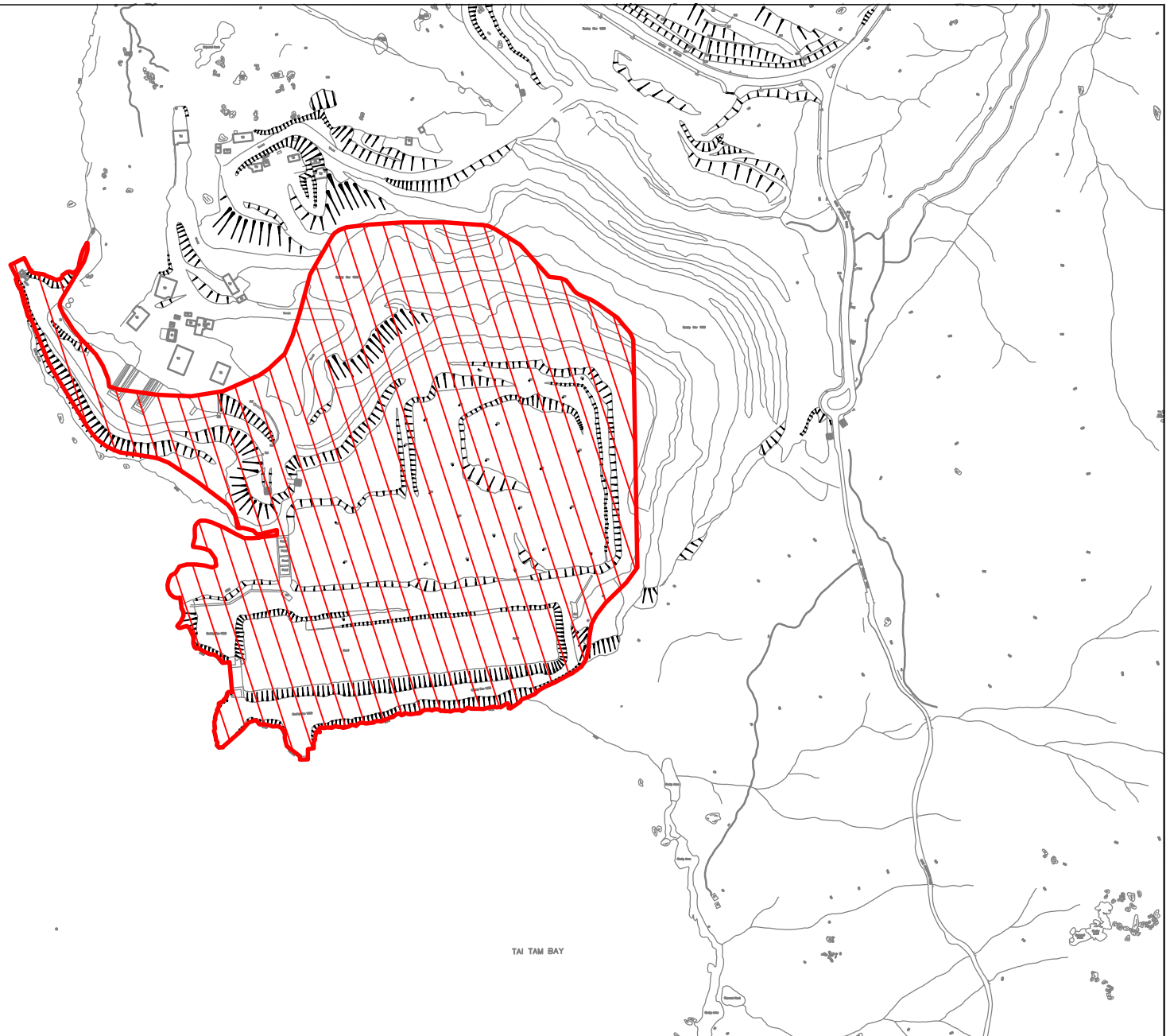
## FIGURES

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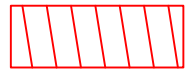


TAI TAM BAY



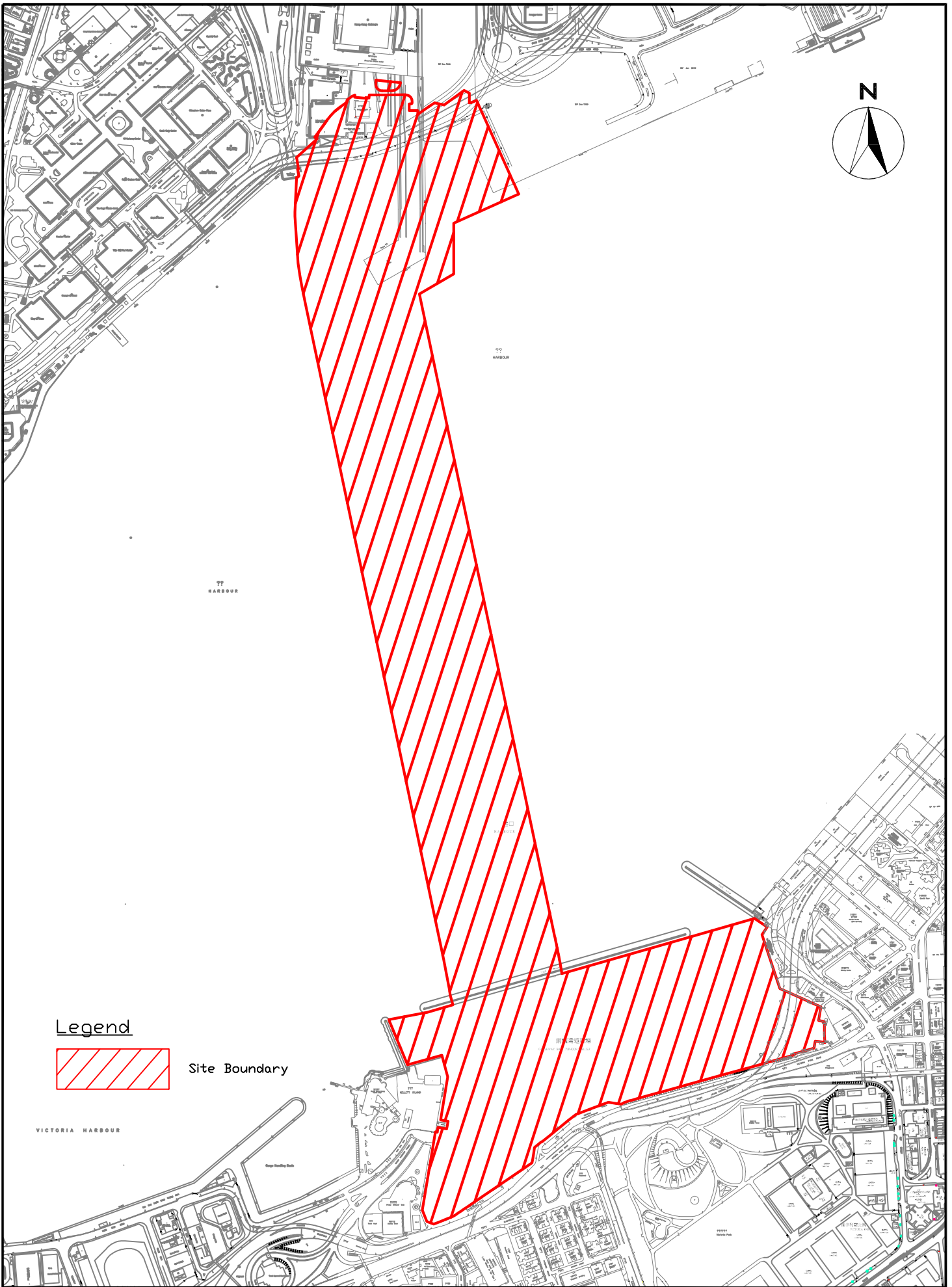
TAI TAM BAY

Legend



Site Boundary

SCALE	1:150	DATE	12/2014
CHECK	CHECK	DRAWN	VW
JOB No.	MA14047	FIGURE NO.	1a
		REV	-



**Legend**

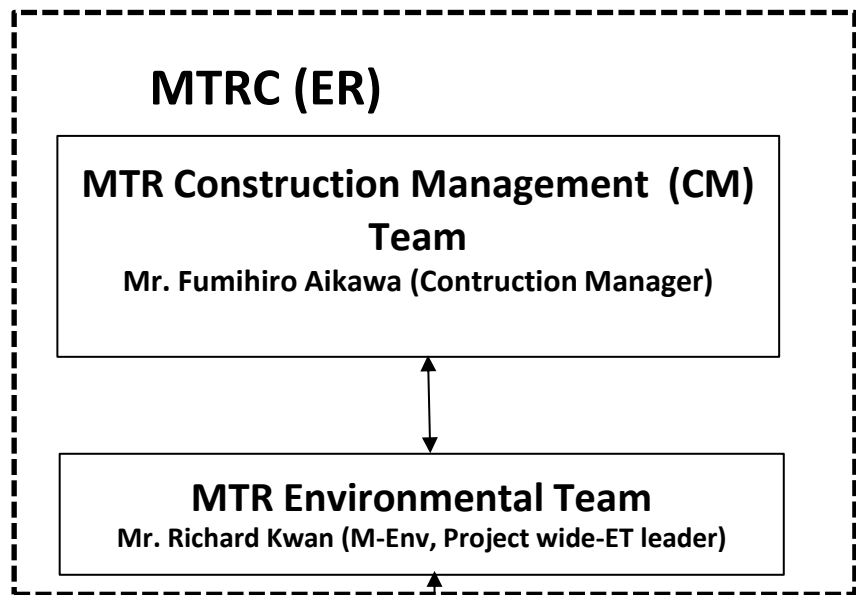


Site Boundary

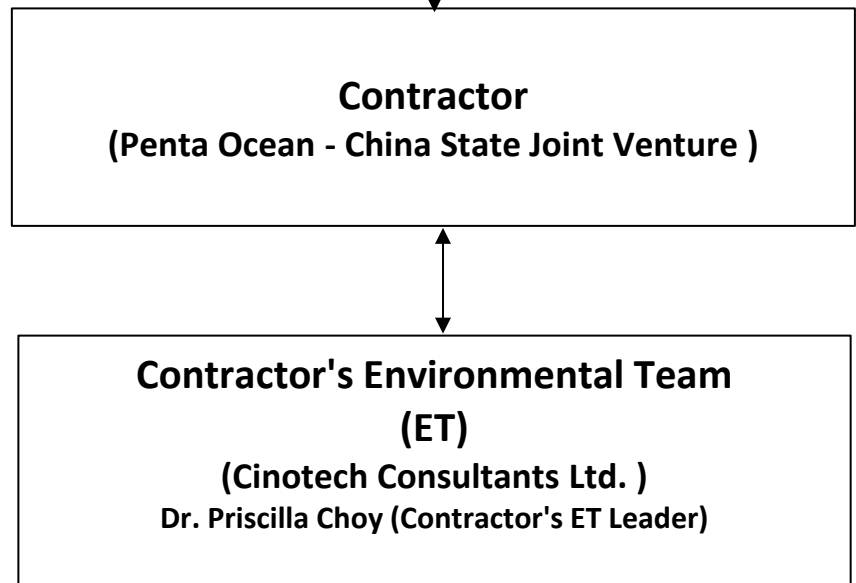
**CINOTECH**  
Cinotech Consultants Limited

SCL 1121 - NSL Cross Harbour Tunnels  
**Site Layout Plan**  
(Victoria Harbour)

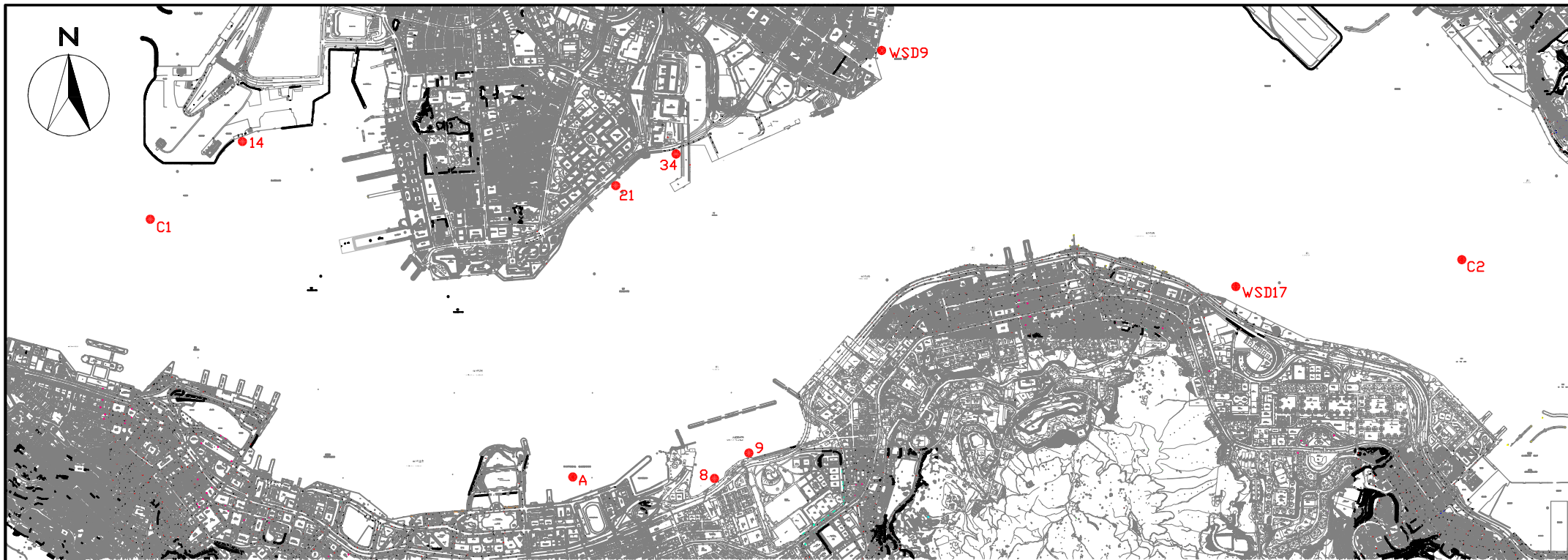
SCALE	1:220	DATE	1/2015
CHECK	JF	DRAWN	VW
JOB No.	MA14047	FIGURE NO.	1b
		REV	-



↔ Line of communication



Title	SCL Contract 1121 The Shatin to Central Link - NSL Cross Harbour Tunnels Project Organisation for Environmental Works	Scale	N.T.S	Project No.	MA14047	<b>CINOTECH</b>
		Date	Jan-15	Figure	2	



COORDINATE	EASTING	NORTHING
A	836268	816045
14	834477	817891
WSD9	837930	818357
WSD17	839863	817077
C1	833977	817442
C2	841088	817223
8	837036	816008
9	837223	816150
21	836484	817642
34	836828	817844

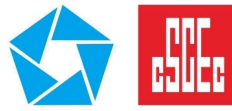
### LEGEND

● Water Quality Monitoring Station

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**APPENDIX A  
TENTATIVE CONSTRUCTION  
PROGRAMME**

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Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
<b>1121 - 11 - 3M Rolling Programme (10 - 12/2015) (Ref. to PMP Rev 1a) (Updated as of 30 Sep 2015)</b>												
01121.CD10000	Date for Commencement			0.0	15-Dec-14 A			100%				
<b>ENGINEERING</b>												
<b>License and Permit Application</b>												
<b>SP License Application for Batching Plant in Shek O</b>												
01121.EG11120	batching plant - Issue SP license by EPD			1.0	03-Jul-15 A	20-Oct-15	255.0	90%				
<b>Detail Engineering</b>												
<b>General Submission</b>												
<b>Tunnel Drainage</b>												
01121.EG11340-20	[Tunnel Drainage ME4/IMT11] - Engineer comment and approve			0.0	29-Jul-15 A	30-Sep-15	314.0	0%				
<b>Cost Center B - North Ventilation Building NOV</b>												
<b>NOV - Temporary Work Design</b>												
<b>NOV - Temporary Pipe Pile Wall Cofferdam Design</b>												
01121.EG12890	NOV - Temp Cofferdam (Stage 2) - RDO / BD / GEO comment and approve			11.0	09-Jul-15 A	10-Oct-15	2151.0	40%				
01121.EG12900	NOV - Temp Cofferdam (Stage 3) - issue working drawings			7.0	11-Oct-15	17-Oct-15	2267.0	0%				
<b>NOV - ELS and Utilities Temporary Support Design</b>												
01121.EG12910	NOV - ELS & UU support (Stage 2) - RDO / BD / GEO comment and approve			70.0	30-Sep-15	08-Dec-15	97.0	0%				
<b>NOV - Pumping Test Proposal</b>												
01121.EG12960	NOV - Pumping Test Proposal (Stage 2) - Prepare and submit detail design			0.0	17-Aug-15 A	06-Sep-15 A		100%				
01121.EG12970	NOV - Pumping Test Proposal (Stage 2) - Engineer comment and approve			8.0	07-Sep-15 A	07-Oct-15	114.0	0%				
01121.EG12980	NOV - Pumping Test Proposal (Stage 2) - RDO / BD / GEO comment and approve			70.0	08-Oct-15	16-Dec-15	114.0	0%				
<b>Cost Center C - Hung Hom Landfall Tunnels</b>												
<b>HUH Temporary Work Design</b>												
<b>HUH (Area B) - Temporary Pipe Pile Wall Cofferdam &amp; ELS Design</b>												
01121.EG10670-10	HUH (Area B) - Temp Cofferdam & ELS (Stage 2) - Preapre and submit detail design (Amendment)			0.0	18-Aug-15 A	18-Sep-15 A		100%				
01121.EG10670-20	HUH (Area B) - Temp Cofferdam & ELS (Stage 2) - Engineer comment and approve			15.0	19-Sep-15 A	17-Oct-15	1855.0	0%				
01121.EG12730	HUH (Area B) - Temp Cofferdam & ELS (Stage 3) - RDO / BD / GEO comment and approve			0.0	25-Apr-15 A	07-Dec-15	2210.0	95%				
<b>HUH (Area B) - Pumping Test Proposal</b>												
01121.EG11830	HUH Tunnel (Area B) - Pumping Test Proposal (Stage 2) - RDO / BD / GEO comment and approve			70.0	30-Nov-15	07-Feb-16	112.0	0%				
<b>HUH (Area C) - Temporary Pipe Pile Wall Cofferdam &amp; ELS Design</b>												
01121.EG12800	HUH (Area C) - Temp Cofferdam & ELS (Stage 3) - RDO / BD / GEO comment and approve (resubmit to BD 11/9/15)			12.0	09-Jul-15 A	11-Oct-15	1843.0	70%				
01121.EG12810	HUH (Area C) - Temp Cofferdam & ELS (Stage 3) - issue working drawings			7.0	12-Oct-15	18-Oct-15	1843.0	0%				
<b>HUH (Area C) - Pumping Test Proposal</b>												
01121.EG12850	HUH Tunnel (Area C) - Pumping Test Proposal (Stage 2) - Prepare and submit detail design			0.0	07-Aug-15 A	07-Sep-15 A		100%				
01121.EG12860	HUH Tunnel (Area C) - Pumping Test Proposal (Stage 2) - Engineer comment and approve			0.0	08-Sep-15 A	09-Nov-15	44.0	80%				

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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.EG12870	HUH Tunnel (Area C) - Pumping Test Proposal (Stage 2) - RDO / BD / GEO comment and approval			70.0	09-Nov-15	17-Jan-16	44.0	0%				
01121.EG12880	HUH Tunnel (Area C) - Pumping Test Proposal (Stage 3) - issue construction drawings			7.0	18-Jan-16	24-Jan-16	44.0	0%				
<b>HUH Permanent Work Design</b>				<b>114.0</b>	<b>22-Apr-15 A</b>	<b>21-Jan-16</b>	<b>146.0</b>					
<b>HUH - Finger Pier Demolition Work</b>				<b>6.0</b>	<b>22-Apr-15 A</b>	<b>21-Jan-16</b>	<b>146.0</b>					
01121.EG11470	HUH Finger Pier - demolition plan (Stage 2) - submit to GEO / BD / RDO (Ramp 1 approved 14/9, Ramp 2 await BD reply)			0.0	22-Apr-15 A	14-Sep-15 A		100%				
01121.EG11480	HUH Finger Pier - demolition plan (Stage 3) - issue working drawings			6.0	16-Jan-16	21-Jan-16	146.0	0%				
<b>HUH - Re-provisioning of Finger Pier</b>				<b>80.0</b>	<b>23-Jul-15 A</b>	<b>18-Dec-15</b>	<b>103.0</b>					
01121.EG10640	Finger Pier - Permanent Work (Stage 2) - Statutory Submission and Approval			74.0	23-Jul-15 A	12-Dec-15	103.0	0%				
01121.EG10650	Finger Pier - Permanent Wok (stage 3) - Issue Working Drawing			6.0	13-Dec-15	18-Dec-15	103.0	0%				
<b>Cost center D - Immersed Tube Tunnels</b>				<b>68.0</b>	<b>23-Feb-15 A</b>	<b>20-Dec-15</b>	<b>1802.0</b>					
<b>IMT Temporary Work Design</b>				<b>22.0</b>	<b>31-Jul-15 A</b>	<b>21-Oct-15</b>	<b>429.0</b>					
<b>IMT Dredging Plan</b>				<b>22.0</b>	<b>31-Jul-15 A</b>	<b>21-Oct-15</b>	<b>429.0</b>					
01121.EG11530	IMT Dredging Plan (Stage 2) - Engineer Comment, Re-Submit and Approve			0.0	31-Jul-15 A	30-Sep-15	429.0	95%				
01121.EG11540	IMT Dredging Plan (Stage 2) - Gov't Authorities endorsement (submit to BD 25/8/15)			22.0	21-Aug-15 A	21-Oct-15	429.0	60%				
<b>IMT Permanent Work Design</b>				<b>68.0</b>	<b>23-Feb-15 A</b>	<b>20-Dec-15</b>	<b>1802.0</b>					
<b>IMT Foundation and Marine Earthwork</b>				<b>7.0</b>	<b>13-Jul-15 A</b>	<b>06-Oct-15</b>	<b>327.0</b>					
01121.EG11680	IMT Foundation and backfill (Stage 2) - RDO/BD/GEO Submission and Approval (BD no further comment, approval not issue)			0.0	13-Jul-15 A	30-Sep-15	327.0	90%				
01121.EG11690	IMT Foundation and backfill (Stage 3) - Issue Working Drawings			7.0	30-Sep-15	06-Oct-15	327.0	0%				
<b>IMT Tunnel Structure Design</b>				<b>68.0</b>	<b>23-Feb-15 A</b>	<b>20-Dec-15</b>	<b>1802.0</b>					
01121.EG12060	IMT Tunnel Structure Design (Stage 2) - Prepare and Submit Detail Design			32.0	23-Feb-15 A	31-Oct-15	1831.0	90%				
01121.EG12070	IMT Tunnel Structure Design (Stage 2) - Engineer Comment, Re-Submit and Approve			22.0	03-Jun-15 A	20-Nov-15	1831.0	65%				
01121.EG12170	IMT Tunnel Structure Design (Stage 2) - RDO/BD/GEO Submission and Approval			70.0	29-Jul-15 A	20-Dec-15	1831.0	50%				
01121.EG12170-05	IMT package M2 - comment from HyD recieved on 26 Aug 15			0.0		26-Aug-15 A		100%				
01121.EG12170-10	IMT package M2 - MTR approve on 17 Sep 15			0.0		17-Sep-15 A		100%				
01121.EG12170-20	IMT package M2 - MTR submit to RDO on 15 Sep 15			0.0		15-Sep-15 A		100%				
01121.EG12170-60	IMT package M3a - submit to MTR on 4 Sep 15			0.0		04-Sep-15 A		100%				
01121.EG12170-70	IMT package M3b - target submit at end of Oct			26.0	30-Sep-15	31-Oct-15	1844.0	0%				
<b>IMT Immersion Joint Design</b>				<b>0.0</b>	<b>31-Jul-15 A</b>	<b>25-Sep-15 A</b>						
01121.EG12310-10	IMT package M4 - 1st submission to RDO on 31 Jul 15			0.0		31-Jul-15 A		100%				
01121.EG12310-20	IMT package M4 - resubmission ready 25-Sep-15 (except 4hrs FRP design, subject to MTR's advice)			0.0		25-Sep-15 A		100%				
<b>Cost Center E - CBTS Tunnels</b>				<b>35.0</b>	<b>30-Jun-15 A</b>	<b>11-Nov-15</b>	<b>1835.0</b>					
<b>CBTS Marine Traffic Impact Assessment</b>				<b>0.0</b>	<b>02-Jul-15 A</b>	<b>30-Sep-15</b>	<b>1870.0</b>					
01121.EG10090	CBTS MTIA - Submit to MD and Approve			0.0	03-Jul-15 A	30-Sep-15	27.0	50%				
01121.EG10090-10	CBTS MTIA - 1st submission to MD on 2 Jul 15			0.0		02-Jul-15 A		100%				
01121.EG10090-20	CBTS MTIA - comment from MD received on 22 Jul 15			0.0		22-Jul-15 A		100%				

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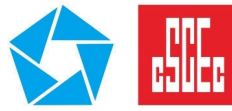
- ◆ Current Milestone
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**Updated 3M Rolling Programme (Oct - Dec 2015)**

**(Updated as of 30 Sep 2015)**

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02-Oct-15		Vincent Yeung	K. Hatakeyama





Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.EG10090-30	CBTS MTIA - 2nd submission to MD on 1 Sep 15			0.0		01-Sep-15 A		100%				
<b>CBTS Temporary Work Design</b>				35.0	30-Jun-15 A	11-Nov-15	1835.0					
<b>CBTS - Instrumentation and Monitoring</b>				35.0	30-Jun-15 A	11-Nov-15	1835.0					
01121.EG11720	CBTS - Instrumentation and Monitoring - Engineer Comment, Re-Submit and Approve			43.0	30-Jun-15 A	11-Nov-15	152.0	90%				
01121.EG11720-10	CBTS - instrumentation and monitoring - to be re-submit to MTR in 13 Oct 15			11.0	30-Sep-15	13-Oct-15	1859.0	0%				
<b>CBTS - (VH3B &amp; VH3C) Temporary Reclamation Design</b>				35.0	30-Jun-15 A	11-Nov-15	1835.0					
01121.EG10860	CBTS - Temp Reclamation Design (VH3B & 3C) - Engineer comment, re-submit and approve			43.0	30-Jun-15 A	11-Nov-15	152.0	90%				
01121.EG10860-10	CBTS - Temp Reclamation Design - to be re-submit to MTR in 13 Oct 15			11.0	30-Sep-15	13-Oct-15	1859.0	0%				
<b>CBTS - (VH3B, VH3C &amp; VH3D) Temporary Pipe Pile Wave Barrier Wall Design</b>				35.0	30-Jun-15 A	11-Nov-15	1835.0					
01121.EG11990	CBTS - Temp Wave Barrier Wall (VH3B, 3C & 3D) - Engineer Comment, Re-Submit and Approve			43.0	30-Jun-15 A	11-Nov-15	213.0	90%				
01121.EG11990-10	CBTS - Temp wave barrier wall - to be re-submit to MTR in 13 Oct 15			11.0	30-Sep-15	13-Oct-15	1859.0	0%				
<b>Cost Centre G - RRIW</b>				96.0	19-Aug-15 A	25-Jan-16	1774.0					
<b>RRIW - Re-provisioning of Seawall at Hung Hom</b>				96.0	10-Sep-15 A	25-Jan-16	1774.0					
01121.EG10360	RRIW - HUH Seawall - Re-provisioning Design (Stage 2) - Statutory Submission and Approval			70.0	17-Nov-15	25-Jan-16	493.0	0%				
01121.EG10360-10	RRIW - HUH seawall re-provisioning - MTR rejected on 10 Sep 15			0.0		10-Sep-15 A		100%				
01121.EG10360-20	RRIW - HUH seawall re-provisioning - to be re-submit on 16 Oct 15			14.0	11-Sep-15 A	16-Oct-15	400.0	50%				
01121.EG10360-30	RRIW - HUH seawall re-provisioning - Engineer comment and approve			25.0	17-Oct-15	16-Nov-15	400.0	0%				
<b>RRIW - Re-provisioning of CBTS Breakwater</b>				58.0	19-Aug-15 A	08-Dec-15	1812.0					
01121.EG10430	RRIW - CBTS Breakwater - Re-provisioning Design (Stage 2) - Gov't Authorities endorsement			70.0	30-Sep-15	08-Dec-15	528.0	0%				
01121.EG10430-10	RRIW - CBTS breakwater re-provisioning - MTR approve detail design subject to comment (19 Aug 15)			0.0		19-Aug-15 A		100%				
<b>CONSTRUCTION</b>				287.0	21-Feb-15 A	17-Sep-16	1583.0					
<b>Cost Centre A - General Preliminary</b>				300.0	21-Feb-15 A	17-Sep-16	1566.0					
<b>A3</b>				0.0	21-Feb-15 A	20-Jul-15 A						
01121.15140	A3 - Specified Plans - Implementation with Satisfactory from Engineer			0.0	21-Feb-15 A	20-Jul-15 A		100%				
<b>A5</b>				116.0	23-Nov-15	17-Mar-16	1750.0					
01121.15210	A5 - Specified Plans - Implementation with Satisfactory from Engineer			116.0	23-Nov-15	17-Mar-16	100.0	0%				
01121.15220	A5 - Preliminary ABWF and BS Programme - Prepare, Submit and Approve			116.0	23-Nov-15	17-Mar-16	1750.0	0%				
<b>A6</b>				300.0	23-Nov-15	17-Sep-16	1202.0					
01121.15240	A6 - Specified Plans - Implementation with Satisfactory from Engineer			180.0	18-Mar-16	13-Sep-16	100.0	0%				
01121.15260	A6 - Programming Management System - Implementation with Satisfactory from Engineer			295.0	25-Nov-15	14-Sep-16	284.0	0%				
01121.15270	A6 - NOV ABWF Shop Drawing & Material Submission (AIP) - Prepare, Submit and Approve			300.0	23-Nov-15	17-Sep-16	1202.0	0%				
01121.15280	A6 - NOV BS Shop Drawing & Material Submission (AIP) - Prepare, Submit and Approve			300.0	23-Nov-15	17-Sep-16	1202.0	0%				
<b>Cost Centre B - North Ventilation Building NOV</b>				94.0	06-Jul-15 A	22-Jan-16	1776.0					
<b>NOV Site Preparation Works</b>				0.0	06-Jul-15 A	06-Jul-15 A						
01121.23660	NOV - Complete Diversion of Existing Cooling Main and Hand Over of Site by 1112 to 1121			0.0	06-Jul-15 A			100%				

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Updated 3M Rolling Programme (Oct - Dec 2015)

(Updated as of 30 Sep 2015)

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02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015				
									Sep	Oct	Nov	Dec	
<b>NOV Cofferdam Construction (West)</b>													
<b>NOV Cofferdam (West) - Pipe Pile Casing</b>													
01121.13798-1250	NOV - West - Install Pipe Pile Casing (DP125-BP134) (10 nos.)	10 nos.	2 nos.	6.0	21-Sep-15 A	07-Oct-15	-8.0	20%					
01121.13798-1260	NOV - West - Install Pipe Pile Casing (DP135-BP151) (17 nos.)	17 nos.		12.0	16-Oct-15	30-Oct-15	-8.0	0%					
01121.13798-1270	NOV - West - Install Pipe Pile Casing (DP115-DP124) (10 nos.)	10 nos.	2 nos.	6.0	22-Sep-15 A	23-Nov-15	-8.0	20%					
01121.13798-1280	NOV - West - Install Pipe Pile Casing (DP105-DP114) (10 nos.)	10 nos.		7.0	03-Dec-15	10-Dec-15	-8.0	0%					
01121.13798-1290	NOV - West - Install Pipe Pile Casing (DP095-DP104) (10 nos.)	10 nos.		7.0	22-Dec-15	31-Dec-15	-8.0	0%					
01121.13798-1300	NOV - West - Install Pipe Pile Casing (DP079-DP094) (16 nos.)	16 nos.		12.0	09-Jan-16	22-Jan-16	-8.0	0%					
<b>NOV Cofferdam (West) - Rock Socket</b>													
01121.13799-10	NOV - West - Rock Socket (DP125-DP134) - 1st 5 nos.	5 nos.		2.0	08-Oct-15	09-Oct-15	-8.0	0%					
01121.13799-15	NOV - West - Rock Socket (DP125-DP134) - remaining 5 nos.	5 nos.		2.0	14-Oct-15	15-Oct-15	-8.0	0%					
01121.13799-20	NOV - West - Rock Socket (DP135-DP151) - 1st 9 nos.	9 nos.		5.0	31-Oct-15	05-Nov-15	-8.0	0%					
01121.13799-25	NOV - West - Rock Socket (DP135-DP151) - remaining 8 nos.	8 nos.		4.0	12-Nov-15	16-Nov-15	-8.0	0%					
01121.13799-30	NOV - West - Rock Socket (DP115-DP124) - 1st 5 nos.	5 nos.		3.0	24-Nov-15	26-Nov-15	-8.0	0%					
01121.13799-35	NOV - West - Rock Socket (DP115-DP124) - remaining 5 nos.	5 nos.		2.0	01-Dec-15	02-Dec-15	-8.0	0%					
01121.13799-40	NOV - West - Rock Socket (DP105-DP114) - 1st 5 nos.	5 nos.		3.0	11-Dec-15	14-Dec-15	-8.0	0%					
01121.13799-45	NOV - West - Rock Socket (DP105-DP114) - remaining 5 nos.	5 nos.		3.0	18-Dec-15	21-Dec-15	-8.0	0%					
01121.13799-50	NOV - West - Rock Socket (DP095-DP104) - 1st 5 nos.	5 nos.		2.0	02-Jan-16	04-Jan-16	-8.0	0%					
<b>NOV Cofferdam (West) - H-pile &amp; Grouting</b>													
01121.13799-180	NOV - West - H-section & grouting (DP125-DP134) - 1st 5 nos.	5 nos.		3.0	10-Oct-15	13-Oct-15	-8.0	0%					
01121.13799-190	NOV - West - H-section & grouting (DP125-DP134) - remaining 5 nos.	5 nos.		2.0	16-Oct-15	17-Oct-15	7.0	0%					
01121.13799-200	NOV - West - H-section & grouting (DP135-DP151) - 1st 9 nos.	9 nos.		5.0	06-Nov-15	11-Nov-15	-8.0	0%					
01121.13799-210	NOV - West - H-section & grouting (DP135-DP151) - remaining 8 nos.	8 nos.		4.0	17-Nov-15	20-Nov-15	-3.0	0%					
01121.13799-220	NOV - West - H-section & grouting (DP115-DP124) - 1st 5 nos.	5 nos.		3.0	27-Nov-15	30-Nov-15	-8.0	0%					
01121.13799-230	NOV - West - H-section & grouting (DP115-DP124) - remaining 5 nos.	5 nos.		2.0	03-Dec-15	04-Dec-15	0.0	0%					
01121.13799-240	NOV - West - H-section & grouting (DP105-DP114) - 1st 5 nos.	5 nos.		3.0	15-Dec-15	17-Dec-15	-8.0	0%					
01121.13799-250	NOV - West - H-section & grouting (DP105-DP114) - remaining 5 nos.	5 nos.		2.0	22-Dec-15	23-Dec-15	-1.0	0%					
<b>NOV Cofferdam Construction (East)</b>													
<b>NOV Cofferdam (East) - Pipe Pile Casing</b>													
01121.13798-1310	NOV - East - Install Pipe Pile Casing (DP059-BP068) (10 nos.)	10 nos.		7.0	05-Oct-15*	12-Oct-15	-8.0	0%					
01121.13798-1320	NOV - East - Install Pipe Pile Casing (DP069-BP078) (10 nos.)	10 nos.		7.0	22-Oct-15	29-Oct-15	-8.0	0%					
01121.13798-1330	NOV - East - Install Pipe Pile Casing (DP049-DP058) (10 nos.)	10 nos.		7.0	09-Nov-15	16-Nov-15	-8.0	0%					
01121.13798-1340	NOV - East - Install Pipe Pile Casing (DP039-DP048) (10 nos.)	10 nos.		7.0	25-Nov-15	02-Dec-15	-8.0	0%					
01121.13798-1350	NOV - East - Install Pipe Pile Casing (DP029-DP038) (10 nos.)	10 nos.		7.0	12-Dec-15	19-Dec-15	-8.0	0%					
01121.13798-1360	NOV - East - Install Pipe Pile Casing (DP019-DP028) (10 nos.)	10 nos.		7.0	30-Dec-15	07-Jan-16	-8.0	0%					

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02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015				
									Sep	Oct	Nov	Dec	
<b>NOV Cofferdam (East) - Rock Socket</b>									64.0	13-Oct-15	29-Dec-15	-8.0	
01121.13799-100	NOV - East - Rock Socket (DP059-DP068) - 1st 5 nos.	5 nos.		3.0	13-Oct-15	15-Oct-15	-8.0	0%					
01121.13799-105	NOV - East - Rock Socket (DP059-DP068) - remaining 5 nos.	5 nos.		2.0	19-Oct-15	20-Oct-15	-8.0	0%					
01121.13799-110	NOV - East - Rock Socket (DP069-DP078) - 1st 5 nos.	5 nos.		3.0	30-Oct-15	02-Nov-15	-8.0	0%					
01121.13799-115	NOV - East - Rock Socket (DP069-DP078) - remaining 5 nos.	5 nos.		2.0	06-Nov-15	07-Nov-15	-8.0	0%					
01121.13799-120	NOV - East - Rock Socket (DP049-DP058) - 1st 5 nos.	5 nos.		3.0	17-Nov-15	19-Nov-15	-8.0	0%					
01121.13799-125	NOV - East - Rock Socket (DP049-DP058) - remaining 5 nos.	5 nos.		2.0	23-Nov-15	24-Nov-15	-8.0	0%					
01121.13799-130	NOV - East - Rock Socket (DP039-DP048) - 1st 5 nos.	5 nos.		3.0	03-Dec-15	05-Dec-15	-8.0	0%					
01121.13799-135	NOV - East - Rock Socket (DP039-DP048) - remaining 5 nos.	5 nos.		2.0	10-Dec-15	11-Dec-15	-8.0	0%					
01121.13799-140	NOV - East - Rock Socket (DP029-DP038) - 1st 5 nos.	5 nos.		2.0	21-Dec-15	22-Dec-15	-8.0	0%					
01121.13799-145	NOV - East - Rock Socket (DP029-DP038) - remaining 5 nos.	5 nos.		2.0	28-Dec-15	29-Dec-15	-8.0	0%					
<b>NOV Cofferdam (East) - H-pile &amp; Grouting</b>									63.0	16-Oct-15	31-Dec-15	0.0	
01121.13799-300	NOV - East - H-section & grouting (DP059-DP068) - 1st 5 nos.	5 nos.		2.0	16-Oct-15	17-Oct-15	-8.0	0%					
01121.13799-310	NOV - East - H-section & grouting (DP059-DP068) - remaining 5 nos.	5 nos.		2.0	22-Oct-15	23-Oct-15	0.0	0%					
01121.13799-320	NOV - East - H-section & grouting (DP069-DP078) - 1st 5 nos.	5 nos.		3.0	03-Nov-15	05-Nov-15	-8.0	0%					
01121.13799-330	NOV - East - H-section & grouting (DP069-DP078) - remaining 5 nos.	5 nos.		3.0	09-Nov-15	11-Nov-15	-1.0	0%					
01121.13799-340	NOV - East - H-section & grouting (DP049-DP058) - 1st 5 nos.	5 nos.		2.0	20-Nov-15	21-Nov-15	-8.0	0%					
01121.13799-350	NOV - East - H-section & grouting (DP049-DP058) - remaining 5 nos.	5 nos.		2.0	25-Nov-15	26-Nov-15	0.0	0%					
01121.13799-360	NOV - East - H-section & grouting (DP039-DP048) - 1st 5 nos.	5 nos.		3.0	07-Dec-15	09-Dec-15	-8.0	0%					
01121.13799-370	NOV - East - H-section & grouting (DP039-DP048) - remaining 5 nos.	5 nos.		2.0	12-Dec-15	14-Dec-15	-1.0	0%					
01121.13799-380	NOV - East - H-section & grouting (DP029-DP038) - 1st 5 nos.	5 nos.		2.0	23-Dec-15	24-Dec-15	-8.0	0%					
01121.13799-390	NOV - East - H-section & grouting (DP029-DP038) - remaining 5 nos.	5 nos.		2.0	30-Dec-15	31-Dec-15	0.0	0%					
<b>NOV Cofferdam Construction and ELS Installation</b>									0.0	22-Aug-15 A	19-Sep-15 A		
01121.13794	NOV - (Summary) Condition survey and ug utilities survey			0.0	31-Aug-15 A	19-Sep-15 A		100%					
01121.13794-10	NOV - U/U detection			0.0	31-Aug-15 A	15-Sep-15 A		100%					
01121.13794-20	NOV - form trial pit			0.0	07-Sep-15 A	15-Sep-15 A		100%					
01121.13794-30	NOV - condition survey			0.0	31-Aug-15 A	19-Sep-15 A		100%					
01121.13797	NOV - predrilling for pipe pile	14 nos.	14 nos.	0.0	22-Aug-15 A	05-Sep-15 A		100%					
<b>Cost Centre C - Hung Hom Cut and Cover Tunnels</b>									107.0	09-Aug-15 A	06-Feb-16	1763.0	
<b>HUH Submerged Tunnel (Area B)</b>									107.0	10-Aug-15 A	06-Feb-16	1763.0	
<b>HUH Area B - HUH Temp Cofferdam</b>									107.0	10-Aug-15 A	06-Feb-16	1763.0	
<b>HUH Area B - Under Bypass Cofferdam (By SNE)</b>									107.0	10-Aug-15 A	06-Feb-16	1763.0	
<b>Rock Socket &amp; Grouting - West - SNE</b>									29.0	10-Aug-15 A	04-Nov-15	1820.0	
01121.21695	HUH Area B (under bypass) - Deck 1 West - rock socket (BP076, BP078 @3d) (SNE)	2 nos.	2 nos.	0.0	10-Aug-15 A	11-Aug-15 A		100%					
01121.21730	HUH Area B (under bypass) - West - redrive initial piles (BP076, BP078) by Gyro Press (SNE)	2 nos.	2 nos.	0.0	09-Sep-15 A	12-Sep-15 A		100%					

Data Date: 30-Sep-15

- ◆ Current Milestone
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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.21750	HUH Area B (under bypass) - West - Install pipe pile (BP095-BP096 @1.5d) (SNE)	2 nos.	2 nos.	0.0	17-Sep-15 A	20-Sep-15 A		100%				
01121.25825	HUH Area B (under bypass) - West - rock socket (BP082) (SNE)	1 no.		1.0	30-Sep-15	30-Sep-15	0.0	0%				
01121.25826	HUH Area B (under bypass) - West - rock socket (BP080) (SNE)	1 no.		1.0	02-Oct-15	02-Oct-15	0.0	0%				
01121.25830	HUH Area B (under bypass) - West - rock socket (BP084) (SNE)	1 no.		1.0	03-Oct-15	03-Oct-15	0.0	0%				
01121.25880	HUH Area B (under bypass) - West - rock socket (BP086) (SNE)	1 no.		1.0	05-Oct-15	05-Oct-15	0.0	0%				
01121.25890	HUH Area B (under bypass) - West - rock socket (BP088) (SNE)	1 no.		1.0	06-Oct-15	06-Oct-15	0.0	0%				
01121.25900	HUH Area B (under bypass) - West - rock socket (BP090) (SNE)	1 no.		1.0	07-Oct-15	07-Oct-15	3.0	0%				
01121.25910	HUH Area B (under bypass) - West - rock socket (BP092) (SNE)	1 no.		1.0	08-Oct-15	08-Oct-15	3.0	0%				
01121.25920	HUH Area B (under bypass) - West - rock socket (BP094) (SNE)	1 no.		1.0	09-Oct-15	09-Oct-15	3.0	0%				
01121.25930	HUH Area B (under bypass) - West - rock socket (BP096) (SNE)	1 no.		1.0	10-Oct-15	10-Oct-15	3.0	0%				
01121.25940	HUH Area B (under bypass) - West - rock socket (BP074) (SNE)	1 no.		1.0	12-Oct-15	12-Oct-15	3.0	0%				
01121.25940-100	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP080) (SNE)	1 no.		1.0	07-Oct-15	07-Oct-15	0.0	0%				
01121.25940-110	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP082) (SNE)	1 no.		1.0	08-Oct-15	08-Oct-15	0.0	0%				
01121.25940-120	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP084) (SNE)	1 no.		1.0	09-Oct-15	09-Oct-15	0.0	0%				
01121.25940-130	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP086) (SNE)	1 no.		1.0	10-Oct-15	10-Oct-15	0.0	0%				
01121.25940-140	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP088) (SNE)	1 no.		1.0	12-Oct-15	12-Oct-15	0.0	0%				
01121.25940-150	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP090) (SNE)	1 no.		1.0	13-Oct-15	13-Oct-15	0.0	0%				
01121.25940-160	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP092) (SNE)	1 no.		1.0	14-Oct-15	14-Oct-15	0.0	0%				
01121.25940-170	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP094) (SNE)	1 no.		1.0	15-Oct-15	15-Oct-15	0.0	0%				
01121.25940-180	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP096) (SNE)	1 no.		1.0	16-Oct-15	16-Oct-15	0.0	0%				
01121.25940-190	HUH Area B (under bypass) - West - re-drive casing to design toe level (BP074) (SNE)	1 no.		1.0	17-Oct-15	17-Oct-15	0.0	0%				
01121.25940-200	HUH Area B (under bypass) - West - install H-section & grouting (BP078, BP084) (SNE)	1 no.		3.0	24-Oct-15	27-Oct-15	3.0	0%				
01121.25940-210	HUH Area B (under bypass) - West - install H-section & grouting (BP090, BP096) (SNE)	1 no.		7.0	28-Oct-15	04-Nov-15	3.0	0%				
<b>Rock Socket &amp; Grouting - East - SNE</b>				<b>97.0</b>	<b>24-Aug-15 A</b>	<b>06-Feb-16</b>	<b>1763.0</b>					
01121.22090	HUH Area B (under bypass) - East - install pipe pile (BP025-BP026 @1.5d) (SNE)	2 nos.	2 nos.	0.0	24-Aug-15 A	27-Aug-15 A		100%				
01121.22100	HUH Area B (under bypass) - East - install pipe pile (BP027-BP028 @1.5d) (SNE)	2 nos.	2 nos.	0.0	28-Aug-15 A	31-Aug-15 A		100%				
01121.22110	HUH Area B (under bypass) - East - install pipe pile (BP029-BP030 @1.5d) (SNE)	2 nos.	2 nos.	0.0	04-Sep-15 A	05-Sep-15 A		100%				
01121.22130	HUH Area B (under bypass) - East - install pipe pile (BP031-BP032 @1.5d) (SNE)	2 nos.	2 nos.	0.0	08-Sep-15 A	10-Sep-15 A		100%				
01121.22140	HUH Area B (under bypass) - East - install pipe pile (BP033-BP034 @1.5d) (SNE)	2 nos.	2 nos.	0.0	11-Sep-15 A	13-Sep-15 A		100%				
01121.25950	HUH Area B (under bypass) - East - rock socket (BP018) (SNE)	1 no.		1.0	13-Oct-15	13-Oct-15	3.0	0%				
01121.26030	HUH Area B (under bypass) - East - rock socket (BP020) (SNE)	1 no.		1.0	14-Oct-15	14-Oct-15	3.0	0%				
01121.26032	HUH Area B (under bypass) - East - rock socket (BP022) (SNE)	1 no.		1.0	15-Oct-15	15-Oct-15	3.0	0%				
01121.26033	HUH Area B (under bypass) - East - rock socket (BP024) (SNE)	1 no.		1.0	16-Oct-15	16-Oct-15	3.0	0%				
01121.26034	HUH Area B (under bypass) - East - rock socket (BP026) (SNE)	1 no.		1.0	17-Oct-15	17-Oct-15	3.0	0%				
01121.26050	HUH Area B (under bypass) - East - rock socket (BP028) (SNE)	1 no.		1.0	19-Oct-15	19-Oct-15	3.0	0%				

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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



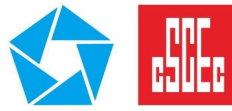
Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.26055	HUH Area B (under bypass) - East - rock socket (BP030) (SNE)	1 no.		1.0	20-Oct-15	20-Oct-15	3.0	0%				
01121.26120	HUH Area B (under bypass) - East - rock socket (BP032) (SNE)	1 no.		1.0	22-Oct-15	22-Oct-15	3.0	0%				
01121.26130	HUH Area B (under bypass) - East - rock socket (BP034) (SNE)	1 no.		1.0	23-Oct-15	23-Oct-15	3.0	0%				
01121.26130-100	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP018) (SNE)	1 no.		1.0	19-Oct-15	19-Oct-15	0.0	0%				
01121.26130-110	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP020) (SNE)	1 no.		1.0	20-Oct-15	20-Oct-15	0.0	0%				
01121.26130-120	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP022) (SNE)	1 no.		1.0	22-Oct-15	22-Oct-15	0.0	0%				
01121.26130-130	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP024) (SNE)	1 no.		1.0	23-Oct-15	23-Oct-15	0.0	0%				
01121.26130-140	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP026) (SNE)	1 no.		1.0	24-Oct-15	24-Oct-15	0.0	0%				
01121.26130-150	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP028) (SNE)	1 no.		1.0	26-Oct-15	26-Oct-15	0.0	0%				
01121.26130-160	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP030) (SNE)	1 no.		1.0	27-Oct-15	27-Oct-15	0.0	0%				
01121.26130-170	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP032) (SNE)	1 no.		1.0	28-Oct-15	28-Oct-15	0.0	0%				
01121.26130-180	HUH Area B (under bypass) - East - re-drive casing to design toe level (BP034) (SNE)	1 no.		1.0	29-Oct-15	29-Oct-15	0.0	0%				
01121.26130-200	HUH Area B (under bypass) - East - install H-section & grouting (BP022, BP028) (SNE)	2 nos.		4.0	30-Oct-15	03-Nov-15	0.0	0%				
01121.26130-220	HUH Area B (under bypass) - East - install H-section & grouting (BP034) (SNE)	1 no.		4.0	04-Nov-15	07-Nov-15	0.0	0%				
01121.26130-400	HUH Area B (under bypass) - East - rock socket (BP019) (SNE)	1 no.		1.0	29-Jan-16	29-Jan-16	18.0	0%				
01121.26130-410	HUH Area B (under bypass) - East - rock socket (BP021) (SNE)	1 no.		1.0	30-Jan-16	30-Jan-16	18.0	0%				
01121.26130-420	HUH Area B (under bypass) - East - rock socket (BP023) (SNE)	1 no.		1.0	01-Feb-16	01-Feb-16	18.0	0%				
01121.26130-430	HUH Area B (under bypass) - East - rock socket (BP025) (SNE)	1 no.		1.0	02-Feb-16	02-Feb-16	18.0	0%				
01121.26130-440	HUH Area B (under bypass) - East - rock socket (BP027) (SNE)	1 no.		1.0	03-Feb-16	03-Feb-16	29.0	0%				
01121.26130-450	HUH Area B (under bypass) - East - rock socket (BP029) (SNE)	1 no.		1.0	04-Feb-16	04-Feb-16	34.0	0%				
01121.26130-460	HUH Area B (under bypass) - East - rock socket (BP031) (SNE)	1 no.		1.0	05-Feb-16	05-Feb-16	35.0	0%				
01121.26130-470	HUH Area B (under bypass) - East - rock socket (BP033) (SNE)	1 no.		1.0	06-Feb-16	06-Feb-16	36.0	0%				
<b>Truss Beam and Deck - SNE</b>				<b>43.0</b>	<b>09-Nov-15</b>	<b>30-Dec-15</b>	<b>0.0</b>					
01121.21618	HUH Area B (under bypass) - Deck 1 - construct truss beam (BP034 / BP096 @1.5d) (SNE)	1 no.		3.0	09-Nov-15	11-Nov-15	0.0	0%				
01121.21800	HUH Area B (under bypass) - Deck 1 - construct truss beam (BP028 / BP090 @1.5d) (SNE)	1 no.		3.0	12-Nov-15	14-Nov-15	0.0	0%				
01121.21830	HUH Area B (under bypass) - Deck 2 - construct truss beam (BP022 / BP084 @1.5d) (SNE)	1 no.		3.0	16-Nov-15	18-Nov-15	0.0	0%				
01121.21862	HUH Area B (under bypass) - construct deck 3	1 no.		7.0	21-Dec-15	30-Dec-15	0.0	0%				
<b>HUH Area B - Under Bypass Cofferdam - (by A3 Platform)</b>				<b>78.0</b>	<b>10-Aug-15 A</b>	<b>04-Jan-16</b>	<b>0.0</b>					
<b>A3 Platform Fabrication and Construction</b>				<b>78.0</b>	<b>10-Aug-15 A</b>	<b>04-Jan-16</b>	<b>0.0</b>					
01121.21775	HUH Area B - A3 Platform design and approval			0.0	10-Aug-15 A	30-Sep-15	2.0	0%				
01121.21777-100	HUH Area B - A3 Platform - steel frame off site fabrication			33.0	15-Sep-15 A	09-Nov-15	0.0	0%				
<b>A3 Platform 1st Frame</b>				<b>13.0</b>	<b>21-Sep-15 A</b>	<b>15-Oct-15</b>	<b>0.0</b>					
01121.21777-102	HUH Area B - A3 Platform - delivery of fabricated material to site			2.0	01-Oct-15 A	02-Oct-15	0.0	100%				
01121.21777-109	HUH Area B - A3 Platform Stage 1-1 - remove seawall for frame installation			0.0	21-Sep-15 A	30-Sep-15 A		100%				
01121.21777-110	HUH Area b - A3 Platform Stage 1-1 - install pipe jacket frame, cast counter weight concrete & construct deck			6.0	03-Oct-15	09-Oct-15	0.0	0%				

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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.21777-120	HUH Area B - A3 Platform Stage 1-1 - construct pipe pile C1-A, C1-B, C1-C, C1-D			5.0	10-Oct-15	15-Oct-15	0.0	0%				
<b>A3 Platform 2nd Frame</b>				15.0	16-Oct-15	03-Nov-15	0.0					
01121.21777-150	HUH Area B - A3 platform Stage 1-1 - install steel frame & deck for E1, W1, M1			9.0	16-Oct-15	27-Oct-15	0.0	0%				
01121.21777-160	HUH Area B - A3 platform Stage 1-2 - construct pipe pile C2-A, C2-B, C2-C, C2-D			9.0	24-Oct-15	03-Nov-15	0.0	0%				
<b>A3 Platform 3rd Frame</b>				14.0	04-Nov-15	19-Nov-15	0.0					
01121.21777-180	HUH Area B - A3 platform Stage 1-2 - install steel frame & deck for E2, W2, M2			7.0	04-Nov-15	11-Nov-15	0.0	0%				
01121.21777-190	HUH Area B - A3 platform Stage 1-3 - construct pipe pile C3-A, C3-B, C3-C, C3-D			10.0	09-Nov-15	19-Nov-15	0.0	0%				
<b>A3 Platform 4th Frame</b>				14.0	20-Nov-15	05-Dec-15	0.0					
01121.21777-210	HUH Area B - A3 platform Stage 1-3 - install steel frame & deck for E3, W3, M3			7.0	20-Nov-15	27-Nov-15	0.0	0%				
01121.21777-220	HUH Area B - A3 platform Stage 1-4 - construct pipe pile C4-A, C4-B, C4-C, C4-D			10.0	25-Nov-15	05-Dec-15	0.0	0%				
<b>A3 Platform 5th Frame</b>				14.0	07-Dec-15	22-Dec-15	0.0					
01121.21777-235	HUH Area B - A3 platform Stage 1-4 - install steel frame & deck for E4, W4, M4			7.0	07-Dec-15	14-Dec-15	0.0	0%				
01121.21777-250	HUH Area B - A3 platform Stage 1-5 - construct pipe pile at grid C5-A, C5-B, C5-C, C5-D			8.0	11-Dec-15	19-Dec-15	0.0	0%				
01121.21777-270	HUH Area B - A3 platform Stage 1-5 - complete final welding works at C5-A, C5-B, C5-C, C5-D			2.0	21-Dec-15	22-Dec-15	0.0	0%				
<b>A3 Platform 6th Frame</b>				8.0	23-Dec-15	04-Jan-16	0.0					
01121.27650	HUH Area B - A3 platform final stage - install steel frame & deck for E5, W5, M5			8.0	23-Dec-15	04-Jan-16	0.0	0%				
<b>HUH Area B - Outside Bypass Cofferdam (By Ngai Shun)</b>				68.0	24-Aug-15 A	19-Dec-15	1802.0					
<b>HUH Area B - Outside Bypass Cofferdam - Install Casing</b>				31.0	24-Aug-15 A	06-Nov-15	1838.0					
01121.24990-04	HUH Area B (outside bypass) - West - mobilization for installing pipe pile			0.0	31-Aug-15 A	30-Sep-15	0.0	0%				
01121.24990-05	HUH Area B (outside bypass) - East - mobilization for installing pipe pile			0.0	24-Aug-15 A	28-Sep-15 A		100%				
01121.24992	HUH Area B (outside bypass) - West - install casing (BP072) (NS)	1 no.	1 no.	0.0	29-Sep-15 A	30-Sep-15 A		100%				
01121.24993	HUH Area B (outside bypass) - West - install casing (BP071) (NS)	1 nos	1 no.	0.0	30-Sep-15 A	01-Oct-15 A		100%				
01121.24994	HUH Area B (outside bypass) - West - install casing (BP070) (NS)	1 nos	1 no.	0.0	01-Oct-15 A	02-Oct-15 A		100%				
01121.24995	HUH Area B (outside bypass) - West - install casing (BP069) (NS)	1 nos		1.0	30-Sep-15	30-Sep-15	0.0	0%				
01121.24996	HUH Area B (outside bypass) - West - install casing (BP068) (NS)	1 nos		1.0	02-Oct-15	02-Oct-15	0.0	0%				
01121.24997	HUH Area B (outside bypass) - West - install casing (BP067) (NS)	1 nos		1.0	03-Oct-15	03-Oct-15	0.0	0%				
01121.24998	HUH Area B (outside bypass) - West - install casing (BP066) (NS)	1 nos		1.0	05-Oct-15	05-Oct-15	0.0	0%				
01121.25002	HUH Area B (outside bypass) - West - install casing (BP065) (NS)	1 nos		1.0	06-Oct-15	06-Oct-15	0.0	0%				
01121.25003	HUH Area B (outside bypass) - West - install casing (BP064) (NS)	1 nos		1.0	07-Oct-15	07-Oct-15	0.0	0%				
01121.25004	HUH Area B (outside bypass) - West - install casing (BP063) (NS)	1 nos		1.0	08-Oct-15	08-Oct-15	0.0	0%				
01121.25006	HUH Area B (outside bypass) - West - install casing (BP073) (NS)	1 nos	1 no.	0.0	28-Sep-15 A	29-Sep-15 A		100%				
01121.25009	HUH Area B (outside bypass) - West - install casing (BP183) (NS)	1 nos		1.0	03-Nov-15	03-Nov-15	0.0	0%				
01121.25009-10	HUH Area B (outside bypass) - West - install casing (BP182) (NS)	1 nos		1.0	04-Nov-15	04-Nov-15	0.0	0%				
01121.25009-20	HUH Area B (outside bypass) - West - install casing (BP181) (NS)	1 nos		1.0	05-Nov-15	05-Nov-15	0.0	0%				
01121.25009-30	HUH Area B (outside bypass) - West - install casing (BP180) (NS)	1 nos		1.0	06-Nov-15	06-Nov-15	0.0	0%				

Data Date: 30-Sep-15

- ◆ Current Milestone
- ◇ Baseline Milestone
- Actual Work
- Critical Remaining Work
- Remaining Work
- Project Baseline
- Remaining Le...

**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.25013	HUH Area B (outside bypass) - East - Install casing (BP016 @2d) (NS)	1 no.	1 no.	0.0	07-Sep-15 A	08-Sep-15 A		100%				
01121.25014	HUH Area B (outside bypass) - East - Install casing (BP015 @2d) (NS)	1 no.	1 no.	0.0	08-Sep-15 A	09-Sep-15 A		100%				
01121.25015	HUH Area B (outside bypass) - East - Install casing (BP014 @2d) (NS)	1 no.	1 no.	0.0	09-Sep-15 A	09-Sep-15 A		100%				
01121.25016	HUH Area B (outside bypass) - East - Install casing (BP013) (NS)	1 no.	1 no.	0.0	09-Sep-15 A	10-Sep-15 A		100%				
01121.25017	HUH Area B (outside bypass) - East - Install casing (BP012) (NS)	1 no.	1 no.	0.0	10-Sep-15 A	11-Sep-15 A		100%				
01121.25019	HUH Area B (outside bypass) - East - Install casing (BP011) (NS)	1 no.	1 no.	0.0	11-Sep-15 A	12-Sep-15 A		100%				
01121.25020	HUH Area B (outside bypass) - East - Install casing (BP010) (NS)	1 no.	1 no.	0.0	14-Sep-15 A	15-Sep-15 A		100%				
01121.25022	HUH Area B (outside bypass) - East - Install casing (BP009) (NS)	1 no.	1 no.	0.0	15-Sep-15 A	16-Sep-15 A		100%				
01121.25023	HUH Area B (outside bypass) - East - Install casing (BP008) (NS)	1 no.	1 no.	0.0	16-Sep-15 A	17-Sep-15 A		100%				
01121.25024	HUH Area B (outside bypass) - East - Install casing (BP007) (NS)	1 no.	1 no.	0.0	17-Sep-15 A	18-Sep-15 A		100%				
01121.25025	HUH Area B (outside bypass) - East - Install casing (BP017) (NS)	1 no.	1 no.	0.0	18-Sep-15 A	19-Sep-15 A		100%				
01121.25030	HUH Area B (outside bypass) - East - Install casing (BP006) (NS)	1 no.	1 no.	0.0	19-Sep-15 A	19-Sep-15 A		100%				
01121.25032	HUH Area B (outside bypass) - East - Install casing (BP005) (NS)	1 no.	1 no.	0.0	21-Sep-15 A	22-Sep-15 A		100%				
01121.25034	HUH Area B (outside bypass) - East - Install casing (BP004) (NS)	1 no.	1 no.	0.0	22-Sep-15 A	23-Sep-15 A		100%				
01121.25050	HUH Area B (outside bypass) - East - Install casing (BP003) (NS)	1 nos.	1 no.	0.0	23-Sep-15 A	24-Sep-15 A		100%				
01121.25052	HUH Area B (outside bypass) - East - Install casing (BP002) (NS)	1 nos.	1 no.	0.0	24-Sep-15 A	25-Sep-15 A		100%				
01121.25054	HUH Area B (outside bypass) - East - Install casing (BP001) (NS)	1 nos.	1 no.	0.0	25-Sep-15 A	26-Sep-15 A		100%				
01121.25060	HUH Area B (outside bypass) - East - Install casing (BP163) (NS)	1 no.	1 no.	0.0	28-Sep-15 A	29-Sep-15 A		100%				
01121.25062	HUH Area B (outside bypass) - East - Install casing (BP162) (NS)	1 no.	1 no.	0.0	29-Sep-15 A	30-Sep-15 A		100%				
01121.25080	HUH Area B (outside bypass) - East - Install casing (BP161) (NS)	1 nos.		1.0	14-Oct-15	14-Oct-15	5.0	0%				
01121.25082	HUH Area B (outside bypass) - East - Install casing (BP160) (NS)	1 nos.	1 no.	0.0	30-Sep-15 A	30-Sep-15 A		100%				
<b>HUH Area B - Outside Bypass Cofferdam - Rock Socket</b>				<b>39.0</b>	<b>15-Sep-15 A</b>	<b>16-Nov-15</b>	<b>0.0</b>					
01121.26610	HUH Area B (outside bypass) - West - rock socket (BP072) (NS)	1 no.		1.0	09-Oct-15	09-Oct-15	0.0	0%				
01121.26620	HUH Area B (outside bypass) - West - rock socket (BP070) (NS)	1 no.		1.0	10-Oct-15	10-Oct-15	0.0	0%				
01121.26630	HUH Area B (outside bypass) - West - rock socket (BP068) (NS)	1 no.		1.0	12-Oct-15	12-Oct-15	0.0	0%				
01121.26640	HUH Area B (outside bypass) - West - rock socket (BP066) (NS)	1 no.		1.0	13-Oct-15	13-Oct-15	0.0	0%				
01121.26650	HUH Area B (outside bypass) - West - rock socket (BP064) (NS)	1 no.		1.0	14-Oct-15	14-Oct-15	0.0	0%				
01121.26660	HUH Area B (outside bypass) - West - rock socket (BP071) (NS)	1 no.		1.0	22-Oct-15	22-Oct-15	0.0	0%				
01121.26670	HUH Area B (outside bypass) - West - rock socket (BP069) (NS)	1 no.		1.0	23-Oct-15	23-Oct-15	0.0	0%				
01121.26680	HUH Area B (outside bypass) - West - rock socket (BP067) (NS)	1 no.		1.0	24-Oct-15	24-Oct-15	0.0	0%				
01121.26690	HUH Area B (outside bypass) - West - rock socket (BP065) (NS)	1 no.		1.0	26-Oct-15	26-Oct-15	0.0	0%				
01121.26700	HUH Area B (outside bypass) - West - rock socket (BP063) (NS)	1 no.		1.0	27-Oct-15	27-Oct-15	0.0	0%				
01121.26705	HUH Area B (outside bypass) - West - rock socket (BP073) (NS)	1 no.		1.0	07-Nov-15	07-Nov-15	0.0	0%				
01121.26710	HUH Area B (outside bypass) - West - rock socket (BP183) (NS)	1 no.		1.0	09-Nov-15	09-Nov-15	0.0	0%				
01121.26720	HUH Area B (outside bypass) - West - rock socket (BP181) (NS)	1 no.		1.0	10-Nov-15	10-Nov-15	0.0	0%				

Data Date: 30-Sep-15

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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.26730	HUH Area B (outside bypass) - West - rock socket (BP182) (NS)	1 no.		1.0	14-Nov-15	14-Nov-15	0.0	0%				
01121.26740	HUH Area B (outside bypass) - West - rock socket (BP180) (NS)	1 no.		1.0	16-Nov-15	16-Nov-15	0.0	0%				
01121.26750	HUH Area B (outside bypass) - East - rock socket (BP016) (NS)	1 no.		2.0	30-Sep-15	02-Oct-15	5.0	0%				
01121.26760	HUH Area B (outside bypass) - East - rock socket (BP014) (NS)	1 no.		1.0	03-Oct-15	03-Oct-15	5.0	0%				
01121.26770	HUH Area B (outside bypass) - East - rock socket (BP012) (NS)	1 no.		1.0	05-Oct-15	05-Oct-15	5.0	0%				
01121.26780	HUH Area B (outside bypass) - East - rock socket (BP010) (NS)	1 nos.		1.0	06-Oct-15	06-Oct-15	5.0	0%				
01121.26790	HUH Area B (outside bypass) - East - rock socket (BP008) (NS)	1 nos.		1.0	07-Oct-15	07-Oct-15	5.0	0%				
01121.26800	HUH Area B (outside bypass) - East - rock socket (BP015) (NS)	1 no.	1 no.	0.0	15-Sep-15 A	15-Sep-15 A		100%				
01121.26810	HUH Area B (outside bypass) - East - rock socket (BP013) (NS)	1 no.	1 no.	0.0	16-Sep-15 A	16-Sep-15 A		100%				
01121.26820	HUH Area B (outside bypass) - East - rock socket (BP011) (NS)	1 no.	1 no.	0.0	17-Sep-15 A	17-Sep-15 A		100%				
01121.26830	HUH Area B (outside bypass) - East - rock socket (BP009) (NS)	1 no.	1 no.	0.0	18-Sep-15 A	18-Sep-15 A		100%				
01121.26840	HUH Area B (outside bypass) - East - rock socket (BP007) (NS)	1 no.	1 no.	0.0	19-Sep-15 A	19-Sep-15 A		100%				
01121.26850	HUH Area B (outside bypass) - East - rock socket (BP017) (NS)	1 nos.		1.0	15-Oct-15	15-Oct-15	5.0	0%				
01121.26860	HUH Area B (outside bypass) - East - rock socket (BP006) (NS)	1 nos.		1.0	16-Oct-15	16-Oct-15	5.0	0%				
01121.26870	HUH Area B (outside bypass) - East - rock socket (BP004) (NS)	1 nos.		1.0	17-Oct-15	17-Oct-15	5.0	0%				
01121.26880	HUH Area B (outside bypass) - East - rock socket (BP002) (NS)	1 nos.		1.0	19-Oct-15	19-Oct-15	5.0	0%				
01121.26890	HUH Area B (outside bypass) - East - rock socket (BP163) (NS)	1 no.		1.0	20-Oct-15	20-Oct-15	5.0	0%				
01121.26900	HUH Area B (outside bypass) - East - rock socket (BP161) (NS)	1 no.		1.0	22-Oct-15	22-Oct-15	5.0	0%				
01121.26910	HUH Area B (outside bypass) - East - rock socket (BP005) (NS)	1 no.		1.0	30-Oct-15	30-Oct-15	5.0	0%				
01121.26920	HUH Area B (outside bypass) - East - rock socket (BP003) (NS)	1 nos.		1.0	31-Oct-15	31-Oct-15	5.0	0%				
01121.26930	HUH Area B (outside bypass) - East - rock socket (BP001) (NS)	1 nos.		1.0	02-Nov-15	02-Nov-15	5.0	0%				
01121.26940	HUH Area B (outside bypass) - East - rock socket (BP162) (NS)	1 no.		1.0	03-Nov-15	03-Nov-15	5.0	0%				
01121.26950	HUH Area B (outside bypass) - East - rock socket (BP160) (NS)	1 no.		1.0	04-Nov-15	04-Nov-15	5.0	0%				
<b>HUH Area B - Outside Bypass Cofferdam - Install H-Section &amp; Grouting</b>				<b>35.0</b>	<b>23-Sep-15 A</b>	<b>18-Nov-15</b>	<b>0.0</b>					
01121.26960	HUH Area B (outside bypass) - West - install H-section & grouting (BP072) (NS)	1 no.		1.0	15-Oct-15	15-Oct-15	0.0	0%				
01121.26970	HUH Area B (outside bypass) - West - install H-section & grouting (BP070) (NS)	1 no.		1.0	16-Oct-15	16-Oct-15	0.0	0%				
01121.26980	HUH Area B (outside bypass) - West - install H-section & grouting (BP068) (NS)	1 no.		1.0	17-Oct-15	17-Oct-15	0.0	0%				
01121.26990	HUH Area B (outside bypass) - West - install H-section & grouting (BP066) (NS)	1 no.		1.0	19-Oct-15	19-Oct-15	0.0	0%				
01121.27000	HUH Area B (outside bypass) - West - install H-section & grouting (BP064) (NS)	1 no.		1.0	20-Oct-15	20-Oct-15	0.0	0%				
01121.27010	HUH Area B (outside bypass) - West - install H-section & grouting (BP071) (NS)	1 no.		1.0	28-Oct-15	28-Oct-15	0.0	0%				
01121.27020	HUH Area B (outside bypass) - West - install H-section & grouting (BP069) (NS)	1 no.		1.0	29-Oct-15	29-Oct-15	0.0	0%				
01121.27030	HUH Area B (outside bypass) - West - install H-section & grouting (BP067) (NS)	1 no.		1.0	30-Oct-15	30-Oct-15	0.0	0%				
01121.27040	HUH Area B (outside bypass) - West - install H-section & grouting (BP065) (NS)	1 no.		1.0	31-Oct-15	31-Oct-15	0.0	0%				
01121.27050	HUH Area B (outside bypass) - West - install H-section & grouting (BP063) (NS)	1 no.		1.0	02-Nov-15	02-Nov-15	0.0	0%				
01121.27060	HUH Area B (outside bypass) - West - install H-section & grouting (BP073) (NS)	1 no.		1.0	11-Nov-15	11-Nov-15	0.0	0%				

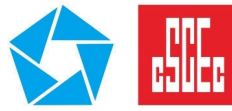
Data Date: 30-Sep-15

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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama





Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.27070	HUH Area B (outside bypass) - West - install H-section & grouting (BP183) (NS)	1 no.		1.0	12-Nov-15	12-Nov-15	0.0	0%				
01121.27080	HUH Area B (outside bypass) - West - install H-section & grouting (BP181) (NS)	1 no.		1.0	13-Nov-15	13-Nov-15	0.0	0%				
01121.27090	HUH Area B (outside bypass) - West - install H-section & grouting (BP182) (NS)	1 no.		1.0	17-Nov-15	17-Nov-15	0.0	0%				
01121.27100	HUH Area B (outside bypass) - West - install H-section & grouting (BP180) (NS)	1 no.		1.0	18-Nov-15	18-Nov-15	0.0	0%				
01121.27110	HUH Area B (outside bypass) - East - install H-section & grouting (BP016) (NS)	1 no.		1.0	08-Oct-15	08-Oct-15	5.0	0%				
01121.27120	HUH Area B (outside bypass) - East - install H-section & grouting (BP014) (NS)	1 no.		1.0	09-Oct-15	09-Oct-15	5.0	0%				
01121.27130	HUH Area B (outside bypass) - East - install H-section & grouting (BP012) (NS)	1 no.		1.0	10-Oct-15	10-Oct-15	5.0	0%				
01121.27140	HUH Area B (outside bypass) - East - install H-section & grouting (BP010) (NS)	1 nos.		1.0	12-Oct-15	12-Oct-15	5.0	0%				
01121.27150	HUH Area B (outside bypass) - East - install H-section & grouting (BP008) (NS)	1 nos.		1.0	13-Oct-15	13-Oct-15	5.0	0%				
01121.27160	HUH Area B (outside bypass) - East - install H-section & grouting (BP015) (NS)	1 no.	1 no.	0.0	23-Sep-15 A	23-Sep-15 A		100%				
01121.27170	HUH Area B (outside bypass) - East - install H-section & grouting (BP013) (NS)	1 no.	1 no.	0.0	25-Sep-15 A	25-Sep-15 A		100%				
01121.27180	HUH Area B (outside bypass) - East - install H-section & grouting (BP011) (NS)	1 no.	1 no.	0.0	29-Sep-15 A	29-Sep-15 A		100%				
01121.27190	HUH Area B (outside bypass) - East - install H-section & grouting (BP009) (NS)	1 no.	1 no.	0.0	30-Sep-15 A	30-Sep-15 A		100%				
01121.27200	HUH Area B (outside bypass) - East - install H-section & grouting (BP007) (NS)	1 no.	1 no.	0.0	02-Oct-15 A	02-Oct-15 A		100%				
01121.27210	HUH Area B (outside bypass) - East - install H-section & grouting (BP017) (NS)	1 nos.		1.0	23-Oct-15	23-Oct-15	5.0	0%				
01121.27220	HUH Area B (outside bypass) - East - install H-section & grouting (BP006) (NS)	1 nos.		1.0	24-Oct-15	24-Oct-15	5.0	0%				
01121.27230	HUH Area B (outside bypass) - East - install H-section & grouting (BP004) (NS)	1 nos.		1.0	26-Oct-15	26-Oct-15	5.0	0%				
01121.27240	HUH Area B (outside bypass) - East - install H-section & grouting (BP002) (NS)	1 nos.		1.0	27-Oct-15	27-Oct-15	5.0	0%				
01121.27250	HUH Area B (outside bypass) - East - install H-section & grouting (BP163) (NS)	1 no.		1.0	28-Oct-15	28-Oct-15	5.0	0%				
01121.27260	HUH Area B (outside bypass) - East - install H-section & grouting (BP161) (NS)	1 no.		1.0	29-Oct-15	29-Oct-15	5.0	0%				
01121.27270	HUH Area B (outside bypass) - East - install H-section & grouting (BP005) (NS)	1 no.		1.0	05-Nov-15	05-Nov-15	5.0	0%				
01121.27280	HUH Area B (outside bypass) - East - install H-section & grouting (BP003) (NS)	1 nos.		1.0	06-Nov-15	06-Nov-15	5.0	0%				
01121.27290	HUH Area B (outside bypass) - East - install H-section & grouting (BP001) (NS)	1 nos.		1.0	07-Nov-15	07-Nov-15	5.0	0%				
01121.27300	HUH Area B (outside bypass) - East - install H-section & grouting (BP162) (NS)	1 no.		1.0	09-Nov-15	09-Nov-15	5.0	0%				
01121.27310	HUH Area B (outside bypass) - East - install H-section & grouting (BP160) (NS)	1 no.		1.0	10-Nov-15	10-Nov-15	5.0	0%				
<b>HUH Area B - Outside Bypass - Truss Beam and Deck</b>				<b>27.0</b>	<b>19-Nov-15</b>	<b>19-Dec-15</b>	<b>0.0</b>					
01121.24932	HUH Area B (outside bypass) - Deck 3 - construct truss beam - (BP016 / BP078 @1.5d) (NS)			3.0	19-Nov-15	21-Nov-15	0.0	0%				
01121.24940	HUH Area B (outside bypass) - Deck 4 - construct truss beam - (BP010 / BP072 @1.5d) (NS)			3.0	23-Nov-15	25-Nov-15	0.0	0%				
01121.24950	HUH Area B (outside bypass) - Deck 5 - construct truss beam - (BP004 / BP066 @1.5d) (NS)			4.0	26-Nov-15	30-Nov-15	0.0	0%				
01121.24970	HUH Area B (outside bypass) - Deck 6 - construct truss beam - (BP161 / BP181 @1.5d) (NS)			3.0	01-Dec-15	03-Dec-15	0.0	0%				
01121.25010	HUH Area B (outside bypass) - construct deck 6 (NS)			6.0	04-Dec-15	10-Dec-15	0.0	0%				
01121.25040	HUH Area B (outside bypass) - construct deck 5 (NS)			4.0	11-Dec-15	15-Dec-15	0.0	0%				
01121.25070	HUH Area B (outside bypass) - construct deck 4 (NS)			4.0	16-Dec-15	19-Dec-15	0.0	0%				
<b>HUH Area B - Wing Walls</b>				<b>54.0</b>	<b>11-Nov-15</b>	<b>15-Jan-16</b>	<b>0.0</b>					
01121.19360	HUH Area B - West - install wing wall pipe pile (12 nos.) (NS)	12 nos.		12.0	19-Nov-15	02-Dec-15	0.0	0%				

Data Date: 30-Sep-15

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**Updated 3M Rolling Programme (Oct - Dec 2015)**  
**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.19370	HUH Area B - East - install wing wall pipe pile (14 nos.) (NS)	14 nos.		14.0	11-Nov-15	26-Nov-15	5.0	0%				
01121.19380	HUH Area B - West - install wing wall sheet pile			15.0	03-Dec-15	19-Dec-15	0.0	0%				
01121.19390	HUH Area B - East - install wing wall sheet pile			18.0	27-Nov-15	17-Dec-15	5.0	0%				
01121.19420	HUH Area B - West - cut wing wall pipe pile and sheet pile			25.0	15-Dec-15	15-Jan-16	0.0	0%				
01121.19480	HUH Area B - East - cut wing wall pipe pile and sheet pile			25.0	09-Dec-15	09-Jan-16	5.0	0%				
<b>HUH Land base Tunnel (Area C)</b>				<b>13.0</b>	<b>09-Aug-15 A</b>	<b>15-Oct-15</b>	<b>88.0</b>					
<b>HUH Area C - Ground Investigations</b>				<b>13.0</b>	<b>09-Aug-15 A</b>	<b>15-Oct-15</b>	<b>88.0</b>					
01121.12990-30	HUH Area C - Jet Grout - apply jet grout adjacent to FHOB	65 nos.	44 nos.	13.0	09-Aug-15 A	15-Oct-15	88.0	68%				
<b>Cost centre D - Immersed Tunnels</b>				<b>131.0</b>	<b>28-May-15 A</b>	<b>09-Mar-16</b>	<b>1739.0</b>					
<b>Site Preparation at Shek O</b>				<b>69.0</b>	<b>28-May-15 A</b>	<b>21-Dec-15</b>	<b>1801.0</b>					
<b>Concrete Batching Plant</b>				<b>0.0</b>	<b>25-Aug-15 A</b>	<b>28-Sep-15 A</b>						
01121.23210	Shek O - Concrete Batching Plant - Concrete Trial Mix			0.0	25-Aug-15 A	28-Sep-15 A		100%				
<b>Casting Basin Dewatering and Preparation</b>				<b>30.0</b>	<b>20-Jun-15 A</b>	<b>05-Nov-15</b>	<b>1527.0</b>					
<b>Dewatering, Leveling</b>				<b>30.0</b>	<b>20-Jun-15 A</b>	<b>05-Nov-15</b>	<b>1527.0</b>					
01121.21540	Shek O Dewatering & Site Formation (2 Stages)			18.0	20-Jun-15 A	22-Oct-15	26.0	100%				
01121.21590	Shek O Dewatering & Site Formation - Rock fill to level the south pocket (to remaining 0.5m thick) (remaining portion)			14.0	26-Aug-15 A	16-Oct-15	1531.0	20%				
01121.24350-40	Shek O Site formation after dewatering - (Area 2) grading work, trench excavation			0.0	11-Aug-15 A	15-Sep-15 A		100%				
01121.24350-50	Shek O Site formation after dewatering - (Area 2) utilities installation			0.0	01-Sep-15 A	15-Sep-15 A		100%				
01121.24350-60	Shek O Site formation after dewatering - (Area 2) concrete paving	2300m3		0.0	01-Sep-15 A	15-Sep-15 A		100%				
01121.24350-70	Shek O Site formation after dewatering - (Area 3) grading work, trench excavation			20.0	25-Aug-15 A	24-Oct-15	162.0	51%				
01121.24350-80	Shek O Site formation after dewatering - (Area 3) utilities installation			17.0	07-Sep-15 A	20-Oct-15	162.0	51%				
01121.24350-90	Shek O Site formation after dewatering - (Area 3) concrete paving	2500m3		17.0	07-Sep-15 A	20-Oct-15	162.0	51%				
01121.24351-10	Shek O Site formation after dewatering - (Area 4) grading work, trench excavation			17.0	19-Aug-15 A	20-Oct-15	76.0	36%				
01121.24351-20	Shek O Site formation after dewatering - (Area 4) utilities installation			17.0	21-Sep-15 A	20-Oct-15	76.0	36%				
01121.24351-30	Shek O Site formation after dewatering - (Area 4) concrete paving	2500m3		16.0	21-Sep-15 A	20-Oct-15	76.0	36%				
01121.24351-40	Shek O Site formation after dewatering - (Area 5) grading work, trench excavation			30.0	26-Sep-15 A	05-Nov-15	220.0	21%				
01121.24351-50	Shek O Site formation after dewatering - (Area 5) utilities installation			30.0	26-Sep-15 A	05-Nov-15	220.0	21%				
01121.24351-60	Shek O Site formation after dewatering - (Area 5) concrete paving	2500m3		30.0	26-Sep-15 A	05-Nov-15	220.0	21%				
<b>Traveling Formwork Fabrication &amp; Delivery</b>				<b>69.0</b>	<b>28-May-15 A</b>	<b>21-Dec-15</b>	<b>1488.0</b>					
<b>Type A (Set 1)</b>				<b>19.0</b>	<b>28-May-15 A</b>	<b>23-Oct-15</b>	<b>88.0</b>					
01121.PC10142-30	Formwork Type A (set 1) base - site assembling			0.0	28-Aug-15 A	30-Sep-15	96.0	10%				
01121.PC10142-40	Formwork Type A (set 1) wall and soffit - fabrication and trial assembly	100%	24%	0.0	28-May-15 A	29-Aug-15 A		100%				
01121.PC10142-50	Formwork Type A (set 1) wall and soffit - shipping (same to ID PC10335)			0.0	16-Sep-15 A	16-Sep-15 A		100%				
01121.PC10142-60	Formwork Type A (set 1) wall and soffit - site assembling			19.0	17-Sep-15 A	23-Oct-15	88.0	0%				
<b>Type A (Set 2)</b>				<b>24.0</b>	<b>25-Aug-15 A</b>	<b>29-Oct-15</b>	<b>1533.0</b>					

Data Date: 30-Sep-15

- ◆ Current Milestone
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- Remaining Le...

**Updated 3M Rolling Programme (Oct - Dec 2015)**

**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015				
									Sep	Oct	Nov	Dec	
01121.PC10152-30	Formwork Type A (set 2) base - site assembling			0.0	25-Aug-15 A	30-Sep-15 A		100%					
01121.PC10152-50	Formwork Type A (set 2) wall and soffit - shipping (same to ID PC10410)			0.0	16-Sep-15 A	16-Sep-15 A		100%					
01121.PC10152-60	Formwork Type A (set 2) wall and soffit - site assembling			24.0	17-Sep-15 A	29-Oct-15	72.0	0%					
<b>Type B (Set 1)</b>				<b>69.0</b>	<b>06-Jun-15 A</b>	<b>21-Dec-15</b>	<b>1488.0</b>						
01121.PC10160-10	Formwork Type B (set 1) base - fabrication and trial assembly			1.0	06-Jun-15 A	30-Sep-15	166.0	99%					
01121.PC10160-20	Formwork Type B (set 1) base - shipping			4.0	02-Oct-15	06-Oct-15	223.0	0%					
01121.PC10160-30	Formwork Type B (set 1) base - site assembling			28.0	07-Oct-15	09-Nov-15	223.0	0%					
01121.PC10160-40	Formwork Type B (set 1) wall and soffit - fabrication and trial assembly			15.0	01-Jul-15 A	17-Oct-15	1488.0	99%					
01121.PC10160-50	Formwork Type B (set 1) wall and soffit - shipping (same to ID PC10410)			26.0	19-Oct-15	18-Nov-15	1488.0	0%					
01121.PC10160-60	Formwork Type B (set 1) wall and soffit - site assembling			28.0	19-Nov-15	21-Dec-15	1488.0	0%					
<b>Type B (Set 2)</b>				<b>59.0</b>	<b>20-Jul-15 A</b>	<b>09-Dec-15</b>	<b>185.0</b>						
01121.PC10180-10	Formwork Type B (set 2) base - fabrication and trial assembly			1.0	20-Jul-15 A	30-Sep-15	166.0	95%					
01121.PC10180-20	Formwork Type B (set 2) base - shipping			4.0	02-Oct-15	06-Oct-15	166.0	0%					
01121.PC10180-30	Formwork Type B (set 2) base - site assembling			28.0	07-Oct-15	09-Nov-15	166.0	0%					
01121.PC10180-40	Formwork Type B (set 2) wall and soffit - fabrication and trial assembly			1.0	20-Jul-15 A	30-Sep-15	189.0	95%					
01121.PC10180-50	Formwork Type B (set 2) wall and soffit - shipping (same to ID PC10410)			26.0	07-Oct-15	06-Nov-15	185.0	0%					
01121.PC10180-60	Formwork Type B (set 2) wall and soffit - site assembling			28.0	07-Nov-15	09-Dec-15	185.0	0%					
<b>Mobile Tower Cranes Foundations/Tracks and Erection</b>				<b>20.0</b>	<b>26-Sep-15 A</b>	<b>24-Oct-15</b>	<b>1850.0</b>						
01121.10010-10	Shek O Tower Crane - excavation for footing construction			3.0	26-Sep-15 A	03-Oct-15	1850.0	0%					
01121.10010-20	Shek O Tower Crane - lay blinding layer			1.0	05-Oct-15	05-Oct-15	1850.0	0%					
01121.10010-30	Shek O Tower Crane - rebar fixing and formwork erection			3.0	06-Oct-15	08-Oct-15	1850.0	0%					
01121.10010-40	Shek O Tower Crane - Concreting			1.0	09-Oct-15	09-Oct-15	1850.0	0%					
01121.10010-50	Shek O Tower Crane - install tower crane			5.0	19-Oct-15	24-Oct-15	1850.0	0%					
<b>Immersed Tunnel Units Fabrication</b>				<b>131.0</b>	<b>07-Sep-15 A</b>	<b>09-Mar-16</b>	<b>222.0</b>						
<b>IMT8 (9 Bays)</b>				<b>117.0</b>	<b>07-Sep-15 A</b>	<b>22-Feb-16</b>	<b>191.0</b>						
01121.20698	IMT8 - base steel plate waterproofing layer			4.0	07-Sep-15 A	05-Oct-15	26.0	0%					
01121.20700	IMT8 - Base Slab End Bay 1			9.0	14-Nov-15	24-Nov-15	184.0	0%					
01121.20710	IMT8 - Base Slab Bay 2			7.0	06-Oct-15	13-Oct-15	92.0	0%					
01121.20720	IMT8 - Base Slab Bay 3			8.0	14-Oct-15	23-Oct-15	92.0	0%					
01121.20730	IMT8 - Base Slab Bay 4			8.0	24-Oct-15	02-Nov-15	92.0	0%					
01121.20740	IMT8 - Base Slab Bay 5			8.0	03-Nov-15	11-Nov-15	92.0	0%					
01121.20750	IMT8 - Base Slab Bay 6			8.0	12-Nov-15	20-Nov-15	92.0	0%					
01121.20760	IMT8 - Base Slab Bay 7			8.0	21-Nov-15	30-Nov-15	92.0	0%					
01121.20770	IMT8 - Base Slab Bay 8			8.0	01-Dec-15	09-Dec-15	92.0	0%					
01121.20780	IMT8 - Base Slab End Bay 9			9.0	10-Dec-15	19-Dec-15	171.0	0%					

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**(Updated as of 30 Sep 2015)**

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Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.20790	IMT8 - Casting Walls and Roof End Bay 1			13.0	04-Feb-16	22-Feb-16	191.0	0%				
01121.20800	IMT8 - Casting Walls and Roof Bay 2			13.0	24-Oct-15	07-Nov-15	88.0	0%				
01121.20810	IMT8 - Casting Walls and Roof Bay 3			12.0	09-Nov-15	21-Nov-15	88.0	0%				
01121.20820	IMT8 - Casting Walls and Roof Bay 4			12.0	23-Nov-15	05-Dec-15	88.0	0%				
01121.20830	IMT8 - Casting Walls and Roof Bay 5			12.0	07-Dec-15	19-Dec-15	88.0	0%				
01121.20840	IMT8 - Casting Walls and Roof Bay 6			12.0	21-Dec-15	06-Jan-16	88.0	0%				
<b>IMT6 (9 Bays)</b>				<b>81.0</b>	<b>07-Nov-15</b>	<b>16-Feb-16</b>	<b>135.0</b>					
01121.20498	IMT6 - base steel plate waterproofing layer			14.0	07-Nov-15	23-Nov-15	112.0	0%				
01121.20500	IMT6 - Base Slab End Bay 9			8.0	04-Feb-16	16-Feb-16	135.0	0%				
01121.20510	IMT6 - Base Slab Bay 8 - fixing rebar and cast in item			4.0	24-Nov-15	27-Nov-15	117.0	0%				
01121.20515	IMT 6 - Base Slab Bay 8 - steel formwork erection and concreting			3.0	24-Dec-15	29-Dec-15	92.0	0%				
<b>IMT5 (9 Bays)</b>				<b>14.0</b>	<b>29-Dec-15</b>	<b>14-Jan-16</b>	<b>266.0</b>					
01121.19738	IMT5 - base steel plate waterproofing layer			14.0	29-Dec-15	14-Jan-16	266.0	0%				
<b>IMT4 (9 Bays)</b>				<b>68.0</b>	<b>06-Oct-15</b>	<b>24-Dec-15</b>	<b>57.0</b>					
01121.16075	IMT4 - base steel plate waterproofing layer			13.0	06-Oct-15	20-Oct-15	26.0	0%				
01121.16090	IMT4 - Base Slab Bay 2			7.0	22-Oct-15	29-Oct-15	40.0	0%				
01121.16100	IMT4 - Base Slab Bay 3			8.0	30-Oct-15	07-Nov-15	40.0	0%				
01121.16110	IMT4 - Base Slab Bay 4			8.0	09-Nov-15	17-Nov-15	40.0	0%				
01121.16120	IMT4 - Base Slab Bay 5			8.0	18-Nov-15	26-Nov-15	40.0	0%				
01121.16130	IMT4 - Base Slab Bay 6			8.0	27-Nov-15	05-Dec-15	40.0	0%				
01121.16140	IMT4 - Base Slab Bay 7			8.0	07-Dec-15	15-Dec-15	50.0	0%				
01121.16150	IMT4 - Base Slab Bay 8			8.0	16-Dec-15	24-Dec-15	57.0	0%				
<b>IMT9.2 (8 Bays)</b>				<b>14.0</b>	<b>10-Dec-15</b>	<b>28-Dec-15</b>	<b>252.0</b>					
01121.20881	IMT9 - base steel plate waterproofing layer			14.0	10-Dec-15	28-Dec-15	252.0	0%				
<b>IMT2 (9 Bays)</b>				<b>69.0</b>	<b>22-Oct-15</b>	<b>13-Jan-16</b>	<b>43.0</b>					
01121.20118	IMT2 - base steel plate waterproofing layer			14.0	22-Oct-15	06-Nov-15	26.0	0%				
01121.20130	IMT2 - Base Slab Bay 8			7.0	07-Nov-15	14-Nov-15	26.0	0%				
01121.20140	IMT2 - Base Slab Bay 7			8.0	16-Nov-15	24-Nov-15	26.0	0%				
01121.20150	IMT2 - Base Slab Bay 6			8.0	25-Nov-15	03-Dec-15	26.0	0%				
01121.20160	IMT2 - Base Slab Bay 5			8.0	04-Dec-15	12-Dec-15	26.0	0%				
01121.20170	IMT2 - Base Slab Bay 4			8.0	14-Dec-15	22-Dec-15	26.0	0%				
01121.20180	IMT2 - Base Slab Bay 3			8.0	23-Dec-15	04-Jan-16	36.0	0%				
01121.20190	IMT2 - Base Slab Bay 2			8.0	05-Jan-16	13-Jan-16	43.0	0%				
<b>IMT3 (9 Bays)</b>				<b>50.0</b>	<b>08-Jan-16</b>	<b>09-Mar-16</b>	<b>169.0</b>					
01121.20308	IMT3 - base steel plate waterproofing layer			50.0	08-Jan-16	09-Mar-16	169.0	0%				

Data Date: 30-Sep-15

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**Updated 3M Rolling Programme (Oct - Dec 2015)**

**(Updated as of 30 Sep 2015)**

Date	Revision	Checked	Approved
02-Oct-15		Vincent Yeung	K. Hatakeyama



Activity ID	Activity Name	Total Qty	Completed Qty	Rem. Dur.	Start	Finish	Total Float	Activity % complete	2015			
									Sep	Oct	Nov	Dec
01121.20320	IMT3 - Base Slab Bay 2			9.0	15-Jan-16	25-Jan-16	169.0	0%				
IMT11 (6 Curved Bays)				14.0	24-Nov-15	09-Dec-15	112.0					
01121.19508	IMT11 - base steel plate waterproofing layer			14.0	24-Nov-15	09-Dec-15	112.0	0%				
IMT Marine Works in Victoria Harbour				127.0	07-Sep-15 A	04-Mar-16	1743.0					
IMT Bulk Dredging				127.0	07-Sep-15 A	04-Mar-16	1743.0					
01121.22850	IMT1 - Remove CDG (phase 1)			26.0	07-Sep-15 A	31-Oct-15	0.0	0%				
01121.22850-100	IMT1 - Remove rock (phase 1)			42.0	02-Nov-15	19-Dec-15	1802.0	0%				
01121.22850-110	IMT1 - plant mobilization for Removal CDG (phase 2)			36.0	02-Nov-15	12-Dec-15	0.0	0%				
01121.22850-120	IMT1 - Remove CDG (phase 2)			26.0	14-Dec-15	15-Jan-16	0.0	0%				
01121.22855	IMT1 - Rock Breaking (phase 2)			29.0	16-Jan-16	22-Feb-16	0.0	0%				
01121.23410	IMT6 - bulk dredging	51838 m3		86.0	19-Nov-15	04-Mar-16	149.0	0%				
Cost Centre E - CBTS Tunnels				93.0	03-Nov-15	25-Feb-16	20.0					
North Section at VH3A & VH3B (Outside Typhoon Shelter - Against Existing Breakwater Wall)				93.0	03-Nov-15	25-Feb-16	20.0					
Temporary Reclamation				93.0	03-Nov-15	25-Feb-16	20.0					
01121.12150	CBTS - Install Monitoring Instrumentation			20.0	03-Nov-15	25-Nov-15	23.0	0%				
01121.12170	CBTS - Apply MDN			26.0	03-Nov-15	28-Nov-15	24.0	0%				
01121.12400	CBTS (VH3A & VH3B) - install pipe pile outside breakwater (70 nos.) (1 vibrating hammer, 1 Gyro @2d/WF, 2WF)	70 nos.		70.0	30-Nov-15	25-Feb-16	20.0	0%				

Data Date: 30-Sep-15	◆ Current Milestone	■ Remaining Le...
	◇ Baseline Milestone	
■ Actual Work		
■ Critical Remaining Work		
■ Remaining Work		
■ Project Baseline		

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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 (Wet Season)**

<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
<b>WSD Salt Water Intake (Station 14, A, WSD9, WSD17)</b>		
DO in mg/L	<2.1	<2
SS in mg/L	6.0	6.0
Turbidity in NTU	4.7	6.5
<b>Cooling Water Intake (Station 8, 9, 21 &amp; 34)</b>		
DO in mg/L	2.8	2.7
SS in mg/L	6.9	9.1
Turbidity in NTU	11.3	17.2
<b>GB3</b>		
DO in mg/L	5.5	5.3
SS in mg/L	4.5	4.5
Turbidity in NTU	2.1	2.4

## Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

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

<b>Parameters</b>	<b>Action Level</b>	<b>Limit Level</b>
<b>WSD Salt Water Intake (Station 14, A, WSD9, WSD17)</b>		
DO in mg/L	<2.1	<2
SS in mg/L	6.9	6.9
Turbidity in NTU	5.0	7.0
<b>Cooling Water Intake (Station 8, 9, 21 &amp; 34)</b>		
DO in mg/L	3.3	3.2
SS in mg/L	8.0	10.4
Turbidity in NTU	12.2	18.5
<b>GB3</b>		
DO in mg/L	6.8	6.5
SS in mg/L	9.3	9.3
Turbidity in NTU	5.0	5.6

## Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.



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**APPENDIX C  
WATER QUALITY MONITORING  
SCHEDULE**

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**Shatin to Central Link - Contract No. 1121**  
**NSL Cross Harbour Tunnels**  
**Water Quality Monitoring Schedule (September 2015)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Sep	2-Sep	3-Sep	4-Sep	5-Sep
			Mid-Flood 8:38 Mid-Ebb 14:49		Mid-Flood 10:38 Mid-Ebb 16:29	
6-Sep	7-Sep	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep
	Mid-Ebb 8:09 Mid-Flood 15:34		Mid-Ebb 10:03 Mid-Flood 17:08		Mid-Ebb 11:25 Mid-Flood 18:03	
13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep
	Mid-Ebb 13:04 Mid-Flood 19:13		Mid-Flood 7:57 Mid-Ebb 14:08		Mid-Flood 9:18 Mid-Ebb 15:15	
20-Sep	21-Sep	22-Sep	23-Sep	24-Sep	25-Sep	26-Sep
		Mid-Ebb 6:34 Mid-Flood 14:38		Mid-Ebb 8:55 Mid-Flood 16:21		Mid-Ebb 10:39 Mid-Flood 17:26
27-Sep	28-Sep	29-Sep	30-Sep	1-Oct	2-Oct	3-Oct
	Mid-Ebb 12:16 Mid-Flood 18:35		Mid-Ebb 13:45 Mid-Flood 19:49			

**Water Quality Monitoring Stations**  
C1, C2, 9, 21, 34, A, WSD9, WSD17

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

**Shatin to Central Link - Contract No. 1121**  
**NSL Cross Harbour Tunnels**  
**Tentative Water Quality Monitoring Schedule (October 2015)**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				<b>1-Oct</b>	2-Oct	3-Oct
						Mid-Flood 10:34 Mid-Ebb 16:11
<b>4-Oct</b>	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct
		Mid-Ebb 7:28 Mid-Flood 15:14		Mid-Ebb 9:31 Mid-Flood 16:28		Mid-Ebb 10:57 Mid-Flood 17:20
<b>11-Oct</b>	12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct
	Mid-Ebb 12:05 Mid-Flood 18:04		Mid-Ebb 13:09 Mid-Flood 18:54		Mid-Flood 8:25 Mid-Ebb 14:16	
<b>18-Oct</b>	19-Oct	20-Oct	<b>21-Oct</b>	22-Oct	23-Oct	24-Oct
	Mid-Flood 11:04 Mid-Ebb 16:22			Mid-Ebb 7:04 Mid-Flood 14:50		Mid-Ebb 9:21 Mid-Flood 16:11
<b>25-Oct</b>	26-Oct	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct
	Mid-Ebb 11:08 Mid-Flood 17:23		Mid-Ebb 12:42 Mid-Flood 18:37		Mid-Flood 8:29 Mid-Ebb 14:14	

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

**Water Quality Monitoring Stations**  
C1, C2, 9, 21, 34, A, WSD9, WSD17

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

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

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### Water Quality Monitoring Results at 21 - 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*
2-Sep-15	Rainy	Moderate	15:32	Surface	1	24.6	24.6	7.6	7.7	28.4	28.4	66.9	67.2	4.7	4.8	4.5	2.4	2.4	4.1	6	5.5	5.3
						24.6	24.6	7.7	7.7	28.3	28.4	67.2	67.1	4.8	4.8		2.4	2.4		5	5.5	
				Middle	3.5	24.6	24.6	7.8	7.8	29.8	29.4	61.2	61.4	4.3	4.4		3.7	4.2		4	4.0	
				24.6	24.6	7.8	7.8	29.0	29.4	61.6	61.4	4.4	4.4					4	4.0			
				Bottom	6	24.6	24.6	7.8	7.8	29.5	29.6	62.3	62.3	4.4	4.4					7	6.5	
						24.6	24.6	7.8	7.8	29.6	29.6	62.3	62.3	4.4	4.4					6	6.5	
4-Sep-15	Sunny	Moderate	16:19	Surface	1	25.9	25.9	7.9	7.9	33.0	33.0	82.7	83.4	5.6	5.6	5.5	3.0	3.0	2.9	7	7.0	6.5
						25.9	25.9	7.9	7.9	33.0	33.0	83.4	83.1	5.6	5.6		2.9	2.9		7	7.0	
				Middle	3.5	26.0	26.0	7.9	7.9	33.0	33.1	81.9	82.0	5.5	5.5		2.8	2.8		6	6.5	
				26.0	26.0	7.9	7.9	33.1	33.1	82.1	82.0	5.5	5.5					6	6.5			
				Bottom	6	25.7	25.7	7.9	7.9	33.1	33.1	80.6	79.8	5.5	5.5					6	6.0	
						25.7	25.7	7.9	7.9	33.1	33.1	79.8	80.2	5.4	5.5					6	6.0	
7-Sep-15	Cloudy	Moderate	08:57	Surface	1	26.3	26.3	8.1	8.1	29.1	29.1	77.5	77.4	5.3	5.3	5.1	4.5	4.5	4.1	3	3.0	4.2
						26.3	26.3	8.1	8.1	29.1	29.1	77.2	77.4	5.3	5.3		4.4	4.5		3	3.0	
				Middle	3.5	26.3	26.3	8.0	8.0	29.4	29.4	74.6	74.6	5.1	5.1		4.3	4.3		4	3.5	
				26.3	26.3	7.9	7.9	29.4	29.4	74.6	74.6	5.1	5.1					4	3.5			
				Bottom	6	26.3	26.3	7.8	7.8	30.1	30.1	72.1	71.2	4.9	4.9					6	6.0	
						26.3	26.3	7.8	7.8	30.1	30.1	70.2	71.2	4.8	4.9					6	6.0	
9-Sep-15	Sunny	Moderate	10:41	Surface	1	27.0	27.0	7.7	7.7	33.2	33.0	68.3	68.1	4.5	4.5	4.4	2.9	2.9	5.3	3	3.5	3.5
						26.9	27.0	7.7	7.7	32.8	33.0	67.9	68.1	4.5	4.5		2.9	2.9		4	3.5	
				Middle	3.5	26.3	26.5	7.9	7.9	33.8	33.7	67.7	67.9	4.5	4.5		5.7	5.8		4	4.0	
				26.6	26.5	7.9	7.9	33.6	33.7	68.0	67.9	4.5	4.5					4	4.0			
				Bottom	6	25.6	25.8	8.0	8.0	33.7	33.8	61.1	61.3	4.1	4.1					3	3.0	
						25.9	25.8	8.0	8.0	33.8	33.8	61.4	61.3	4.1	4.1					3	3.0	
11-Sep-15	Sunny	Moderate	12:05	Surface	1	28.0	27.8	7.7	7.8	31.4	31.6	80.3	79.8	5.3	5.3	5.2	5.0	5.0	4.2	5	5.5	6.0
						27.6	27.8	7.8	7.8	31.7	31.6	79.3	79.8	5.2	5.3		4.9	5.0		6	5.5	
				Middle	3.5	27.0	27.0	7.9	7.9	32.0	32.1	78.1	78.1	5.2	5.2		4.4	4.4		7	6.5	
				26.9	27.0	7.9	7.9	32.1	32.1	78.1	78.1	5.2	5.2					7	6.5			
				Bottom	6	26.7	26.7	7.9	7.9	32.3	32.3	77.1	77.0	5.2	5.2					6	6.0	
						26.7	26.7	7.9	7.9	32.3	32.3	76.8	77.0	5.1	5.2					6	6.0	
14-Sep-15	Sunny	Moderate	13:47	Surface	1	27.0	27.1	7.7	7.7	30.5	30.5	66.1	66.1	4.4	4.4	4.3	2.7	2.7	5.4	5	5.0	5.2
						27.1	27.1	7.7	7.7	30.5	30.5	66.1	66.1	4.4	4.4		2.7	2.7		5	5.0	
				Middle	3.5	26.3	26.4	7.9	7.9	31.0	31.1	65.5	65.7	4.4	4.4		6.3	6.0		5	5.0	
				26.5	26.4	7.9	7.9	31.2	31.1	65.8	65.7	4.4	4.4					5	5.0			
				Bottom	6	26.1	26.1	8.0	8.0	31.3	31.4	59.9	59.9	4.1	4.1					5	5.5	
						26.1	26.1	8.0	8.0	31.5	31.4	59.9	59.9	4.1	4.1					6	5.5	
16-Sep-15	Sunny	Moderate	14:55	Surface	1	30.0	30.0	7.6	7.6	29.7	29.7	78.0	78.2	5.0	5.0	4.8	4.7	4.8	4.6	4	4.0	6.2
						30.0	30.0	7.6	7.6	29.7	29.7	78.2	78.1	5.0	5.0		4.8	4.8		4	4.0	
				Middle	3.5	28.1	28.1	7.8	7.9	30.4	30.4	70.6	70.9	4.7	4.7		3.6	3.6		3	3.0	
				28.0	28.1	7.9	7.9	30.3	30.4	71.1	70.9	4.7	4.7					3	3.0			
				Bottom	6	28.0	28.0	8.1	8.1	31.0	31.0	69.7	69.4	4.6	4.6					11	11.5	
						27.9	28.0	8.1	8.1	30.9	31.0	69.1	69.4	4.6	4.6					12	11.5	
18-Sep-15	Sunny	Moderate	15:49	Surface	1	28.5	28.5	7.8	7.8	31.0	31.0	70.4	70.4	4.6	4.6	4.6	7.6	7.6	7.6	7	6.5	6.3
						28.5	28.5	7.8	7.8	31.0	31.0	70.3	70.4	4.6	4.6		7.6	7.6		6	6.5	
				Middle	3.5	28.2	28.2	7.9	7.9	31.5	31.6	69.6	69.7	4.6	4.6		7.5	7.5		7	7.0	
				28.1	28.2	7.9	7.9	31.6	31.6	69.7	69.7	4.6	4.6					7	7.0			
				Bottom	6	28.0	28.0	8.0	8.0	31.8	31.9	70.9	70.1	4.7	4.6					5	5.5	
						28.0	28.0	8.0	8.0	31.9	31.9	69.3	70.1	4.5	4.6					6	5.5	

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at 21 - 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*
22-Sep-15	Cloudy	Moderate	07:23	Surface	1	29.3 29.2	29.3	7.7 7.7	7.7	29.8 29.9	29.9	73.8 73.9	73.9	4.8 4.8	4.8	4.7	5.0 5.0	5.0	5.3	6 5	5.5	4.8
				Middle	3.5	28.1 28.1	28.1	8.0 8.0	8.0	30.6 30.6	30.6	71.5 71.6	71.6	4.7 4.7	4.7		4.8 4.5	4.7		5 5	5.0	
				Bottom	6	28.0 27.9	28.0	8.2 8.1	8.2	30.9 31.0	31.0	70.0 69.6	69.8	4.6 4.6	4.6		6.1 6.1	6.1		4 4	4.0	
24-Sep-15	Sunny	Moderate	09:39	Surface	1	28.4 28.4	28.4	7.9 7.9	7.9	30.0 29.8	29.9	74.6 76.2	75.4	4.9 5.0	5.0	4.7	4.4 4.5	4.5	4.9	4 4	4.0	5.3
				Middle	3.5	28.1 28.1	28.1	8.1 8.1	8.1	30.2 30.1	30.2	69.8 68.1	69.0	4.6 4.5	4.6		4.3 4.5	4.4		8 8	8.0	
				Bottom	6	28.1 28.1	28.1	8.1 8.1	8.1	31.0 31.0	31.0	68.9 67.5	68.2	4.5 4.4	4.5		5.6 5.7	5.7		4 4	4.0	
26-Sep-15	Rainy	Moderate	11:13	Surface	1	27.8 27.4	27.6	7.8 7.8	7.8	31.4 31.6	31.5	79.8 78.7	79.3	5.3 5.2	5.3	5.2	4.5 4.4	4.5	3.7	7 8	7.5	6.2
				Middle	3.5	26.8 26.7	26.8	7.9 8.0	8.0	32.0 32.1	32.1	77.5 77.6	77.6	5.2 5.2	5.2		3.9 3.8	3.9		5 5	5.0	
				Bottom	6	26.5 26.5	26.5	7.9 7.9	7.9	32.3 32.3	32.3	76.5 76.2	76.4	5.1 5.1	5.1		2.6 2.7	2.7		6 6	6.0	
28-Sep-15	Sunny	Moderate	12:03	Surface	1	26.6 26.5	26.6	7.8 7.8	7.8	31.1 31.4	31.3	90.6 87.4	89.0	6.1 5.9	6.0	5.9	3.1 3.0	3.1	4.7	5 5	5.0	4.7
				Middle	3.5	26.4 26.4	26.4	8.0 7.9	8.0	32.4 31.8	32.1	84.9 81.7	83.3	5.7 5.5	5.6		9.3 7.5	8.4		5 5	5.0	
				Bottom	6	26.6 26.5	26.6	7.7 7.8	7.8	31.2 31.3	31.3	90.8 90.7	90.8	6.1 6.1	6.1		2.6 2.6	2.6		4 4	4.0	
30-Sep-15	Fine	Moderate	14:23	Surface	1	29.6 29.4	29.5	7.9 7.9	7.9	29.2 29.3	29.3	79.0 78.6	78.8	5.1 5.1	5.1	5.0	5.1 5.2	5.2	4.9	4 4	4.0	5.7
				Middle	3.5	28.6 28.5	28.6	8.1 8.1	8.1	31.1 31.0	31.1	75.5 75.5	75.5	4.9 4.9	4.9		4.5 4.4	4.5		6 6	6.0	
				Bottom	6	28.3 28.3	28.3	8.2 8.2	8.2	33.3 33.4	33.4	77.6 77.6	77.6	5.0 5.0	5.0		5.0 5.1	5.1		7 7	7.0	

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at 21 - 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*				
2-Sep-15	Rainy	Moderate	09:22	Surface	1	24.4	24.4	7.8	7.8	28.6	28.5	67.4	67.2	4.8	4.8	4.4	2.6	2.7	4.1	4	4.0	5.5				
						24.4		7.8		28.4		66.9		4.8			2.8			4			4			
				Middle	3.5	24.4	24.4	7.9	8.0	29.7	29.7	59.4	59.6	4.2	4.2		3.8	3.9		4	4.5		5	8	8.0	
				24.4		7.9		30.1		60.7		4.3		4.3		5.6			8							
				24.4		8.0		29.9		60.8		4.3		4.3		5.9	5.8		8	8.0						
4-Sep-15	Sunny	Moderate	10:08	Surface	1	26.0	26.0	7.8	7.8	32.3	32.3	79.1	79.1	5.4	5.4	5.3	2.7	2.7	3.4	5	5.0	5.0				
						26.0		7.8		32.3		79.0		5.3			2.7			5			5			
				Middle	3.5	25.5	25.5	7.8	7.8	32.5	32.5	77.2	76.8	5.3	5.3		3.6	3.7		5	5.0		5			
				25.5		7.8		32.5		76.4		5.2		5.3		3.7			5							
				25.4		7.8		32.6		75.7		5.2		5.2		3.9	3.9		5	5.0						
				25.4		7.8		32.6		75.5		5.2		5.2		3.8	3.9		5	5.0						
7-Sep-15	Cloudy	Moderate	16:19	Surface	1	26.3	26.3	7.9	7.9	29.2	29.3	77.1	77.0	5.3	5.3	5.0	4.3	4.3	4.0	7	7.0	5.5				
						26.3		7.9		29.3		76.9		5.3			4.3			7			7			
				Middle	3.5	26.3	26.3	8.1	8.1	29.2	29.2	74.5	74.5	5.1	5.1		4.3	4.4		5	4.5		4			
				26.3		8.0		29.1		74.5		5.1		5.1		4.5			4							
				26.2		8.2		29.8		67.6		4.6		4.6		3.2	3.3		5	5.0						
				26.2		8.2		29.9		67.2		4.6		4.6		3.4			5							
9-Sep-15	Sunny	Moderate	17:42	Surface	1	27.3	27.3	7.7	7.7	32.8	33.0	68.4	68.3	4.5	4.5	4.4	2.7	2.6	5.9	4	4.0	3.7				
						27.2		7.6		33.2		68.2		4.5			2.5			4			4			
				Middle	3.5	26.5	26.6	7.8	7.9	33.7	33.6	67.8	67.8	4.5	4.5		6.7	6.8		4	4.0		4			
				26.6		7.9		33.5		67.8		4.5		4.5		6.8			4							
				25.9		8.0		34.0		61.4		4.1		4.1		8.1			3	3.0						
				26.0		8.0		33.9		61.3		4.1		4.1		8.6	8.4		3							
11-Sep-15	Fine	Moderate	18:35	Surface	1	26.9	26.9	7.5	7.5	31.4	31.5	86.6	86.6	5.8	5.8	5.6	5.0	5.2	4.7	6	6.0	6.2				
						26.8		7.5		31.5		86.5		5.8			5.3			6			6			
				Middle	3.5	26.6	26.6	7.6	7.6	32.1	32.1	81.8	81.6	5.5	5.5		4.4	4.6		5	5.0		5			
				26.6		7.6		32.0		81.4		5.5		5.5		4.8			5							
				26.6		7.6		32.3		79.9		5.4		5.4		4.6	4.4		8	7.5						
				26.6		7.7		32.4		79.7		5.3		5.4		4.1			7							
14-Sep-15	Fine	Moderate	19:42	Surface	1	26.9	27.0	7.7	7.7	30.5	30.4	65.8	65.9	4.4	4.4	4.3	2.8	2.8	5.2	4	4.0	5.0				
						27.1		7.7		30.2		66.0		4.4			4.4			2.8			4		4	
				Middle	3.5	26.5	26.5	7.9	7.9	31.0	31.0	65.6	65.5	4.4	4.4		5.6	5.4		5	5.0		5			
				26.4		7.8		30.9		65.4		4.4		4.4		5.2			5							
				25.7		8.0		31.5		59.5		4.1		4.1		7.8	7.5		6	6.0						
				25.8		8.0		31.3		59.3		4.1		4.1		7.1			6							
16-Sep-15	Sunny	Moderate	08:46	Surface	1	29.6	29.6	7.7	7.7	29.8	29.9	74.3	74.4	4.8	4.8	4.7	5.1	5.1	5.4	6	6.0	6.0				
						29.5		7.7		29.9		74.4		4.8			4.8			5.1			6		6	
				Middle	3.5	28.4	28.4	8.0	8.0	30.6	30.6	72.0	72.1	4.7	4.7		4.9	4.8		7	6.5		6			
				28.4		7.9		30.6		72.1		4.7		4.7		4.6			6							
				28.3		8.1		30.9		70.4		4.6		4.6		6.2	6.2		5	5.5						
				28.2		8.1		31.0		70.0		4.6		4.6		6.2			6							
18-Sep-15	Sunny	Moderate	09:57	Surface	1	28.7	28.7	7.9	7.9	31.2	31.2	70.9	70.8	4.6	4.6	4.6	7.4	7.4	7.4	8	7.5	6.0				
						28.6		7.9		31.2		70.6		4.6			4.6			7.3			7		7	
				Middle	3.5	28.2	28.2	8.0	8.0	31.7	31.8	69.6	69.6	4.6	4.6		7.2	7.3		6	5.5		5			
				28.2		8.0		31.8		69.6		4.6		4.6		7.4			5							
				28.0		8.1		32.1		69.8		4.6		4.6		7.4	7.4		5	5.0						
				28.0		8.1		32.1		69.8		4.6		4.6		7.4			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 21 - 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*
22-Sep-15	Cloudy	Moderate	15:25	Surface	1	29.7	29.7	7.6	7.7	29.8	29.8	77.4	77.5	5.0	5.0	4.8	4.6	4.7	4.5	6	5.5	6.7
						29.7	29.7	7.7	7.7	29.8	29.8	77.5	77.5	5.0	5.0		4.7	4.7		5	5.5	
				Middle	3.5	27.8	27.7	7.9	7.9	30.5	30.5	70.0	70.2	4.6	4.7		3.5	3.5		4	9.5	
		27.7	27.7	7.9	7.9	30.4	30.5	70.4	70.2	4.7	4.7	3.4	3.5									
		27.7	27.7	8.1	8.1	31.0	31.0	69.0	68.7	4.6	4.6	5.2	5.3					5	5.0			
		27.6	27.7	8.1	8.1	30.9	31.0	68.4	68.7	4.5	4.6	5.3	5.3					5	5.0			
24-Sep-15	Sunny	Moderate	17:07	Surface	1	28.6	28.6	7.9	7.9	29.8	29.8	74.8	74.4	4.9	4.9	4.7	4.0	4.0	4.4	3	3.5	5.8
						28.6	28.6	7.9	7.9	29.8	29.8	74.0	74.4	4.9	4.9		3.9	4.0		4	3.5	
				Middle	3.5	28.3	28.3	8.0	8.0	30.3	30.4	69.8	69.5	4.6	4.6		4.5	4.6		7	7.0	
		28.3	28.3	8.0	8.0	30.5	30.4	69.1	69.5	4.5	4.6	4.6	4.6					7	7.0			
		28.2	28.2	8.0	8.0	31.1	31.1	68.7	69.2	4.5	4.6	4.7	4.7					7	7.0			
		28.2	28.2	8.0	8.0	31.0	31.1	69.6	69.2	4.6	4.6	4.6	4.7					7	7.0			
26-Sep-15	Rainy	Moderate	18:09	Surface	1	27.0	27.0	7.5	7.5	31.3	31.4	86.5	86.5	5.8	5.8	5.5	4.2	4.4	3.9	5	5.0	6.0
						26.9	27.0	7.5	7.5	31.4	31.4	86.4	86.5	5.8	5.8		4.5	4.4		5	5.0	
				Middle	3.5	26.7	26.7	7.6	7.6	32.0	32.0	81.6	81.5	5.5	5.5		3.6	3.8		5	5.0	
		26.7	26.7	7.6	7.6	32.0	32.0	81.3	81.5	5.4	5.5	4.0	3.8					5	5.0			
		26.7	26.7	7.7	7.7	32.3	32.4	79.8	79.7	5.3	5.3	3.8	3.6					8	8.0			
		26.7	26.7	7.7	7.7	32.4	32.4	79.5	79.7	5.3	5.3	3.3	3.6					8	8.0			
28-Sep-15	Fine	Moderate	18:00	Surface	1	26.7	26.7	8.0	8.0	31.8	31.8	94.6	94.8	6.3	6.4	6.4	10.4	10.2	5.1	5	5.0	5.8
						26.7	26.7	8.0	8.0	31.8	31.8	94.9	94.8	6.4	6.4		10.0	10.2		5	5.0	
				Middle	3.5	26.9	27.2	7.9	7.9	31.1	31.7	95.0	95.3	6.4	6.4		3.8	4.0		5	5.5	
		27.4	27.2	7.8	7.9	32.2	31.7	95.5	95.3	6.3	6.4	4.2	4.0					6	6.0			
		26.7	26.8	8.0	8.0	31.7	32.0	92.4	96.8	6.2	6.5	1.1	1.2					7	7.0			
		26.9	26.8	7.9	8.0	32.3	32.0	101.1	96.8	6.7	6.5	1.2	1.2					7	7.0			
30-Sep-15	Fine	Moderate	20:24	Surface	1	28.9	29.0	7.8	7.8	29.2	29.2	75.8	75.8	5.0	5.0	5.0	3.9	3.9	4.3	4	4.0	5.0
						29.0	29.0	7.8	7.8	29.2	29.2	75.8	75.8	5.0	5.0		3.9	3.9		4	4.0	
				Middle	3.5	28.5	28.5	8.0	8.0	31.1	31.1	75.5	75.5	4.9	4.9		3.8	3.9		6	6.0	
		28.5	28.5	8.0	8.0	31.0	31.1	75.5	75.5	4.9	4.9	3.9	3.9					6	6.0			
		28.3	28.3	8.1	8.1	33.3	33.3	77.7	77.7	5.0	5.0	5.4	5.1					5	5.0			
		28.2	28.3	8.1	8.1	33.3	33.3	77.6	77.7	5.0	5.0	4.7	5.1					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 34 - 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*			
2-Sep-15	Rainy	Moderate	15:51	Surface	1	24.9 24.9	24.9	7.6 7.6	7.6	28.2 28.0	28.1	72.7 70.8	71.8	5.1 5.0	5.1	4.8	0.7 0.6	0.7	1.1	7 7	7.0	6.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.7	24.9 24.9	24.9	8.0 8.0	8.0	29.0 28.9	29.0	62.5 61.4	62.0	4.4 4.3	4.4		1.5 1.5	1.5		5 5	5.0				
4-Sep-15	Sunny	Moderate	16:36	Surface	1	25.8 25.8	25.8	7.7 7.7	7.7	32.6 32.6	32.6	73.9 73.3	73.6	5.0 5.0	5.0	5.0	4.2 4.2	4.2	5.4	7 7	7.0	6.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	3	25.4 25.4	25.4	7.8 7.8	7.8	32.9 33.0	33.0	72.0 72.7	72.4	4.9 5.0	5.0		6.5 6.5	6.5		6 6	6.0				
7-Sep-15	Cloudy	Moderate	09:15	Surface	1	26.5 26.6	26.6	8.0 8.0	8.0	29.6 29.6	29.6	67.7 67.1	67.4	4.6 4.6	4.6	4.3	4.9 4.9	4.9	4.8	4 4	4.0	5.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	3	26.7 26.7	26.7	8.3 8.4	8.4	30.9 30.8	30.9	60.0 59.9	60.0	4.0 4.0	4.0		4.6 4.8	4.7		8 7	7.5				
9-Sep-15	Sunny	Moderate	11:01	Surface	1	27.1 27.1	27.1	7.7 7.7	7.7	33.3 33.4	33.4	68.5 68.4	68.5	4.5 4.5	4.5	4.5	2.6 2.7	2.7	4.2	4 4	4.0	3.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.9	26.3 26.4	26.4	7.8 7.9	7.9	33.6 33.3	33.5	67.7 67.7	67.7	4.5 4.5	4.5		5.9 5.2	5.6		3 3	3.0				
11-Sep-15	Sunny	Moderate	12:24	Surface	1	27.6 27.2	27.4	7.6 7.6	7.6	31.5 31.7	31.6	80.3 79.4	79.9	5.3 5.3	5.3	5.3	2.2 2.2	2.2	4.4	4 4	4.0	5.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.7	26.9 26.9	26.9	7.7 7.7	7.7	32.0 32.1	32.1	78.1 77.5	77.8	5.2 5.2	5.2		6.4 6.7	6.6		6 6	6.0				
14-Sep-15	Sunny	Moderate	14:04	Surface	1	27.1 27.2	27.2	7.7 7.7	7.7	30.4 30.5	30.5	66.2 66.2	66.2	4.4 4.4	4.4	4.4	3.0 2.9	3.0	4.5	8 8	8.0	6.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.9	26.5 26.4	26.5	7.9 7.9	7.9	31.0 31.2	31.1	65.7 65.7	65.7	4.4 4.4	4.4		5.8 5.9	5.9		4 4	4.0				
16-Sep-15	Sunny	Moderate	15:13	Surface	1	28.9 28.9	28.9	7.7 7.7	7.7	29.9 29.8	29.9	68.8 69.3	69.1	4.5 4.5	4.5	4.5	6.6 6.7	6.7	7.1	5 4	4.5	4.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.8	28.2 28.3	28.3	8.1 8.3	8.2	30.1 30.1	30.1	66.8 68.5	67.7	4.4 4.5	4.5		7.4 7.3	7.4		5 5	5.0				
18-Sep-15	Sunny	Moderate	16:08	Surface	1	28.6 28.5	28.6	7.7 7.7	7.7	30.9 30.9	30.9	68.6 68.1	68.4	4.5 4.5	4.5	4.5	6.9 6.9	6.9	7.1	4 5	4.5	4.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.9	28.2 28.2	28.2	7.8 7.8	7.8	31.2 31.2	31.2	66.6 66.5	66.6	4.4 4.4	4.4		7.1 7.2	7.2		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 34 - 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*			
22-Sep-15	Cloudy	Moderate	07:39	Surface	1	28.9 28.9	28.9	7.8 7.7	7.8	30.0 30.0	30.0	68.2 67.7	68.0	4.5 4.4	4.5	4.5	8.4 8.3	8.4	8.5	4 4	4.0	4.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.9	28.2 28.2	28.2	8.1 8.1	8.1	30.5 30.5	30.5	66.2 65.8	66.0	4.4 4.3	4.4		8.6 8.6	8.6		4 4	4.0				
24-Sep-15	Sunny	Moderate	09:57	Surface	1	28.4 28.4	28.4	8.0 8.0	8.0	29.7 29.9	29.8	78.7 77.2	78.0	5.2 5.1	5.2	5.0	4.9 4.8	4.9	5.3	6 7	6.5	6.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	28.2 28.2	28.2	8.1 8.1	8.1	30.8 31.0	30.9	73.2 71.9	72.6	4.8 4.7	4.8		5.6 5.5	5.6		7 7	7.0				
26-Sep-15	Rainy	Moderate	11:32	Surface	1	27.4 27.0	27.2	7.6 7.7	7.7	31.5 31.7	31.6	79.7 78.8	79.3	5.3 5.3	5.3	5.3	1.5 1.5	1.5	3.8	6 6	6.0	5.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.9	26.7 26.7	26.7	7.7 7.7	7.7	32.0 32.1	32.1	77.5 77.0	77.3	5.2 5.2	5.2		5.9 6.2	6.1		5 5	5.0				
28-Sep-15	Sunny	Moderate	11:49	Surface	1	26.6 26.6	26.6	8.0 7.7	7.9	32.4 31.1	31.8	89.3 92.3	90.8	6.0 6.2	6.1	6.1	4.1 4.2	4.2	6.0	7 6	6.5	5.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-				
				Bottom	2.8	26.6 26.4	26.5	8.0 7.9	8.0	32.5 32.4	32.5	93.8 84.3	89.1	6.3 5.7	6.0		7.6 7.7	7.7		5 5	5.0				
30-Sep-15	Fine	Moderate	14:41	Surface	1	29.4 29.3	29.4	7.7 7.7	7.7	28.5 28.6	28.6	78.0 77.6	77.8	5.1 5.1	5.1	5.1	5.3 5.2	5.3	5.7	6 6	6.0	5.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-				
				Bottom	2.8	28.4 28.4	28.4	7.8 7.8	7.8	31.7 31.9	31.8	77.2 77.2	77.2	5.0 5.0	5.0		6.0 5.9	6.0		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 34 - 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*			
2-Sep-15	Rainy	Moderate	09:40	Surface	1	24.6 24.6	24.6	7.8 7.8	7.8	28.2 28.4	28.3	75.6 73.3	74.5	5.4 5.2	5.3	4.9	1.5 1.3	1.4	1.4	7 8	7.5	5.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	2.8	24.7 24.7	24.7	7.9 7.9	7.9	29.3 29.5	29.4	63.8 62.2	63.0	4.5 4.4	4.5		1.3 1.2	1.3		3 3	3.0				
4-Sep-15	Sunny	Moderate	09:57	Surface	1	25.7 25.7	25.7	7.8 7.8	7.8	32.5 32.5	32.5	76.6 76.0	76.3	5.2 5.2	5.2	5.0	4.0 4.0	4.0	4.7	4 4	4.0	6.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	25.6 25.6	25.6	7.8 7.8	7.8	32.6 32.6	32.6	71.0 70.4	70.7	4.8 4.8	4.8		5.5 5.3	5.4		9 9	9.0				
7-Sep-15	Cloudy	Moderate	16:37	Surface	1	26.6 26.6	26.6	8.1 8.0	8.1	29.3 29.3	29.3	65.5 64.3	64.9	4.5 4.4	4.5	4.3	4.8 4.6	4.7	4.5	4 5	4.5	6.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	3	26.5 26.5	26.5	8.2 8.1	8.2	30.6 30.6	30.6	59.4 59.2	59.3	4.0 4.0	4.0		4.5 4.1	4.3		8 8	8.0				
9-Sep-15	Sunny	Moderate	18:03	Surface	1	27.0 27.0	27.0	7.7 7.7	7.7	32.8 33.0	32.9	68.0 67.9	68.0	4.5 4.5	4.5	4.5	3.2 3.3	3.3	4.4	3 3	3.0	3.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	3.2	26.2 26.4	26.3	7.9 7.9	7.9	33.5 33.4	33.5	67.4 67.6	67.5	4.5 4.5	4.5		5.5 5.5	5.5		3 3	3.0				
11-Sep-15	Fine	Moderate	18:54	Surface	1	26.9 26.9	26.9	7.4 7.5	7.5	31.4 31.5	31.5	83.4 83.1	83.3	5.6 5.6	5.6	5.5	3.5 3.3	3.4	3.7	6 6	6.0	6.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.7	26.9 26.9	26.9	7.5 7.6	7.6	31.8 31.8	31.8	79.9 80.0	80.0	5.3 5.3	5.3		4.0 3.8	3.9		7 7	7.0				
14-Sep-15	Fine	Moderate	19:58	Surface	1	27.3 27.1	27.2	7.6 7.7	7.7	30.5 30.5	30.5	66.3 66.1	66.2	4.4 4.4	4.4	4.4	2.8 3.0	2.9	4.5	5 6	5.5	5.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.9	26.5 26.5	26.5	7.9 7.9	7.9	30.9 30.8	30.9	65.6 65.5	65.6	4.4 4.4	4.4		6.2 6.0	6.1		6 6	6.0				
16-Sep-15	Sunny	Moderate	09:01	Surface	1	29.2 29.2	29.2	7.7 7.7	7.7	30.0 29.9	30.0	68.7 68.2	68.5	4.5 4.4	4.5	4.5	8.5 8.4	8.5	8.6	7 6	6.5	6.8			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	2.9	28.5 28.5	28.5	8.0 8.0	8.0	30.4 30.5	30.5	66.7 66.2	66.5	4.4 4.3	4.4		8.7 8.7	8.7		7 7	7.0				
18-Sep-15	Sunny	Moderate	10:15	Surface	1	28.8 28.7	28.8	7.8 7.8	7.8	31.1 31.1	31.1	69.4 69.0	69.2	4.5 4.5	4.5	4.5	6.5 6.6	6.6	6.8	3 3	3.0	5.5			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-		
				Bottom	3	28.3 28.3	28.3	7.8 7.8	7.8	31.4 31.5	31.5	66.8 66.7	66.8	4.4 4.4	4.4		7.0 7.0	7.0		8 8	8.0				

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at 34 - 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*			
22-Sep-15	Cloudy	Moderate	15:43	Surface	1	28.6 28.6	28.6	7.7 7.7	7.7	30.0 29.9	30.0	68.1 68.7	68.4	4.5 4.5	4.5	4.5	6.5 6.6	6.6	7.0	5 5	5.0	5.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	-
				Bottom	3.1	27.9 28.0	28.0	8.1 8.4	8.3	30.2 30.2	30.2	66.2 67.8	67.0	4.4 4.5	4.5		7.3 7.2	7.3		5 5	5.0				
24-Sep-15	Sunny	Moderate	17:26	Surface	1	28.4 28.4	28.4	8.0 7.9	8.0	29.6 29.5	29.6	79.8 79.7	79.8	5.3 5.3	5.3	5.0	4.9 5.2	5.1	5.6	3 3	3.0	6.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	28.1 28.1	28.1	8.1 8.1	8.1	30.4 30.4	30.4	71.4 71.8	71.6	4.7 4.7	4.7		5.9 6.1	6.0		9 9	9.0				
26-Sep-15	Rainy	Moderate	18:28	Surface	1	27.0 27.0	27.0	7.5 7.5	7.5	31.4 31.4	31.4	83.2 82.9	83.1	5.6 5.5	5.6	5.5	2.5 2.5	2.5	2.4	6 6	6.0	6.3			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	3.1	27.0 27.0	27.0	7.6 7.6	7.6	31.7 31.8	31.8	79.7 79.8	79.8	5.3 5.3	5.3		2.3 2.3	2.3		7 6	6.5				
28-Sep-15	Fine	Moderate	18:19	Surface	1	27.4 27.0	27.2	7.8 7.9	7.9	32.2 30.9	31.6	96.6 94.6	95.6	6.4 6.3	6.4	6.4	4.1 3.8	4.0	3.6	6 5	5.5	6.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.8	26.9 26.7	26.8	7.9 8.0	8.0	32.3 31.5	31.9	97.4 92.2	94.8	6.5 6.2	6.4		3.1 3.2	3.2		7 6	6.5				
30-Sep-15	Fine	Moderate	20:43	Surface	1	29.0 28.9	29.0	7.7 7.7	7.7	28.4 28.5	28.5	76.7 76.3	76.5	5.0 5.0	5.0	5.0	4.5 4.4	4.5	5.1	4 4	4.0	4.0			
				Middle	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-	-	
				Bottom	2.9	28.3 28.3	28.3	7.9 8.0	8.0	31.6 31.7	31.7	77.0 77.2	77.1	5.0 5.0	5.0		5.6 5.5	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 9 - 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*	
2-Sep-15	Rainy	Moderate	14:26	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	24.8 24.8	24.8	7.4 7.4	7.4	32.1 32.1	32.1	108.3 108.1	108.2	7.5 7.5	7.5	7.5	5.1 5.9	5.5	5.5	4 5	4.5	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Sep-15	Sunny	Moderate	16:02	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.6	31.4 31.3	31.4	7.7 7.7	7.7	31.9 31.9	31.9	95.7 95.4	95.6	5.9 5.9	5.9	5.9	1.7 1.6	1.7	1.7	7 6	6.5	6.5	6.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7-Sep-15	Cloudy	Moderate	07:43	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	26.4 26.4	26.4	7.9 7.8	7.9	29.2 29.2	29.2	97.0 96.8	96.9	6.6 6.6	6.6	6.6	4.1 4.0	4.1	4.1	5 5	5.0	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9-Sep-15	Sunny	Moderate	09:43	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	28.1 28.1	28.1	8.1 8.1	8.1	34.0 34.0	34.0	90.1 90.0	90.1	5.8 5.8	5.8	5.8	1.5 1.6	1.6	1.6	4 5	4.5	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-Sep-15	Sunny	Moderate	11:04	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	27.9 27.9	27.9	7.4 7.4	7.4	30.0 30.1	30.1	98.9 98.7	98.8	6.6 6.6	6.6	6.6	4.4 4.2	4.3	4.3	5 6	5.5	5.5	5.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14-Sep-15	Sunny	Moderate	12:48	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	28.1 28.2	28.2	8.1 8.1	8.1	31.6 31.4	31.5	71.2 71.1	71.2	4.7 4.7	4.7	4.7	1.5 1.7	1.6	1.6	6 6	6.0	6.0	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-Sep-15	Sunny	Moderate	13:41	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	28.9 29.1	29.0	7.8 7.8	7.8	28.7 28.7	28.7	93.4 93.9	93.7	6.1 6.2	6.2	6.2	2.5 2.6	2.6	2.6	5 5	5.0	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Sep-15	Sunny	Moderate	14:45	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	29.8 29.9	29.9	7.6 7.7	7.7	29.5 29.5	29.5	95.4 95.5	95.5	6.2 6.2	6.2	6.2	3.5 3.6	3.6	3.6	7 6	6.5	6.5	6.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at 9 - 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*	
22-Sep-15	Cloudy	Moderate	06:13	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	29.6	29.6	7.8	7.8	28.5	28.5	99.4	99.2	6.5	6.5	6.5	2.9	2.7	2.7	6	6.0	6.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Sep-15	Sunny	Moderate	08:33	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	28.6	28.6	7.8	7.9	31.8	31.9	91.3	91.6	5.9	6.0	6.0	3.9	3.8	3.8	6	5.5	5.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Sep-15	Rainy	Moderate	10:12	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	27.7	27.7	7.5	7.5	30.0	30.0	98.2	98.1	6.5	6.5	6.5	3.9	3.8	3.8	6	7	6.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28-Sep-15	Sunny	Moderate	12:23	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	26.5	26.5	7.9	7.9	31.4	31.6	85.0	82.5	5.7	5.6	5.6	2.5	2.6	2.6	5	4	4.5	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30-Sep-15	Fine	Moderate	13:20	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	30.1	30.1	7.7	7.7	28.2	28.2	100.7	100.7	6.5	6.5	6.5	0.9	1.0	1.0	4	4	4.0	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at 9 - 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*		
2-Sep-15	Rainy	Moderate	08:16	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	24.6	24.6	7.4	7.4	32.2	32.3	105.5	105.4	105.5	7.3	7.3	7.3	7.3	6.8	6.8	6.8	4	4	4.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Sep-15	Sunny	Moderate	10:41	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.6	27.1	27.2	7.3	7.4	32.0	32.0	84.7	83.7	84.2	5.6	5.6	5.6	5.6	1.6	1.6	1.6	4	5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7-Sep-15	Cloudy	Moderate	15:11	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	26.4	26.4	7.8	7.8	29.1	29.1	97.4	97.2	97.3	6.7	6.7	6.7	6.7	4.1	4.2	4.2	6	6	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9-Sep-15	Sunny	Moderate	16:38	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.3	28.2	8.1	8.1	33.8	34.0	88.5	88.3	88.4	5.7	5.7	5.7	5.7	1.8	1.9	1.9	3	4	3.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-Sep-15	Fine	Moderate	17:34	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	27.7	27.8	7.4	7.4	30.0	30.0	99.4	99.2	99.3	6.6	6.6	6.6	6.6	5.4	5.1	5.3	6	6	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14-Sep-15	Fine	Moderate	18:47	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	28.0	28.0	8.1	8.1	31.2	31.4	85.4	85.4	85.4	5.6	5.6	5.6	5.6	1.6	1.8	1.7	5	5	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-Sep-15	Sunny	Moderate	07:36	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	29.9	29.9	7.7	7.7	28.5	28.5	100.1	99.6	99.9	6.5	6.5	6.5	6.5	3.0	2.5	2.8	6	6	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Sep-15	Sunny	Moderate	08:54	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				Middle	1.5	29.9	30.0	7.7	7.7	29.7	29.6	97.8	97.5	97.7	6.3	6.3	6.3	6.3	3.2	3.3	3.3	3	3	3.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at 9 - 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*	
22-Sep-15	Cloudy	Moderate	14:11	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	28.6 28.8	28.7	7.8 7.8	7.8	28.8 28.8	28.8	92.7 93.1	92.9	6.1 6.1	6.1	6.1	2.4 2.5	2.5	2.5	2.5	4 5	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24-Sep-15	Sunny	Moderate	16:01	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	28.8 28.8	28.8	7.8 7.8	7.8	31.7 31.7	31.7	90.2 91.4	90.8	5.8 5.9	5.9	5.9	1.4 1.5	1.5	1.5	1.5	5 4	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Sep-15	Rainy	Moderate	17:08	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	27.8 27.9	27.9	7.4 7.5	7.5	30.0 30.0	30.0	99.3 99.0	99.2	6.6 6.6	6.6	6.6	4.6 4.3	4.5	4.5	4.5	5 5	5.0	5.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28-Sep-15	Fine	Moderate	17:58	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	26.9 26.7	26.8	7.9 8.0	8.0	31.1 31.7	31.4	94.7 92.4	93.6	6.4 6.2	6.3	6.3	2.7 2.8	2.8	2.8	2.8	6 6	6.0	6.0
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30-Sep-15	Fine	Moderate	19:20	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Middle	1.5	29.7 29.6	29.7	7.7 7.7	7.7	28.1 28.1	28.1	99.4 100.3	99.9	6.5 6.5	6.5	6.5	1.2 1.2	1.2	1.2	1.2	4 5	4.5	4.5
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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*
2-Sep-15	Rainy	Moderate	14:43	Surface	1	24.8	24.8	7.8	7.8	26.2	26.3	60.2	59.6	4.3	4.3	4.1	1.1	1.1	2.2	7	7	5.5
				Middle	3	24.8	24.8	7.8	7.8	27.4	27.4	55.6	55.7	4.0	4.0		3.2	3.3		5	5	
				Bottom	5	24.7	24.7	7.9	8.0	30.0	30.1	56.4	56.4	4.0	4.0		2.2	2.3		4	4	
4-Sep-15	Sunny	Moderate	15:35	Surface	1	26.2	26.2	7.8	7.8	32.6	32.6	78.8	79.0	5.3	5.3	5.3	2.9	2.9	3.1	9	9	5.5
				Middle	3	25.5	25.5	7.9	7.9	32.9	32.9	75.8	75.7	5.2	5.2		3.3	3.3		3	3	
				Bottom	5	25.5	25.5	7.9	7.9	33.2	33.2	77.9	78.2	5.3	5.3		2.9	3.0		4	4	
7-Sep-15	Cloudy	Moderate	07:58	Surface	1	26.5	26.5	7.7	7.8	28.6	28.6	82.5	82.2	5.7	5.7	5.0	3.9	4.0	3.1	5	5	4.7
				Middle	3	26.5	26.5	7.8	7.8	28.3	28.2	76.2	75.1	5.2	5.2		3.1	3.0		4	4	
				Bottom	5	26.0	26.0	8.3	8.3	28.9	28.9	59.6	59.3	4.1	4.1		2.3	2.3		5	5	
9-Sep-15	Sunny	Moderate	09:52	Surface	1	27.1	27.1	7.7	7.7	33.0	33.0	69.6	69.5	4.6	4.6	4.5	2.3	2.4	3.6	3	3	5.0
				Middle	3.5	26.4	26.4	7.9	7.9	33.5	33.5	69.0	69.0	4.6	4.6		3.6	3.6		3	3	
				Bottom	6	25.9	25.9	8.0	8.0	34.0	34.0	62.8	62.7	4.2	4.2		4.6	4.7		9	9	
11-Sep-15	Sunny	Moderate	11:19	Surface	1	27.8	27.7	7.7	7.7	31.1	31.2	74.3	73.9	4.9	4.9	4.8	4.9	4.9	4.5	5	5	5.5
				Middle	3	26.9	26.9	7.8	7.9	31.7	31.8	71.4	71.2	4.8	4.8		6.2	5.7		6	5	
				Bottom	5	26.5	26.5	7.9	7.9	32.0	32.1	70.9	70.8	4.8	4.8		3.0	2.8		6	6	
14-Sep-15	Sunny	Moderate	12:58	Surface	1	27.1	27.1	7.7	7.7	30.5	30.6	66.2	66.2	4.4	4.4	4.3	2.6	2.7	3.6	4	4	5.7
				Middle	3	26.5	26.5	7.9	7.9	31.1	31.1	65.8	65.7	4.4	4.4		3.5	3.5		5	4	
				Bottom	5	25.8	26.0	8.0	8.0	31.5	31.5	59.7	59.8	4.1	4.1		4.7	4.7		8	8	
16-Sep-15	Sunny	Moderate	13:55	Surface	1	28.6	28.6	7.7	7.7	29.8	29.8	69.0	69.0	4.5	4.5	4.5	2.7	2.7	3.8	8	8	5.3
				Middle	3	28.2	28.2	7.8	7.8	30.0	30.1	67.6	67.6	4.5	4.5		3.4	3.5		4	4	
				Bottom	5	27.9	27.9	7.9	7.9	30.6	30.7	67.1	67.1	4.4	4.4		5.2	5.2		4	4	
18-Sep-15	Sunny	Moderate	15:00	Surface	1	28.4	28.4	7.6	7.6	31.1	31.1	64.4	64.3	4.2	4.2	4.3	3.1	3.2	4.2	5	5	5.8
				Middle	3	28.0	28.0	7.8	7.8	31.8	31.8	64.6	64.8	4.2	4.3		4.5	4.6		6	5	
				Bottom	5	28.0	28.0	7.9	7.9	32.2	32.2	66.3	66.3	4.3	4.3		4.8	4.7		7	7	

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*		
22-Sep-15	Cloudy	Moderate	06:28	Surface	1	29.0	29.0	7.5	7.5	29.7	29.7	67.7	67.5	4.4	4.4	4.3	3.9	3.9	3.7	3	3.0	4.0		
						29.0		7.5		29.7		67.3		4.4			3.9			3			3	
				Middle	3.5	28.1	28.2	7.8	7.8	30.2	30.2	64.6	64.7	4.3	4.3		2.2	2.3		4	4.0		4	4.0
		28.2		7.8		30.2		64.7		4.3		4.3		2.3		4		4						
		28.0	28.0	7.9	7.9	30.3	30.3	62.3	62.3	4.1	4.1	4.1	4.1	5.0	4.9	5	5.0	5	5.0					
		27.9		7.9		30.3		62.3		4.1		4.1		4.7		5		5						
24-Sep-15	Sunny	Moderate	08:50	Surface	1	28.6	28.6	7.8	7.8	29.0	29.0	76.0	76.5	5.0	5.1	4.9	3.1	3.0	3.9	6	6.0	5.0		
						28.6		7.8		29.0		77.0		5.1			2.9			6			6	
				Middle	3	28.3	28.3	7.8	7.8	29.8	29.6	71.7	71.9	4.7	4.8		4.1	4.3		6	6.5		7	6.5
		28.3		7.8		29.4		72.0		4.8		4.8		4.4		7		7						
		28.2	28.2	7.9	7.9	31.7	31.7	72.2	72.0	4.7	4.7	4.7	4.7	4.3	4.5	<2.5	<2.5	<2.5	<2.5					
		28.2		7.9		31.7		71.7		4.7		4.7		4.6		<2.5		<2.5						
26-Sep-15	Rainy	Moderate	10:27	Surface	1	27.6	27.5	7.7	7.8	31.1	31.2	73.8	73.4	4.9	4.9	4.8	3.2	3.3	4.3	5	5.0	5.8		
						27.3		7.8		31.3		72.9		4.9			4.9			3.3			5	5.0
				Middle	3.5	26.7	26.7	7.9	7.9	31.7	31.7	70.8	70.6	4.8	4.8		6.7	6.2		7	6.5		6	6.5
		26.6		7.9		31.7		70.4		4.7		4.8		5.6		6		6						
		26.3	26.3	8.0	8.0	32.0	32.0	70.3	70.2	4.7	4.7	4.7	4.7	3.5	3.3	6	6.0	6	6.0					
		26.3		8.0		32.0		70.0		4.7		4.7		3.0		6		6						
28-Sep-15	Sunny	Moderate	12:41	Surface	1	26.6	26.6	8.0	8.0	32.2	32.2	94.0	94.2	6.3	6.3	6.2	2.5	2.5	3.7	3	3.5	5.3		
						26.6		8.0		32.2		94.3		6.3			2.5			4			4	
				Middle	3	26.5	26.5	8.0	8.0	32.3	32.3	92.6	94.0	6.2	6.3		3.7	3.7		7	7.0		7	7.0
		26.5		8.0		32.3		95.3		6.4		6.3		3.7		7		7						
		26.5	26.5	8.0	8.0	32.3	32.3	91.4	91.3	6.1	6.1	6.1	6.1	4.9	4.9	5	5.5	5	5.5					
		26.5		8.0		32.3		91.1		6.1		6.1		4.8		6		6						
30-Sep-15	Fine	Moderate	13:37	Surface	1	29.2	29.2	8.2	8.2	28.0	28.4	75.5	75.6	5.0	5.0	4.9	2.4	2.5	3.1	6	6.0	5.2		
						29.1		8.2		28.8		75.6		5.0			2.5			6			6	
				Middle	3.5	28.6	28.6	8.2	8.2	28.9	29.0	73.9	74.0	4.9	4.9		3.4	3.5		5	4.5		4	4.5
		28.6		8.2		29.0		74.1		4.9		4.9		3.5		5		5						
		28.5	28.5	8.2	8.2	30.6	30.7	74.5	74.6	4.9	4.9	4.9	4.9	3.5	3.4	5	5.0	5	5.0					
		28.5		8.2		30.7		74.6		4.9		4.9		3.2		5		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-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*
2-Sep-15	Rainy	Moderate	08:33	Surface	1	24.5 24.6	24.6	7.5 7.5	7.5	26.7 26.6	26.7	66.2 61.2	63.7	4.7 4.4	4.6	4.1	1.7 1.5	1.6	1.9	4 4	4.0	5.0
				Middle	3.5	24.6 24.6	24.6	7.7 7.7	7.7	28.3 28.1	28.2	54.9 54.7	54.8	3.9 3.9	3.9		2.0 2.1	2.1		4 3	3.5	
				Bottom	6	24.5 24.5	24.5	7.8 7.8	7.8	30.2 30.2	30.2	55.0 55.3	55.2	3.9 3.9	3.9		2.1 2.0	2.1		8 7	7.5	
4-Sep-15	Sunny	Moderate	10:58	Surface	1	25.5 25.5	25.5	7.8 7.8	7.8	32.7 32.7	32.7	76.4 76.0	76.2	5.2 5.2	5.2	5.1	3.5 3.5	3.5	4.1	6 6	6.0	5.7
				Middle	3.5	25.3 25.3	25.3	7.8 7.8	7.8	32.8 32.8	32.8	73.3 73.0	73.2	5.0 5.0	5.0		4.2 4.2	4.2		6 6	6.0	
				Bottom	6	25.3 25.3	25.3	7.8 7.8	7.8	32.9 32.9	32.9	72.7 72.6	72.7	5.0 5.0	5.0		4.3 4.6	4.5		5 5	5.0	
7-Sep-15	Cloudy	Moderate	15:29	Surface	1	26.4 26.5	26.5	8.0 8.0	8.0	28.5 28.4	28.5	81.0 80.6	80.8	5.6 5.5	5.6	4.8	4.0 4.0	4.0	3.2	4 4	4.0	5.7
				Middle	3	26.4 26.3	26.4	8.1 8.1	8.1	28.6 28.5	28.6	72.5 72.0	72.3	5.0 5.0	5.0		3.1 3.2	3.2		8 8	8.0	
				Bottom	5	25.9 25.9	25.9	8.2 8.1	8.2	29.0 29.0	29.0	56.8 55.5	56.2	3.9 3.8	3.9		2.4 2.4	2.4		5 5	5.0	
9-Sep-15	Sunny	Moderate	16:57	Surface	1	27.1 27.1	27.1	7.7 7.7	7.7	33.0 33.0	33.0	68.2 68.1	68.2	4.5 4.5	4.5	4.4	2.8 2.7	2.8	4.4	3 3	3.0	5.0
				Middle	3.5	26.2 26.4	26.3	7.9 7.9	7.9	33.3 33.2	33.3	67.3 67.5	67.4	4.5 4.5	4.5		3.8 3.5	3.7		4 4	4.0	
				Bottom	6	25.8 25.8	25.8	7.9 8.0	8.0	33.9 34.1	34.0	61.3 61.2	61.3	4.1 4.1	4.1		6.9 6.7	6.8		8 8	8.0	
11-Sep-15	Fine	Moderate	17:48	Surface	1	26.6 26.6	26.6	7.6 7.6	7.6	31.3 31.3	31.3	77.0 76.5	76.8	5.2 5.2	5.2	5.1	3.5 3.3	3.4	4.4	5 6	5.5	5.8
				Middle	3	26.5 26.5	26.5	7.7 7.7	7.7	31.6 31.6	31.6	74.4 74.3	74.4	5.0 5.0	5.0		4.0 4.2	4.1		5 5	5.0	
				Bottom	5	26.5 26.5	26.5	7.7 7.7	7.7	32.0 32.0	32.0	74.6 74.8	74.7	5.0 5.0	5.0		5.5 5.7	5.6		7 7	7.0	
14-Sep-15	Fine	Moderate	18:57	Surface	1	27.2 27.1	27.2	7.7 7.7	7.7	30.3 30.5	30.4	66.1 66.0	66.1	4.4 4.4	4.4	4.3	2.7 2.7	2.7	3.7	5 5	5.0	5.8
				Middle	3.5	26.5 26.3	26.4	7.9 7.9	7.9	30.8 30.9	30.9	65.5 65.3	65.4	4.4 4.4	4.4		3.6 3.6	3.6		6 6	6.0	
				Bottom	6	25.9 25.8	25.9	7.9 8.0	8.0	31.2 31.3	31.3	59.6 59.3	59.5	4.1 4.1	4.1		4.8 4.8	4.8		6 7	6.5	
16-Sep-15	Sunny	Moderate	07:51	Surface	1	29.3 29.3	29.3	7.5 7.5	7.5	29.6 29.7	29.7	68.2 67.7	68.0	4.4 4.4	4.4	4.3	4.0 4.0	4.0	3.8	4 4	4.0	5.7
				Middle	3	28.4 28.5	28.5	7.7 7.8	7.8	30.1 30.1	30.1	65.1 65.2	65.2	4.3 4.3	4.3		2.3 2.4	2.4		7 7	7.0	
				Bottom	5	28.3 28.2	28.3	7.8 7.9	7.9	30.3 30.3	30.3	62.8 62.8	62.8	4.1 4.1	4.1		5.1 4.8	5.0		6 6	6.0	
18-Sep-15	Sunny	Moderate	09:10	Surface	1	28.8 28.6	28.7	7.6 7.6	7.6	31.0 31.2	31.1	64.6 64.5	64.6	4.2 4.2	4.2	4.2	3.6 4.0	3.8	4.1	7 7	7.0	5.5
				Middle	3	28.1 28.1	28.1	7.8 7.9	7.9	31.8 31.8	31.8	64.3 64.5	64.4	4.2 4.2	4.2		4.2 4.2	4.2		5 5	5.0	
				Bottom	5	28.0 28.0	28.0	8.0 8.0	8.0	32.4 32.4	32.4	65.9 66.1	66.0	4.3 4.3	4.3		4.2 4.2	4.2		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-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*
22-Sep-15	Cloudy	Moderate	14:26	Surface	1	28.3	28.3	7.7	7.7	29.8	29.8	68.4	68.4	4.5	4.5	4.4	2.6	2.6	3.7	4	4.0	5.2
						28.3		7.7		29.8		68.3		4.5			2.5			4		
				Middle	3.5	27.9	27.9	7.8	7.8	30.1	30.1	66.9	67.0	4.4	4.4		3.3	3.4		7	7.5	
		27.9		7.8		30.1		67.0		4.4		4.4	3.4		8							
		27.6	27.6	7.9	7.9	30.7	30.7	66.5	66.5	4.4	4.4	5.1	5.1	4	4.0							
		27.6		7.9		30.7		66.4		4.4		4.4	5.1		4							
24-Sep-15	Sunny	Moderate	16:18	Surface	1	28.8	28.8	7.8	7.8	29.5	29.5	75.2	75.2	4.9	4.9	4.9	1.6	1.6	2.9	4	4.5	5.8
						28.7		7.8		29.5		75.1		4.8			1.5			5		
				Middle	3.5	28.4	28.4	8.0	8.0	29.7	29.8	73.0	73.3	4.8	4.9		2.4	2.5		6	6.0	
		28.4		7.9		29.8		73.6		4.9		4.9	2.5		6							
		28.2	28.2	8.0	8.0	31.4	31.5	73.1	72.9	4.8	4.8	4.4	4.5	7	7.0							
		28.2		8.0		31.6		72.6		4.8		4.8	4.5		7							
26-Sep-15	Rainy	Moderate	17:23	Surface	1	26.7	26.7	7.6	7.6	31.3	31.3	76.8	76.6	5.2	5.2	5.1	3.7	3.6	4.6	3	3.0	5.2
						26.7		7.6		31.3		76.3		5.1			5.2			3		
				Middle	3.5	26.6	26.6	7.7	7.7	31.6	31.6	74.3	74.2	5.0	5.0		4.2	4.3		5	5.0	
		26.6		7.7		31.6		74.1		5.0		5.0	4.4		5							
		26.6	26.6	7.7	7.7	32.0	32.0	74.4	74.5	5.0	5.0	5.7	5.8	7	7.5							
		26.6		7.7		32.0		74.6		5.0		5.0	5.9		8							
28-Sep-15	Fine	Moderate	17:41	Surface	1	27.6	27.5	7.9	7.9	29.1	29.2	99.3	98.6	6.7	6.7	6.3	1.3	1.3	3.4	3	3.0	5.0
						27.4		7.9		29.3		97.9		6.6			6.7			3		
				Middle	3	26.9	26.9	7.9	7.9	30.5	30.5	90.6	89.2	6.1	6.0		3.6	3.8		5	5.0	
		26.9		7.9		30.5		87.8		5.9		6.0	3.9		5							
		26.9	26.9	7.9	7.9	30.6	30.6	89.1	90.7	6.0	6.1	5.3	5.2	7	7.0							
		26.9		7.9		30.6		92.3		6.2		6.1	5.1		7							
30-Sep-15	Fine	Moderate	19:35	Surface	1	29.0	29.0	8.2	8.2	28.7	28.7	75.1	75.1	4.9	4.9	4.9	1.4	1.4	2.4	3	3.0	5.7
						29.0		8.2		28.7		75.0		4.9			4.9			3		
				Middle	3.5	28.6	28.6	8.2	8.2	29.3	29.3	74.3	74.2	4.9	4.9		2.1	2.2		7	6.5	
		28.5		8.2		29.2		74.0		4.9		4.9	2.2		6							
		28.5	28.5	8.0	8.0	30.5	30.6	74.3	74.4	4.9	4.9	3.5	3.5	8	7.5							
		28.5		8.0		30.6		74.4		4.9		4.9	3.5		7							

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*
2-Sep-15	Rainy	Moderate	15:10	Surface	1	24.7	24.7	7.4	7.4	26.5	26.6	70.4	69.7	5.0	5.0	4.7	0.2	0.2	0.9	4	4	4.5
				Middle	7	24.7	24.6	7.7	7.7	26.8	26.9	63.1	63.1	4.5	4.5		1.2	1.2		5	4	
				Bottom	13	24.5	24.5	7.8	7.7	27.8	27.8	62.9	62.8	4.5	4.5		1.2	1.2		5	5	
4-Sep-15	Sunny	Moderate	15:06	Surface	1	26.0	26.0	7.8	7.8	32.5	32.5	77.6	77.3	5.2	5.2	5.1	3.3	3.3	3.3	4	4	5.3
				Middle	7.5	25.5	25.5	7.8	7.8	32.9	32.9	75.7	75.5	5.1	5.1		3.3	3.3		8	8	
				Bottom	14	25.5	25.5	7.9	7.9	33.0	33.0	75.3	75.5	5.1	5.1		3.3	3.3		4	4	
7-Sep-15	Cloudy	Moderate	08:30	Surface	1	26.4	26.4	8.1	8.1	29.0	29.0	85.9	85.8	5.9	5.9	4.3	4.8	4.9	4.5	4	5	5.2
				Middle	7.5	26.0	26.0	8.3	8.3	29.4	29.4	56.0	54.1	3.9	3.7		4.3	4.3		5	4	
				Bottom	14	25.8	25.8	8.1	8.0	29.9	29.8	46.8	45.3	3.2	3.1		4.5	4.3		7	6	
9-Sep-15	Sunny	Moderate	10:17	Surface	1	26.8	26.5	8.2	8.2	33.0	32.9	90.8	90.0	6.0	6.0	5.8	2.8	3.1	4.3	3	3	3.3
				Middle	7	26.2	26.1	8.3	8.3	33.3	33.4	84.8	84.5	5.7	5.7		3.7	4.0		3	3	
				Bottom	13	26.1	26.0	8.3	8.3	34.3	34.3	84.5	84.2	5.6	5.6		5.6	5.7		4	4	
11-Sep-15	Sunny	Moderate	11:47	Surface	1	27.4	27.3	7.7	7.8	30.5	30.6	87.0	87.2	5.8	5.9	5.5	7.7	7.5	3.8	4	5	5.5
				Middle	7	26.4	26.4	7.9	7.9	31.6	31.6	79.8	78.6	5.4	5.3		2.7	2.5		5	6	
				Bottom	13	26.3	26.3	7.9	7.9	31.9	31.9	77.4	76.8	5.2	5.2		1.4	1.4		6	7	
14-Sep-15	Sunny	Moderate	13:22	Surface	1	26.4	26.6	8.2	8.2	30.7	30.7	73.4	73.3	5.0	5.0	4.7	3.5	3.5	4.4	5	6	4.5
				Middle	7.5	26.2	26.2	8.3	8.3	30.7	30.8	68.1	68.2	4.6	4.6		3.9	4.0		4	4	
				Bottom	14	26.1	26.1	8.3	8.3	31.6	31.3	67.7	67.6	4.6	4.6		5.0	5.6		4	4	
16-Sep-15	Sunny	Moderate	14:27	Surface	1	29.1	29.0	7.7	7.7	30.1	30.1	74.9	74.6	4.9	4.9	4.6	3.1	3.1	4.4	4	4	4.5
				Middle	7.5	27.5	27.5	7.8	7.7	30.7	30.7	69.2	68.4	4.6	4.6		4.7	4.7		4	5	
				Bottom	14	27.4	27.3	7.7	7.8	31.0	30.9	65.7	66.1	4.4	4.4		5.4	5.4		5	5	
18-Sep-15	Sunny	Moderate	15:28	Surface	1	28.8	28.8	7.7	7.7	31.1	31.2	74.0	73.9	4.8	4.8	4.8	3.7	3.7	4.4	3	3	3.8
				Middle	7	28.2	28.2	7.9	7.9	32.1	32.2	72.6	72.7	4.7	4.7		4.5	4.5		5	6	
				Bottom	13	28.0	28.0	8.0	8.0	32.5	32.5	72.8	72.9	4.8	4.8		4.9	5.0		3	3	

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*			
22-Sep-15	Cloudy	Moderate	06:54	Surface	1	28.5	28.5	7.7	7.7	29.3	29.4	79.5	79.4	5.2	5.2	4.8	3.0	3.1	4.4	4	4.5	5.2			
						28.5		7.7		29.4		79.3		5.2			3.1			5			5		
				Middle	7	27.7	27.7	7.8	7.8	30.2	30.2	70.8	70.7	4.7	4.7		3.9	3.9		5	5.0				
				27.7		7.8		30.2		70.5		4.7		4.7		3.9		5		6		6.0			
				Bottom	13	27.6	27.6	7.9	7.9	30.4	30.4	69.0	69.3	4.6	4.6		6.2	6.3		6		6		6.4	
						27.5		7.9		30.4		69.5		4.6		4.6		6.4		6		6		6.4	
24-Sep-15	Sunny	Moderate	09:17	Surface	1	28.6	28.6	7.9	7.9	29.9	29.9	80.7	80.3	5.3	5.3	4.8	3.2	3.3	4.3	3	3.0	5.5			
						28.5		7.9		29.9		79.9		5.3			3.3			3			5		5.5
				Middle	7.5	28.1	28.1	8.1	8.1	30.3	30.2	69.5	69.2	4.6	4.6		4.0	4.1		6	5.5				
				28.0		8.0		30.1		68.9		4.6		4.6		4.2		8		8		8.0			
				Bottom	14	27.9	27.9	8.0	8.0	31.5	31.4	68.5	68.9	4.5	4.6		5.5	5.6		8		8		8.0	
						27.9		8.0		31.2		69.2		4.6		4.6		5.7		8		8		8.0	
26-Sep-15	Rainy	Moderate	10:55	Surface	1	27.2	27.1	7.7	7.8	30.5	30.6	86.3	86.6	5.8	5.8	5.5	8.2	8.0	4.3	5	4.5	4.5			
						26.9		7.8		30.7		86.8		5.8			8.0			4			5		5.0
				Middle	7	26.2	26.2	7.9	7.9	31.6	31.6	79.2	78.6	5.4	5.4		3.2	3.0		5	5.0				
				26.2		7.9		31.6		78.0		5.3		5.4		2.8		4		4		4.0			
				Bottom	13	26.1	26.1	7.9	7.9	31.8	31.9	76.8	76.6	5.2	5.2		1.9	1.9		4		4		4.0	
						26.1		7.9		31.9		76.3		5.2		1.9		4		4		4		4.0	
28-Sep-15	Sunny	Moderate	13:14	Surface	1	26.6	26.6	8.0	8.0	32.2	32.2	102.8	103.7	6.9	7.0	6.7	2.6	2.7	3.7	3	3.0	5.3			
						26.6		8.0		32.2		104.5		7.0			2.7			3			6		6.5
				Middle	7	26.5	26.5	8.0	8.0	32.2	32.2	99.2	98.7	6.7	6.7		3.8	3.9		7	6.5				
				26.5		8.0		32.2		98.1		6.6		6.7		3.9		6		7		6.5			
				Bottom	13	26.5	26.5	8.0	8.0	32.2	32.2	95.3	96.3	6.4	6.5		4.2	4.4		6		6		6.5	
						26.5		8.0		32.2		97.2		6.5		4.6		7		7		6.5			
30-Sep-15	Fine	Moderate	14:04	Surface	1	29.0	29.0	8.0	8.0	28.3	28.4	71.5	71.5	4.7	4.7	4.7	2.6	2.6	4.6	5	5.0	5.3			
						28.9		8.0		28.4		71.4		4.7			2.6			5			5		5.0
				Middle	6.5	28.2	28.2	8.1	8.2	28.6	28.7	70.0	70.2	4.7	4.7		4.6	4.7		6	6.0				
				28.2		8.2		28.8		70.4		4.7		4.7		4.8		6		6		6.0			
				Bottom	12	28.1	28.1	8.2	8.2	31.4	31.5	72.7	72.7	4.8	4.8		6.5	6.5		5		5		5.0	
						28.1		8.2		31.5		72.7		4.8		6.4		5		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*
2-Sep-15	Rainy	Moderate	09:00	Surface	1	24.5	24.5	7.8	7.8	26.6	26.6	72.6	71.4	5.2	5.1	4.6	1.2	1.2	1.2	5	5.5	4.7
						24.5	24.5	7.8	7.8	26.6	26.6	70.2	71.4	5.0	5.1		1.1	1.2		6	5.5	
				Middle	7.5	24.5	24.5	8.1	8.1	26.8	26.8	61.3	61.4	4.4	4.4		1.2	1.3		4	4.0	
				24.4	24.4	8.2	8.2	26.7	26.8	61.4	61.4	4.4	4.4	1.4	1.3	4	4.0					
				Bottom	14	24.4	24.4	8.2	8.2	28.1	28.0	61.8	61.7	4.4	4.4	1.1	1.1	4	4.5	5	4.5	
						24.4	24.4	8.2	8.2	27.9	28.0	61.6	61.7	4.4	4.4	1.1	1.1	5	4.5			
4-Sep-15	Sunny	Moderate	11:30	Surface	1	25.5	25.5	7.8	7.8	32.8	32.8	77.6	77.5	5.3	5.3	5.1	3.6	3.6	4.2	5	5.0	5.0
						25.4	25.5	7.8	7.8	32.8	32.8	77.4	77.5	5.3	5.3		3.6	3.6		5	5.0	
				Middle	8	25.3	25.3	7.8	7.8	32.8	32.8	75.2	75.1	5.1	5.1		4.2	4.2		5	5.0	
				25.3	25.3	7.8	7.8	32.8	32.8	74.9	75.1	5.1	5.1	4.1	4.2	5	5.0					
				Bottom	15	25.2	25.2	7.8	7.8	32.9	32.9	73.4	73.5	5.0	5.0	4.6	4.7	5	5.0			
						25.2	25.2	7.8	7.8	32.9	32.9	73.5	73.5	5.0	5.0	4.8	4.7	5	5.0			
7-Sep-15	Cloudy	Moderate	15:56	Surface	1	26.3	26.3	8.1	8.1	29.0	29.0	85.1	85.0	5.8	5.8	4.2	4.9	4.8	4.4	5	5.0	4.2
						26.3	26.3	8.1	8.1	29.0	29.0	84.8	85.0	5.8	5.8		4.7	4.8		5	5.0	
				Middle	7	25.9	25.9	8.2	8.2	29.7	29.7	52.7	52.5	3.6	3.6		4.2	4.1		4	4.0	
				25.9	25.9	8.2	8.2	29.7	29.7	52.2	52.5	3.6	3.6	3.9	4.1	4	4.0					
				Bottom	13	25.7	25.7	8.3	8.3	30.0	30.1	44.6	44.3	3.1	3.1	4.1	4.2	4	3.5	3	3.5	
						25.6	25.7	8.3	8.3	30.1	30.1	44.0	44.3	3.0	3.1	4.2	4.2	3	3.5			
9-Sep-15	Sunny	Moderate	17:18	Surface	1	26.5	26.6	8.2	8.2	33.2	33.1	90.2	90.0	6.0	6.0	5.8	3.8	3.9	4.1	5	5.5	3.8
						26.7	26.6	8.2	8.2	32.9	33.1	89.8	90.0	6.0	6.0		3.9	3.9		6	5.5	
				Middle	7.5	26.3	26.2	8.3	8.3	33.5	33.5	84.9	84.7	5.7	5.7		3.4	3.5		3	3.0	
				26.0	26.2	8.3	8.3	33.4	33.5	84.5	84.7	5.7	5.7	3.6	3.5	3	3.0					
				Bottom	14	26.4	26.3	8.4	8.4	33.7	33.7	84.5	84.4	5.6	5.6	5.4	5.0	3	3.0			
						26.2	26.3	8.3	8.4	33.7	33.7	84.2	84.4	5.6	5.6	4.5	5.0	3	3.0			
11-Sep-15	Fine	Moderate	18:17	Surface	1	26.7	26.7	7.6	7.6	31.8	31.8	81.6	81.5	5.5	5.5	5.2	1.3	1.3	3.8	5	5.5	5.5
						26.7	26.7	7.6	7.6	31.8	31.8	81.3	81.5	5.5	5.5		1.2	1.3		6	5.5	
				Middle	7	26.5	26.5	7.7	7.7	32.4	32.4	76.2	76.2	5.1	5.1		5.2	5.2		5	5.5	
				26.5	26.5	7.7	7.7	32.4	32.4	76.1	76.2	5.1	5.1	5.2	5.2	5	5.5					
				Bottom	13	26.4	26.4	7.7	7.7	32.6	32.6	74.9	74.8	5.0	5.0	4.7	4.8	5	5.5			
						26.4	26.4	7.7	7.7	32.6	32.6	74.7	74.8	5.0	5.0	4.9	4.8	6	5.5			
14-Sep-15	Fine	Moderate	19:19	Surface	1	26.5	26.5	8.2	8.2	30.5	30.5	73.1	72.8	5.0	5.0	4.7	3.2	3.2	3.7	7	7.0	5.3
						26.4	26.5	8.2	8.2	30.4	30.5	72.5	72.8	4.9	5.0		3.2	3.2		7	7.0	
				Middle	7.5	26.3	26.3	8.3	8.3	30.9	30.9	68.1	68.2	4.6	4.6		4.2	4.4		6	6.0	
				26.2	26.3	8.3	8.3	30.9	30.9	68.2	68.2	4.6	4.6	4.6	4.6	6	6.0					
				Bottom	14	26.0	26.0	8.3	8.3	31.2	31.3	67.3	67.3	4.6	4.6	3.5	3.5	3	3.0			
						25.9	26.0	8.3	8.3	31.4	31.3	67.3	67.3	4.6	4.6	3.5	3.5	3	3.0			
16-Sep-15	Sunny	Moderate	08:17	Surface	1	28.8	28.8	7.6	7.6	29.3	29.4	80.0	80.0	5.3	5.3	4.9	3.1	3.2	4.5	4	4.0	4.7
						28.8	28.8	7.6	7.6	29.4	29.4	79.9	80.0	5.2	5.3		3.2	3.2		4	4.0	
				Middle	7.5	28.0	28.0	7.8	7.8	30.1	30.2	71.3	71.2	4.7	4.7		4.0	4.0		4	4.0	
				28.0	28.0	7.8	7.8	30.2	30.2	71.0	71.0	4.7	4.7	4.0	4.0	4	4.0					
				Bottom	14	27.9	27.9	7.8	7.8	30.3	30.4	69.5	69.8	4.6	4.6	6.3	6.4	6	6.0			
						27.8	27.9	7.8	7.8	30.4	30.4	70.0	69.8	4.6	4.6	6.5	6.4	6	6.0			
18-Sep-15	Sunny	Moderate	09:38	Surface	1	28.9	28.9	7.8	7.8	31.0	31.0	74.0	73.9	4.8	4.8	4.8	2.4	2.4	4.0	3	3.0	5.0
						28.9	28.9	7.8	7.8	31.0	31.0	73.8	73.9	4.8	4.8		2.4	2.4		3	3.0	
				Middle	7.5	28.2	28.2	8.0	8.0	31.9	32.0	72.6	72.5	4.7	4.7		4.7	4.8		4	4.0	
				28.2	28.2	8.0	8.0	32.0	32.0	72.4	72.4	4.7	4.7	4.8	4.8	4	4.0					
				Bottom	14	28.0	28.0	8.0	8.1	32.5	32.5	72.7	72.7	4.8	4.8	4.6	4.7	8	8.0			
						28.0	28.0	8.1	8.1	32.5	32.5	72.7	72.7	4.8	4.8	4.7	4.7	8	8.0			

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*
22-Sep-15	Cloudy	Moderate	14:57	Surface	1	28.8 28.6	28.7	7.7 7.7	7.7	30.1 30.1	30.1	74.2 73.7	74.0	4.9 4.8	4.9	4.6	3.5 3.5	3.5	4.5	4 4	4.0	4.0
				Middle	7.5	27.2 27.2	27.2	7.8 7.8	7.8	30.8 30.8	30.8	68.5 67.8	68.2	4.6 4.5	4.6		3.6 3.5	3.6		3 3	3.0	
				Bottom	14	27.1 27.0	27.1	7.7 7.8	7.8	31.0 30.9	31.0	65.1 65.5	65.3	4.4 4.4	4.4		6.3 6.2	6.3		5 5	5.0	
24-Sep-15	Sunny	Moderate	16:45	Surface	1	28.7 28.7	28.7	7.9 7.9	7.9	29.8 29.9	29.9	79.3 80.4	79.9	5.2 5.3	5.3	4.8	3.0 3.1	3.1	4.4	9 8	8.5	5.5
				Middle	7.5	28.1 28.1	28.1	7.8 7.8	7.8	30.2 30.2	30.2	70.7 70.1	70.4	4.7 4.6	4.7		4.6 4.8	4.7		4 4	4.0	
				Bottom	14	28.0 28.0	28.0	7.9 7.9	7.9	31.2 31.1	31.2	68.7 68.7	68.7	4.5 4.5	4.5		5.5 5.5	5.5		4 4	4.0	
26-Sep-15	Rainy	Moderate	17:52	Surface	1	26.8 26.8	26.8	7.6 7.6	7.6	31.7 31.8	31.8	81.4 81.2	81.3	5.5 5.4	5.5	5.2	1.5 1.5	1.5	3.2	5 5	5.0	5.0
				Middle	7.5	26.6 26.6	26.6	7.7 7.7	7.7	32.4 32.4	32.4	76.1 75.9	76.0	5.1 5.1	5.1		3.4 3.5	3.5		5 5	5.0	
				Bottom	14	26.5 26.5	26.5	7.7 7.7	7.7	32.5 32.6	32.6	74.7 74.5	74.6	5.0 5.0	5.0		4.5 4.6	4.6		5 5	5.0	
28-Sep-15	Fine	Moderate	17:26	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	31.4 31.3	31.4	96.1 91.7	93.9	6.4 6.1	6.3	6.5	3.6 3.8	3.7	4.3	5 6	5.5	5.7
				Middle	7	26.8 26.8	26.8	8.0 8.0	8.0	31.8 31.9	31.9	99.4 98.9	99.2	6.7 6.6	6.7		4.4 4.4	4.4		6 5	5.5	
				Bottom	13	26.7 26.7	26.7	8.0 8.0	8.0	32.2 32.2	32.2	99.8 94.9	97.4	6.7 6.4	6.6		4.6 4.8	4.7		6 6	6.0	
30-Sep-15	Fine	Moderate	20:03	Surface	1	28.9 29.0	29.0	8.0 8.1	8.1	28.2 28.2	28.2	72.5 71.3	71.9	4.8 4.7	4.8	4.8	3.2 3.3	3.3	4.0	6 6	6.0	5.5
				Middle	7	28.2 28.2	28.2	8.1 8.1	8.1	28.5 28.6	28.6	70.3 70.3	70.3	4.7 4.7	4.7		3.9 3.8	3.9		5 6	5.5	
				Bottom	13	28.1 28.1	28.1	8.2 8.2	8.2	31.4 31.4	31.4	73.0 72.8	72.9	4.8 4.8	4.8		4.6 4.7	4.7		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 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*	
2-Sep-15	Rainy	Moderate	13:21	Surface	1	24.8	24.8	7.7	7.7	26.9	26.7	72.2	72.1	5.1	5.1	4.8	1.6	1.7	1.9	3	3	4.3	
						24.8		7.7		26.5		72.0		5.1			1.8			3			
				Middle	9.5	24.3	24.3	7.8	7.9	27.9	28.0	64.7	64.7	4.6	4.6		1.3	1.5		6	5		5.5
				24.2		7.9		28.0		64.7		4.6		1.6		5		5.5					
				Bottom	18	24.2	24.2	7.9	7.9	29.6	29.9	64.3	64.4	4.6	4.6	2.4	2.4	4	5	4.5			
						24.2		7.9		30.1		64.4		4.6		2.4		5		4.5			
4-Sep-15	Sunny	Moderate	17:35	Surface	1	26.1	26.1	7.9	7.9	32.8	32.8	82.4	82.2	5.6	5.6	5.5	2.8	2.8	3.1	5	5	5.8	
						26.1		7.9		32.8		82.0		5.5			2.7			5			
				Middle	10	25.9	25.9	7.9	7.9	33.0	33.0	81.1	81.0	5.5	5.5		2.9	3.0		6	5		5.5
				25.9		7.9		33.0		80.9		5.5		3.0	3.0	5		5.5					
				Bottom	19	25.5	25.5	7.9	7.9	33.2	33.2	78.3	78.2	5.3	5.3	3.6	3.6	7	7	7.0			
						25.5		7.9		33.2		78.0		5.3		3.6		7		7.0			
7-Sep-15	Cloudy	Moderate	06:40	Surface	1	26.9	26.8	7.7	7.7	29.3	29.5	84.5	83.5	5.7	5.7	4.5	1.5	1.5	1.9	4	5	4.8	
						26.7		7.7		29.7		82.4		5.6			1.5	1.5		5	4		4.5
				Middle	9.5	25.9	25.9	8.1	8.1	30.2	30.2	59.8	59.5	4.1	4.1		1.5	1.5		7	7		7.0
				25.9		8.1		30.2		59.2		4.1		1.5		7		7.0					
				Bottom	18	25.8	25.8	8.1	8.2	30.4	30.5	56.0	55.5	3.8	3.8	2.6	2.8	3	3	3.0			
						25.7		8.2		30.5		55.0		3.8		3.0		3		3.0			
9-Sep-15	Sunny	Moderate	08:55	Surface	1	26.5	26.5	8.2	8.2	33.0	33.0	91.9	91.6	6.1	6.1	5.9	3.3	3.4	4.2	4	4	4.5	
						26.5		8.2		33.0		91.3		6.1			3.4	3.4		4	4		4.0
				Middle	9.5	26.2	26.2	8.3	8.3	33.5	33.5	86.5	86.5	5.8	5.8		4.0	4.1		6	7		6.5
				26.1		8.3		33.5		86.5		5.8		4.1		7		6.5					
				Bottom	18	26.1	26.1	8.3	8.3	34.0	34.0	86.0	86.0	5.8	5.8	4.9	5.1	3	3	3.0			
						26.1		8.3		34.0		86.0		5.8		5.2		3		3.0			
11-Sep-15	Sunny	Moderate	10:05	Surface	1	26.9	26.9	7.8	7.9	32.4	32.5	88.1	88.1	5.9	5.9	5.5	3.0	3.1	4.2	5	5	5.8	
						26.8		7.9		32.5		88.0		5.9			3.1	3.1		5	5		5.0
				Middle	9.5	26.4	26.4	8.1	8.2	33.2	33.3	80.1	79.7	5.4	5.4		4.1	4.2		6	6		6.0
				26.4		8.2		33.3		79.3		5.3		4.2		6		6.0					
				Bottom	18	26.3	26.3	8.2	8.2	33.5	33.5	79.3	79.2	5.3	5.3	5.1	5.3	7	6	6.5			
						26.3		8.2		33.5		79.1		5.3		5.5		6		6.5			
14-Sep-15	Sunny	Moderate	12:01	Surface	1	26.3	26.3	8.2	8.2	30.5	30.6	73.1	72.9	5.0	5.0	4.7	3.4	3.5	4.1	5	5	5.5	
						26.3		8.2		30.7		72.6		4.9			3.5	3.5		5	5		5.0
				Middle	10	26.2	26.2	8.3	8.3	31.1	31.0	68.2	68.3	4.6	4.6		3.5	3.7		6	6		6.0
				26.2		8.2		30.8		68.3		4.6		3.9		6		6.0					
				Bottom	19	26.1	26.1	8.3	8.3	31.7	31.7	67.8	67.8	4.6	4.6	4.9	5.0	5	6	5.5			
						26.1		8.3		31.6		67.7		4.6		5.1		6		5.5			
16-Sep-15	Sunny	Moderate	12:39	Surface	1	28.7	28.7	7.7	7.8	30.8	30.8	76.1	76.3	5.0	5.0	4.9	5.0	4.9	4.1	7	6	7.2	
						28.7		7.8		30.8		76.5		5.0			4.7	4.9		6	6		6.5
				Middle	9.5	27.5	27.6	8.1	8.1	31.7	31.7	72.2	72.4	4.8	4.8		3.9	4.0		10	10		10.0
				27.6		8.0		31.7		72.5		4.8		4.0		10		10.0					
				Bottom	18	27.4	27.4	8.2	8.2	31.7	31.7	72.0	72.0	4.8	4.8	3.4	3.5	5	5	5.0			
						27.3		8.2		31.7		72.0		4.8		3.5		5		5.0			
18-Sep-15	Sunny	Moderate	13:46	Surface	1	28.9	28.9	7.7	7.7	30.5	30.6	83.1	83.0	5.4	5.4	5.4	3.8	3.9	3.7	4	3	5.3	
						28.8		7.7		30.6		82.9		5.4			3.9	3.9		3	3		3.5
				Middle	9.5	28.1	28.1	7.8	7.8	33.5	33.6	83.3	83.3	5.4	5.4		4.0	4.1		4	4		4.0
				28.1		7.8		33.6		83.3		5.4		4.1		4		4.0					
				Bottom	18	28.0	28.0	7.7	7.8	33.1	33.2	83.3	83.2	5.4	5.4	2.9	3.0	8	8	8.5			
						28.0		7.8		33.2		83.1		5.4		3.0		9		8.5			

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-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*		
22-Sep-15	Cloudy	Moderate	05:18	Surface	1	28.3	28.3	7.8	7.8	30.7	30.7	79.8	79.6	5.2	5.2	4.9	2.8	2.8	3.5	4	4	5.8		
						28.2		7.8		30.7		79.4		5.2			2.7			4.1	4.1		6	6
				Middle	9.5	27.6	27.7	8.2	8.3	31.7	31.6	73.0	73.6	4.8	4.9		4.0	4.0		4.0	4.0		6	6
				27.7		8.3		31.5		74.1		4.9		4.9		3.6	3.6		8	7	7.5			
				Bottom	18	27.5	27.6	8.3	8.3	31.9	31.8	71.0	70.6	4.7	4.7		3.6	3.6		7	7	7.5		
						27.6		8.3		31.7		70.1		4.6		4.7		4.6						
24-Sep-15	Sunny	Moderate	07:27	Surface	1	28.7	28.7	8.0	8.0	29.7	29.6	80.3	79.6	5.3	5.3	5.0	1.8	1.7	2.6	5	5	4.7		
						28.6		8.0		29.5		78.9		5.2			1.5			5	5			
				Middle	10	27.9	27.9	8.1	8.1	31.8	31.8	73.7	73.4	4.8	4.8		3.2	3.3		3.3	3.3		5	5
				27.9		8.0		31.7		73.0		4.8		4.8		2.7			4	4	4.0			
				Bottom	19	27.8	27.8	8.1	8.1	32.5	32.2	72.5	71.7	4.8	4.8		2.7	2.7		4	4	4.0		
						27.8		8.1		31.9		70.8		4.7		4.8		2.7						
26-Sep-15	Rainy	Moderate	09:13	Surface	1	26.7	26.7	7.8	7.9	32.4	32.5	87.4	87.4	5.8	5.8	5.5	2.5	2.6	4.2	4	4	5.0		
						26.6		8.0		32.5		87.3		5.8			2.6			4.6	4.7		5	5
				Middle	10	26.2	26.2	8.2	8.2	33.2	33.2	79.5	79.2	5.3	5.3		4.7	4.7		4.7	4.7		6	6
				26.2		8.2		33.2		78.8		5.3		5.3		5.2			6	5	5.5			
				Bottom	19	26.1	26.1	8.2	8.3	33.5	33.5	78.7	78.7	5.3	5.3		5.3	5.3		5	5	5.5		
						26.1		8.3		33.4		78.6		5.3		5.3		5.3						
28-Sep-15	Sunny	Moderate	10:48	Surface	1	26.7	26.7	7.7	7.7	31.1	31.1	92.0	91.1	6.2	6.2	5.9	2.6	2.7	4.5	6	5	5.8		
						26.7		7.7		31.1		90.2		6.1			2.8			2.9	3.1		6	6
				Middle	9.5	26.5	26.5	7.8	7.8	31.4	31.4	82.8	82.9	5.6	5.6		3.2	3.2		3.2	3.2		6	6
				26.5		7.8		31.4		83.0		5.6		5.6		7.3			6	6	6.0			
				Bottom	18	26.4	26.4	7.9	7.9	32.3	32.4	84.7	85.4	5.7	5.8		7.3	7.6		6	6	6.0		
						26.4		7.9		32.4		86.1		5.8		7.9				6	6	6.0		
30-Sep-15	Fine	Moderate	12:20	Surface	1	29.2	29.2	7.7	7.7	28.2	28.2	80.5	80.1	5.3	5.3	5.2	3.2	3.2	4.1	5	5	5.2		
						29.1		7.7		28.1		79.7		5.2			3.1			3.7	3.8		6	5
				Middle	11.5	28.5	28.5	8.0	8.0	29.0	29.0	78.2	78.3	5.2	5.2		3.8	3.8		3.8	3.8		5	5
				28.5		7.9		29.0		78.4		5.2		5.2		5.4			5	5	5.5			
				Bottom	22	28.3	28.3	7.9	7.9	31.5	31.6	79.2	79.2	5.2	5.2		5.4	5.4		5	5	5.0		
						28.3		7.9		31.6		79.1		5.2		5.4				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 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*
2-Sep-15	Rainy	Moderate	07:11	Surface	1	24.7 24.6	24.7	7.7 7.6	7.7	27.2 27.2	27.2	70.5 70.4	70.5	5.0 5.0	5.0	4.7	1.8 1.5	1.7	1.7	5 5	5.0	4.2
				Middle	9.5	24.0 24.0	24.0	7.9 7.9	7.9	28.3 28.2	28.3	63.1 63.1	63.1	4.5 4.5	4.5		1.5 1.6	1.6		3 3	3.0	
				Bottom	18	24.0 24.0	24.0	7.9 8.0	8.0	31.0 30.4	30.7	63.4 63.2	63.3	4.5 4.5	4.5		1.7 1.8	1.8		5 4	4.5	
4-Sep-15	Sunny	Moderate	09:12	Surface	1	26.1 26.1	26.1	7.9 7.9	7.9	33.2 33.2	33.2	72.8 73.1	73.0	4.9 4.9	4.9	5.0	1.8 1.7	1.8	3.0	8 7	7.5	5.5
				Middle	10	25.4 25.4	25.4	7.9 7.9	7.9	33.4 33.4	33.4	74.7 74.3	74.5	5.1 5.0	5.1		3.2 3.2	3.2		4 4	4.0	
				Bottom	19	25.4 25.4	25.4	7.9 7.9	7.9	33.4 33.4	33.4	73.2 73.3	73.3	5.0 5.0	5.0		3.9 3.9	3.9		5 5	5.0	
7-Sep-15	Cloudy	Moderate	14:12	Surface	1	26.6 26.5	26.6	7.9 7.9	7.9	30.0 30.1	30.1	81.6 81.0	81.3	5.5 5.5	5.5	4.5	1.8 1.8	1.8	3.5	4 4	4.0	4.3
				Middle	9.5	25.9 25.9	25.9	8.0 8.1	8.1	30.4 30.3	30.4	59.1 59.1	59.1	4.1 4.1	4.1		1.2 1.0	1.1		3 3	3.0	
				Bottom	18	25.7 25.6	25.7	8.1 8.1	8.1	30.7 30.8	30.8	54.7 53.9	54.3	3.8 3.7	3.8		7.8 7.3	7.6		6 6	6.0	
9-Sep-15	Sunny	Moderate	15:51	Surface	1	26.6 26.4	26.5	8.1 8.2	8.2	33.2 32.6	32.9	90.4 89.2	89.8	6.0 6.0	6.0	5.8	3.1 3.7	3.4	3.9	7 6	6.5	5.5
				Middle	9	26.5 26.2	26.4	8.2 8.3	8.3	33.2 33.2	33.2	85.0 84.7	84.9	5.7 5.7	5.7		3.6 4.1	3.9		4 5	4.5	
				Bottom	17	26.3 26.4	26.4	8.3 8.3	8.3	34.0 33.6	33.8	84.5 84.4	84.5	5.6 5.6	5.6		4.3 4.3	4.3		6 5	5.5	
11-Sep-15	Fine	Moderate	16:35	Surface	1	26.5 26.5	26.5	7.6 7.6	7.6	32.7 32.7	32.7	84.6 84.3	84.5	5.7 5.6	5.7	5.6	3.7 3.7	3.7	4.6	6 6	6.0	5.8
				Middle	9.5	26.5 26.5	26.5	7.7 7.7	7.7	33.2 33.2	33.2	82.1 82.0	82.1	5.5 5.5	5.5		4.6 4.7	4.7		7 6	6.5	
				Bottom	18	26.5 26.5	26.5	7.7 7.7	7.7	33.3 33.3	33.3	81.7 81.8	81.8	5.5 5.5	5.5		5.2 5.3	5.3		5 5	5.0	
14-Sep-15	Fine	Moderate	18:01	Surface	1	26.6 26.7	26.7	8.2 8.2	8.2	30.4 30.5	30.5	73.2 72.9	73.1	5.0 4.9	5.0	4.7	3.3 4.0	3.7	4.2	7 6	6.5	4.8
				Middle	10	26.1 26.1	26.1	8.3 8.3	8.3	31.0 31.2	31.1	67.9 68.2	68.1	4.6 4.6	4.6		3.9 4.2	4.1		4 3	3.5	
				Bottom	19	26.1 25.9	26.0	8.3 8.3	8.3	31.3 31.4	31.4	67.5 67.3	67.4	4.6 4.6	4.6		4.8 4.7	4.8		4 5	4.5	
16-Sep-15	Sunny	Moderate	06:40	Surface	1	28.6 28.5	28.6	7.8 7.8	7.8	30.7 30.7	30.7	80.4 79.9	80.2	5.3 5.2	5.3	5.0	2.9 2.8	2.9	3.6	7 6	6.5	5.8
				Middle	9	27.9 28.0	28.0	8.2 8.2	8.2	31.7 31.4	31.6	73.5 74.6	74.1	4.8 4.9	4.9		4.2 4.1	4.2		4 5	4.5	
				Bottom	17	27.8 27.9	27.9	8.3 8.3	8.3	31.9 31.6	31.8	71.5 70.6	71.1	4.7 4.6	4.7		3.7 3.7	3.7		6 7	6.5	
18-Sep-15	Sunny	Moderate	07:53	Surface	1	29.2 29.0	29.1	7.8 7.8	7.8	30.2 30.4	30.3	83.5 83.2	83.4	5.4 5.4	5.4	5.4	2.5 3.0	2.8	2.9	7 7	7.0	6.0
				Middle	9.5	28.1 28.1	28.1	7.7 7.7	7.7	33.3 33.4	33.4	83.0 83.1	83.1	5.4 5.4	5.4		3.5 3.5	3.5		5 6	5.5	
				Bottom	18	28.0 28.0	28.0	7.8 7.8	7.8	33.0 33.1	33.1	84.0 84.0	84.0	5.4 5.4	5.4		2.4 2.4	2.4		5 6	5.5	

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*
22-Sep-15	Cloudy	Moderate	13:08	Surface	1	28.4 28.4	28.4	7.7 7.8	7.8	30.8 30.8	30.8	75.4 75.9	75.7	4.9 5.0	5.0	4.9	4.9 4.6	4.8	4.0	6 7	6.5	5.5
				Middle	9	27.2 27.3	27.3	8.1 8.1	8.1	31.7 31.7	31.7	71.6 71.9	71.8	4.8 4.8	4.8		3.8 3.9	3.9		5 5	5.0	
				Bottom	17	27.1 27.0	27.1	8.2 8.2	8.2	31.8 31.7	31.8	71.3 71.4	71.4	4.8 4.8	4.8		3.3 3.4	3.4		5 5	5.0	
24-Sep-15	Sunny	Moderate	14:55	Surface	1	28.8 28.8	28.8	7.9 7.9	7.9	29.4 29.6	29.5	80.9 83.5	82.2	5.3 5.5	5.4	5.0	3.4 3.7	3.6	3.7	5 5	5.0	5.7
				Middle	9.5	27.9 27.8	27.9	8.0 8.0	8.0	31.3 31.4	31.4	72.7 72.6	72.7	4.8 4.8	4.8		3.1 3.2	3.2		4 5	4.5	
				Bottom	18	27.8 27.7	27.8	8.1 8.1	8.1	32.1 32.1	32.1	72.0 70.8	71.4	4.7 4.7	4.7		4.3 4.4	4.4		7 8	7.5	
26-Sep-15	Rainy	Moderate	16:09	Surface	1	26.6 26.6	26.6	7.6 7.6	7.6	32.6 32.6	32.6	84.4 84.1	84.3	5.6 5.6	5.6	5.5	2.5 2.5	2.5	3.9	3 3	3.0	5.0
				Middle	9.5	26.6 26.6	26.6	7.7 7.8	7.8	33.1 33.2	33.2	82.0 81.8	81.9	5.5 5.5	5.5		4.2 4.5	4.4		5 5	5.0	
				Bottom	18	26.6 26.6	26.6	7.8 7.8	7.8	33.3 33.3	33.3	81.6 81.6	81.6	5.4 5.4	5.4		4.8 4.9	4.9		7 7	7.0	
28-Sep-15	Fine	Moderate	19:50	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	31.3 31.3	31.3	96.7 95.5	96.1	6.5 6.4	6.5	6.5	3.4 3.5	3.5	4.2	5 4	4.5	5.8
				Middle	9	26.8 26.8	26.8	8.0 8.0	8.0	31.7 31.7	31.7	101.0 95.7	98.4	6.8 6.4	6.6		4.6 4.8	4.7		5 5	5.0	
				Bottom	17	26.7 26.7	26.7	8.0 8.0	8.0	32.1 32.1	32.1	96.3 96.3	96.3	6.4 6.4	6.4		4.3 4.7	4.5		8 8	8.0	
30-Sep-15	Fine	Moderate	18:21	Surface	1	28.9 28.9	28.9	7.7 7.7	7.7	28.3 28.2	28.3	79.5 79.7	79.6	5.2 5.3	5.3	5.2	1.5 1.6	1.6	2.6	7 6	6.5	5.8
				Middle	12	28.4 28.4	28.4	8.0 8.0	8.0	28.5 28.5	28.5	78.2 78.5	78.4	5.2 5.2	5.2		2.3 2.4	2.4		6 5	5.5	
				Bottom	23	28.3 28.2	28.3	7.8 7.8	7.8	31.1 31.2	31.2	77.2 77.1	77.2	5.1 5.1	5.1		3.7 3.8	3.8		5 6	5.5	

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at WSD17 - 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*
2-Sep-15	Rainy	Moderate	16:08	Surface	1	24.6 24.5	24.6	7.5 7.4	7.5	26.8 26.8	26.8	71.9 70.5	71.2	5.1 5.1	5.1	4.9	1.5 1.5	1.5	1.6	9 9	9.0	5.8
				Middle	3.5	24.5 24.6	24.6	7.7 7.7	7.7	27.4 27.3	27.4	66.4 66.5	66.5	4.7 4.7	4.7		1.3 1.3	1.3		4 5	4.5	
				Bottom	6	24.6 24.5	24.6	7.8 7.8	7.8	28.2 28.0	28.1	67.1 67.0	67.1	4.8 4.8	4.8		1.8 1.9	1.9		4 4	4.0	
4-Sep-15	Sunny	Moderate	16:50	Surface	1	25.9 25.9	25.9	7.9 7.9	7.9	33.0 33.0	33.0	81.1 80.9	81.0	5.5 5.5	5.5	5.5	2.9 2.9	2.9	3.0	7 7	7.0	5.8
				Middle	3.5	25.8 25.8	25.8	7.9 7.9	7.9	33.2 33.2	33.2	79.8 80.3	80.1	5.4 5.4	5.4		2.8 2.8	2.8		6 7	6.5	
				Bottom	6	25.7 25.7	25.7	7.9 7.9	7.9	33.3 33.3	33.3	81.0 80.9	81.0	5.5 5.5	5.5		3.3 3.4	3.4		4 4	4.0	
7-Sep-15	Cloudy	Moderate	09:33	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	29.4 29.4	29.4	75.8 74.7	75.3	5.2 5.1	5.2	4.9	5.0 4.8	4.9	4.6	4 3	3.5	5.7
				Middle	4	26.3 26.3	26.3	8.3 8.3	8.3	29.5 29.5	29.5	70.2 70.4	70.3	4.8 4.8	4.8		4.5 4.6	4.6		7 7	7.0	
				Bottom	7	26.3 26.3	26.3	8.3 8.2	8.3	31.4 31.4	31.4	69.2 68.6	68.9	4.7 4.6	4.7		4.3 4.5	4.4		6 7	6.5	
9-Sep-15	Sunny	Moderate	11:22	Surface	1	26.3 26.0	26.2	8.3 8.3	8.3	33.3 33.2	33.3	74.9 74.5	74.7	5.0 5.0	5.0	5.0	2.1 2.1	2.1	4.3	7 7	7.0	4.2
				Middle	3.5	26.0 25.7	25.9	8.3 8.3	8.3	33.5 33.6	33.6	74.0 73.5	73.8	5.0 5.0	5.0		4.3 4.5	4.4		<2.5 <2.5	<2.5	
				Bottom	6	25.8 26.2	26.0	8.3 8.3	8.3	33.9 34.2	34.1	73.5 74.1	73.8	4.9 4.9	4.9		6.4 6.4	6.4		3 3	3.0	
11-Sep-15	Sunny	Moderate	12:43	Surface	1	27.4 27.3	27.4	7.5 7.6	7.6	31.6 31.7	31.7	101.2 102.3	101.8	6.7 6.8	6.8	6.5	2.0 1.9	2.0	2.5	6 6	6.0	5.5
				Middle	3.5	26.9 26.8	26.9	7.7 7.7	7.7	32.0 32.1	32.1	97.6 96.4	97.0	6.5 6.4	6.5		2.4 2.5	2.5		5 5	5.0	
				Bottom	6	26.6 26.6	26.6	7.7 7.7	7.7	32.3 32.3	32.3	92.2 91.4	91.8	6.2 6.1	6.2		3.0 2.7	2.9		6 5	5.5	
14-Sep-15	Sunny	Moderate	14:27	Surface	1	26.6 26.2	26.4	8.3 8.3	8.3	30.4 30.6	30.5	72.9 72.5	72.7	4.9 4.9	4.9	4.9	3.2 3.4	3.3	4.2	4 4	4.0	5.0
				Middle	3.5	26.1 26.1	26.1	8.3 8.3	8.3	31.1 31.0	31.1	71.9 71.8	71.9	4.9 4.9	4.9		4.5 4.5	4.5		5 5	5.0	
				Bottom	6	25.9 25.9	25.9	8.3 8.3	8.3	31.6 31.6	31.6	71.5 71.5	71.5	4.9 4.9	4.9		4.9 4.9	4.9		6 6	6.0	
16-Sep-15	Sunny	Moderate	15:30	Surface	1	28.9 28.9	28.9	8.0 8.0	8.0	29.9 29.9	29.9	79.9 80.5	80.2	5.2 5.3	5.3	5.2	3.2 3.3	3.3	3.5	9 8	8.5	5.5
				Middle	3.5	28.6 28.6	28.6	7.7 7.7	7.7	30.1 30.1	30.1	78.9 78.7	78.8	5.2 5.2	5.2		3.2 3.2	3.2		4 4	4.0	
				Bottom	6	28.2 28.1	28.2	7.9 7.8	7.9	30.3 30.3	30.3	76.0 75.7	75.9	5.0 5.0	5.0		4.0 4.2	4.1		4 4	4.0	
18-Sep-15	Sunny	Moderate	16:23	Surface	1	28.0 28.0	28.0	7.2 7.2	7.2	31.3 31.3	31.3	72.8 72.8	72.8	4.8 4.8	4.8	4.8	4.2 4.2	4.2	4.4	4 5	4.5	4.2
				Middle	3.5	28.0 28.0	28.0	7.5 7.5	7.5	31.6 31.6	31.6	72.6 72.6	72.6	4.8 4.8	4.8		4.2 4.2	4.2		4 4	4.0	
				Bottom	6	28.0 28.0	28.0	7.7 7.7	7.7	31.5 31.5	31.5	72.5 72.5	72.5	4.8 4.8	4.8		4.8 4.7	4.8		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 WSD17 - 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*
22-Sep-15	Cloudy	Moderate	07:58	Surface	1	28.5	28.5	7.2	7.3	29.9	29.9	78.6	78.5	5.2	5.2	5.0	3.3	3.3	4.2	5	5.0	5.3
						28.5		7.3		29.9		78.3		5.2			3.3			5		
				Middle	3.5	28.1	28.1	7.8	7.8	30.6	30.6	77.1	76.6	5.1	5.1		4.2	4.2		4	4.0	
		28.1		7.8		30.5		76.0		5.0		5.1		4.1		4						
		27.8	27.9	7.9	7.9	30.8	30.8	73.1	73.1	4.8	4.8	4.8	4.8	5.2	5.2	7	7.0					
		27.9		7.9		30.8		73.1		4.8		4.8	5.1	5.2	7							
24-Sep-15	Sunny	Moderate	10:15	Surface	1	28.5	28.5	8.0	8.0	29.3	29.4	74.4	74.6	4.9	4.9	4.9	2.6	2.5	3.4	6	6.0	5.5
						28.5		8.0		29.4		74.7		4.9			2.4			6		
				Middle	3.5	28.2	28.2	8.0	8.0	30.7	30.6	73.6	73.5	4.8	4.8		3.2	3.3		5	5.0	
		28.2		8.0		30.4		73.3		4.8		4.8	3.3		5							
		28.1	28.1	7.9	7.9	31.1	31.1	75.3	75.2	5.0	5.0	5.0	5.0	4.5	4.4	6	5.5					
		28.1		7.8		31.1		75.1		4.9		5.0	4.3	4.4	5							
26-Sep-15	Rainy	Moderate	11:50	Surface	1	27.2	27.2	7.6	7.6	31.6	31.7	100.5	101.1	6.7	6.8	6.5	2.5	2.5	3.0	4	3.5	5.3
						27.1		7.6		31.7		101.6		6.8			2.4			3		
				Middle	3.5	26.7	26.7	7.7	7.7	32.0	32.0	96.9	96.4	6.5	6.5		2.9	3.0		6	6.0	
		26.6		7.7		32.0		95.8		6.4		6.5	3.0		6							
		26.4	26.4	7.8	7.8	32.2	32.3	91.5	91.2	6.2	6.2	6.2	6.2	3.5	3.4	6	6.5					
		26.4		7.8		32.3		90.8		6.1		6.2	3.2	3.4	7							
28-Sep-15	Sunny	Moderate	11:28	Surface	1	26.7	26.7	7.8	7.9	30.9	31.7	86.7	91.1	5.8	6.1	6.2	2.5	2.5	3.5	7	6.5	5.8
						26.6		8.0		32.4		95.5		6.4			2.5			6		
				Middle	3.5	26.7	26.7	7.8	7.9	30.9	31.7	91.5	92.2	6.2	6.2		2.6	2.6		4	4.0	
		26.6		8.0		32.5		92.9		6.2		6.2	2.6		4							
		26.6	26.6	7.7	7.7	32.3	32.3	92.4	93.0	6.2	6.3	6.2	6.3	5.4	5.5	7	7.0					
		26.6		7.7		32.3		93.5		6.3		6.3	5.5		7							
30-Sep-15	Fine	Moderate	14:59	Surface	1	28.8	28.8	7.7	7.7	29.2	29.3	79.5	79.6	5.2	5.2	5.2	1.6	1.6	3.1	4	4.0	5.2
						28.8		7.7		29.3		79.7		5.2			1.6			4		
				Middle	3.5	28.2	28.2	8.0	8.0	29.7	29.8	79.1	79.1	5.2	5.2		3.5	3.6		6	5.5	
		28.2		8.0		29.8		79.1		5.2		5.2	3.6		5							
		28.1	28.1	8.1	8.1	31.9	31.9	79.9	79.9	5.2	5.2	5.2	5.2	3.8	4.1	6	6.0					
		28.1		8.1		31.9		79.9		5.2		5.2	4.4	4.1	6							

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at WSD17 - 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*
2-Sep-15	Rainy	Moderate	09:58	Surface	1	24.4	24.4	7.8	7.8	27.0	27.1	73.3	72.6	5.3	5.2	4.9	1.7	1.7	1.6	6	6.0	5.2
						24.4	24.4	7.8	7.8	27.1	27.1	71.8	72.6	5.1	5.2		1.6	1.7		6	6.0	
				Middle	3.5	24.4	24.4	7.8	7.8	27.6	27.6	65.3	65.2	4.7	4.7		1.8	1.9		4	4.0	
				Bottom	6	24.3	24.3	7.7	7.7	28.2	28.3	65.4	65.5	4.7	4.7	1.2	1.2	6	5.5			
						24.3	24.3	7.7	7.7	28.4	28.3	65.5	65.5	4.7	4.7							
4-Sep-15	Sunny	Moderate	09:42	Surface	1	25.4	25.4	7.8	7.8	32.8	32.8	78.1	77.6	5.3	5.3	5.1	2.7	2.7	3.8	5	5.0	5.2
						25.4	25.4	7.8	7.8	32.8	32.8	77.1	77.6	5.3	5.3		2.7	2.7		5	5.0	
				Middle	3.5	25.3	25.3	7.8	7.8	32.9	32.9	74.2	74.1	5.1	5.1		3.2	3.3		5	5.0	
				Bottom	6	25.2	25.2	7.8	7.9	33.2	33.2	73.1	73.1	5.0	5.0	5.1	5.3	6	5.5			
						25.2	25.2	7.9	7.9	33.2	33.2	73.0	73.1	5.0	5.0							
7-Sep-15	Cloudy	Moderate	16:54	Surface	1	26.3	26.3	7.9	7.9	29.4	29.4	74.3	74.3	5.1	5.1	4.8	4.0	4.1	4.5	6	5.5	5.7
						26.3	26.3	7.8	7.9	29.3	29.4	74.3	74.3	5.1	5.1		4.1	4.1		5	5.5	
				Middle	4	26.3	26.3	8.0	8.0	29.4	29.5	70.5	70.5	4.8	4.8		4.8	4.8		6	6.5	
				Bottom	7	26.3	26.3	8.3	8.3	31.2	31.3	68.3	67.8	4.6	4.6	4.5	4.5	5	5.0			
						26.3	26.3	8.3	8.3	31.4	31.3	67.3	67.8	4.6	4.6							
9-Sep-15	Sunny	Moderate	18:25	Surface	1	26.6	26.6	8.3	8.3	33.0	32.9	75.0	74.9	5.0	5.0	5.0	3.0	2.9	4.4	4	4.0	4.2
						26.5	26.6	8.3	8.3	32.8	32.9	74.8	74.9	5.0	5.0		2.8	2.9		4	4.0	
				Middle	3.5	26.3	26.1	8.3	8.3	33.4	33.5	74.2	73.9	5.0	5.0		4.5	4.6		5	4.5	
				Bottom	6	25.8	25.9	8.3	8.3	33.8	33.9	73.3	73.4	4.9	4.9	5.5	5.6	4	4.0			
						25.9	25.9	8.3	8.3	34.0	33.9	73.5	73.5	4.9	4.9							
11-Sep-15	Fine	Moderate	19:13	Surface	1	27.2	27.2	7.5	7.5	31.4	31.4	98.9	99.1	6.6	6.6	6.5	2.3	2.2	2.8	6	6.0	5.8
						27.2	27.2	7.5	7.5	31.4	31.4	99.2	99.1	6.6	6.6		2.1	2.2		6	6.0	
				Middle	3.5	27.1	27.1	7.7	7.7	31.7	31.7	98.1	98.0	6.5	6.5		2.7	2.8		6	6.0	
				Bottom	6	27.1	27.1	7.8	7.8	32.0	32.0	95.5	95.5	6.4	6.4	3.4	3.3	6	5.5			
						27.1	27.1	7.8	7.8	32.0	32.0	95.5	95.5	6.4	6.4							
14-Sep-15	Fine	Moderate	20:20	Surface	1	26.4	26.4	8.3	8.3	30.4	30.5	72.5	72.5	4.9	4.9	4.9	3.1	3.2	4.4	5	5.0	5.7
						26.4	26.4	8.3	8.3	30.5	30.5	72.5	72.5	4.9	4.9		3.2	3.2		5	5.0	
				Middle	3.5	25.9	25.9	8.3	8.3	31.0	31.1	71.5	71.5	4.9	4.9		5.2	5.2		7	7.0	
				Bottom	6	25.9	26.0	8.3	8.3	31.1	31.5	71.4	71.3	4.9	4.9	5.2	5.2	5	5.0			
						25.9	26.0	8.3	8.3	31.4	31.5	71.2	71.3	4.9	4.9							
16-Sep-15	Sunny	Moderate	09:20	Surface	1	28.8	28.8	7.2	7.3	29.9	29.9	79.2	79.1	5.2	5.2	5.1	3.4	3.4	4.3	5	4.5	5.0
						28.8	28.8	7.3	7.3	29.8	29.9	78.9	79.1	5.2	5.2		3.4	3.4		4	4.5	
				Middle	3.5	28.4	28.4	7.8	7.8	30.5	30.5	77.6	77.1	5.1	5.1		4.3	4.3		6	6.0	
				Bottom	6	28.1	28.2	7.9	7.9	30.7	30.8	76.5	73.6	4.9	4.9	4.2	5.3	4	4.5			
						28.2	28.2	7.9	7.9	30.8	30.8	73.6	73.6	4.8	4.9	5.2	5.3	5	4.5			
18-Sep-15	Sunny	Moderate	10:33	Surface	1	28.0	28.0	7.3	7.3	31.5	31.6	73.4	73.2	4.8	4.8	4.8	3.1	3.2	3.6	3	3.5	5.3
						28.0	28.0	7.3	7.3	31.6	31.6	72.9	73.2	4.8	4.8		3.2	3.2		4	3.5	
				Middle	3.5	28.1	28.1	7.5	7.5	31.8	31.9	72.2	72.4	4.7	4.8		3.6	3.6		3	3.5	
				Bottom	6	28.0	28.0	7.7	7.7	32.0	32.0	72.5	72.7	4.8	4.8	3.6	4.0	4	3.5			
						28.0	28.0	7.7	7.7	31.9	32.0	72.6	72.7	4.8	4.8							

Remarks: \*DA: Depth-Averaged

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

### Water Quality Monitoring Results at WSD17 - 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*
22-Sep-15	Cloudy	Moderate	16:01	Surface	1	28.6	28.6	8.1	8.1	29.9	29.9	79.2	79.6	5.2	5.2	5.1	3.1	3.2	3.4	3	3.0	5.5
						28.6		8.0		29.9		79.9		5.2			3.1	3.1		3	4.0	
				Middle	4	28.3	28.3	7.7	7.7	30.1	30.2	78.2	78.2	5.2	5.2		3.1	3.1		4	4.0	
				28.3		7.7		30.2		78.1		5.1		5.2		3.9	4.0	9	9.5			
				Bottom	7	27.9	27.9	7.9	7.9	30.3	30.4	75.3	75.2	5.0	5.0		4.1		10			
						27.8		7.9		30.4		75.1		5.0								
24-Sep-15	Sunny	Moderate	17:43	Surface	1	28.6	28.6	7.9	8.0	29.2	29.3	75.3	75.4	5.0	5.0	5.0	2.3	2.4	2.6	4	3.5	4.2
						28.5		8.0		29.3		75.5		5.0			2.4			3		
				Middle	3.5	28.4	28.4	7.9	7.9	30.8	30.7	76.2	76.4	5.0	5.0		2.1	2.2		5	5.0	
				28.4		7.9		30.6		76.5		5.0		5.0		2.3		5				
				Bottom	6	28.3	28.3	8.0	8.0	31.1	31.1	74.8	74.6	4.9	4.9		3.3		4	4.0		
						28.3		8.0		31.0		74.3		4.9		3.2	3.3	4				
26-Sep-15	Rainy	Moderate	18:47	Surface	1	27.3	27.3	7.5	7.5	31.3	31.3	98.8	99.0	6.6	6.6	6.5	2.5	2.4	3.0	6	6.0	5.7
						27.3		7.5		31.3		99.1		6.6			2.3			6		
				Middle	3.5	27.2	27.2	7.7	7.7	31.7	31.7	97.9	97.8	6.5	6.5		2.9	3.0		7	7.0	
				27.2		7.7		31.7		97.7		6.5		6.5		3.0		7				
				Bottom	6	27.2	27.2	7.8	7.8	31.9	31.9	95.3	95.3	6.3	6.3		3.6	3.5	4	4.0		
						27.2		7.8		31.9		95.3		6.3		3.4		4				
28-Sep-15	Fine	Moderate	18:30	Surface	1	26.7	26.7	8.0	8.0	31.6	31.6	94.2	94.4	6.3	6.3	6.4	3.5	3.3	4.1	5	5.0	5.5
						26.7		8.0		31.6		94.6		6.3			3.1			5		
				Middle	3.5	27.0	27.2	7.9	7.9	30.9	31.1	94.9	95.1	6.4	6.4		4.0	4.1		3	3.5	
				27.4		7.9		31.2		95.3		6.3		6.4		4.1		4				
				Bottom	6	26.8	27.1	8.0	8.0	31.5	31.4	92.1	97.0	6.2	6.5		4.9	4.8	8	8.0		
						27.4		7.9		31.2		101.8		6.8		4.7		8				
30-Sep-15	Fine	Moderate	20:58	Surface	1	28.8	28.8	7.9	7.9	29.1	29.1	80.4	80.5	5.3	5.3	5.2	1.5	1.5	3.3	6	6.0	5.2
						28.8		7.8		29.1		80.5		5.3			1.4			6		
				Middle	4	28.2	28.2	8.0	8.0	29.7	29.7	78.9	78.9	5.2	5.2		3.9	3.8		4	4.5	
				28.2		8.0		29.7		78.9		5.2		5.2		3.6		5				
				Bottom	7	28.1	28.1	8.1	8.1	31.9	31.9	79.3	79.3	5.2	5.2		4.6	4.7	5	5.0		
						28.1		8.1		31.9		79.2		5.2		4.7		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 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*
2-Sep-15	Rainy	Moderate	16:08	Surface	1	24.6 24.5	24.6	7.5 7.4	7.5	26.8 26.8	26.8	71.9 70.5	71.2	5.1 5.1	5.1	4.9	1.5 1.5	1.5	1.6	9 9	9.0	5.8
				Middle	3.5	24.5 24.6	24.6	7.7 7.7	7.7	27.4 27.3	27.4	66.4 66.5	66.5	4.7 4.7	4.7		1.3 1.3	1.3		4 5	4.5	
				Bottom	6	24.6 24.5	24.6	7.8 7.8	7.8	28.2 28.0	28.1	67.1 67.0	67.1	4.8 4.8	4.8		1.8 1.9	1.9		4 4	4.0	
4-Sep-15	Sunny	Moderate	16:50	Surface	1	25.9 25.9	25.9	7.9 7.9	7.9	33.0 33.0	33.0	81.1 80.9	81.0	5.5 5.5	5.5	5.5	2.9 2.9	2.9	3.0	7 7	7.0	5.8
				Middle	3.5	25.8 25.8	25.8	7.9 7.9	7.9	33.2 33.2	33.2	79.8 80.3	80.1	5.4 5.4	5.4		2.8 2.8	2.8		6 7	6.5	
				Bottom	6	25.7 25.7	25.7	7.9 7.9	7.9	33.3 33.3	33.3	81.0 80.9	81.0	5.5 5.5	5.5		3.3 3.4	3.4		4 4	4.0	
7-Sep-15	Cloudy	Moderate	09:33	Surface	1	26.3 26.3	26.3	8.0 8.0	8.0	29.4 29.4	29.4	75.8 74.7	75.3	5.2 5.1	5.2	4.9	5.0 4.8	4.9	4.6	4 3	3.5	5.7
				Middle	4	26.3 26.3	26.3	8.3 8.3	8.3	29.5 29.5	29.5	70.2 70.4	70.3	4.8 4.8	4.8		4.5 4.6	4.6		7 7	7.0	
				Bottom	7	26.3 26.3	26.3	8.3 8.2	8.3	31.4 31.4	31.4	69.2 68.6	68.9	4.7 4.6	4.7		4.3 4.5	4.4		6 7	6.5	
9-Sep-15	Sunny	Moderate	11:22	Surface	1	26.3 26.0	26.2	8.3 8.3	8.3	33.3 33.2	33.3	74.9 74.5	74.7	5.0 5.0	5.0	5.0	2.1 2.1	2.1	4.3	7 7	7.0	4.2
				Middle	3.5	26.0 25.7	25.9	8.3 8.3	8.3	33.5 33.6	33.6	74.0 73.5	73.8	5.0 5.0	5.0		4.3 4.5	4.4		<2.5 <2.5	<2.5	
				Bottom	6	25.8 26.2	26.0	8.3 8.3	8.3	33.9 34.2	34.1	73.5 74.1	73.8	4.9 4.9	4.9		6.4 6.4	6.4		3 3	3.0	
11-Sep-15	Sunny	Moderate	12:43	Surface	1	27.4 27.3	27.4	7.5 7.6	7.6	31.6 31.7	31.7	101.2 102.3	101.8	6.7 6.8	6.8	6.5	2.0 1.9	2.0	2.5	6 6	6.0	5.5
				Middle	3.5	26.9 26.8	26.9	7.7 7.7	7.7	32.0 32.1	32.1	97.6 96.4	97.0	6.5 6.4	6.5		2.4 2.5	2.5		5 5	5.0	
				Bottom	6	26.6 26.6	26.6	7.7 7.7	7.7	32.3 32.3	32.3	92.2 91.4	91.8	6.2 6.1	6.2		3.0 2.7	2.9		6 5	5.5	
14-Sep-15	Sunny	Moderate	14:27	Surface	1	26.6 26.2	26.4	8.3 8.3	8.3	30.4 30.6	30.5	72.9 72.5	72.7	4.9 4.9	4.9	4.9	3.2 3.4	3.3	4.2	4 4	4.0	5.0
				Middle	3.5	26.1 26.1	26.1	8.3 8.3	8.3	31.1 31.0	31.1	71.9 71.8	71.9	4.9 4.9	4.9		4.5 4.5	4.5		5 5	5.0	
				Bottom	6	25.9 25.9	25.9	8.3 8.3	8.3	31.6 31.6	31.6	71.5 71.5	71.5	4.9 4.9	4.9		4.9 4.9	4.9		6 6	6.0	
16-Sep-15	Sunny	Moderate	15:30	Surface	1	28.9 28.9	28.9	8.0 8.0	8.0	29.9 29.9	29.9	79.9 80.5	80.2	5.2 5.3	5.3	5.2	3.2 3.3	3.3	3.5	9 8	8.5	5.5
				Middle	3.5	28.6 28.6	28.6	7.7 7.7	7.7	30.1 30.1	30.1	78.9 78.7	78.8	5.2 5.2	5.2		3.2 3.2	3.2		4 4	4.0	
				Bottom	6	28.2 28.1	28.2	7.9 7.8	7.9	30.3 30.3	30.3	76.0 75.7	75.9	5.0 5.0	5.0		4.0 4.2	4.1		4 4	4.0	
18-Sep-15	Sunny	Moderate	16:23	Surface	1	28.0 28.0	28.0	7.2 7.2	7.2	31.3 31.3	31.3	72.8 72.8	72.8	4.8 4.8	4.8	4.8	4.2 4.2	4.2	4.4	4 5	4.5	4.2
				Middle	3.5	28.0 28.0	28.0	7.5 7.5	7.5	31.6 31.6	31.6	72.6 72.6	72.6	4.8 4.8	4.8		4.2 4.2	4.2		4 4	4.0	
				Bottom	6	28.0 28.0	28.0	7.7 7.7	7.7	31.5 31.5	31.5	72.5 72.5	72.5	4.8 4.8	4.8		4.8 4.7	4.8		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*
22-Sep-15	Cloudy	Moderate	07:58	Surface	1	28.5	28.5	7.2	7.3	29.9	29.9	78.6	78.5	5.2	5.2	5.0	3.3	3.3	4.2	5	5.0	5.3
						28.5		7.3		29.9		78.3		5.2			3.3			5		
				Middle	3.5	28.1	28.1	7.8	7.8	30.6	30.6	77.1	76.6	5.1	5.1		4.2	4.2		4	4.0	
		28.1		7.8		30.5		76.0		5.0		5.1		4.1		4						
		27.8	27.9	7.9	7.9	30.8	30.8	73.1	73.1	4.8	4.8	4.8	4.8	5.2	5.2	7	7.0					
		27.9		7.9		30.8		73.1		4.8		4.8		5.1		7						
24-Sep-15	Sunny	Moderate	10:15	Surface	1	28.5	28.5	8.0	8.0	29.3	29.4	74.4	74.6	4.9	4.9	4.9	2.6	2.5	3.4	6	6.0	5.5
						28.5		8.0		29.4		74.7		4.9			2.4			6		
				Middle	3.5	28.2	28.2	8.0	8.0	30.7	30.6	73.6	73.5	4.8	4.8		3.2	3.3		5	5.0	
		28.2		8.0		30.4		73.3		4.8		4.8		3.3		5						
		28.1	28.1	7.9	7.9	31.1	31.1	75.3	75.2	5.0	5.0	5.0	5.0	4.5	4.4	6	5.5					
		28.1		7.8		31.1		75.1		4.9		5.0		4.3		5						
26-Sep-15	Rainy	Moderate	11:50	Surface	1	27.2	27.2	7.6	7.6	31.6	31.7	100.5	101.1	6.7	6.8	6.5	2.5	2.5	3.0	4	3.5	5.3
						27.1		7.6		31.7		101.6		6.8			2.4			3		
				Middle	3.5	26.7	26.7	7.7	7.7	32.0	32.0	96.9	96.4	6.5	6.5		2.9	3.0		6	6.0	
		26.6		7.7		32.0		95.8		6.4		6.5		3.0		6						
		26.4	26.4	7.8	7.8	32.2	32.3	91.5	91.2	6.2	6.2	6.2	6.2	3.5	3.4	6	6.5					
		26.4		7.8		32.3		90.8		6.1		6.2		3.2		7						
28-Sep-15	Sunny	Moderate	11:28	Surface	1	26.7	26.7	7.8	7.9	30.9	31.7	86.7	91.1	5.8	6.1	6.2	2.5	2.5	3.5	7	6.5	5.8
						26.6		8.0		32.4		95.5		6.4			2.5			6		
				Middle	3.5	26.7	26.7	7.8	7.9	30.9	31.7	91.5	92.2	6.2	6.2		2.6	2.6		4	4.0	
		26.6		8.0		32.5		92.9		6.2		6.2		2.6		4						
		26.6	26.6	7.7	7.7	32.3	32.3	92.4	93.0	6.2	6.3	6.2	6.3	5.4	5.5	7	7.0					
		26.6		7.7		32.3		93.5		6.3		6.3		5.5		7						
30-Sep-15	Fine	Moderate	14:59	Surface	1	28.8	28.8	7.7	7.7	29.2	29.3	79.5	79.6	5.2	5.2	5.2	1.6	1.6	3.1	4	4.0	5.2
						28.8		7.7		29.3		79.7		5.2			1.6			4		
				Middle	3.5	28.2	28.2	8.0	8.0	29.7	29.8	79.1	79.1	5.2	5.2		3.5	3.6		6	5.5	
		28.2		8.0		29.8		79.1		5.2		5.2		3.6		5						
		28.1	28.1	8.1	8.1	31.9	31.9	79.9	79.9	5.2	5.2	5.2	5.2	3.8	4.1	6	6.0					
		28.1		8.1		31.9		79.9		5.2		5.2		4.4		6						

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*
2-Sep-15	Rainy	Moderate	09:58	Surface	1	24.4	24.4	7.8	7.8	27.0	27.1	73.3	72.6	5.3	5.2	4.9	1.7	1.7	1.6	6	6.0	5.2
						24.4	24.4	7.8	7.8	27.1	27.1	71.8	72.6	5.1	5.2		1.6	1.7		6	6.0	
				Middle	3.5	24.4	24.4	7.8	7.8	27.6	27.6	65.3	65.2	4.7	4.7		1.8	1.9		4	4.0	
				Bottom	6	24.3	24.3	7.7	7.7	28.2	28.3	65.4	65.5	4.7	4.7	1.2	1.2	6	5.5			
						24.3	24.3	7.7	7.7	28.4	28.3	65.5	65.5	4.7	4.7							
4-Sep-15	Sunny	Moderate	09:42	Surface	1	25.4	25.4	7.8	7.8	32.8	32.8	78.1	77.6	5.3	5.3	5.1	2.7	2.7	3.8	5	5.0	5.2
						25.4	25.4	7.8	7.8	32.8	32.8	77.1	77.6	5.3	5.3		2.7	2.7		5	5.0	
				Middle	3.5	25.3	25.3	7.8	7.8	32.9	32.9	74.2	74.1	5.1	5.1		3.2	3.3		5	5.0	
				Bottom	6	25.2	25.2	7.8	7.9	33.2	33.2	73.1	73.1	5.0	5.0	5.1	5.3	6	5.5			
						25.2	25.2	7.9	7.9	33.2	33.2	73.0	73.1	5.0	5.0							
7-Sep-15	Cloudy	Moderate	16:54	Surface	1	26.3	26.3	7.9	7.9	29.4	29.4	74.3	74.3	5.1	5.1	4.8	4.0	4.1	4.5	6	5.5	5.7
						26.3	26.3	7.8	7.9	29.3	29.4	74.3	74.3	5.1	5.1		4.1	4.1		5	5.5	
				Middle	4	26.3	26.3	8.0	8.0	29.4	29.5	70.5	70.5	4.8	4.8		4.8	4.8		6	6.5	
				Bottom	7	26.3	26.3	8.3	8.3	31.2	31.3	68.3	67.8	4.6	4.6	4.5	4.5	5	5.0			
						26.3	26.3	8.3	8.3	31.4	31.3	67.3	67.8	4.6	4.6							
9-Sep-15	Sunny	Moderate	18:25	Surface	1	26.6	26.6	8.3	8.3	33.0	32.9	75.0	74.9	5.0	5.0	5.0	3.0	2.9	4.4	4	4.0	4.2
						26.5	26.6	8.3	8.3	32.8	32.9	74.8	74.9	5.0	5.0		2.8	2.9		4	4.0	
				Middle	3.5	26.3	26.1	8.3	8.3	33.4	33.5	74.2	73.9	5.0	5.0		4.5	4.6		5	4.5	
				Bottom	6	25.8	25.9	8.3	8.3	33.8	33.9	73.3	73.4	4.9	4.9	5.5	5.6	4	4.0			
						25.9	25.9	8.3	8.3	34.0	33.9	73.5	73.4	4.9	4.9							
11-Sep-15	Fine	Moderate	19:13	Surface	1	27.2	27.2	7.5	7.5	31.4	31.4	98.9	99.1	6.6	6.6	6.5	2.3	2.2	2.8	6	6.0	5.8
						27.2	27.2	7.5	7.5	31.4	31.4	99.2	99.1	6.6	6.6		2.1	2.2		6	6.0	
				Middle	3.5	27.1	27.1	7.7	7.7	31.7	31.7	98.1	98.0	6.5	6.5		2.7	2.8		6	6.0	
				Bottom	6	27.1	27.1	7.8	7.8	32.0	32.0	95.5	95.5	6.4	6.4	3.4	3.3	6	5.5			
						27.1	27.1	7.8	7.8	32.0	32.0	95.5	95.5	6.4	6.4							
14-Sep-15	Fine	Moderate	20:20	Surface	1	26.4	26.4	8.3	8.3	30.4	30.5	72.5	72.5	4.9	4.9	4.9	3.1	3.2	4.4	5	5.0	5.7
						26.4	26.4	8.3	8.3	30.5	30.5	72.5	72.5	4.9	4.9		3.2	3.2		5	5.0	
				Middle	3.5	25.9	25.9	8.3	8.3	31.0	31.1	71.5	71.5	4.9	4.9		5.2	5.2		7	7.0	
				Bottom	6	25.9	26.0	8.3	8.3	31.1	31.5	71.4	71.3	4.9	4.9	5.2	5.2	7	7.0			
						25.9	26.0	8.3	8.3	31.4	31.5	71.2	71.3	4.9	4.9							
16-Sep-15	Sunny	Moderate	09:20	Surface	1	28.8	28.8	7.2	7.3	29.9	29.9	79.2	79.1	5.2	5.2	5.1	3.4	3.4	4.3	5	4.5	5.0
						28.8	28.8	7.3	7.3	29.8	29.9	78.9	79.1	5.2	5.2		3.4	3.4		4	4.5	
				Middle	3.5	28.4	28.4	7.8	7.8	30.5	30.5	77.6	77.1	5.1	5.1		4.3	4.3		6	6.0	
				Bottom	6	28.1	28.2	7.9	7.9	30.7	30.8	76.5	73.6	4.9	4.9	4.2	5.3	4	4.5			
						28.2	28.2	7.9	7.9	30.8	30.8	73.6	73.6	4.8	4.9	5.2	5.3	5	4.5			
18-Sep-15	Sunny	Moderate	10:33	Surface	1	28.0	28.0	7.3	7.3	31.5	31.6	73.4	73.2	4.8	4.8	4.8	3.1	3.2	3.6	3	3.5	5.3
						28.0	28.0	7.3	7.3	31.6	31.6	72.9	73.2	4.8	4.8		3.2	3.2		4	3.5	
				Middle	3.5	28.1	28.1	7.5	7.5	31.8	31.9	72.2	72.4	4.7	4.8		3.6	3.6		3	3.5	
				Bottom	6	28.0	28.0	7.7	7.7	32.0	32.0	72.5	72.7	4.8	4.8	3.6	4.0	4	3.5			
						28.0	28.0	7.7	7.7	31.9	32.0	72.6	72.7	4.8	4.8							

Remarks: \*DA: Depth-Averaged

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

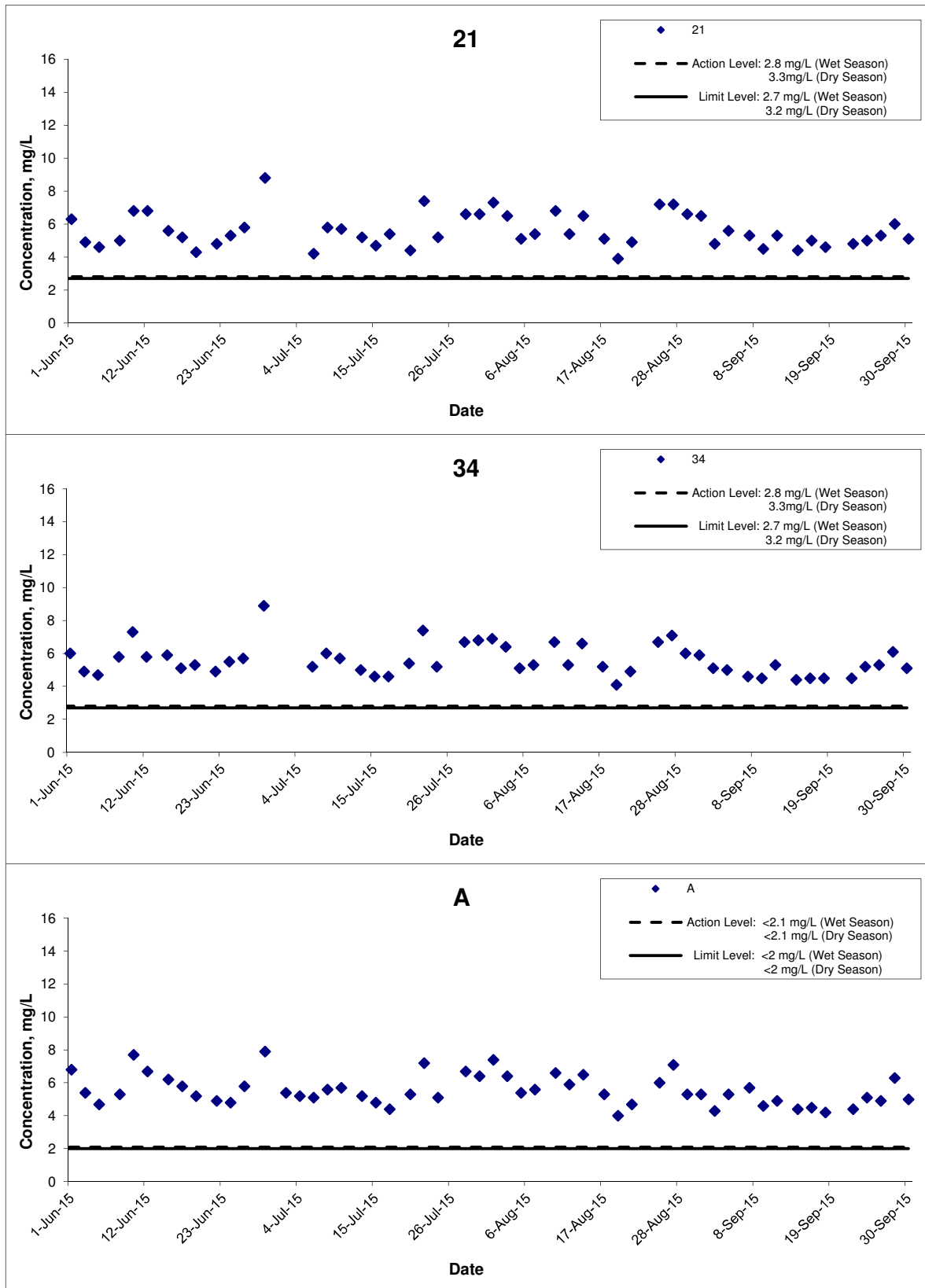
**Water Quality Monitoring Results at WSD9 - Mid-Flood Tide**

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*
22-Sep-15	Cloudy	Moderate	16:01	Surface	1	28.6	28.6	8.1	8.1	29.9	29.9	79.2	79.6	5.2	5.2	5.1	3.1	3.2	3.4	3	3.0	5.5
						28.6		8.0		29.9		79.9		5.2			3.1	3.1		3	4.0	
				Middle	4	28.3	28.3	7.7	7.7	30.1	30.2	78.2	78.2	5.2	5.2		3.1	3.1		4	4.0	
				28.3		7.7		30.2		78.1		5.1	5.2		3.9	4.0		9	9.5			
				Bottom	7	27.9	27.9	7.9	7.9	30.3	30.4	75.3	75.2	5.0	5.0		4.1			10		
						27.8		7.9		30.4		75.1		5.0								
24-Sep-15	Sunny	Moderate	17:43	Surface	1	28.6	28.6	7.9	8.0	29.2	29.3	75.3	75.4	5.0	5.0	5.0	2.3	2.4	2.6	4	3.5	4.2
						28.5		8.0		29.3		75.5		5.0			2.4			3		
				Middle	3.5	28.4	28.4	7.9	7.9	30.8	30.7	76.2	76.4	5.0	5.0		2.1	2.2		5	5.0	
				28.4		7.9		30.6		76.5		5.0	5.0		2.3			5				
				Bottom	6	28.3	28.3	8.0	8.0	31.1	31.1	74.8	74.6	4.9	4.9		3.3	3.3		4	4.0	
						28.3		8.0		31.0		74.3		4.9		3.2			4			
26-Sep-15	Rainy	Moderate	18:47	Surface	1	27.3	27.3	7.5	7.5	31.3	31.3	98.8	99.0	6.6	6.6	6.5	2.5	2.4	3.0	6	6.0	5.7
						27.3		7.5		31.3		99.1		6.6			2.3			6		
				Middle	3.5	27.2	27.2	7.7	7.7	31.7	31.7	97.9	97.8	6.5	6.5		2.9	3.0		7	7.0	
				27.2		7.7		31.7		97.7		6.5	6.5		3.0			7				
				Bottom	6	27.2	27.2	7.8	7.8	31.9	31.9	95.3	95.3	6.3	6.3		3.6	3.5		4	4.0	
						27.2		7.8		31.9		95.3		6.3		3.4			4			
28-Sep-15	Fine	Moderate	18:30	Surface	1	26.7	26.7	8.0	8.0	31.6	31.6	94.2	94.4	6.3	6.3	6.4	3.5	3.3	4.1	5	5.0	5.5
						26.7		8.0		31.6		94.6		6.3			3.1			5		
				Middle	3.5	27.0	27.2	7.9	7.9	30.9	31.1	94.9	95.1	6.4	6.4		4.0	4.1		3	3.5	
				27.4		7.9		31.2		95.3		6.3	6.4		4.1			4				
				Bottom	6	26.8	27.1	8.0	8.0	31.5	31.4	92.1	97.0	6.2	6.5		4.9	4.8		8	8.0	
						27.4		7.9		31.2		101.8		6.8		4.7			8			
30-Sep-15	Fine	Moderate	20:58	Surface	1	28.8	28.8	7.9	7.9	29.1	29.1	80.4	80.5	5.3	5.3	5.2	1.5	1.5	3.3	6	6.0	5.2
						28.8		7.8		29.1		80.5		5.3			1.4			6		
				Middle	4	28.2	28.2	8.0	8.0	29.7	29.7	78.9	78.9	5.2	5.2		3.9	3.8		4	4.5	
				28.2		8.0		29.7		78.9		5.2	5.2		3.6			5				
				Bottom	7	28.1	28.1	8.1	8.1	31.9	31.9	79.3	79.3	5.2	5.2		4.6	4.7		5	5.0	
						28.1		8.1		31.9		79.2		5.2		4.7			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



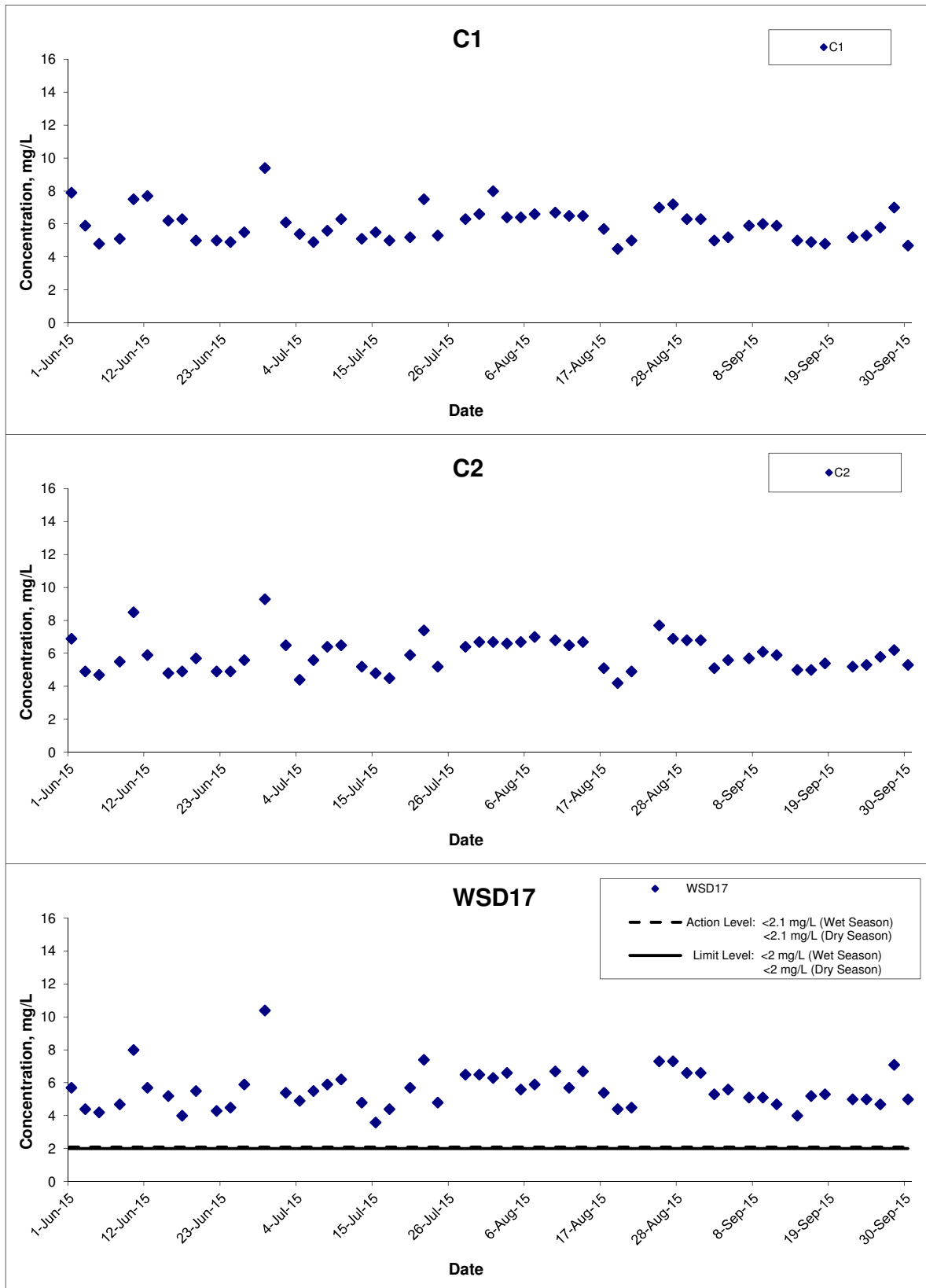
**Title**  
 Shatin to Central Link – Contract 1121  
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## Dissolved Oxygen (Surface) at Mid-Ebb Tide



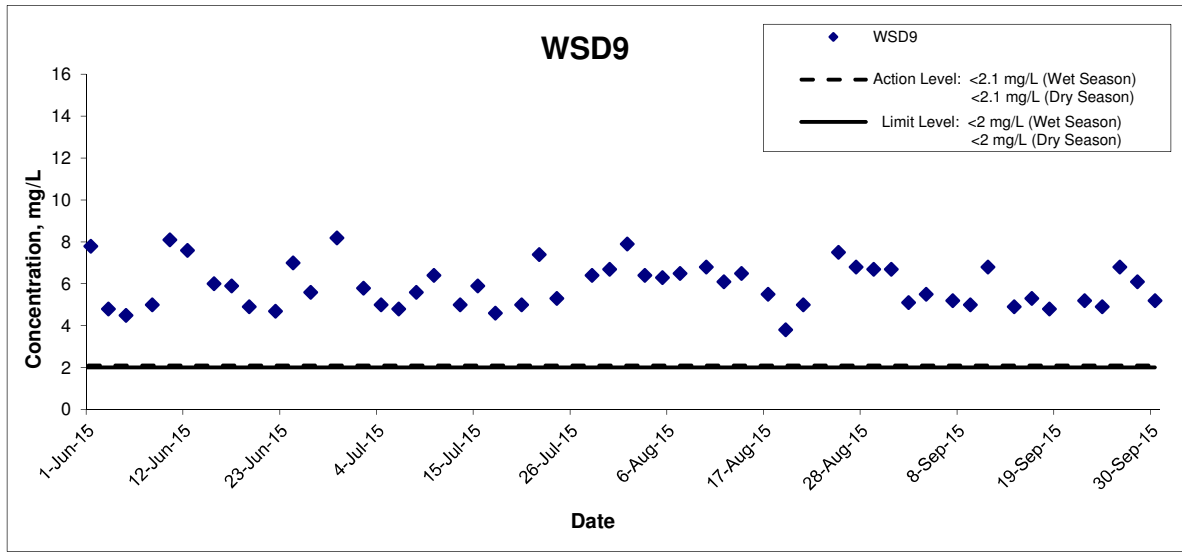
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 Advance Works for NSL Cross Harbour Tunnels  
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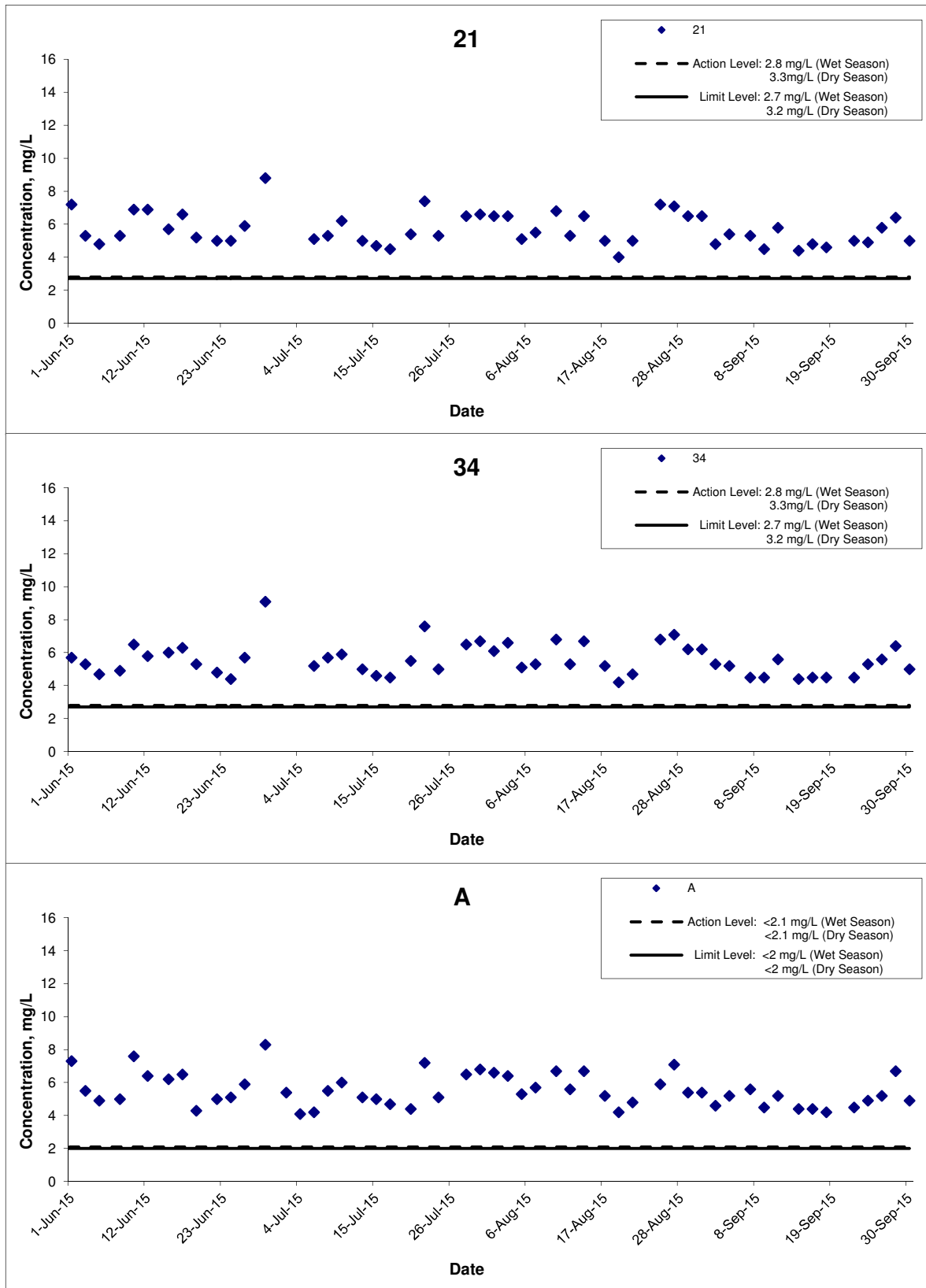


## Dissolved Oxygen (Surface) at Mid-Ebb Tide



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## Dissolved Oxygen (Surface) at Mid-Flood Tide



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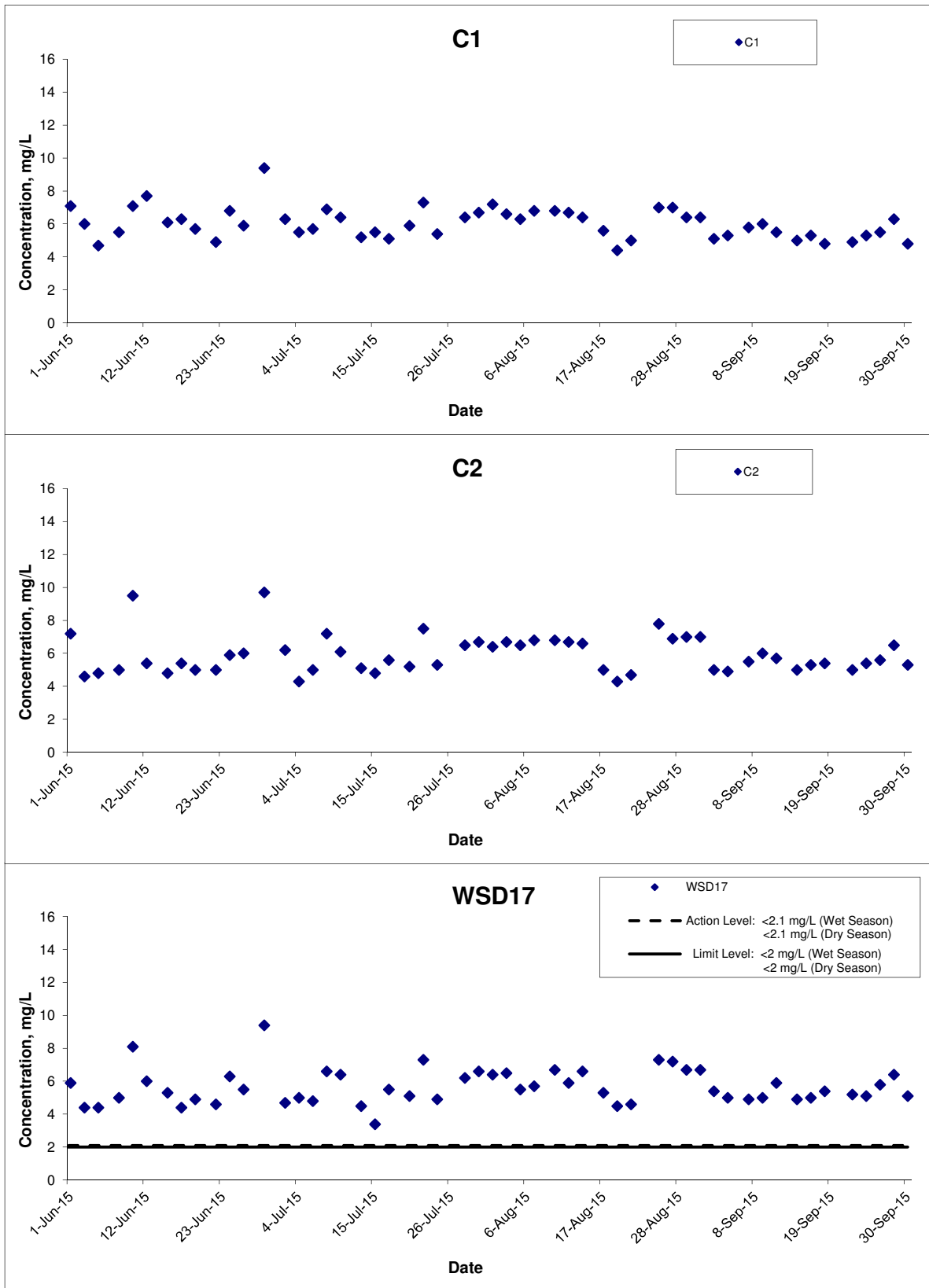
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## Dissolved Oxygen (Surface) at Mid-Flood Tide



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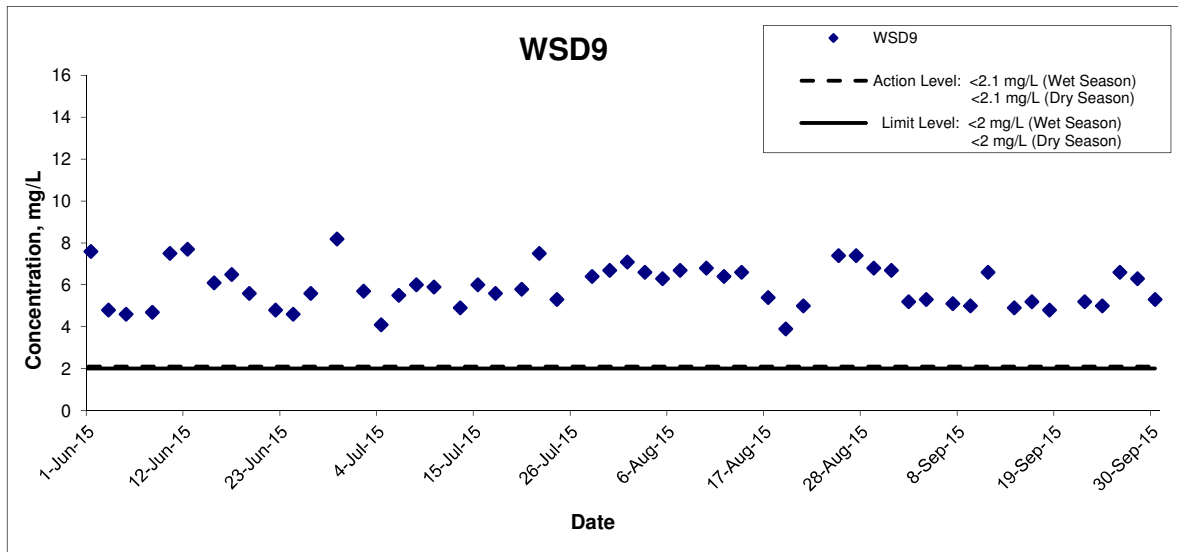
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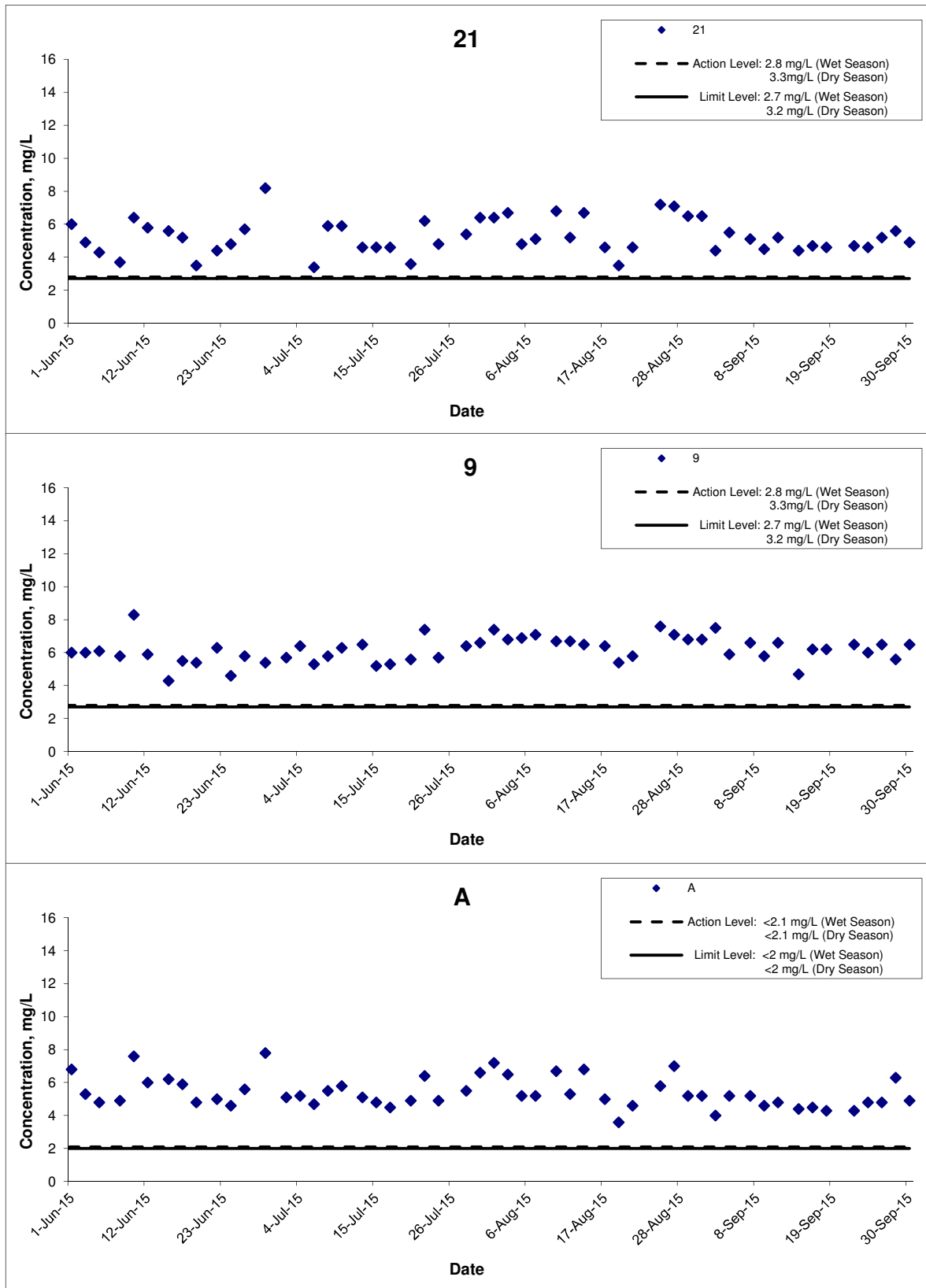


## Dissolved Oxygen (Surface) at Mid-Flood Tide



Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	CINOTECH
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## Dissolved Oxygen (Middle) at Mid-Ebb Tide



**Title**  
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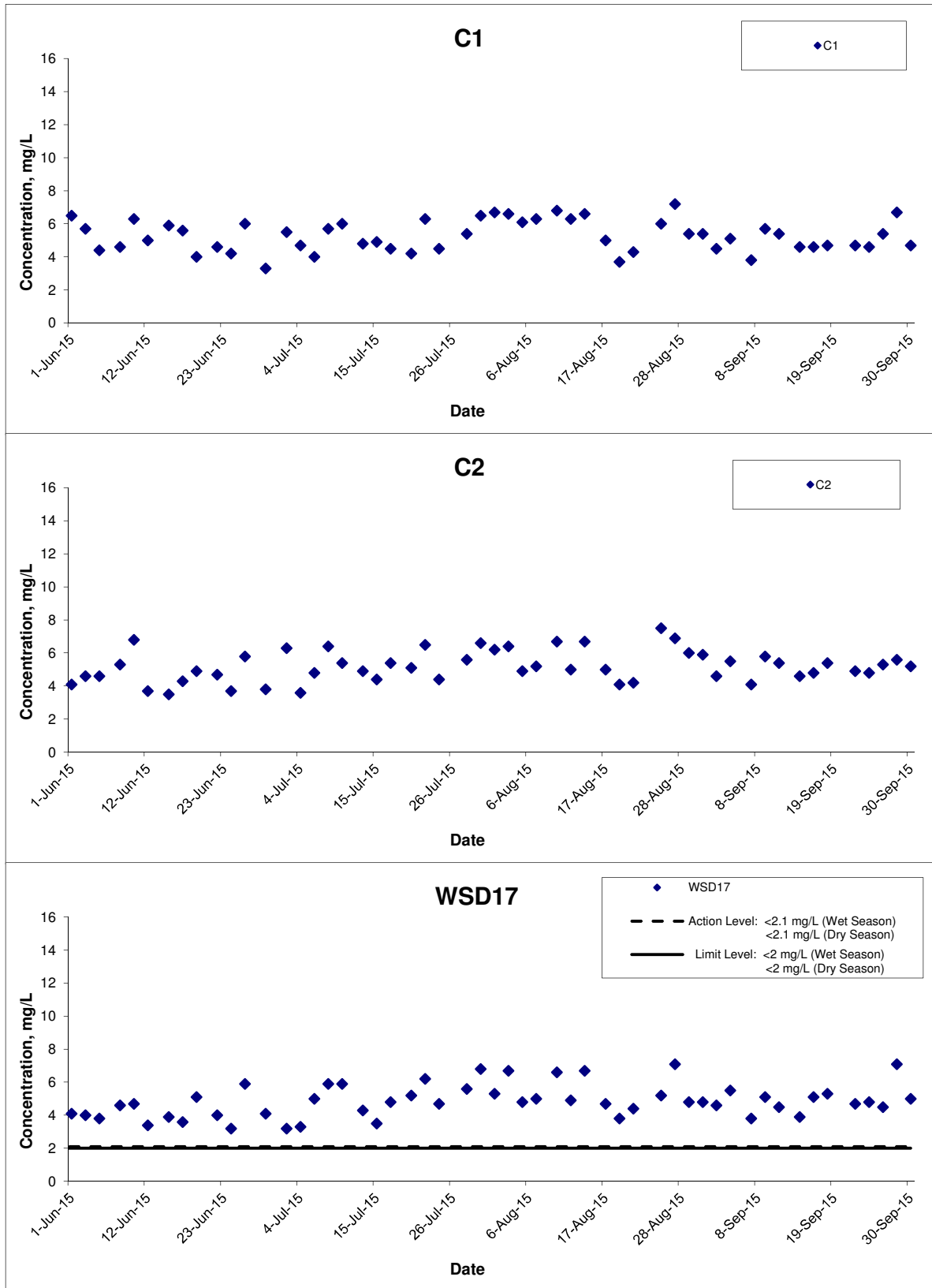
**Date**  
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## Dissolved Oxygen (Middle) at Mid-Ebb Tide



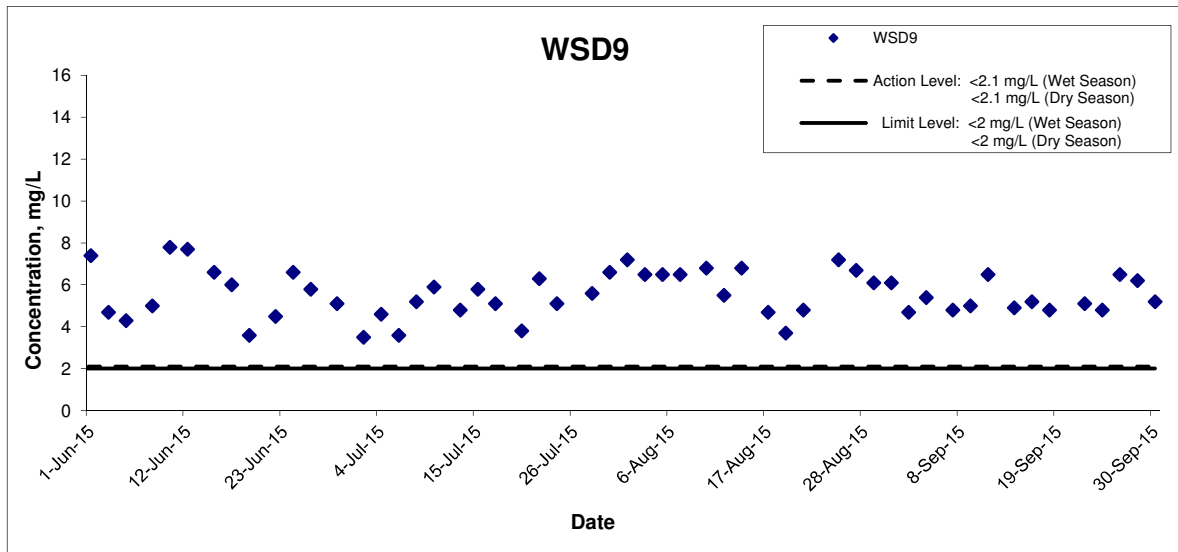
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 Advance Works for NSL Cross Harbour Tunnels  
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 Results

**Scale**  
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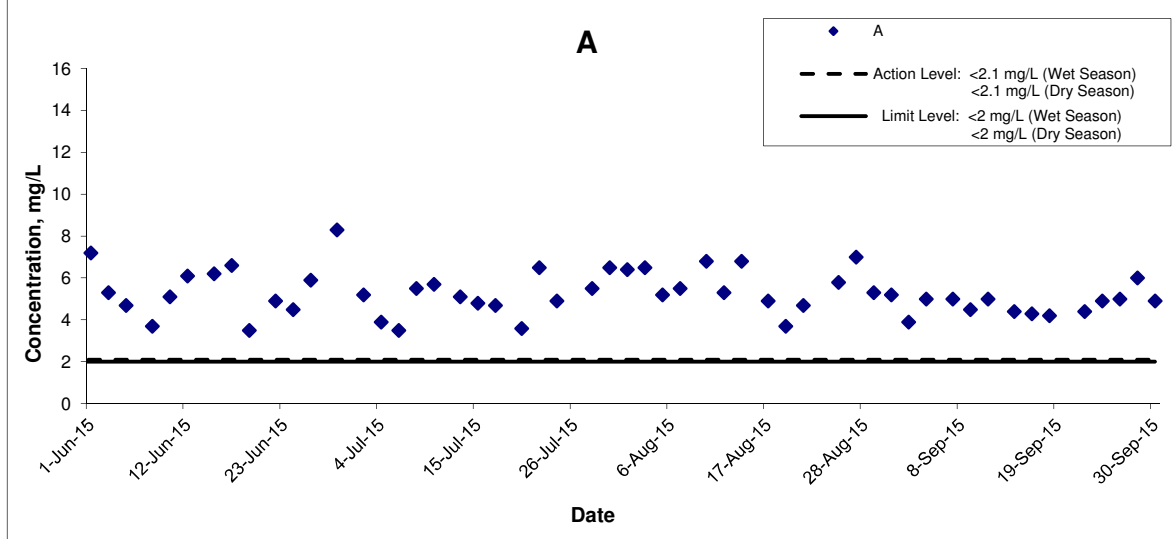
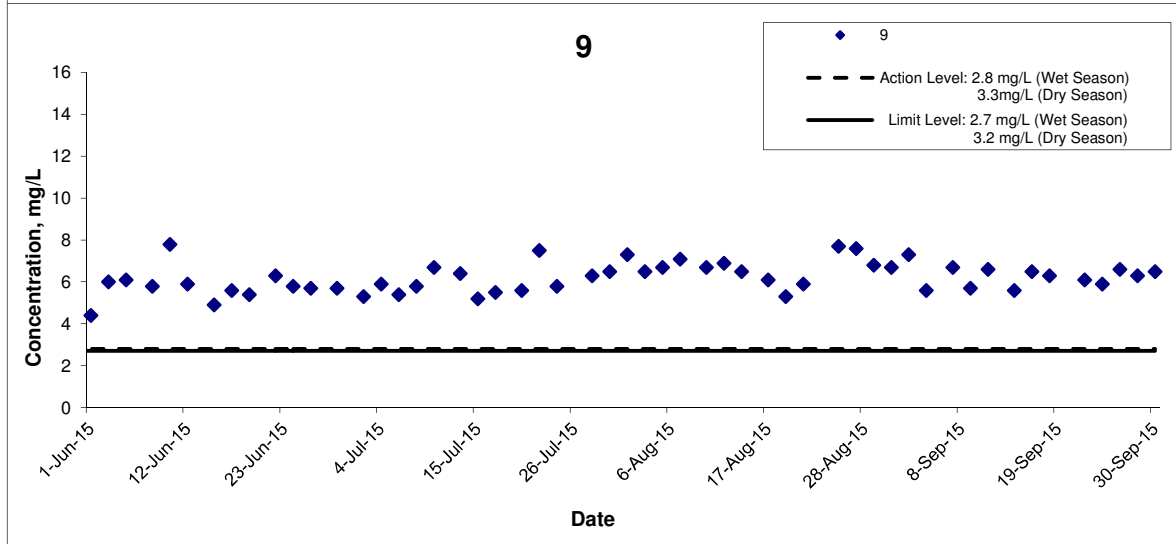
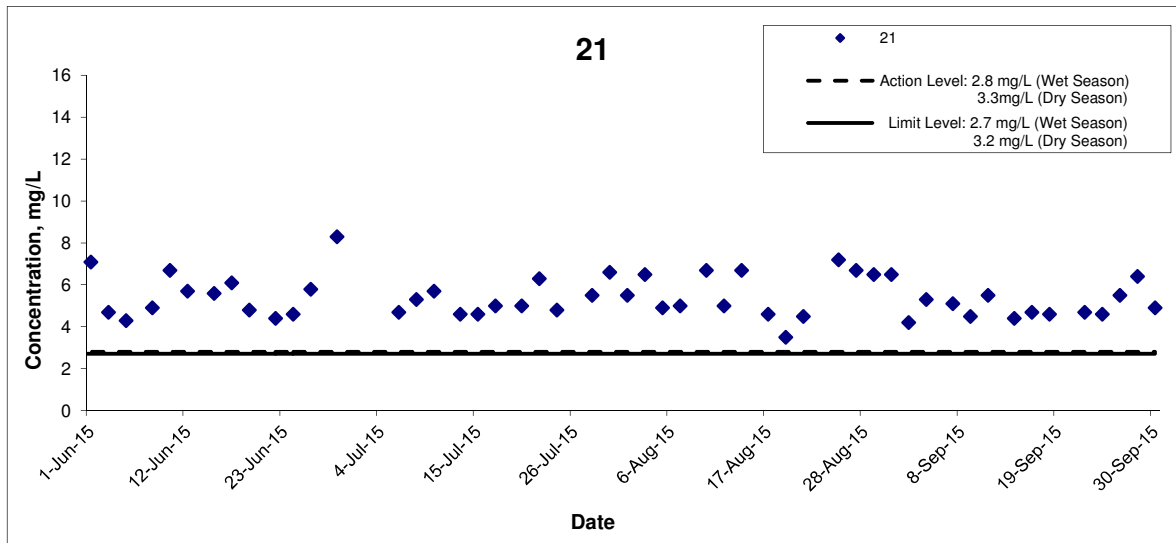


## Dissolved Oxygen (Middle) at Mid-Ebb Tide



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## Dissolved Oxygen (Middle) at Mid-Flood Tide



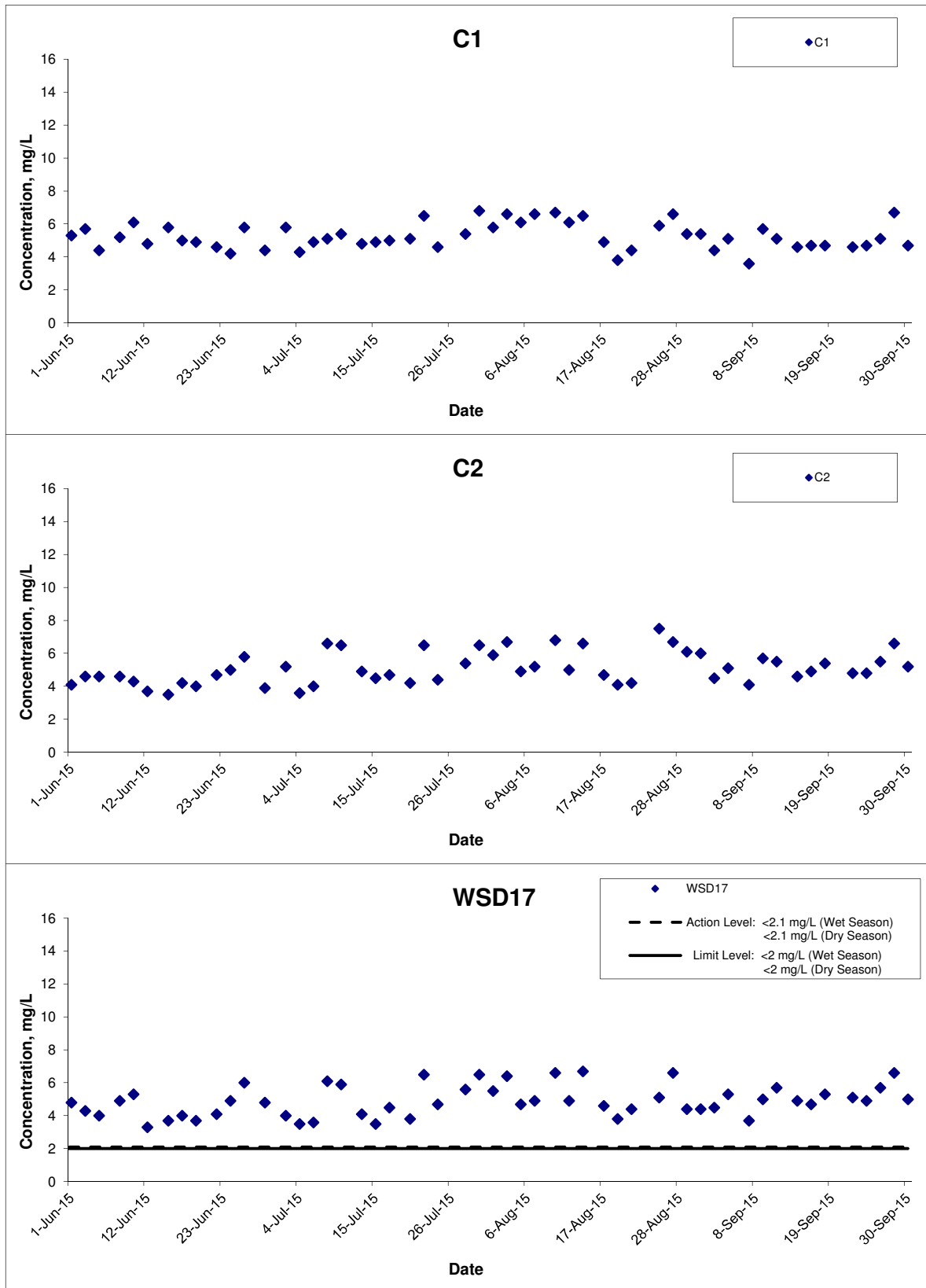
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## Dissolved Oxygen (Middle) at Mid-Flood Tide



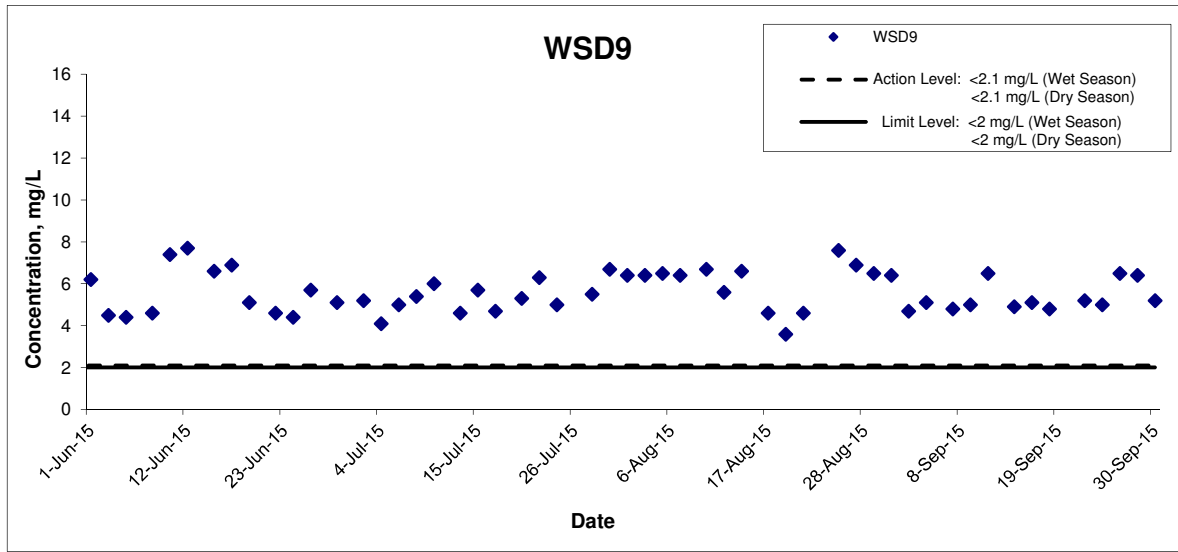
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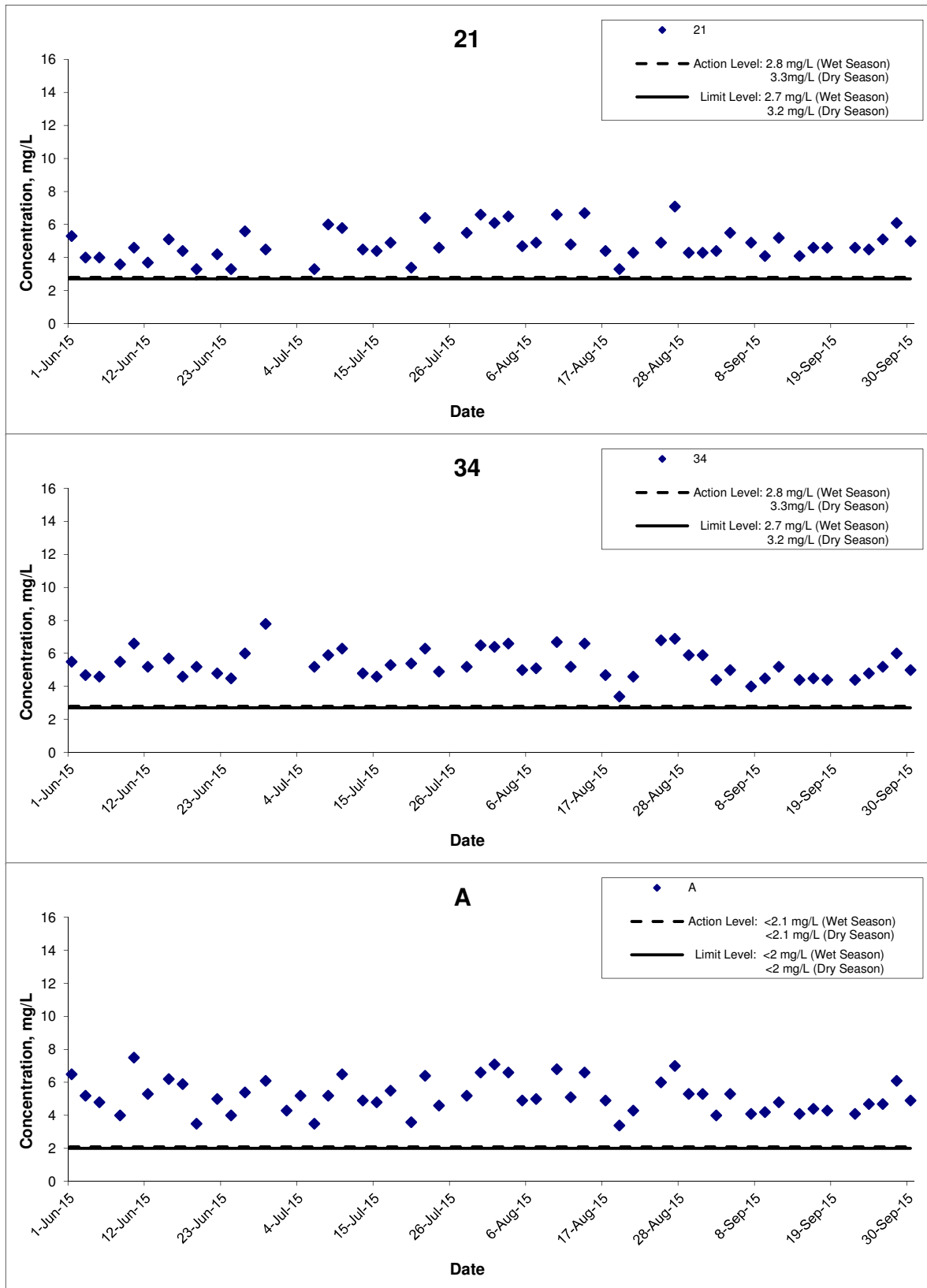
### Dissolved Oxygen (Middle) at Mid-Flood Tide



Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	
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## Dissolved Oxygen (Bottom) at Mid-Ebb Tide



**Title**  
 Shatin to Central Link – Contract 1121  
 Advance Works for NSL Cross Harbour Tunnels  
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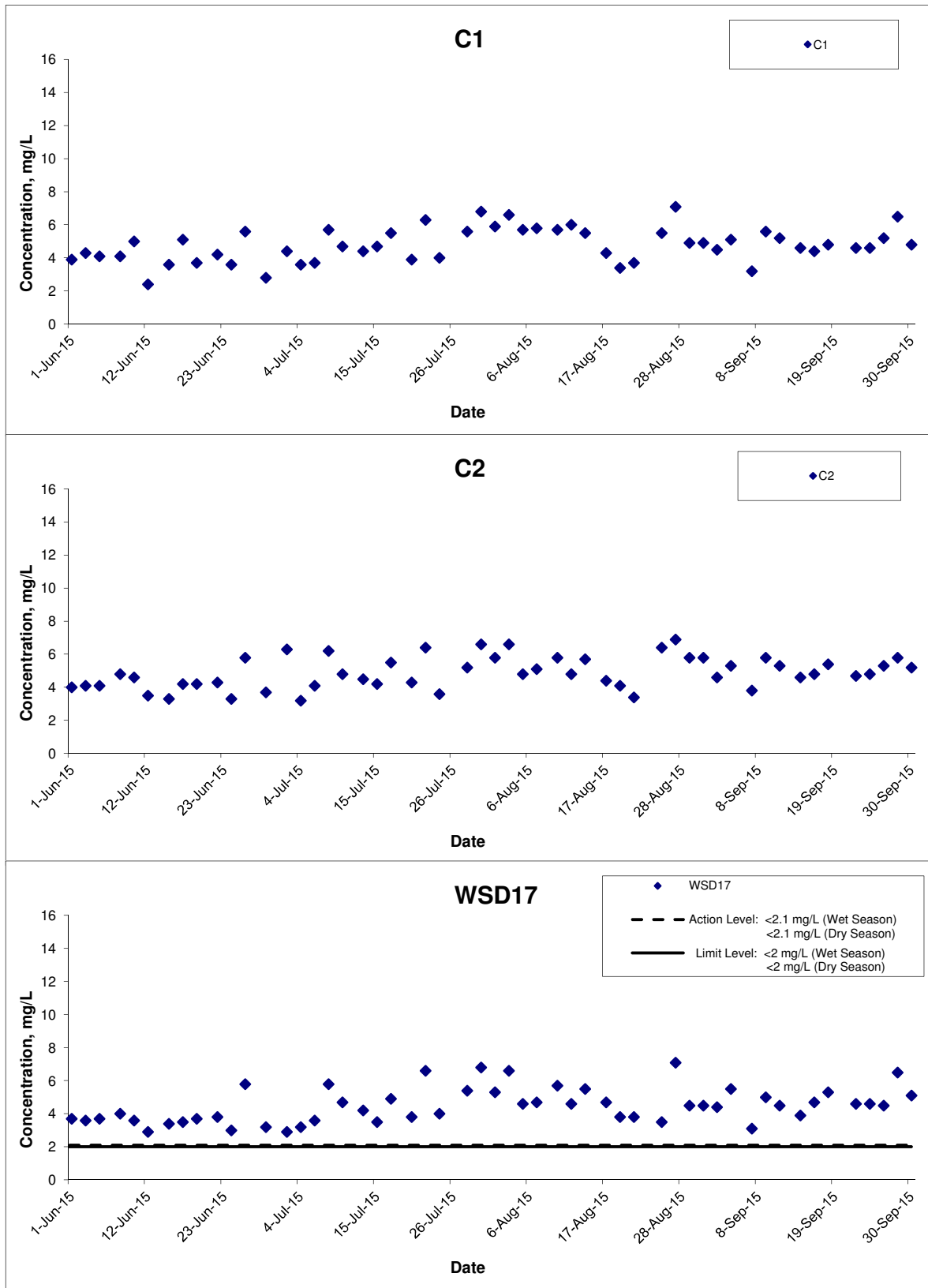
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## Dissolved Oxygen (Bottom) at Mid-Ebb Tide



**Title**  
 Shatin to Central Link – Contract 1121  
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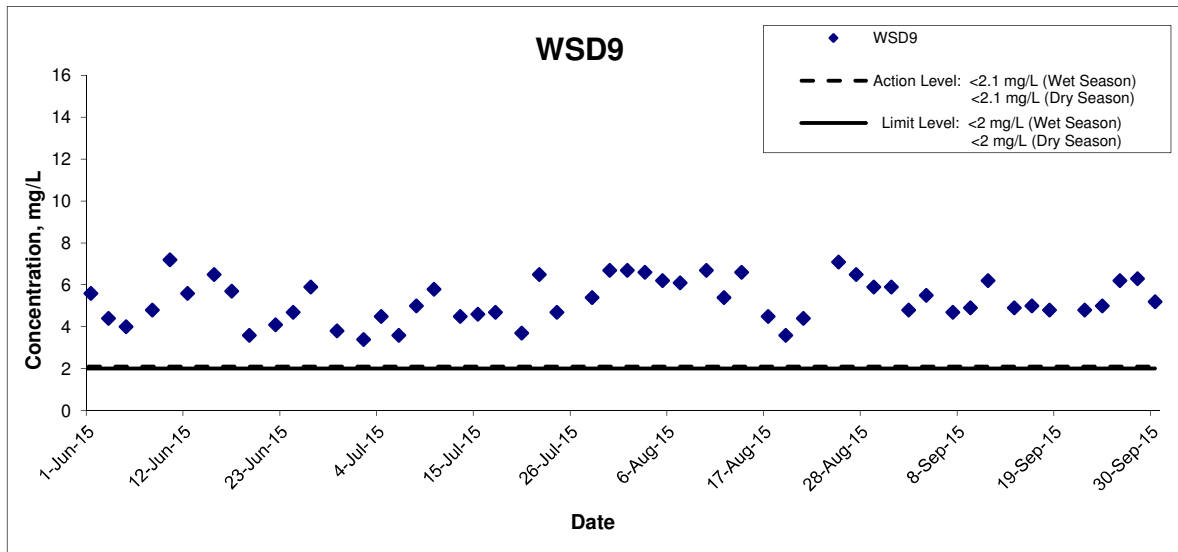
**Date**  
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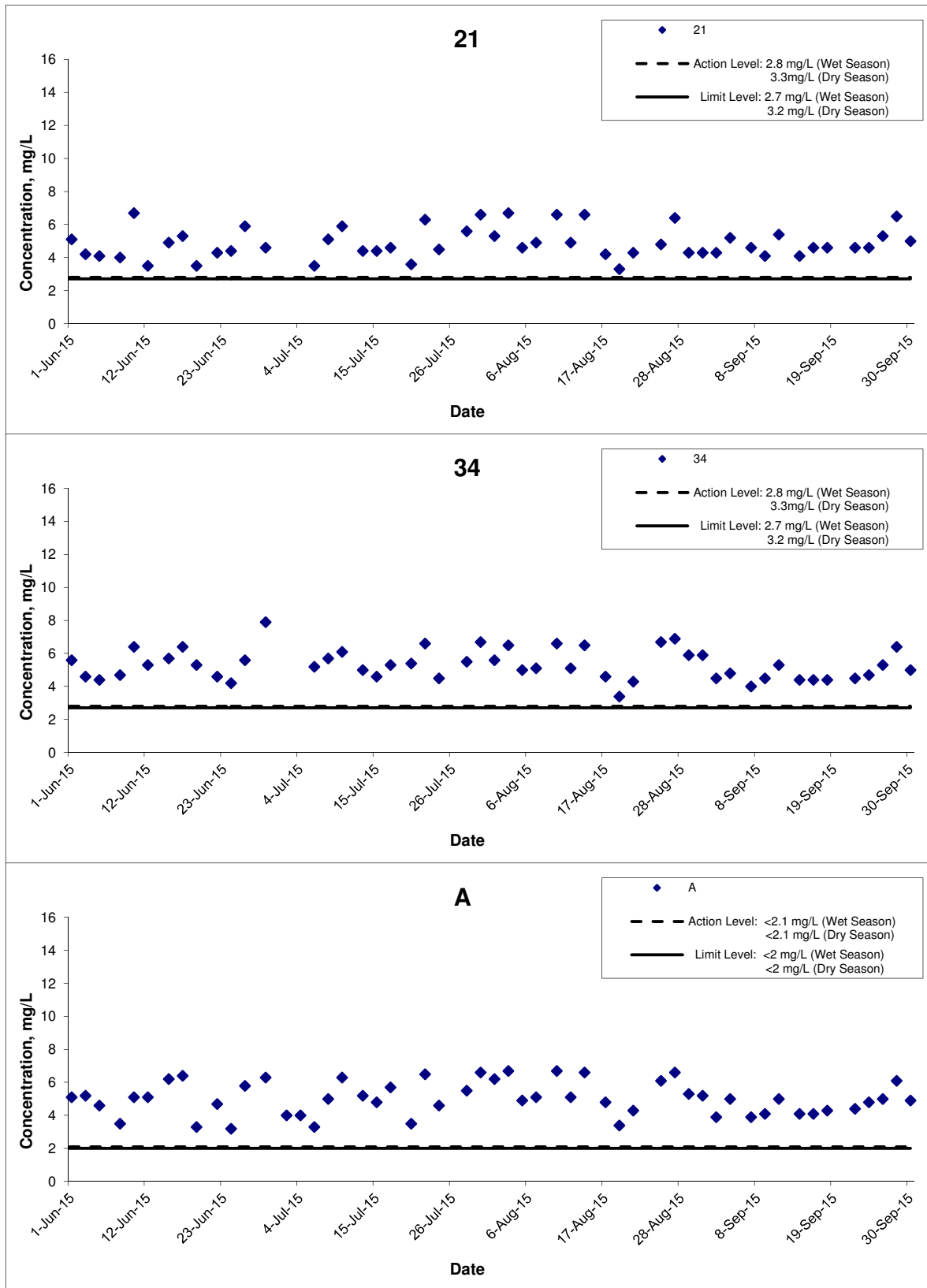


## Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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## Dissolved Oxygen (Bottom) at Mid-Flood Tide



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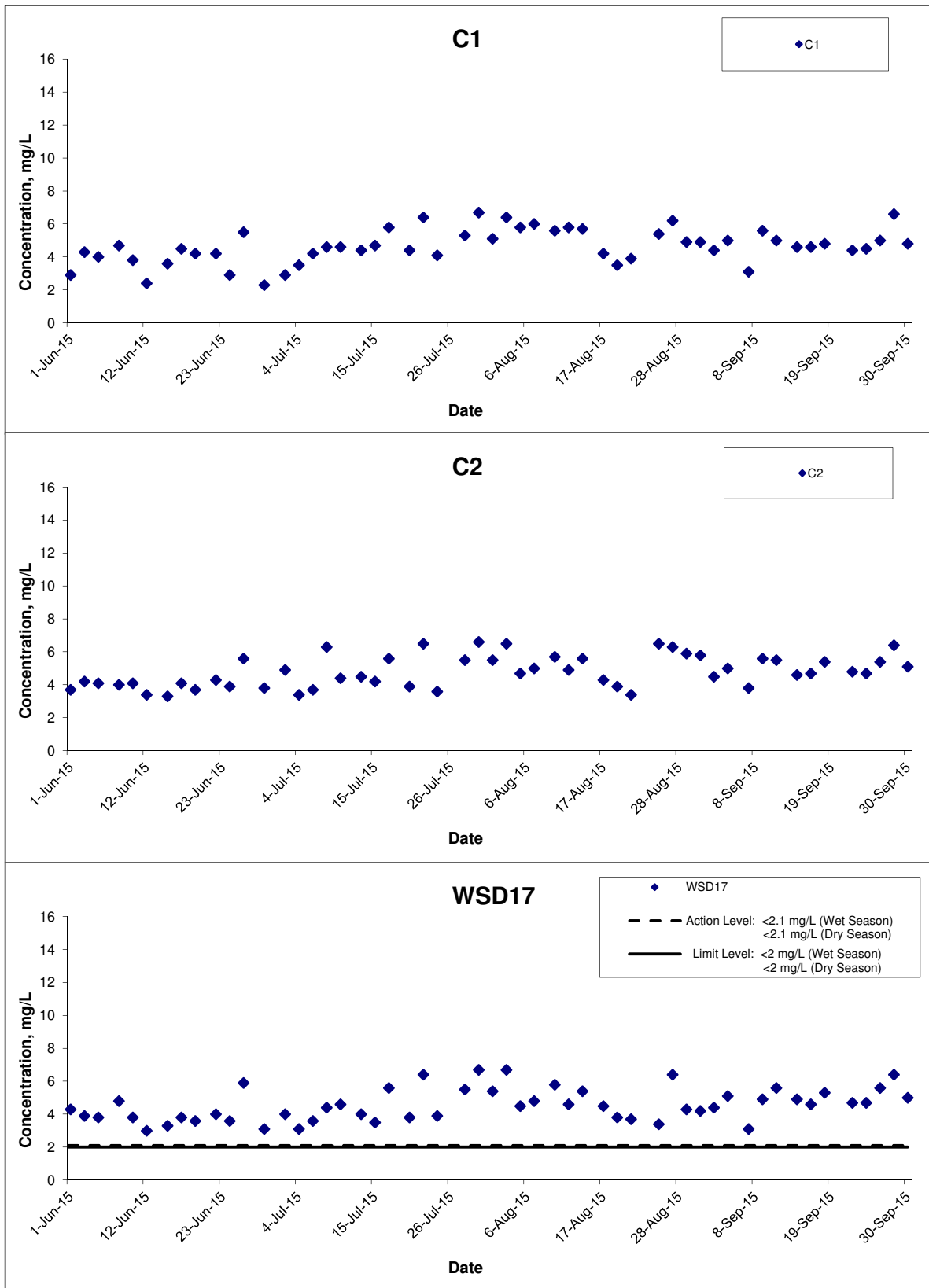
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## Dissolved Oxygen (Bottom) at Mid-Flood Tide



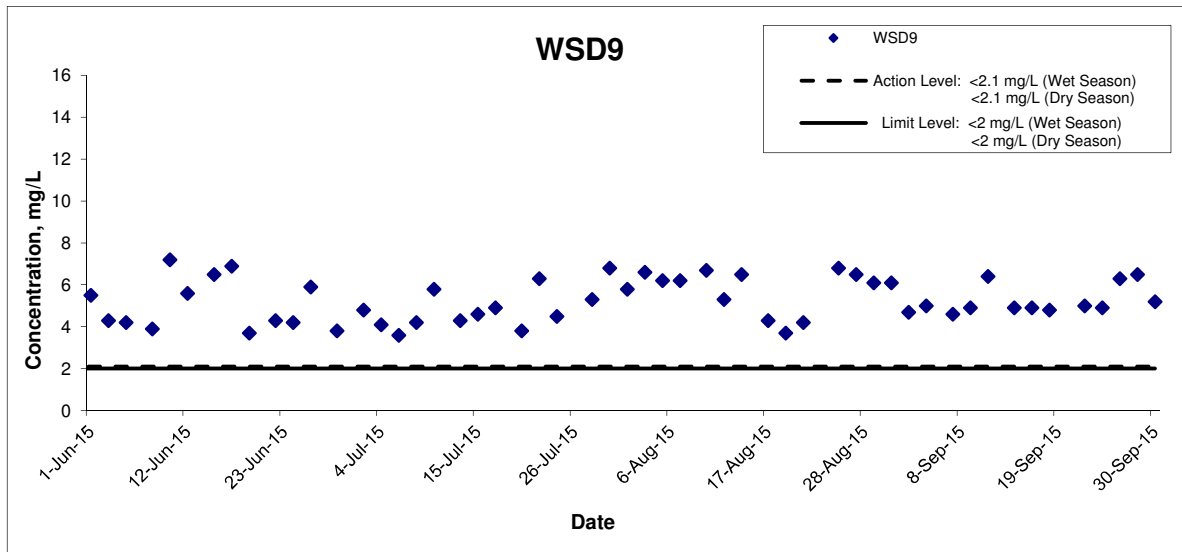
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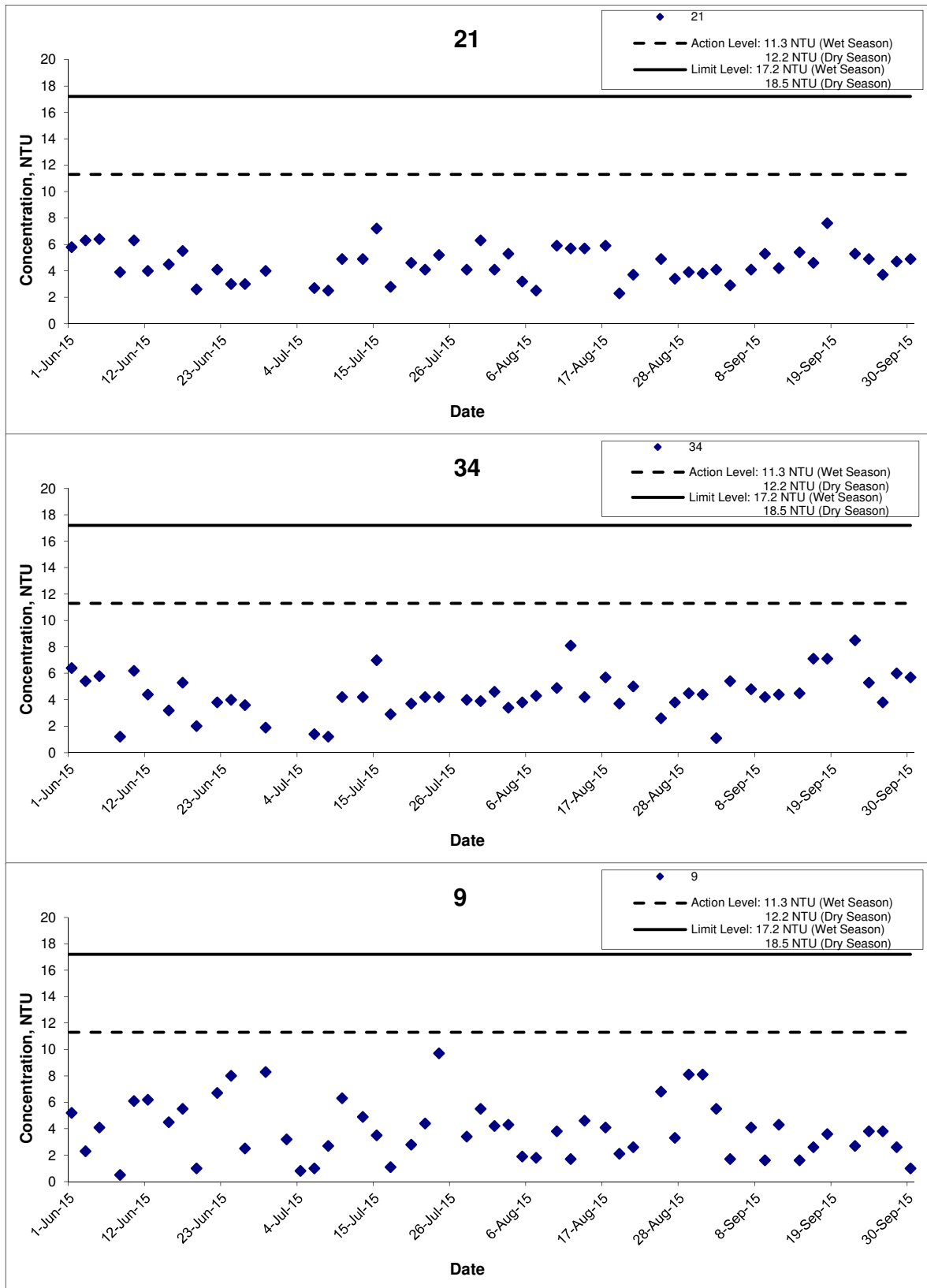


## Dissolved Oxygen (Bottom) at Mid-Flood Tide



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## Turbidity (Depth-averaged) at Mid-Ebb Tide



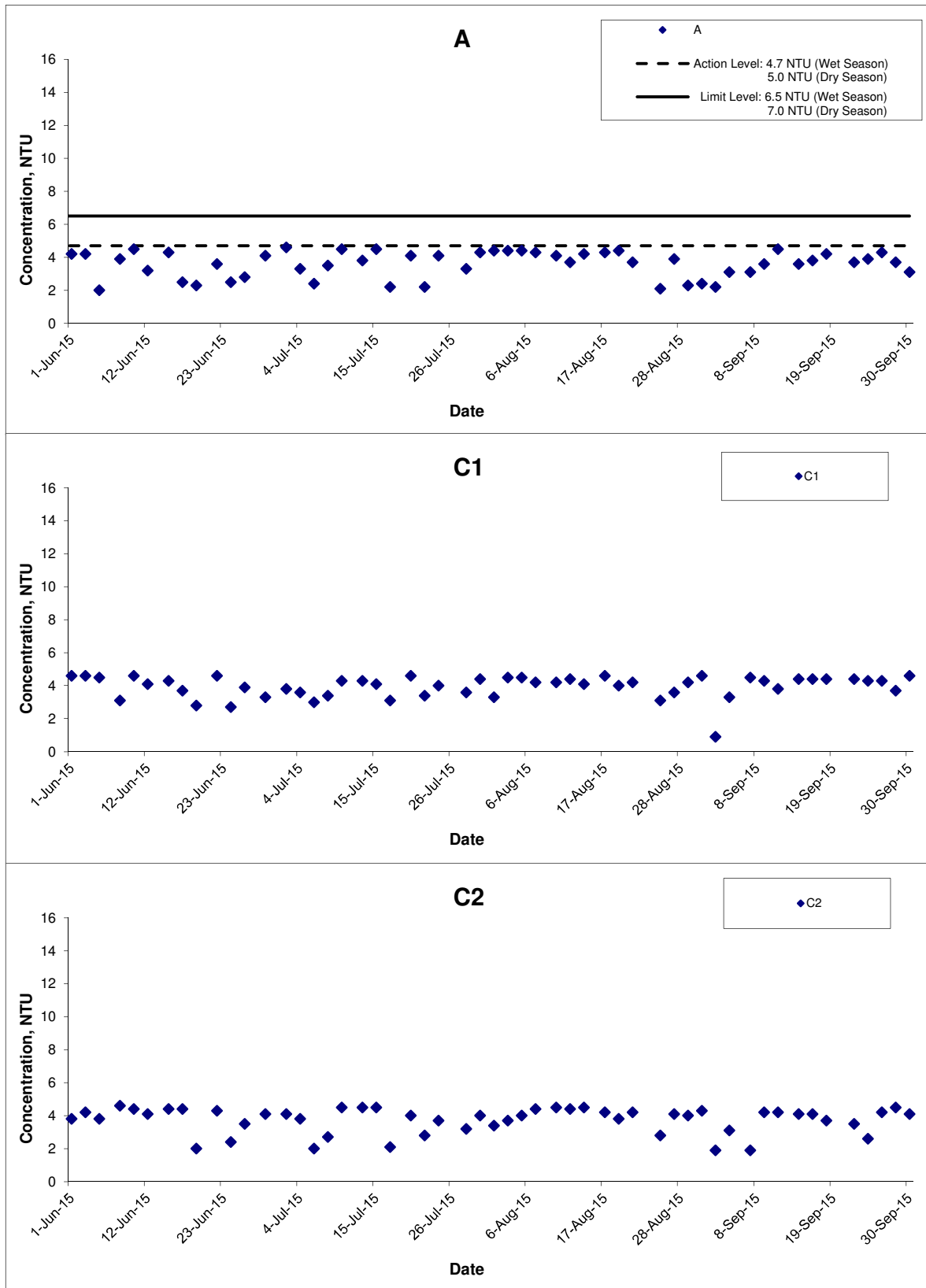
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## Turbidity (Depth-averaged) at Mid-Ebb Tide



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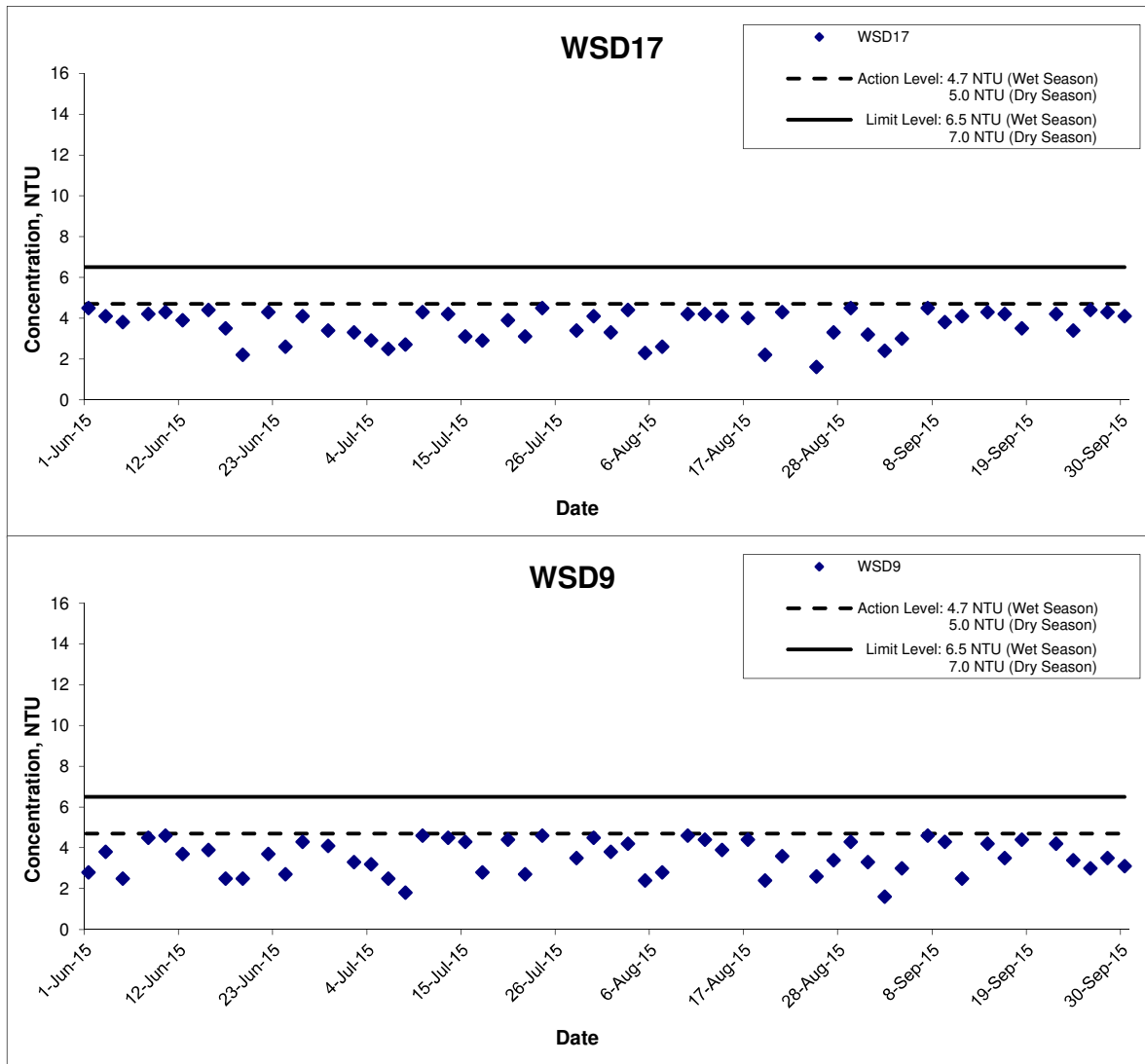
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## Turbidity (Depth-averaged) at Mid-Ebb Tide



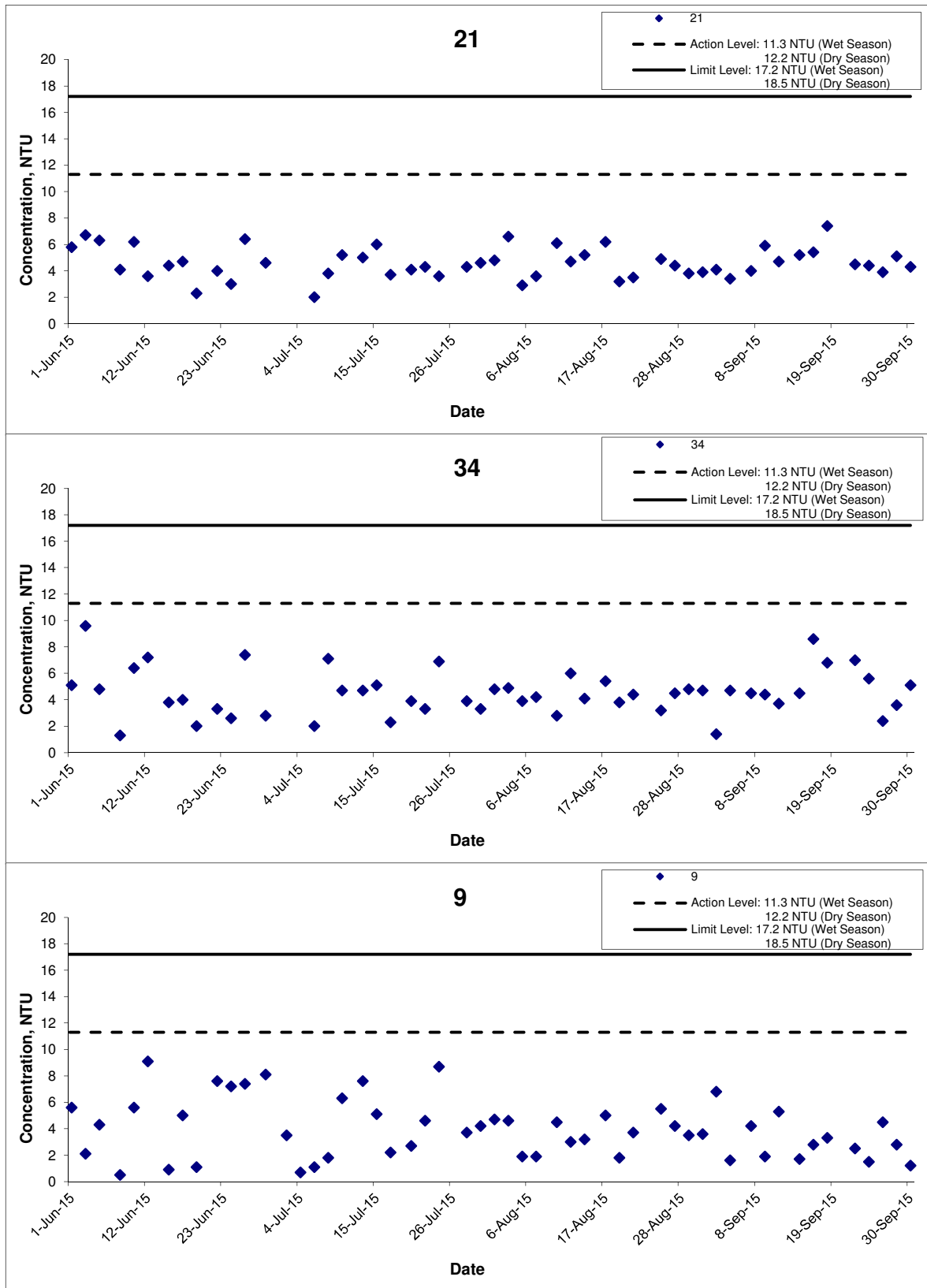
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## Turbidity (Depth-averaged) at Mid-Flood Tide



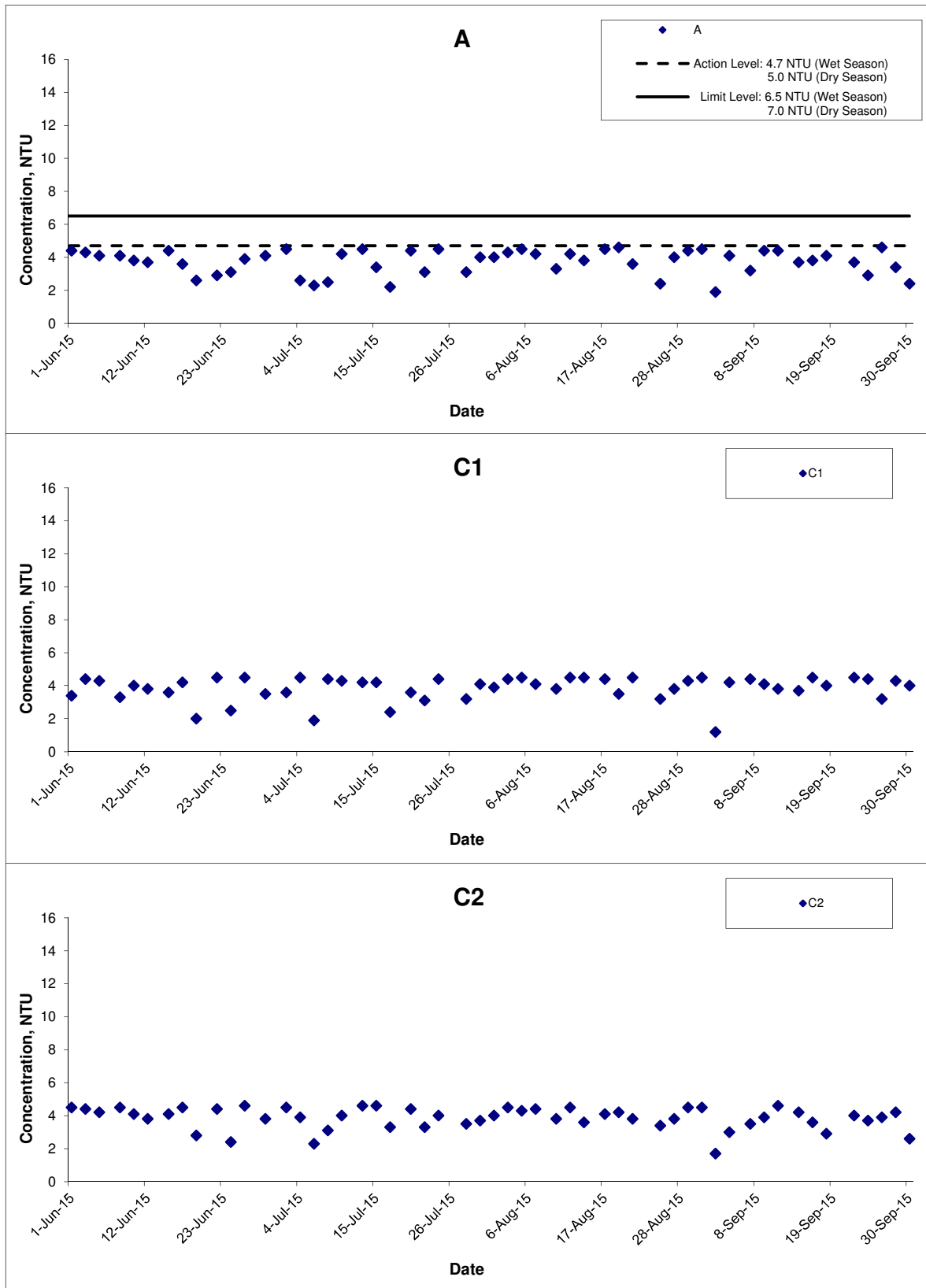
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## Turbidity (Depth-averaged) at Mid-Flood Tide



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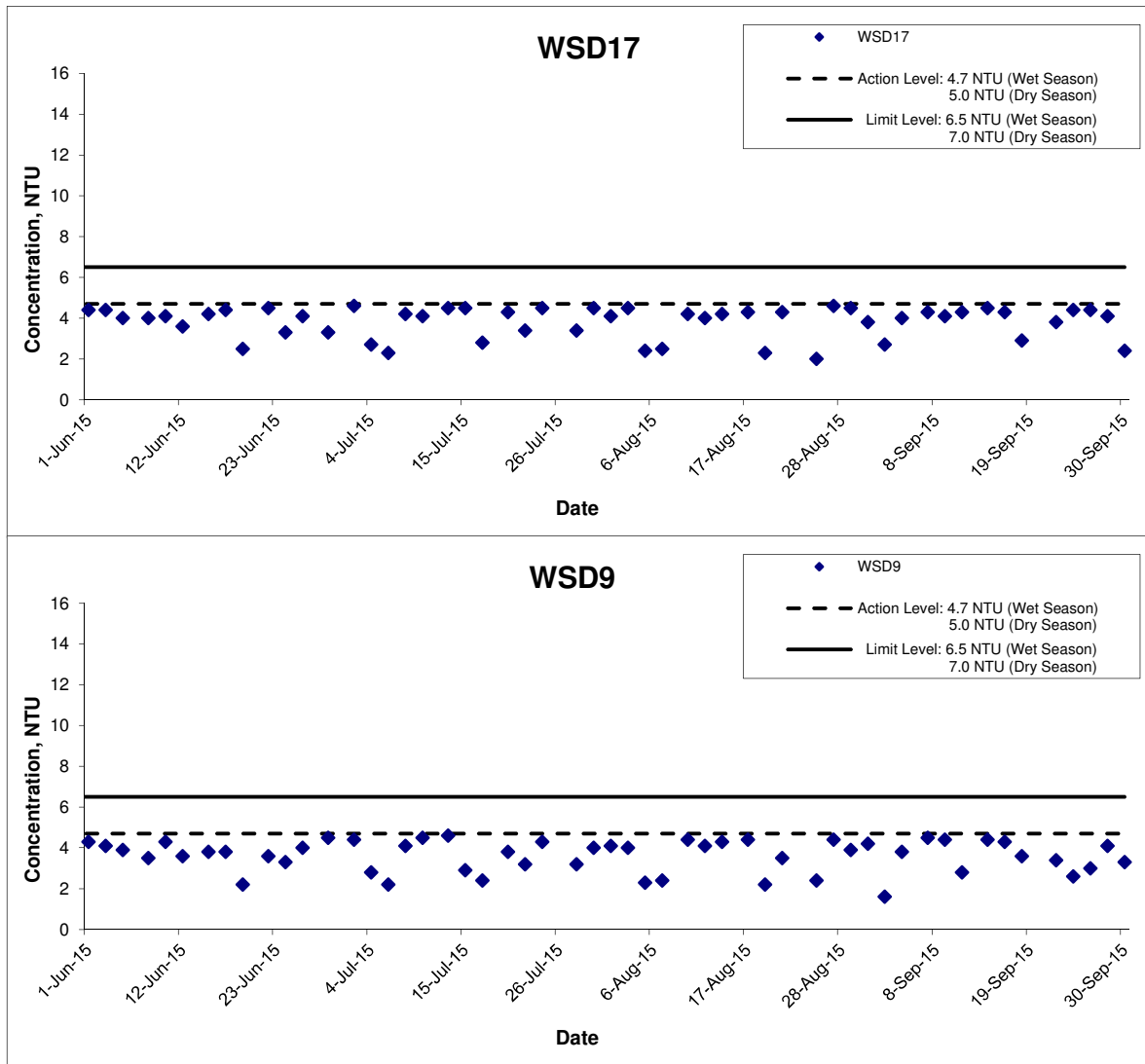
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## Turbidity (Depth-averaged) at Mid-Flood Tide



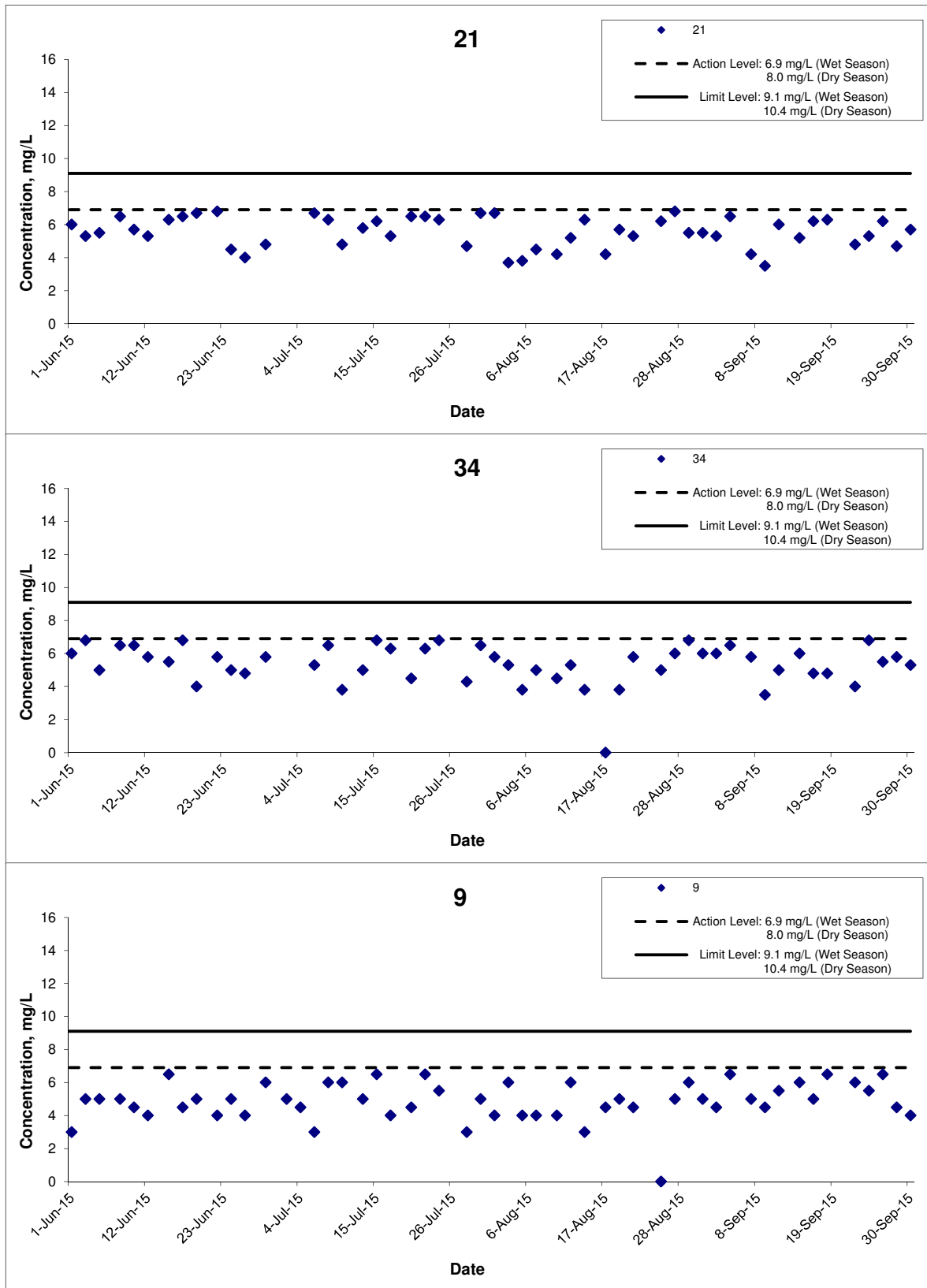
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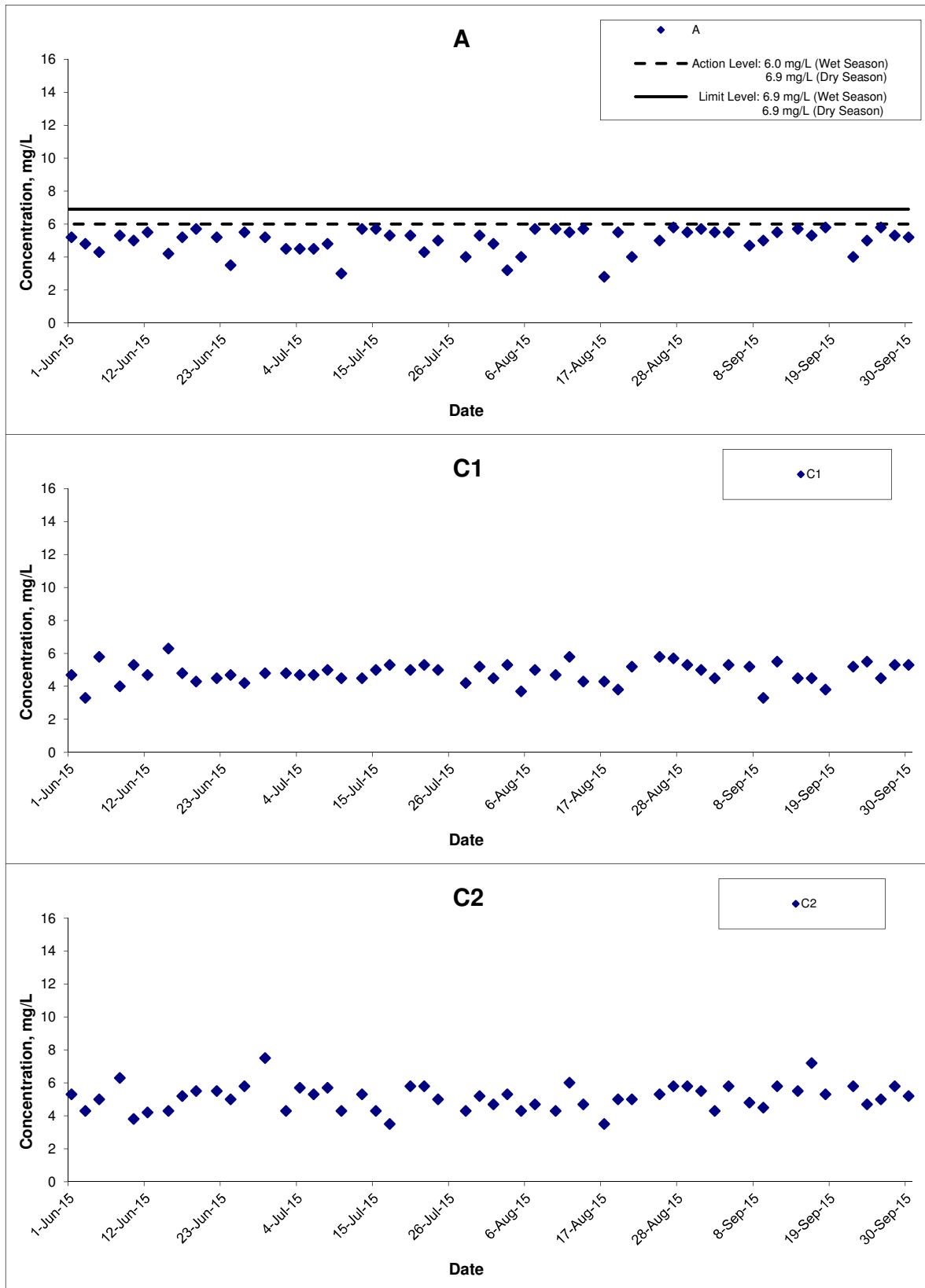
## Suspended Solids (Depth-averaged) at Mid-Ebb Tide



The graphical point at zero concentration is presented as <2.5 mg/L

Title Shatin to Central Link – Contract 1121 Advance Works for NSL Cross Harbour Tunnels Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA14047	CINOTECH
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## Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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Shatin to Central Link – Contract 1121  
Advance Works for NSL Cross Harbour Tunnels  
Graphical Presentation of Water Quality Monitoring  
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Sep 15

Project No.

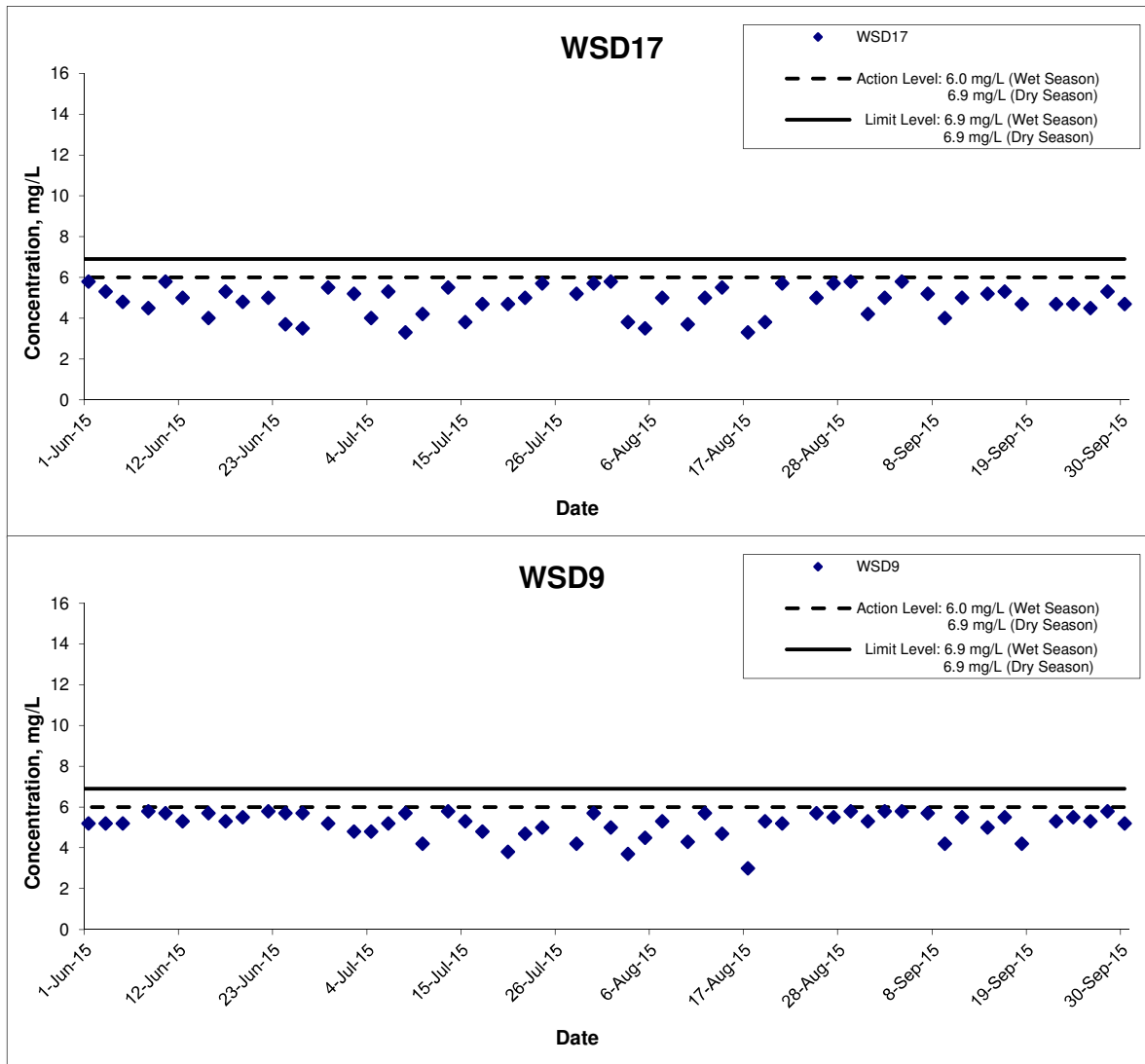
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## Suspended Solids (Depth-averaged) at Mid-Ebb Tide



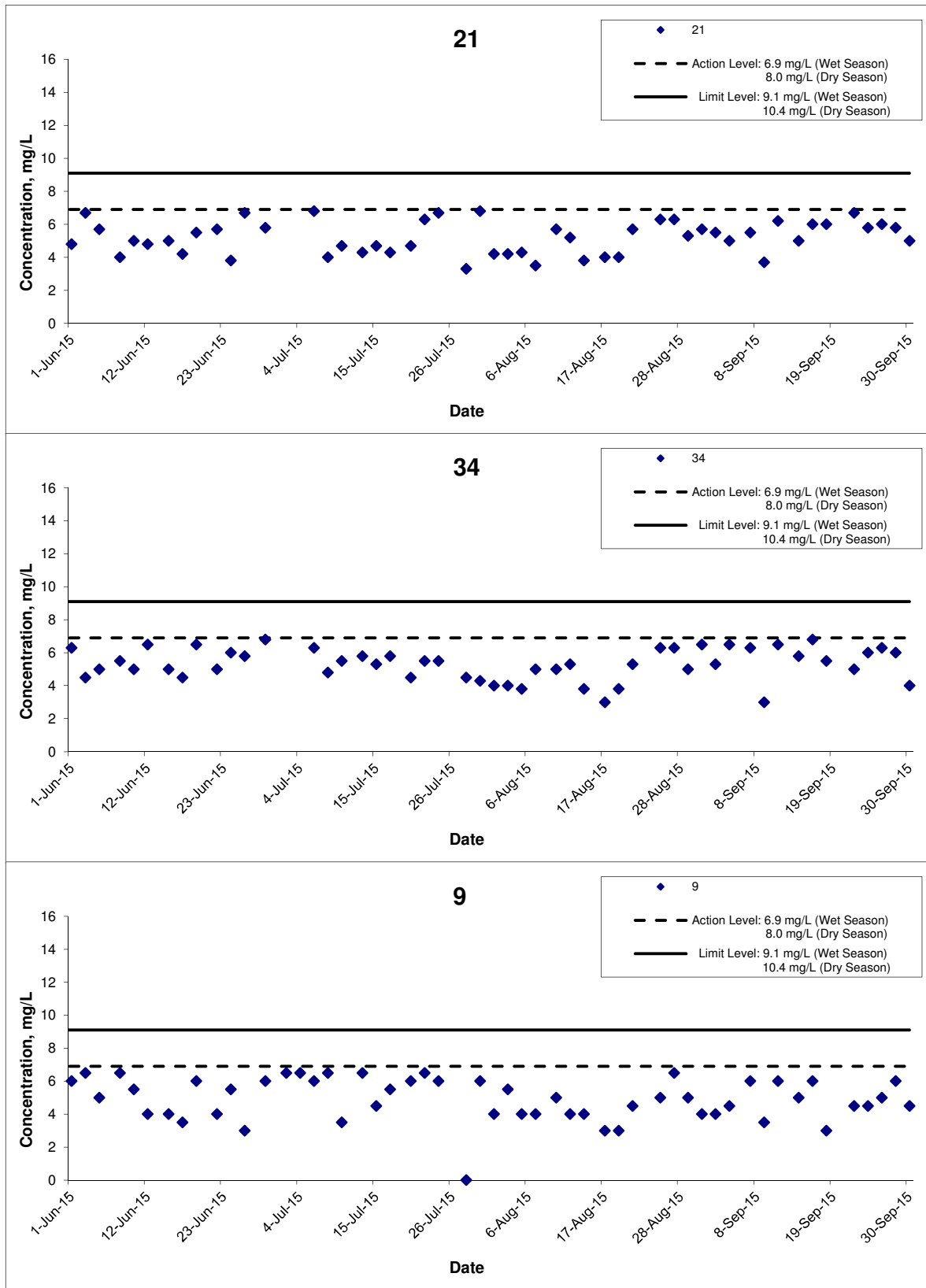
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 Advance Works for NSL Cross Harbour Tunnels  
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## Suspended Solids (Depth-averaged) at Mid-Flood Tide

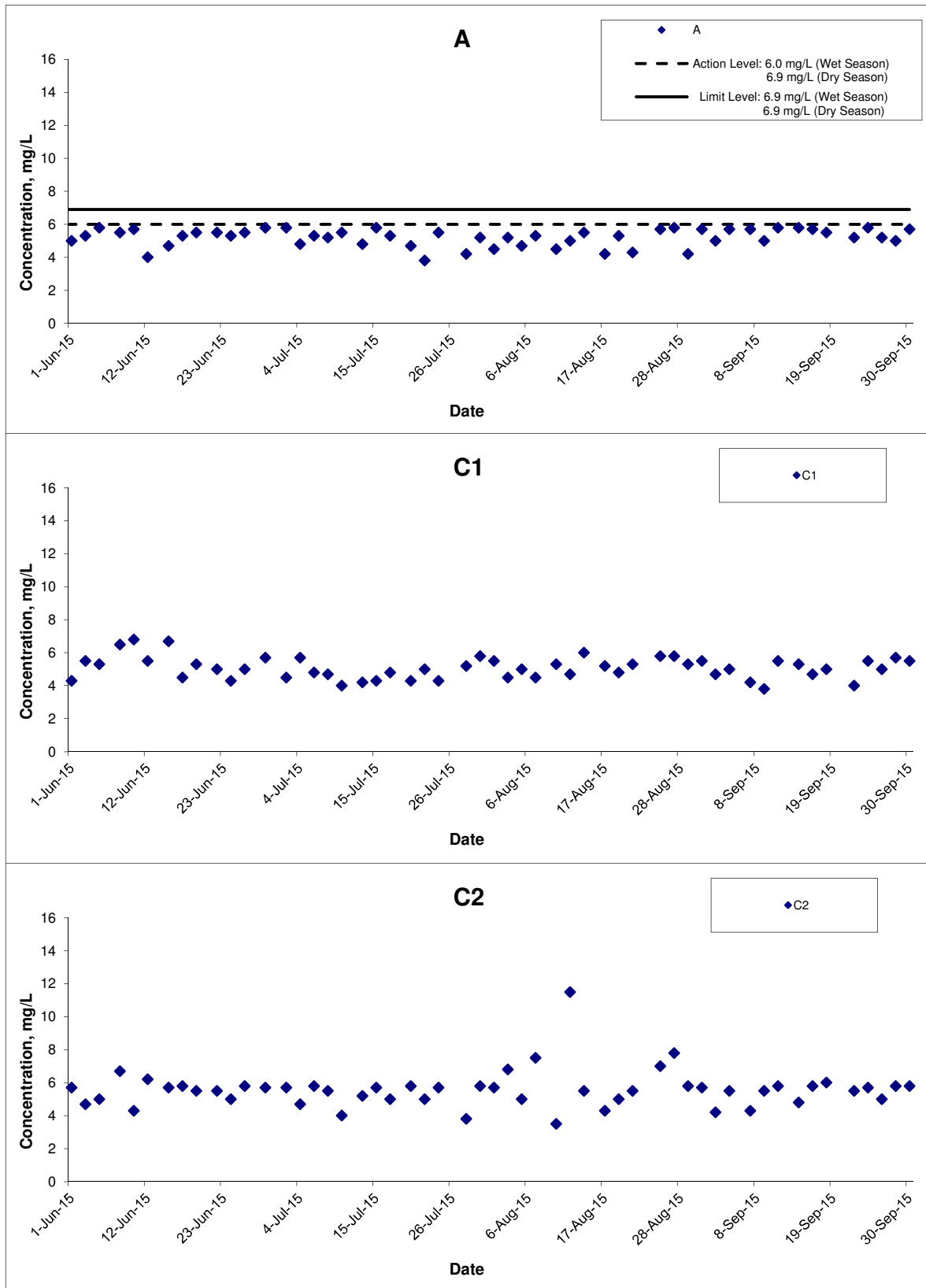


The graphical point at zero concentration is presented as <2.5 mg/L

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## Suspended Solids (Depth-averaged) at Mid-Flood Tide



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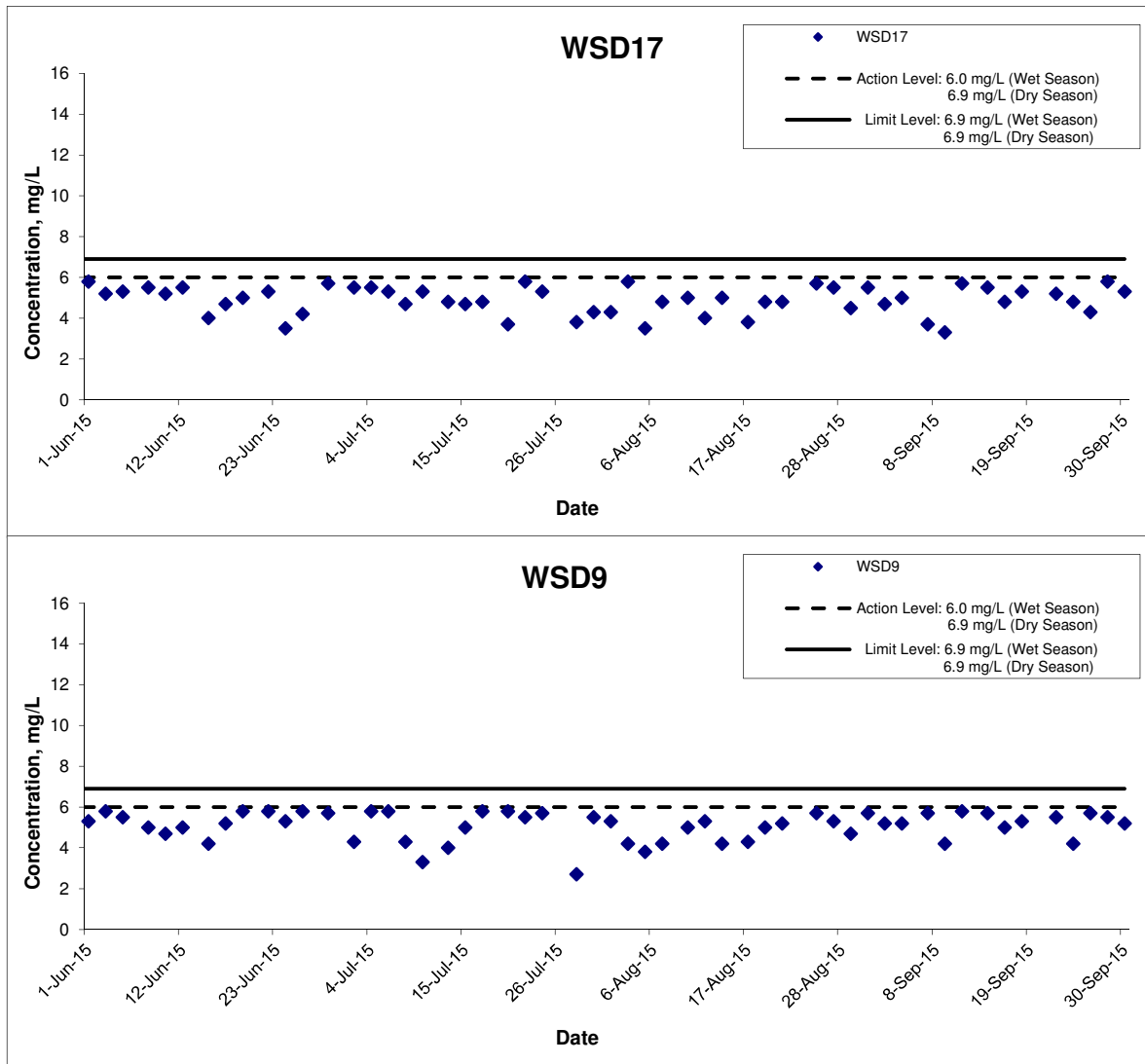
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## Suspended Solids (Depth-averaged) at Mid-Flood Tide



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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/150721-1
Date of Issue:	2015-07-21
Date Received:	2015-07-21
Date Tested:	2015-07-21
Date Completed:	2015-07-21
Next Due Date:	2015-10-20

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

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### Certificate of Calibration

**Item for calibration:**

Description : Multiparameter Water Quality Probe  
Manufacturer : Aquaread Ltd  
Model No. : AP-2000-D  
Serial No. : 135240520  
Equipment No. : W.18.04

**Test conditions:**

Room Temperature : 23 degree Celsius  
Relative Humidity : 64 %

**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: 13504  
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/150721-1
Date of Issue:	2015-07-21
Date Received:	2015-07-21
Date Tested:	2015-07-21
Date Completed:	2015-07-21
Next Due Date:	2015-10-20

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### Results:

#### 1. Conductivity performance check

Specific Conductivity, $\mu\text{S/cm}$		Correction, $\mu\text{S/cm}$	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 O <sub>2</sub> /L		Correction, mg O <sub>2</sub> /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\*\*\*\*\*

## TEST REPORT

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

Test Report No.:	C/W/150721-2
Date of Issue:	2015-07-21
Date Received:	2015-07-21
Date Tested:	2015-07-21
Date Completed:	2015-07-21
Next Due Date:	2015-10-20

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

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### Certificate of Calibration

**Item for calibration:**

Description	: Multiparameter Water Quality Probe
Manufacturer	: Aquaread Ltd
Model No.	: AP-2000-D
Serial No.	: 128041320
Equipment No.	: W.18.09

**Test conditions:**

Room Temperature	: 23 degree Celsius
Relative Humidity	: 64 %

**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  
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/150721-2
Date of Issue:	2015-07-21
Date Received:	2015-07-21
Date Tested:	2015-07-21
Date Completed:	2015-07-21
Next Due Date:	2015-10-20
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**Results:**

1. Conductivity performance check

Specific Conductivity, $\mu\text{S/cm}$		Correction, $\mu\text{S/cm}$	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 O <sub>2</sub> /L		Correction, mg O <sub>2</sub> /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\*\*\*\*\*

## TEST REPORT

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

Test Report No.:	C/W/150721-3
Date of Issue:	2015-07-21
Date Received:	2015-07-21
Date Tested:	2015-07-21
Date Completed:	2015-07-21
Next Due Date:	2015-10-20

**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. : 135240420  
Equipment No. : W.18.10

**Test conditions:**

Room Temperature : 23 degree Celsius  
Relative Humidity : 64 %

**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: 13364  
1. Calibration check with Formazin standard solution  
pH / ORP electrode, Batch: 13504  
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/150721-3
Date of Issue:	2015-07-21
Date Received:	2015-07-21
Date Tested:	2015-07-21
Date Completed:	2015-07-21
Next Due Date:	2015-10-20
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 O <sub>2</sub> /L		Correction, mg O <sub>2</sub> /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.:	23145
Date of Issue:	2015/09/04
Date Received:	2015/09/02
Date Tested:	2015/09/02
Date Completed:	2015/09/04

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/02

Number of Sample: 84

Custody No.: MA14047/150831

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	9	9	1	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.:	23157
Date of Issue:	2015/09/07
Date Received:	2015/09/04
Date Tested:	2015/09/04
Date Completed:	2015/09/07

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/04

Number of Sample: 84

Custody No.: MA14047/150904

\*\*\*\*\*

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	2	107

\*\*\*\*\*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.:	23176
Date of Issue:	2015/09/08
Date Received:	2015/09/07
Date Tested:	2015/09/07
Date Completed:	2015/09/08

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/07

Number of Sample: 84

Custody No.: MA14047/150907

\*\*\*\*\*

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	11	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.:	23206
Date of Issue:	2015/09/10
Date Received:	2015/09/09
Date Tested:	2015/09/09
Date Completed:	2015/09/10

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/09

Number of Sample: 84

Custody No.: MA14047/150909

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	7	1	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.:	23242
Date of Issue:	2015/09/14
Date Received:	2015/09/11
Date Tested:	2015/09/11
Date Completed:	2015/09/14

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/11

Number of Sample: 84


Custody No.: MA14047/150911

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	97

\*\*\*\*\*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.:	23256
Date of Issue:	2015/09/15
Date Received:	2015/09/14
Date Tested:	2015/09/14
Date Completed:	2015/09/15

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/14

Number of Sample: 84

Custody No.: MA14047/150914

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	4	4	2	105

\*\*\*\*\*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.:	23263
Date of Issue:	2015/09/17
Date Received:	2015/09/16
Date Tested:	2015/09/16
Date Completed:	2015/09/17

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels  
Sampling Date: 2015/09/16  
Number of Sample: 84  
Custody No.: MA14047/150916

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	9	9	5	96

\*\*\*\*\*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.:	23270
Date of Issue:	2015/09/21
Date Received:	2015/09/18
Date Tested:	2015/09/18
Date Completed:	2015/09/21

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/18

Number of Sample: 84

Custody No.: MA14047/150918

\*\*\*\*\*

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
21mf	6	7	2	103

\*\*\*\*\*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.:	23334
Date of Issue:	2015/09/23
Date Received:	2015/09/22
Date Tested:	2015/09/22
Date Completed:	2015/09/23
Page:	1 of 1

**ATTN: Ms. Mei Ling Tang**

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels  
Sampling Date: 2015/09/22  
Number of Sample: 84  
Custody No.: MA14047/150922

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
21mf	10	10	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.:	23355
Date of Issue:	2015/09/25
Date Received:	2015/09/24
Date Tested:	2015/09/24
Date Completed:	2015/09/25

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/24

Number of Sample: 84

Custody No.: MA14047/150924

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	6	6	2	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.:	23374
Date of Issue:	2015/09/29
Date Received:	2015/09/26
Date Tested:	2015/09/26
Date Completed:	2015/09/29

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/26

Number of Sample: 84

Custody No.: MA14047/150926

\*\*\*\*\*

Total Suspended Solids Sampling Point	Duplicate Analysis			QC Recovery, %
	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
21bf	8	8	3	105

\*\*\*\*\*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.:	23380
Date of Issue:	2015/09/29
Date Received:	2015/09/28
Date Tested:	2015/09/28
Date Completed:	2015/09/29

Page: 1 of 1

**ATTN: Ms. Mei Ling Tang**

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels

Sampling Date: 2015/09/28

Number of Sample: 84

Custody No.: MA14047/150928

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
WSD9se	7	6	4	100

\*\*\*\*\*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.:	23394
Date of Issue:	2015/10/02
Date Received:	2015/09/30
Date Tested:	2015/09/30
Date Completed:	2015/10/02

**ATTN: Ms. Mei Ling Tang**

Page: 1 of 1

Project Name: Shatin to Central Link - Contract No.1121  
- NSL Cross Harbour Tunnels  
Sampling Date: 2015/09/30  
Number of Sample: 84  
Custody No.: MA14047/150930

\*\*\*\*\*

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
21be	7	7	3	100

\*\*\*\*\*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: September 2015**

- a) Exceedance Report for Dust Monitoring (NIL)**
- b) 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 1121 NSL Cross Harbour Tunnels**

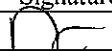

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	150907
Date	7 September 2015 (Monday)
Time	14:00 – 16:45

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

Ref. No.	Remarks/Observations	Related Item No.
150907-R02	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>To remove the floating rubbish near the water intakes at Hung Hom.</li> </ul>	B 31
150907-R03	<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 – 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 E – Air Quality</b></p> <ul style="list-style-type: none"> <li>Provide proper top and 3 sides enclosure for cement grouting machine in Hung Hom NOV area.</li> </ul> <p><b>Part F - Construction Noise Impact</b></p> <ul style="list-style-type: none"> <li>No environmental deficiency was identified during the site inspection.</li> </ul>	E 16
150907-R01	<p><b>Part G – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>To provide drip tray for chemical containers on paved area at the Shek O Casting Basin.</li> </ul> <p><b>Part H – 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 I - Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on previous audit section (Ref. No.:150831), all the environmental deficiencies were observed to be improved/rectified by the Contractor.</li> </ul>	G10

	Name	Signature	Date
Recorded by	Johnny Fung		7 September 2015
Checked by	Dr. Priscilla Choy		7 September 2015

*Shatin to Central Link -*

*Contract 1121 NSL Cross Harbour Tunnels*

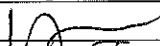

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	150914
Date	14 September 2015 (Monday)
Time	14:00 – 16:45

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

Ref. No.	Remarks/Observations	Related Item No.
150914-R02	<b>Part B – Water Quality</b> • To remove the floating rubbish near the silt curtain at Northern Dock Gate at Shek O.	B 31
150914-R03	• To clear the sand at the U-channel near Concrete Batching Plant in Shek O.	B 7
	<b>Part C – Ecology / Others</b> • No environmental deficiency was identified during the site inspection.	
	<b>Part D – Landscape &amp; Visual</b> • No environmental deficiency was identified during the site inspection.	
150914-O01	<b>Part E – Air Quality</b> • Unpaved area observed dusty at Shek O Casting Basin. The contractor is reminded to provide frequent water spray to avoid dust generation.	E 5
	<b>Part F - Construction Noise Impact</b> • No environmental deficiency was identified during the site inspection.	
150914-R04	<b>Part G – Waste/Chemical Management</b> • To clear properly the oil leakage in Hung Hom and provide tarpaulin sheets to the maintenance work of plants on unpaved area.	G9
	<b>Part H – Permits/Licenses</b> • No environmental deficiency was identified during the site inspection.	
	<b>Part I - Others</b> • Follow-up on previous audit section (Ref. No.:150907), all the environmental deficiencies were observed to be improved/rectified by the Contractor.	

	Name	Signature	Date
Recorded by	Johnny Fung		14 September 2015
Checked by	Dr. Priscilla Choy		14 September 2015

*Shatin to Central Link -*

*Contract 1121 NSL Cross Harbour Tunnels*

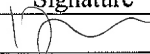

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	150921
Date	21 September 2015 (Monday)
Time	14:00 – 16:45

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

Ref. No.	Remarks/Observations	Related Item No.
150921-R01	<p><b>Part B – Water Quality</b></p> <ul style="list-style-type: none"> <li>The contractor is reminded to remove the floating rubbish near the silt curtain at Northern Dock Gate at Shek O and near the seawater intake at Hung Hom.</li> </ul>	B 31
150921-R02	<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 – 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 E – Air Quality</b></p> <ul style="list-style-type: none"> <li>To properly repair the dust curtain at the discharge point of Barging Facility in Hung Hom.</li> </ul>	E 21
150921-R03	<p><b>Part F - 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 G – Waste/Chemical Management</b></p> <ul style="list-style-type: none"> <li>To provide a plug for drip tray of generator-set in Hung Hom.</li> </ul> <p><b>Part H – 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 I - Others</b></p> <ul style="list-style-type: none"> <li>Follow-up on previous audit section (Ref. No.:150914), follow up action is needed to be reviewed for item ref. no.150914-R02.</li> </ul>	G10

	Name	Signature	Date
Recorded by	Johnny Fung		21 September 2015
Checked by	Dr. Priscilla Choy		21 September 2015

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**APPENDIX I  
EVENT AND ACTION PLANS**

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## Event and Action Plan for Marine Water Quality Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>ACTION LEVEL</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 the Contractor's working methods;</li> <li>4. Discuss remedial measures with the IEC and Contractor; and</li> <li>5. Ensure 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 the 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. Make agreement on the remedial measures to be implemented; and</li> <li>3. Discuss with the ET and IEC on the effectiveness of the implemented 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 within 3 working days of notification; and</li> <li>7. Implement the agreed remedial measures.</li> </ol>

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>LIMIT LEVEL</b>				
1. Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat in-situ measurement to confirm findings;</li> <li>Inform the Contractor, IEC, EPD and ER;</li> <li>Rectify unacceptable practice;</li> <li>Check monitoring data, all plant, equipment and the Contractor's working methods;</li> <li>Discuss with the ET and IEC and propose remedial measures to the IEC, EPD and ER; and</li> <li>Ensure the agreed remedial measures are implemented.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET, ER and Contractor on the implemented mitigation measures;</li> <li>Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and</li> <li>Review and advise the ET and ER the effectiveness of the implemented remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET, IEC and Contractor on the implemented mitigation measures;</li> <li>Request the Contractor to critically review the working methods;</li> <li>Make agreement on the remedial measures to be implemented; and</li> <li>Assess the effectiveness of the implemented remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform the ER and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes of working methods;</li> <li>Discuss with ET , IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification; and</li> <li>Implement the agreed remedial measures.</li> </ol>
2. Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> <li>Inform the Contractor, IEC, EPD and ER;</li> <li>Check monitoring data, all plant, equipment and the Contractor's working methods;</li> <li>Discuss remedial measures with the IEC, EPD, ER and Contractor;</li> <li>Ensure remedial measures are implemented; and</li> <li>Increase the monitoring frequency to daily until no exceedance of Limit level</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET, ER and Contractor on the implemented measures;</li> <li>Review proposals on remedial measures submitted by the Contractor and advise the ER accordingly; and</li> <li>Review and advise the ET and ER the effectiveness of the implemented remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss with the ET, IEC and Contractor on the implemented mitigation measures;</li> <li>Request the Contractor to critically review the working methods;</li> <li>Make agreement on the remedial measures to be implemented;</li> <li>Discuss with the the ET, IEC and Contractor on the effectiveness of the implemented remedial measures; and</li> <li>Consider and instruct, if necessary,</li> </ol>	<ol style="list-style-type: none"> <li>Identify source(s) of impact;</li> <li>Inform the ER and confirm notification of the non-compliance in writing;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes of working methods;</li> <li>Discuss with the ET, IEC and ER and propose remedial measures to IEC and ER within 3 working days of notification;</li> <li>Implement the agreed remedial measures; and</li> </ol>



EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	for two consecutive days.		the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	8. As directed by the ER, to slow down or to stop all or part of the marine works or construction activities.

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**APPENDIX J  
UPDATED ENVIRONMENTAL MITIGATION  
IMPLEMENTATION SCHEDULE**

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## SCL Works Contract 1121 - 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>Cultural Heritage Impact (Construction Phase)</i></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	Construction phase	EIAO	N/A
<b><i>Ecology (Construction Phase)</i></b>							
S 5.133	The following mitigation measures in controlling water quality change shall be implemented: <ul style="list-style-type: none"> <li>- Installation of silt curtains around the dredgers, where appropriate, during dredging activities;</li> <li>- Use of closed grab dredger during dredging; and</li> <li>- Reduction of dredging rate</li> </ul>	To minimize changes in water quality impact on marine flora and fauna	Contractor	All reclamation and dredging works areas	Construction phase	• EIAO-TM	N/A  N/A N/A
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	^
ERR S3.6.3	Installation of floating type silt curtains around the area of 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	^

## SCL Works Contract 1121 - 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>Fisheries Impact</i></b>							
S5.132	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	N/A
S5.133	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	N/A
S6.59	After completion of armour rock filling, the final surfaces of the protective armour rock layer shall be checked by ultrasonic sounding survey. Measures such as removing the rock or breaking the rock into pieces shall be implemented in case of non-compliance	To minimize the IMT protrusion above the seabed	Contractor	Along IMT laying works areas	Construction phase	• EIAO-TM	N/A
<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	^

## SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

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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	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	All works sites	Construction phase	• EIAO-TM	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	All works sites	Construction phase	• EIAO-TM	N/A
<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	^
Table 8.5	Barging facilities: (i) Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every	To minimize dust impacts	Contractor	Barging facility at Shek O Casting Basin	Construction phase	APCO	^

## SCL Works Contract 1121 - 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>working hours 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 1.0 L/m<sup>2</sup> 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 1.0L/m<sup>2</sup> to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&amp;A programme as specified in the EM&amp;A Manual</p> <p>(ii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.</p>						^
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the Guidance Note on the Best	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	N/A

## SCL Works Contract 1121 - 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
	Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) shall be followed and implemented.						
Table 8.6	<p>During operation of concrete batching plant:</p> <p>(i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system.</p> <p>(ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos.</p> <p>(iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins.</p> <p>(iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors.</p> <p>(v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the</p>	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	APCO	N/A  N/A  N/A  N/A

## SCL Works Contract 1121 - 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>transit mixer of a truck in "wet form".</p> <p>(vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant.</p> <p>(vii) Transportation of materials within the plant – Provide watering twice a day would be provided.</p>						N/A
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%. 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</p>	To minimize dust impact	Contractor	<p>Works areas at:</p> <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>• Shek O Casting Basin</li> </ul>	Construction phase	APCO	*



## SCL Works Contract 1121 - 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
	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.						
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</li> </ul>	To minimize dust impact	Contractor	<p>Works areas at:</p> <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> </ul>	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	<p>*</p> <p>*</p> <p>^</p> <p>^</p> <p>^</p> <p>N/A</p>

## SCL Works Contract 1121 - 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>washing facilities at the exit points of the site.</p> <ul style="list-style-type: none"> <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 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</li> </ul>						<p>#</p> <p>N/A</p> <p>^</p> <p>^</p> <p>*</p> <p>N/A</p>

## SCL Works Contract 1121 - 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
	program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						
<b><i>Air Quality (Construction Phase)</i></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	All construction sites	Construction stage	• APCO	^ ^ ^
<b><i>Construction Noise (Airborne)</i></b>							
S9.55	Implement the following good site practices: <ul style="list-style-type: none"> <li>• only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;</li> <li>• machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;</li> </ul>	Control construction airborne noise	Contractor	Works areas	Construction phase	• EIAO-TM	^ ^ ^

## SCL Works Contract 1121 - 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>• plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;</li> <li>• silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;</li> <li>• mobile plant should be sited as far away from NSRs as possible and practicable;</li> <li>• material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul>						<p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</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> </ul>	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <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> </ul>	Construction stage	• EIAO-TM	N/A

## SCL Works Contract 1121 - 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>• 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> <li>• Lorry</li> <li>• Wheel loader</li> <li>• Roller vibratory</li> </ul>						
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> </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> </ul>	Construction stage	• EIAO-TM	N/A

## SCL Works Contract 1121 - 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>• Grout pump</li> <li>• Hand held breaker</li> <li>• Hydraulic breaker</li> <li>• Saw, concrete</li> </ul>						
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>	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <ul style="list-style-type: none"> <li>• Cross Harbour section up to Breakwater of CBTS</li> <li>• Breakwater of CBTS to SOV</li> </ul>	Construction stage	• EIAO-TM	N/A
<b>Water Quality (Construction Phase)</b>							
S11.200 & 201	<p>All excavation and tunnel construction works will be undertaken within the cofferdam and there will be no open dredging.</p> <p>Removal of fender piles of Hung Hom Bypass and minor marine piling works will be carried out prior to the construction of the elevated platform adjacent to the cofferdam at Hung Hom Landfall. Reinstatement of the</p>	To minimize release of sediment and contaminants during temporary reclamation.	Contractor	Marine works at Hung Hom Landfall	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A  ^

## SCL Works Contract 1121 - 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>fender piles will be carried out upon completion of tunnel section. Potential release of sediment due to abovementioned works could be minimized by installation of silt curtains surrounding the works area as appropriate. All excavation and tunnel construction works will be undertaken within the cofferdam.</p> <p>No open dredging shall be allowed.</p>						N/A
S11.202	<p>All temporary reclamation works will adopt an approach where temporary seawalls will first be formed to enclose each phase of the temporary reclamation. Installation of diaphragm wall on temporary reclamation as well as any bulk filling will proceed behind the completed seawall. Any gaps that may need to be provided for marine access will be shielded by silt curtains to control sediment plume dispersion away from the site.</p> <p>Demolition of temporary reclamation including the demolition of the diaphragm wall and dredging to the existing seabed levels will also be carried out behind the temporary seawall.</p> <p>Temporary seawall will be removed after completion of all excavation and dredging works for demolition of the temporary reclamation.</p>	To minimize loss of fines and contaminants during temporary reclamations	Contractor	All temporary reclamation works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A  N/A  N/A

## SCL Works Contract 1121 - 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
S11. 202	During construction of the temporary reclamation, temporary seawall will be partially constructed to protect the nearby seawater intakes from further dredging activities. For example, the seawalls along the southeast and northeast boundaries of PW1.1 shall be constructed first (above high water mark) so that the seawater intake at the inner water would be protected from the impacts from the remaining dredging activities along the northwest boundary.	To minimize water quality impact upon the cooling water intakes in CBTS from temporary reclamation works	Contractor	Temporary reclamation works areas in CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
S11. 202	Dredging will be carried out by closed grab dredger to minimize release of sediment and other contaminants during dredging.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All temporary reclamation and dredging works areas within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
S11. 202 & Table 11.25	Silt curtains will be deployed to fully enclose the closed grab dredger and shall be extended from water surface to the seabed, as far as practicable, during any dredging operation.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All temporary reclamation and dredging works areas within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
S11. 202 & Table 11.23	Silt screens will be installed at the cooling water intakes within the CBTS during the temporary reclamation period.	To minimize water quality impact upon the cooling water intakes in CBTS from	Contractor	Cooling water intakes inside CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A



## SCL Works Contract 1121 - 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
		marine construction activities					
S11. 203 & Table 11.24	No more than two dredgers (of about 8 m <sup>3</sup> capacity each) shall be operated for dredging within the typhoon shelter at any time for the tunnel construction works. Moreover, the combined dredging rate for all concurrent dredging works (include dredging works for concurrent projects such as WDII and CWB) to be undertaken within the CBTS shall not exceed 4,500 m <sup>3</sup> per day (and 281 m <sup>3</sup> per hour with a maximum working period of 16 hours per day) throughout the entire construction period.	To minimize loss of fines and contaminants during dredging in CBTS	Contractor	All dredging works areas within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
ERR 6.7.1	Closed grab dredger shall be used for any dredging operations, except at for removal of fill material at the gap at the IMT/ME4 interface, which will be carried out by air lift or sand pump method	To minimize water quality impact in CBTS from marine construction activities	Contractor	All marine works areas within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
ERR 6.7.1	Fill materials removed by air lift or sand pumping method shall be stored inside impermeable compartment of the barge	To minimize water quality impact in CBTS from marine construction activities	Contractor	All marine works areas within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
ERR 6.7.1	Bulk filling operation within CBTS shall be carried out by closed grab dredger and/or by feeding the fill material into a	To minimize water quality impact in CBTS from	Contractor	All marine works areas within	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A

## SCL Works Contract 1121 - 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
	down pipe for placing of fill materials	marine construction activities		CBTS			
EP 2.18.1a	Pipe piles shall be used to form temporary seawalls for IMT construction within CBTS.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
EP 2.18.1b	The temporary seawalls shall not be removed before completion of all dredging or filling works for IMT construction, except for a small section of pipe piles adjoining IMT11 to facilitate the necessary dredging works for placing the IMT11.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
EP 2.18.1j	Water quality monitoring shall be conducted at cooling water intake 9 for Windsor House during IMT construction within CBTS. The monitoring frequency, parameters, equipment and methodology shall follow those for dredging and filling as stipulated in the EM&A Manual.	To minimize water quality impact in CBTS from IMT construction	Contractor	IMT construction works within CBTS	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
S11. 204	Bulk filling along the IMT tunnel alignment for SCL shall be carried out after the bulk dredging works along the IMT alignment are completed. Hence, bulk dredging and bulk filling along the IMT alignment shall not be undertaken at the same time.	To minimize loss of fines and contaminants during IMT construction	Contractor	Marine works areas in Victoria Harbour	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
S11. 204	Dredging for IMT and SCL2 construction shall be carried out	To minimize loss of fines	Contractor	Marine works	Construction	<ul style="list-style-type: none"> <li>• EIAO-TM</li> </ul>	N/A

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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
	by closed grab dredger to minimize release of sediment and other contaminants during dredging.	and contaminants during dredging in the Victoria Harbour		areas in Victoria Harbour	phase	<ul style="list-style-type: none"> <li>• WPCO</li> </ul>	
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>	N/A
S11. 204	Dredging for temporary reclamation outside the CBTS (at SCL2) shall not be carried out concurrently with the dredging / filling works for IMT construction.	To minimize loss of fines and contaminants from dredging / filling 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>	N/A
S11. 205	Floating type or frame type silt curtains shall be deployed around the dredging operations within 200m from the Hung Hom landfall.	To minimize loss of fines and contaminants from dredging in the Victoria Harbour	Contractor	Construction of northern IMT segment in the near shore region within 200 m from the Hung Hom landfall	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^
EP 2.19e	Frame type silt curtains shall be deployed around the dredging operations for the remaining IMT segments outside 200 m from the Hung Hom landfall.	To minimize water quality impacts in Victoria Harbour from IMT construction	Contractor	Construction of northern IMT segment in	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^

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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
				Victoria Harbour outside 200m from the Hung Hom landfall			
S11. 205 & Table 11.23	Silt screens shall be installed at the cooling water intakes for East Rail Extension, Metropolis and Hong Kong Coliseum (namely 21, 34 and 35 respectively) which are in close vicinity of the northern IMT segment.	To protect the beneficial use of water intakes along the Kowloon waterfront from dredging / filling activities	Contractor	Construction of northern IMT segment in the near shore region within 200 m from the Hung Hom landfall	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^
S11.207	<p>If underwater blasting is required for SCL construction, the following precautionary / mitigation measures shall be adopted:</p> <ul style="list-style-type: none"> <li>• Charge shall be placed in cores within the rock in order that there will be no blast directly into the water.</li> <li>• In terms of the construction sequence, sediment dredging (within the planned IMT works area) shall be conducted prior to any underwater blasting.</li> </ul>	To protect the water quality in Victoria Harbour from any possible underwater blasting	Contractor	Marine works areas in Victoria Harbour	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
Table 11.23	Silt screens shall be installed at the WSD Flushing Water Intakes at Kowloon Station, Tai Wan, Quarry Bay and Wan	To protect the beneficial use of flushing water	Contractor	Flushing water intake points in	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A

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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
	Chai (namely Intakes 14, WSD9, WSD17 and A respectively) during any dredging / filling works outside the CBTS for temporary reclamation at SCL2 or for IMT construction	intakes in Victoria Harbour from dredging / filling activities		Victoria Harbour			
S11.210 - S11.211 & Table 11.24 ERR S6.7.1	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, except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) 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, except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) 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 / bulk filling works shall be 16 hours per day. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. If the marine works for	To minimize loss of fines and contaminants from dredging / filling 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>	N/A

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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>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 except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) shall not exceed 4,500 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 except for the area within 60m from the southern boundary of the temporary reclamation at Hung Hom Landfall) 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. Silt screen shall be deployed at the Kowloon Station Intake to minimize the water quality impact. Only one chiseling machine or hydraulic breaker shall be adopted for rock breaking.</p> <p>For any dredging / filling work for IMT construction within 60m from the southern boundary of the temporary reclamation at</p>						

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	Hung Hom Landfall: <ul style="list-style-type: none"> <li>• The daily production rate shall not exceed 1,500m<sup>3</sup> per day</li> <li>• the hourly production rate shall not exceed 93m<sup>3</sup></li> </ul>						N/A  N/A
S11.215	The following good site practices shall be undertaken during filling and dredging: <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> </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>	^  ^  ^  ^





## SCL Works Contract 1121 - 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
	disposed of as soon as possible to avoid being washed into the nearby receiving waters.						
S11.217	<p>The following mitigation measures are proposed to minimize the potential water quality impacts from any marine piling works:</p> <ul style="list-style-type: none"> <li>• The potential release of sediment or excavated materials could be controlled through the installation of silt curtains surrounding the working area as necessary.</li> <li>• Spoil shall be collected by sealed hopper barges for proper disposal.</li> </ul>	To minimize release of sediment and pollutants from marine piling activities	Contractor	Marine piling works areas	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^  ^
S11.218	<p>Silt screens are recommended to be deployed at the seawater intakes during the construction works period.</p> <p>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.</p>	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	To minimize water quality impacts from	Contractor	Marine works area	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	*

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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
	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.	illegal dumping and littering from marine vessels and runoff from the coastal area				<ul style="list-style-type: none"> <li>• WDO</li> </ul>	
S11.220 & 221	Any wastewater including washdown waters and any concrete curing waters generated from the casting basin shall be drained to the wastewater treatment unit. Appropriate treatment process such as sedimentation and oil removal shall be employed for the wastewater treatment units so that any discharge from the casting basin will comply with standards stipulated in the TM-DSS. Recovered oil from any oil interceptor shall be properly contained, labeled and stored on site prior to collection by licensed collectors for disposal. During the flooding of the basin with seawater (accomplished by pumps) no escape of water could occur as the cofferdam will still be in place. Prior to opening a channel through the cofferdam, water inside the basin will be skimmed of floating debris. A period of settling of 24 hours before opening the basin to the sea would allow much of the suspended material to settle out. The channel through the cofferdam will only be opened with the approval of the Site Engineer to the effect	To minimize water quality impacts from the washdown, flooding and draining operation at Shek O Casting Basin	Contractor	Shek O Casting Basin	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	^



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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
	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.	discharge of uncontaminated groundwater			phase	<ul style="list-style-type: none"> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	
S11.252	<p>The following good site practices shall be adopted for the proposed barging points:</p> <ul style="list-style-type: none"> <li>- all vessels shall be sized so that adequate clearance is 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 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</li> <li>- loading of barges and hoppers shall be controlled to prevent splashing of material into the surrounding water.</li> </ul> <p>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>	To minimize water quality impacts generated from the barging points.	Contractor	Barging Points	Construction phase	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> </ul>	N/A
S11.253	There is a need to apply to EPD for a discharge licence for	To minimize water quality	Contractor	All construction	Construction	• EIAO-TM	N/A

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	<p>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 minimize 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.</p>	<p>impact from effluent discharges from construction sites</p>		<p>works areas</p>	<p>phase</p>	<ul style="list-style-type: none"> <li>• WPCO</li> <li>• TM-DSS</li> </ul>	
S11.254	<p>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</p>	<p>minimize water quality impact from accidental spillage of chemical</p>	<p>Contractor</p>	<p>All construction works areas</p>	<p>Construction phase</p>	<ul style="list-style-type: none"> <li>• EIAO-TM</li> <li>• WPCO</li> <li>• TM-DSS</li> <li>• WDO</li> </ul>	<p>^</p>

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	and complied with for control of chemical wastes.						
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	<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>	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>	<p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>







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	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.						
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	<b><i>Storage, Collection and Transportation of Waste</i></b> Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, shall be handled and stored well to	minimize potential adverse environmental impacts arising from waste storage	Contractor	All works sites	Construction phase	-	^

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	ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area shall be provided with covers and water 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	minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All works sites	Construction phase	-	N/A  ^ ^  N/A  ^

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	<p>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)</p> <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>						^  ^
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>	<p>minimize potential adverse environmental impacts arising from waste collection and disposal</p>	Contractor	All works sites	Construction phase	<ul style="list-style-type: none"> <li>• DEVB TCW No. 6/2010</li> </ul>	^
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</li> </ul>	<p>minimize potential adverse environmental impacts during the handling, transportation and disposal of C&amp;D materials</p>	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>	^  ^  ^

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	<p>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.</p> <p>While opportunities for reusing the non-inert portion shall be 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>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</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</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 1121 - 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
	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 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</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	^

## SCL Works Contract 1121 - 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>Water Pollution Control Ordinance (WPCO).</p> <ul style="list-style-type: none"> <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 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</li> </ul>						<p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>

## SCL Works Contract 1121 - 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
	handling contaminated sediments. Adequate washing and cleaning facilities shall also be provided on site.						
S12.95	<p><b><i>Sediments</i></b></p> <p>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 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.</p>	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	N/A
S12.97	<p><b><i>Containers for Storage of Chemical Waste</i></b></p> <p>The Contractor shall register with EPD as a chemical waste producer and to follow the guidelines stated in the Code of</p>	register with EPD as a Chemical waste producer and store	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging,	

## SCL Works Contract 1121 - 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>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 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>	chemical waste in appropriate containers				Labelling and Storage of Chemical Wastes	^  ^  ^
S12.98	<p><b><i>Chemical Waste Storage Area</i></b></p> <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> </ul>	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	^  ^  ^  ^  ^



## SCL Works Contract 1121 - 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 properly arranged so that incompatible materials are adequately separated.						^
S12.99	<p><b>Chemical Waste</b></p> <p>- 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.</p>	clearly label the chemical waste at works areas	Contractor	All works sites	Construction phase	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes	^
S12.100	<p><b>Collection and Disposal of Chemical Waste</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>General Refuse</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</p>	properly store and separate from other C&D materials for subsequent collection and	Contractor	All works sites	Construction phase	-	*



## SCL Works Contract 1121 - Environmental Mitigation Implementation Schedule

# 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 2015 (year)

**Contract No:** SCL1121  
**Date Reported:** September 2015

Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rocks and Large Broken Concrete (See Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill from 1111	Imported Fill from 1112	Delivered to Hong Hum Barging Point and disposed by 1112* [Note: (5)]	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(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 '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000tonne)
Jan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
June	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
July	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0932	0.000	0.000	0.000	0.000	0.010
Aug	0.048	0.000	0.000	23.673	0.000	5.695	18.415	0.000	0.000	0.000	0.000	0.000	0.035
<b>Sept</b>	<b>0.981</b>	<b>0.000</b>	<b>0.000</b>	<b>18.842</b>	<b>0.000</b>	<b>5.748</b>	<b>13.163</b>	N/A	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.025</b>
Oct													
Nov													
Dec													
<b>Total</b>	<b>1.029</b>	<b>0.000</b>	<b>0.000</b>	<b>42.515</b>	<b>0.000</b>	<b>11.443</b>	<b>31.578</b>	<b>0.0932</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.097</b>

**Notes:**

- (1) The performance targets are given below:
  - All excavated materials to be sorted for recovering the inert portion of C&D materials, e.g. hard rocks, soil and broken concrete, for reuse on the Site or disposal to designated outlets;
  - All metallic waste to be recovered for collection by recycling contractors;
  - All cardboard and paper packaging (for plant, equipment and materials) to be recovered, properly stockpiled in dry and covered condition to prevent cross contamination;
  - All chemical wastes to be collected and properly disposed of by specialist contractors; and
  - All demolition debris to be stored to recover broken concrete, reinforcement bars, mechanical and electrical fittings, hardware as well as other fitting / materials that have established recycling outlets.
- (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (3) Broken concrete for recycling into aggregates.
- (4) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (5) “\*” The inert C&D was delivered to the Hong Hum Barging Point and disposed by 1112.



## Monthly Summary of Marine Sediment Flow for 2015 (year)

Contract No: SCL1121  
Date Reported: September 2015

Month	Volume of Sediments Generated Monthly Bulk Volume)															
	Type 1 – Open Sea Disposal				Type 1 – Open Sea Disposal (Dedicated Site)				Type 2 – Confined Marine Disposal				Type 3 – Special Treatment Disposal			
	Generated from 1111	Generated from 1112	Generated from 1121	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Disposed	Generated from 1111	Generated from 1112	Generated from 1121	Disposed
Unit	(in '000m <sup>3</sup> )				(in '000m <sup>3</sup> )				(in '000m <sup>3</sup> )				(in '000m <sup>3</sup> )			
Jan	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May	0.000	0.000	9.535	9.535	0.000	0.000	0.000	0.000	0.000	0.000	6.583	6.583	0.000	0.000	0.000	0.000
June	0.000	0.000	3.190	3.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Sub-Total</b>	<b>0.00</b>	<b>0.00</b>	<b>12.725</b>	<b>12.725</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>6.538</b>	<b>6.538</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
July	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug	6.941	0.000	0.000	6.306	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Sept</b>	<b>5.542</b>	<b>0.000</b>	<b>0.000</b>	<b>6.176</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>1.942</b>	<b>0.000</b>	<b>1.542</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Oct																
Nov																
Dec																
<b>Total</b>	<b>12.483</b>	<b>0.000</b>	<b>12.725</b>	<b>25.208</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>1.942</b>	<b>6.583</b>	<b>8.08</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</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
EPD Ref.: H18/RS/00020927- 15	18 Aug 2015 / Shek O Casting Basin	Public / 20 Aug 2015	<p>18/8—投訴人致電投訴私家路往石澳道，俗稱「鶴咀」，有人在公地放石頭建立平台及碼頭，並擺放兩個新的綠色化學桶，以支柱支撐起達6-7 呎高，要求部門盡快跟進。</p> <p>18/8 投訴人致電補充資料，表示曾聯絡地政署，地政署表示「鶴咀」範圍已交於香港地鐵公司作工場，每天都有化學原料運送到上址，綠色化學桶擺放，懷疑沒有進行環境評估，下雨時污水滲入海，污染環境，影響泳客，要求部門盡快跟進。</p>	<p>According to the information provided by the Contractor, the vertical tanks erected at the Barging Point at Shek O are not for chemical storage.</p> <p>The Contractor has implemented various mitigation measures to mitigate the possible marine water quality impact since the commencement of works in Shek O.</p> <p>To further ensure that no adverse marine water quality impact would be caused by the works, the following additional mitigation measures were implemented by the Contractor after the complaint was received:</p> <ul style="list-style-type: none"> <li>• Perimeter of the bottom of the perimeter channels are paved with cement;</li> <li>• Accumulated grit, sand materials and general refuse are regularly removed from the channels;</li> <li>• The outlet of sand traps are temporarily blocked and their design (especially inlet and outlet pipe levels) are under review to increase the efficiency to handle surface</li> </ul>	Closed



				<p>run-off; and</p> <ul style="list-style-type: none"> <li>• Empty chemical containers are removed from the site</li> </ul> <p>Based on the findings of regular and additional mitigation measures implemented by the Contractor on site, no polluted wastewater is observed to be discharged out of site and no adverse water quality impact is caused by this Project to the sea waters near the Project site.</p> <p>The Complaint Investigation Report has been submitted to EPD on 11 Sep 2015 accordingly. File Closed.</p>	
<p>EPD Ref.: K01/RE/00024203-15</p>	<p>21 Sep 2015 / Tsim Sha Tsui East</p>	<p>Public / 22 Sep 2015</p>	<p>On 21<sup>st</sup> September 2015, EPD received a complaint from Incorporated Owners of a commercial building located in Tsim Sha Tsui East about the marine water quality in Tsim Sha Tsui East. The complainant mentioned that a lot of marine organism and blocking particles were found flowing in their central air-conditioning system</p>	<p>To be reported in the next Monthly EM&amp;A Report.</p>	<p>To be reported.</p>

			of the building. The normal functioning of their central air-conditioning system was affected.		
--	--	--	--	--	--

**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 September 2015 – SCL Works  
Contract 1123 Exhibition Station and Western Approach  
Tunnel**

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**Leighton – China State J.V.**

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

**Works Contract 1123 -  
Exhibition Station and Western Approach Tunnel**

**Monthly EM&A Report for  
September 2015**

[October 2015]

	Name	Signature
Prepared & Checked:	Lemon Lam	
Reviewed, Approved & Certified:	Y W Fung (Contractor's Environmental Team Leader)	

Version: 0	Date: 9 October 2015
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**Disclaimer**

This Environmental Monitoring and Audit Report is prepared for Leighton – China State J.V. and is given for its sole benefit in relation to and pursuant to SCL1123 and may not be disclosed to, quoted to or relied upon by any person other than Leighton – China State J.V. without our prior written consent. No person (other than Leighton – China State J.V. into whose possession a copy of this Manual comes may rely on this plan without our express written consent and Leighton – China State J.V. may not rely on it for any purpose other than as described above.

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## EXECUTIVE SUMMARY

Shatin to Central Link Contract 1123 – Exhibition Station and Western Approach Tunnel (hereafter called “the Project”) covers part of the construction of the Shatin to Central Link (SCL).

The Project comprises the construction of an underground station (Exhibition Station) and 300 m of cut and cover tunnel (Western Approach Tunnel) along Convention Avenue.

The EM&A programme commenced on 1 June 2015. The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 30 September 2015. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Exhibition Station (PTI Area)	<ul style="list-style-type: none"><li>• Utilities Diversion/ Protection</li><li>• Provision of Temporary Footbridge</li><li>• Demolition of Ferry Pier Footbridge</li><li>• Prebored socket H-Piles (PBSH) &amp; King Post</li><li>• Pipe Pile Wall Works</li><li>• Diaphragm Wall Works</li></ul>
Western Approach Tunnel WAT Area A	<ul style="list-style-type: none"><li>• Temporary Fire Escape Access for HKCEC</li><li>• Diaphragm Wall Works</li></ul>

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

No exceedance of Action / Limit Level of air quality was recorded in the reporting month.

### Breaches of Action and Limit Levels for Noise

#### Regular Noise Monitoring

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:-

<b>Location</b>	<b>Site Activities</b>
Exhibition Station (PTI Area)	<ul style="list-style-type: none"> <li>• Utilities Diversion/ Protection</li> <li>• Provision of Temporary Footbridge</li> <li>• Prebored socket H-Piles (PBSH) &amp; King Post</li> <li>• Pipe Pile Wall Works</li> <li>• Diaphragm Wall Works</li> </ul>
Exhibition Station (Swimming Pool Area)	<ul style="list-style-type: none"> <li>• Mobilization, Site Preparation and Establishment</li> <li>• Removal Obstruction/ Backfilling Swimming pool</li> <li>• Pile/ Obstruction Removal</li> </ul>
Exhibition Station (Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> <li>• Diaphragm Wall Works</li> <li>• Temporary Traffic Management</li> </ul>
Western Approach Tunnel WAT Area A	<ul style="list-style-type: none"> <li>• Diaphragm Wall Works</li> </ul>

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



## **1 INTRODUCTION**

Leighton – China State Joint Venture (JV) was commissioned by MTR as the Civil Contractor for Works Contract 1123. AECOM Asia Company Limited (AECOM) was appointed by JV 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 fourth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period from 1 to 30 September 2015.

### **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) was subsequently applied and the latest EP (EP No. EP-436/2012/B) was issued by the Director of Environmental Protection (DEP) on 19 March 2015.
- 2.1.3 The construction of the SCL is divided into different civil construction works contracts and Works Contract 1123 – Exhibition Station and Western Approach involves the construction of an underground station (Exhibition Station) and 300m of cut and cover tunnel (Western Approach Tunnel) along Convention Avenue.
- 2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

### 2.2 Site Description

- 2.2.1 The major construction activities under Works Contract 1123 include:
- (a) Site preparation;
  - (b) Demolition works;
  - (c) Utilities works;
  - (d) Box Culvert works;
  - (e) Diaphragm wall construction and piling works;
  - (f) Pile Removal works;
  - (g) Excavation & Lateral Support (ELS) works; and
  - (h) Re-provisioning/ Reinstatement works.

### 2.3 Construction Programme and Activities

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

Location	Site Activities
Exhibition Station (PTI Area)	<ul style="list-style-type: none"> <li>• Utilities Diversion/ Protection</li> <li>• Provision of Temporary Footbridge</li> <li>• Demolition of Ferry Pier Footbridge</li> <li>• Prebored socket H-Piles (PBSH) &amp; King Post</li> <li>• Pipe Pile Wall Works</li> <li>• Diaphragm Wall Works</li> </ul>
Western Approach Tunnel WAT Area A	<ul style="list-style-type: none"> <li>• Temporary Fire Escape Access for HKCEC</li> <li>• Diaphragm Wall Works</li> </ul>

- 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. Walter Lam	3959 2128	3959 2200
		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
JV	Contractor	Project Director	Mr. KC Cheung	3973 0846	31051126
		Environmental Manager	Mr. Chris Chan	6463 2318	
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	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		
<b>Environmental Permit</b>				
EP-436/2012/B	19-Mar-15	-	Valid	-
<b>Construction Noise Permit</b>				
GW-RS0799-15	28-Jul-15	27-Jan-15	Valid	An area near Hong Kong Convention and Exhibition Centre (W16, W17, W18a) – <i>Renewal for CNP GW-RS0453-15</i>
GW-RS0790-15	01-Aug-15	14-Sep-15	Valid	A section of Convention Avenue near Expo Drive East (W13T) – <i>Renewal for CNP GW-RS0704-15</i>
GW-RS0939-15	1-Sep-15	29-Feb-16	Valid	An area near the junction of Convention Avenue and Fleming Road (W12T)
GW-RS0973-15	14-Sep-15	21-Sep-15	Valid	A section of Convention Avenue near Tonnochy Road
<b>Wastewater Discharge License</b>				
WT00021388-2015	14-Apr-15	30-Apr-20	Valid	For Site Portions W16, W17, W18a
WT00021864-2015	15-Jun-15	30-Jun-20	Valid	For Site Portion W12T (PTI)
WT00022480-2015	4-Sep-15	30-Sep-20	Valid	For site portion W1a, W1b
WT00022482-2015	4-Sep-15	30-Sep-20	Valid	For site portion W9a, W9b
<b>Chemical Waste Producer Registration</b>				
5213-135-L2881-01	02-Apr-15	End of the Project	Valid	For Whole Site
<b>Billing Account for Construction Waste Disposal</b>				
7021736	16-Feb-15	End of Contract	Valid	For Disposal of C&D Waste
<b>Notification Under Air Pollution Control (Construction Dust) Regulation</b>				
385128	04-Feb-15	End of Contract	Valid	For Whole Site

### 3 ENVIRONMENTAL MONITORING REQUIREMENTS

#### 3.1 Construction Dust Monitoring

##### *Monitoring Requirements*

- 3.1.1 In accordance with the approved EM&A Manuals, 24-hour Total Suspended Particulates (TSP) level at the designated air quality monitoring station is required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

##### *Monitoring Equipment*

- 3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual. Brand and model of the equipment is given in **Table 3.1**.

**Table 3.1 Air Quality Monitoring Equipment**

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10380))
Calibration Kit	TISCH Environmental Orifice (Model TE-5025A (Orifice I.D.: 0843))

##### *Monitoring Locations*

- 3.1.3 The monitoring station for construction dust monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

**Table 3.2 Locations of Construction Dust Monitoring Station**

ID	Air Sensitive Receiver (ASR) ID in EIA Report	Dust Monitoring Station
AM2 <sup>[1]</sup>	EXA6	Wanchai Sports Ground
AM3 <sup>[2]</sup>	EXA5	Existing Harbour Road Sports Centre

Note:

[1] The impact monitoring at AM2 was currently carried out by Works Contract 1128. Upon the area of Wanchai Sports Ground handed over to 1123, the monitoring works would be taken up by this Project.

[2] The impact monitoring at AM3 was handed over from Contract SCL1126 in June 2015.

##### *Monitoring Methodology*

#### 3.1.4 24-hour TSP Monitoring

- (a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable:-
- (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
  - (ii) Two samplers should not be placed less than 2m apart from each others;
  - (iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
  - (iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
  - (v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
  - (vi) No furnace or incinerator flues nearby.
  - (vii) Airflow around the sampler was unrestricted.

- (viii) The sampler was located more than 20 meters from any dripline.
  - (ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
  - (x) Permission was obtained to set up the samplers and access to the monitoring station.
  - (xi) A secured supply of electricity was obtained to operate the sampler.
- (b) Preparation of Filter Papers
- (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
  - (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than  $\pm 3$  °C; the relative humidity (RH) was < 50% and not variable by more than  $\pm 5$ %. A convenient working RH was 40%.
  - (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.
- (c) Field Monitoring
- (i) The power supply was checked to ensure the HVS works properly.
  - (ii) The filter holder and the area surrounding the filter were cleaned.
  - (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
  - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
  - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
  - (vi) Then the shelter lid was closed and was secured with the aluminium strip.
  - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
  - (viii) A new flow rate record sheet was set into the flow recorder.
  - (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m<sup>3</sup>/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m<sup>3</sup>/min).
  - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
  - (xi) The initial elapsed time was recorded.
  - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
  - (xiii) The final elapsed time was recorded.
  - (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
  - (xv) It was then placed in a clean envelope and sealed.
  - (xvi) All monitoring information was recorded on a standard data sheet.
  - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
  - (ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
  - (iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

**Monitoring Schedule for the Reporting Month**

3.1.5 The schedule for environmental monitoring in September 2015 is provided in **Appendix F**.

### 3.2 Construction Noise Monitoring

#### *Monitoring Requirements*

- 3.2.1 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 3.3** 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 3.3 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*

- 3.2.2 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 3.4**.

**Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring**

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. 2238 (S/N: 2285692), (S/N: 2800927), (S/N: 2800930)) Rion (Model No. NL-31 (S/N: 00320528))
Acoustic Calibrator	Rion (Model No. NC-73 (S/N: 10307223))

#### *Monitoring Locations*

- 3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.5** and shown in **Figure 3.1**.

**Table 3.5 Noise Monitoring Station during Construction Phase**

Identification No.	Noise Sensitive Receiver (NSR) ID in EIA Report	Noise Monitoring Station	Alternative Noise Monitoring Location
NM2 <sup>[1]</sup>	EX1	Causeway Centre, Block A	Harbour Centre <sup>[2]</sup>

Note:

[1] The impact monitoring at NM2 was handed over from Works Contract SCL1126 in June 2015.

[2] The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014.

#### *Monitoring Methodology*

- 3.2.4 Monitoring Procedure

- (a) Façade measurements were made at NM2.
- (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.

### 3.2.5 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

3.2.6 The schedule for environmental monitoring in September 2015 is provided in **Appendix F**.

## 3.3 Continuous noise monitoring

3.3.1 According to EP conditions under EP-436/2012/B (Condition 2.7 and 2.8), the latest Construction Noise Mitigation Measures Plan (CNMMP) and Continuous Noise Monitoring Plan (CNMP) were submitted to EPD in July 2015 respectively, it is predicted that no residual air-borne construction noise impact exceeding the relevant noise criteria is anticipated. No continuous noise monitoring is required under this Contract.

## 3.4 Landscape and Visual

3.4.1 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**

<b>EP Condition</b>	<b>Submission</b>	<b>Submission Date</b>
Condition 3.4 (EP-436/2012/B)	Monthly EM&A Report for August 2015	14 September 2015

## 5 MONITORING RESULTS

### 5.1 Construction Dust Monitoring

- 5.1.1 The impact monitoring at AM2 was currently carried out by Works Contract 1128. Upon the area of Wanchai Sports Ground handed over to 1123, the monitoring works would be taken up by this Project.
- 5.1.2 The monitoring results for 24-hour TSP are summarised in **Table 5.1**. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

**Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period**

ID	Average ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
AM2	31.3	20.3 – 51.4	160	260
AM3	22.7	10.9 – 37.0	169	260

- 5.1.3 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.
- 5.1.4 The event and action plan is annexed in **Appendix I**.
- 5.1.5 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

### 5.2 Regular Construction Noise Monitoring

- 5.2.1 The monitoring results for noise are summarized in **Table 5.2** and the monitoring data is provided in **Appendix H**.

**Table 5.2 Summary of Construction Noise Monitoring Results in the Reporting Period**

ID	Range, dB(A), $L_{\text{eq}}(30 \text{ mins})$	Limit Level, dB(A), $L_{\text{eq}}(30 \text{ mins})$
NM2 (*)	<Baseline	75

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

- 5.2.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.
- 5.2.4 The event and action plan is annexed in **Appendix I**.
- 5.2.5 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

### 5.3 Waste Management

- 5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.
- 5.3.2 As advised by the Contractor, 1,485m<sup>3</sup> of inert C&D material was generated (1.485m<sup>3</sup> was disposed of as public fill) in the reporting month. No inert C&D materials were reused on site. 18m<sup>3</sup> general refuse was generated in the reporting month. 1,712kg of metals, 25kg of paper/cardboard packaging material and no plastic was collected by recycling contractor in the reporting month. No chemical waste was collected by licensed contractor in the reporting period. The waste flow table is annexed in **Appendix K**.
- 5.3.3 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.
- 5.3.4 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 Practise on the Packaging, Labelling and Storage of Chemical Wastes.

### 5.4 Landscape and Visual

- 5.4.1 Bi-weekly inspection of the implementation of landscape and visual mitigation measures was conducted on 2, 16 and 30 September 2015. 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 2, 9, 16, 23 and 30 September 2015. Joint inspection with the IEC, ER, the Contractor and the ET was conducted on 16 September 2015. 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
Air Quality	9 Sep 15	<ul style="list-style-type: none"> <li>Open stockpile was observed at W16&amp;17. The Contractor should cover the stockpile entirely.</li> </ul>	The item was rectified by the Contractor on 16 Sep 15.
		<ul style="list-style-type: none"> <li>Haul road was observed dry at PTI. The Contractor should water the exposed area timely for dust suppression.</li> </ul>	The item was rectified by the Contractor on 9 Sep 15.
		<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to keep monitor /well maintain of the grouting machine to minimize dust emission at PTI.</li> </ul>	
	16 Sep 15	<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to keep well maintain of the excavator to avoid smoke emission at PTI.</li> </ul>	The item was rectified by the Contractor on 23 Sep 15.
	23 Sep 15	<ul style="list-style-type: none"> <li>Haul road was observed dry at PTI. The Contractor should water the exposed area/haul road timely for dust suppression.</li> </ul>	The item was rectified by the Contractor on 30 Sep 15.
	30 Sep 15	<ul style="list-style-type: none"> <li>Mud trail was observed at the entrance of PTI under the footbridge. The Contractor should remove the mud trail frequently.</li> <li>Reminder: Haul road was observed dry at PTI. The Contractor should water the exposed area/haul road timely for dust suppression.</li> </ul>	The item will be followed up in Oct 15.
Noise	Nil	<ul style="list-style-type: none"> <li>Nil</li> </ul>	Nil
Water Quality	2 Sep 15	<ul style="list-style-type: none"> <li>Muddy water was observed slipping out to public area at PIT. The Contractor should provide sufficient mitigation measures to prevent any surface runoff from the site.</li> </ul>	The item was rectified by the Contractor on 2 Sep 15.
	16 Sep 15	<ul style="list-style-type: none"> <li>Reminder: Preventive measures for site runoff provided near the entrance of PTI were observed insufficient. The Contractor was reminded to provide sufficient preventive measures to prevent potential runoff from site.</li> </ul>	The item was rectified by the Contractor on 23 Sep 15.
	23 Sep 15	<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to provide/enhance the preventive measures (i.e. bunding) for the piling operation at PTI to prevent potential runoff from site.</li> </ul>	The item was rectified by the Contractor on 30 Sep 15.
Waste/ Chemical Management	2 Sep 15	<ul style="list-style-type: none"> <li>Oil stain was observed on bare ground at PTI. The Contractor was reminded to removed the stain and ensure no oil leakage</li> </ul>	The item was rectified by the Contractor on 4 Sep 15.
	16 Sep 15	<ul style="list-style-type: none"> <li>Oil stain under the trench cutter was observed at PTI. The Contractor should keep well maintain of the plant; and remove the oil stain and dispose of as chemical waste properly.</li> </ul>	The item was rectified by the Contractor on 23 Sep 15.
		<ul style="list-style-type: none"> <li>Muddy materials accumulated inside the drip tray was observed at PTI. The Contractor should remove the muddy material and dispose of as chemical waste properly.</li> </ul>	
	23 Sep 15	<ul style="list-style-type: none"> <li>Oil stain under the trench cutter was observed at PTI. The Contractor should remove the oil stain and dispose of as chemical waste properly.</li> <li>Reminder: The Contractor was reminded to provide/set up chemical waste storage area at PTI.</li> </ul>	The item was rectified by the Contractor on 30 Sep 15.
30 Sep 15	<ul style="list-style-type: none"> <li>Reminder: The Contractor was reminded to remove water mixture which accumulated inside the drip trays at PTI and dispose of as chemical waste properly.</li> </ul>	The item will be followed up in Oct 15.	

<b>Parameters</b>	<b>Date</b>	<b>Observations and Recommendations</b>	<b>Follow-up</b>
<b>Landscape &amp; Visual</b>	Nil	Nil	Nil
<b>Permits/ Licenses</b>	Nil	Nil	Nil

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 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month.
- 7.1.2 No noise complaint was received in the reporting month; hence, no Action Level exceedance was recorded.
- 7.1.3 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 J**.

### **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 J**.

## 8 FUTURE KEY ISSUES

### 8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works in between October and December 2015 will be:

Location	Site Activities
Exhibition Station (PTI Area)	<ul style="list-style-type: none"> <li>• Utilities Diversion/ Protection</li> <li>• Provision of Temporary Footbridge</li> <li>• Prebored socket H-Piles (PBSH) &amp; King Post</li> <li>• Pipe Pile Wall Works</li> <li>• Diaphragm Wall Works</li> </ul>
Exhibition Station (Swimming Pool Area)	<ul style="list-style-type: none"> <li>• Mobilization, Site Preparation and Establishment</li> <li>• Removal Obstruction/ Backfilling Swimming pool</li> <li>• Pile/ Obstruction Removal</li> </ul>
Exhibition Station (Tunnel at Tonnochy Road)	<ul style="list-style-type: none"> <li>• Diaphragm Wall Works</li> <li>• Temporary Traffic Management</li> </ul>
Western Approach Tunnel WAT Area A	<ul style="list-style-type: none"> <li>• Diaphragm Wall Works</li> </ul>

### 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 Three Month

8.3.1 The tentative schedules for environmental monitoring in between October and December 2015 are provided in **Appendix F**.

## 9 CONCLUSIONS AND RECOMMENDATIONS

### 9.1 Conclusions

- 9.1.1 24-hour TSP and noise monitoring were carried out in the reporting month.
- 9.1.2 All 24-hour TSP monitoring results complied with the Action / Limit Level at in the reporting month.
- 9.1.3 No noise complaint was received in the reporting month. Hence, no Action Level exceedance was recorded.
- 9.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.5 5 nos. of environmental site inspections were carried out in September 2015. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.6 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/preventive measures to avoid site runoff from the site;

#### Chemical and Waste Management

- Provide proper chemical/chemical waste management.

#### Landscape & Visual Impact

- No specific observation was identified in the reporting month.

#### Permits/licenses

- No specific observation was identified in the reporting month.



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## FIGURES

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**APPENDIX A**

**Construction Programme**

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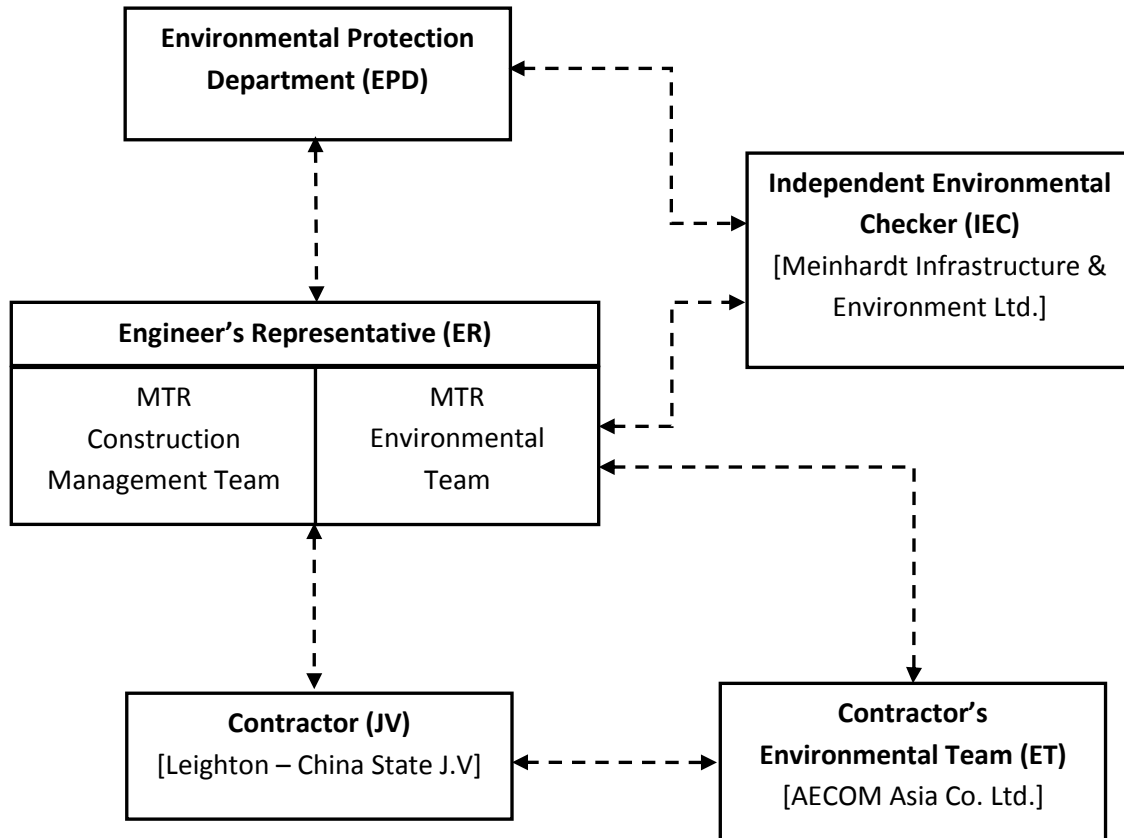
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**APPENDIX B**

**Project Organization Structure**

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## Appendix B Project Organisation Structure



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**APPENDIX C**

**Implementation Schedule of Environmental Mitigation  
Measures**

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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	N/A
<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
<b>Construction Dust Impact</b>						
Table 8.5	Barging facilities: (i) Transportation of spoils to the barging point – Pave all road surfaces within the barging facilities and provide watering once along with the haul road for every working hours 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 1.0 L/m <sup>2</sup> 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	To minimize dust impacts	Contractor	All barging points	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
	<p>equivalent intensity of no less than 1.0L/m<sup>2</sup> to achieve the removal efficiency. The dust levels would be monitored and managed under an EM&amp;A programme as specified in the EM&amp;A Manual.</p> <p>(ii) Unloading of spoil materials – Undertake the unloading process within a 3-sided screen with top tipping hall. Provide water spraying and flexible dust curtains at the discharge point for dust suppression.</p> <p>(iii) Vehicles leaving the barging facilities – Pass vehicles through the wheel washing facilities provided at site exits.</p>					
S8.63	For concrete batching plant, the requirements and mitigation measures stipulated in the <i>Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</i> shall be followed and implemented.	To minimize dust impact	Contractor	Concrete Batching Plant	Construction phase	N/A
Table 8.6	<p>During operation of concrete batching plant:</p> <p>(i) Unloading of aggregates from the tipper trucks to receiving hopper – unload the aggregates from the tipper trucks to the receiving hopper equipped with enclosures on 3 sides and top cover, and water spraying system.</p> <p>(ii) Unloading of cement and PFA from tankers into the silo – Directly load the cement and PFA into the silo via a flexible duct. Install dust collectors at cement/PFA silos.</p> <p>(iii) Storage of aggregates in overhead storage bins – Store the aggregates in fully enclosed overhead storage bins. Cover the top of overhead storage bins with cladding. Install water spraying system at the top of storage bins for watering the aggregates, and fully enclose aggregates storage bins.</p> <p>(iv) Weighing and batching of cementitious materials – Perform the whole process of weighing and mixing in a fully enclosed environment. Equip all the mixers with dust collectors.</p> <p>(v) Loading of concrete from mixer into transit mixer of a truck – Directly load the concrete from the mixer into the transit mixer of a truck in “wet form”.</p> <p>(vi) Tipper trucks and cement tankers leaving the Concrete Batching Plant – Haul road within the site is unpaved. Install wheel washing pit at the gate of the concrete batching plant.</p> <p>(vii) Transportation of materials within the plant – Provide watering twice a day would be provided.</p>	To minimize dust impacts	Contractor	Concrete Batching Plant	Construction phase	N/A
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	@
S8.89	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall, provision of water spraying and flexible dust curtains to reduce dust emission	To minimize dust impact	Contractor	All barging points	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
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 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>	To minimize dust impacts	Contractor	Works areas	Construction phase	@ @ V @ N/A @ N/A V N/A V N/A V
/	<b>Dust suppression measures (con't)</b> <ul style="list-style-type: none"> <li>• De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement</li> </ul>					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 N/A V V N/A 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
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> <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>	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <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 to north of ADM</li> <li>• South of ADM to Overrun Tunnel</li> </ul>	Construction phase	<p>V N/A N/A V N/A N/A N/A N/A N/A N/A V V V N/A N/A N/A</p>
S9.58 – S9.59 & Table 9.17	<p>Movable noise barrier shall be used for the following PME:</p> <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	<p>Works areas at:</p> <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	<p>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</p>
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>	To minimize construction noise impact	Contractor	<p>Works areas at:</p> <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	<p>N/A N/A N/A N/A N/A N/A N/A</p>

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>Water Quality Impact</b>						
<b>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 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 nearby receiving waters.</li> </ul>	To 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	<p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p>
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 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 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>	To minimize water quality impacts from construction site runoff and general construction activities	Contractor	Works areas	Construction Phase	<p style="text-align: center;">@</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">V</p>

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
	<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 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>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 style="text-align: center;">V</p> <p style="text-align: center;">V</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S11.246 & 11.247	<p>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.</p>	<p>To minimize water quality impacts due to sewage generated from construction workforce</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p style="text-align: center;">N/A</p>
S11.248	<p>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.</p>	<p>To minimize impact from discharge of uncontaminated groundwater</p>	<p>Contractor</p>	<p>Works areas</p>	<p>Construction Phase</p>	<p style="text-align: center;">N/A</p>

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
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 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.	To control site run-off generated from any potential contaminated works areas.	Contractor	Any potential contaminated areas to be identified from the Stage 2 SI	Construction Phase	N/A
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 Sections 11.189 to 11.192 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
S11.252	The following good site practices shall be adopted for the proposed barging points: <ul style="list-style-type: none"> <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 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</li> <li>• loading of barges and hoppers shall be controlled to prevent splashing of 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</li> </ul>	To minimize water quality impacts generated from the barging points.	Contractor	Barging points	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 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.	To minimize water quality impact from effluent discharges from construction sites	Contractor	All construction works areas	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
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	N/A
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	N/A N/A N/A
<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 N/A N/A N/A
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	N/A N/A N/A 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.	To achieve waste reduction	Contractor	All 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
	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.					
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	N/A N/A N/A
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 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>	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	Work Sites	Construction Phase	V V N/A 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 N/A V N/A
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

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
S12.89	<p><b>Sediments (con't)</b></p> <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 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.</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
S12.91 – 12.94	<p><b>Sediments (con't)</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 / 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	<p><b>Sediments (con't)</b></p> <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 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.</li> </ul>	To ensure handling of sediments are in accordance to statutory requirements	Contractor	Work Sites, Sediment disposal sites	Construction Phase	N/A
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 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	N/A N/A 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
S12.98	<p><b>Chemical Waste Storage Area</b></p> <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	N/A N/A N/A N/A N/A
S12.99	<p><b>Chemical Waste</b></p> <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	N/A
S12.100	<p><b>Collection and Disposal of Chemical Waste</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.</p>	To monitor the generation, reuse and disposal of chemical waste	Contractor	Work Sites	Construction Phase	N/A
S12.101	<p><b>General Refuse</b> 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>	To properly store and separate from other C&D materials for subsequent collection and disposal	Contractor	Work Sites	Construction Phase	V
S12.102	<p><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.</p>	To facilitate recycling of recyclable portions of refuse	Contractor	Work Sites	Construction Phase	V
S12.103	<p><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.</p>	To raise workers' awareness on recycling issue	Contractor	Work Sites	Construction Phase	V
/	<p><b>Accidental spillage</b> To prevent accidental spillage of chemicals, the following is recommended:</p> <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 N/A
<b>Land Contamination Impact</b>						
S13.23–13.24	<p>For construction works at sites under the current stage of site investigation (Stage 1 SI):</p> <ul style="list-style-type: none"> <li>Precautionary measures such as visual inspection are recommended to be undertaken during construction activities that disturb soil. The inspection process shall involve a visual observation of excavated soils for discolouration and the presence of oils, together with identifying the presence of odours, which may also indicate soil and/or groundwater contamination.</li> <li>If soil materials suspected to be contaminated are encountered during excavation, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during</li> </ul>	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Within Project Boundary where signs of contamination is identified	During excavation works for Cut-and-Cover	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
	demolition, excavation and cut & cover construction shall be temporary stockpiled. Shall concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the Contamination Assessment Report (CAR) and Remediation Action Plans (RAP).					
S13.30	For some sites with currently no SI proposed (i.e. sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28), to be conservative, visual inspection shall be conducted during demolition and excavation to detect any abnormal colour, smell or other characteristics of the soil, due to the nearby land use and/ or construction method. If abnormal colour, smell or other characteristics of contamination are identified for any of these sites, sampling and testing shall be undertaken to verify the presence of contamination. The soil extracted during demolition, excavation and cut & cover construction shall be temporary stockpiled. Should the concentrations of contaminants of concern (COCs) exceed relevant RBRGs as indicated by laboratory analyses, remediation works shall be undertaken with reference to the CAR and RAP.	To act as a general precautionary measure to screen soils for the presence contamination during excavation works for Cut-and-Cover.	Contractor	Areas with no SI proposed (Sites ID 2-02, 2-18, 2-22, 2-23, 2-27, 2-28)	During excavation works for Cut-and-Cover	N/A
S13.36 – 13.38	For areas inaccessible for proper site appraisal and investigation (Stage 2 SI) (i) Site 2-15 <ul style="list-style-type: none"> <li>Upon site access being granted, visual inspection shall be carried out where intrusive works and soil excavation is encountered, for attention on any potential contamination due to its current operation</li> <li>A supplementary CAP shall then be submitted to EPD for endorsement.</li> <li>A CAR/RAP shall be prepared and submitted to EPD for endorsement on completion of the SI and analytical testing.</li> <li>Shall remediation be undertaken a Remediation Report (RR) shall be prepared and submitted to EPD for endorsement to demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP. Information such as soil treatment/ disposal records (including trip tickets), confirmatory sampling results, and photographs shall be included in the aforesaid RR.</li> <li>No construction work shall be carried out prior to the endorsement of the RR by EPD.</li> </ul>	To identify areas with land contamination concern, report laboratory results and propose remediation measures if necessary.  To ensure remediation works have been undertaken before the commencement of any construction works of the Project.	Contractor	Areas unable to be accessed during Stage 1 SI (Site 2-15)	After land resumption and prior to the construction works commencement at the site	N/A
S13.39	Potential Remediation of Contaminated Soil <ul style="list-style-type: none"> <li>Excavation profiles must be properly designed and executed with attention to the relevant requirements for environment, health and safety;</li> <li>Excavation shall be carried out during dry season as far as possible to minimise contaminated runoff from contaminated soils;</li> <li>Supply of suitable clean backfill material is needed after excavation;</li> <li>If remediation is required with chemical oxidation proposed as a contaminant mass reduction technology, chemicals will be securely and separately stored away from sources of ignition or oxidisable items. Handling will be undertaken by personnel with appropriate training and personal protective equipment (PPE).</li> <li>Vehicles containing any excavated materials shall be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates shall be sealed to prevent any discharge during transport or during wet conditions;</li> <li>Speed control for the trucks carrying contaminated materials shall be enforced;</li> <li>Vehicle wheel and body washing facilities at the site's exit points shall be established and used; and</li> <li>Pollution control measures for air emissions e.g. from biopile blower, noise emissions e.g. from blower, and water discharges e.g. runoff control shall be implemented and complied with relevant regulations and guidelines.</li> </ul>	To remediate contaminated soil	Contractor	Identified contaminated sites	Site remediation	N/A
S13. 40	In order to minimize the potential adverse effects on health and safety of construction workers during the course of site remediation, the Occupation Safety and Health Ordinance (OSHO) (Chapter 509) and its subsidiary Regulations shall be followed by all site personnel working on the site at all times. In addition, the following basic health and safety measures shall be implemented as far as possible: <ul style="list-style-type: none"> <li>Set up a list of safety measures for site workers;</li> <li>Provide written information and training on safety for site workers;</li> <li>Keep a log-book and plan showing the contaminated zones and clean zones;</li> <li>Maintain a hygienic working environment;</li> <li>Avoid dust generation;</li> </ul>	To minimise the potentially adverse effects on health and safety of construction workers during the course of site remediation.	Contractor	Identified contaminated sites	Site remediation and prior to construction phase	N/A

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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
	<ul style="list-style-type: none"> <li>• Provide face and respiratory protection gear to site workers;</li> <li>• Provide personal protective clothing (e.g. chemical resistant jackboot, liquid tight gloves) to site workers; and</li> <li>• Provide first aid training and materials to site workers.</li> </ul>					

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****Table 1 Action and Limit Levels for 24-hour TSP**

ID	Location	Action Level	Limit Level
AM2*	Wan Chai Sports Ground	160 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$
AM3	Existing Harbour Road Sports Centre	169 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$

\* The impact monitoring at AM2 was currently carried out by Works Contract 1128. Upon the area of Wanchai Sports Ground handed over to 1123, the monitoring works would be taken up by this Project.

**Table 2 Action and Limit Levels for Construction Noise  
(0700 – 1900 hrs of normal weekdays)**

ID	Location	Action Level	Limit Level
NM2*	Harbour Centre	When one documented complaint is received	75 dB(A)

\* The Access to the designated monitoring location NM2 (i.e. Block A, Causeway Centre) was denied before the commencement of impact monitoring under Works Contract 1126. An alternative monitoring location at Harbour Centre was approved by the ER, agreed by IEC and EPD's formal approval is awaited in August 2014.

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**APPENDIX E**

**Calibration Certificates of Equipments**

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# AECOM Asia Company Limited

## TSP High Volume Sampler

### Field Calibration Report

Station: Exiting Harbour Road Sports Centre (AM3) Operator: Suen Hon Yeung  
 Cal. Date: 29-Jul-15 Next Due Date: 29-Sep-15  
 Equipment No.: A-001-15T Serial No.: 10380

Ambient Condition			
Temperature, Ta (K)	303	Pressure, Pa (mmHg)	757.5

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99924	Intercept, bc	-0.01238
Last Calibration Date:	9-Dec-14	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	9-Dec-15				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (298/Ta)] <sup>1/2</sup>	Qstd (m <sup>3</sup> /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.5	2.71	1.36	44.0	43.56
13	6.4	2.50	1.26	38.0	37.62
10	5.1	2.24	1.12	32.0	31.68
7	4.1	2.00	1.01	27.0	26.73
5	3.1	1.74	0.88	21.0	20.79

By Linear Regression of Y on X

Slope, mw = 46.2363 Intercept, bw = -20.0124

Correlation Coefficient\* = 0.9974

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

#### Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m<sup>3</sup>/min

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

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]<sup>1/2</sup> = 40.50

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

QC Reviewer: WS CHAN

Signature: 

Date: 29/7/15



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE  
 VILLAGE OF CLEVELAND, OH  
 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Dec 09, 2014 Rootmeter S/N 0438320 Ta (K) - 293  
 Operator Tisch Orifice I.D. - 0843 Pa (mm) - 755.65

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORIFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.4010	3.2	2.00
2	NA	NA	1.00	0.9950	6.4	4.00
3	NA	NA	1.00	0.8830	7.9	5.00
4	NA	NA	1.00	0.8420	8.8	5.50
5	NA	NA	1.00	0.6960	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0069	0.7187	1.4221	0.9957	0.7107	0.8806
1.0027	1.0077	2.0112	0.9915	0.9965	1.2454
1.0006	1.1332	2.2486	0.9894	1.1206	1.3924
0.9994	1.1870	2.3584	0.9883	1.1738	1.4603
0.9942	1.4285	2.8443	0.9831	1.4126	1.7612
Qstd slope (m) = 1.99924			Qa slope (m) = 1.25189		
intercept (b) = -0.01238			intercept (b) = -0.00766		
coefficient (r) = 0.99990			coefficient (r) = 0.99990		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)  
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]  
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}  
 Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}



## CERTIFICATE OF CALIBRATION

Certificate No.: 15CA0317 03 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.:	2285692	,	2791211
Adaptors used:	-	,	-

### Item submitted by

Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 17-Mar-2015

Date of test: 18-Mar-2015

### 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 ± 1 °C  
Relative humidity: 60 ± 10 %  
Air pressure: 1010 ± 5 hPa

### Test specifications

- 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.
- 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 ±20%.
- 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 responses 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: 19-Mar-2015

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.: 15CA0317 03 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	
Frequency weightings	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

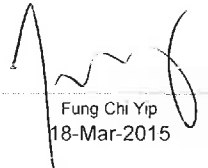
The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

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	

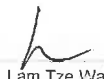
### 3, Response to associated sound calibrator

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: 18-Mar-2015

- End -

Checked by:   
Date: 19-Mar-2015

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.: 15CA0703 02-02 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.:	2800927	,	2791214
Adaptors used:	-	,	-

### Item submitted by

N-009 06  
Customer Name: AECOM ASIA CO., LTD.  
Address of Customer: -  
Request No.: -  
Date of receipt: 03-Jul-2015

Date of test: 04-Jul-2015

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI

### Ambient conditions

Temperature: 21 ± 1 °C  
Relative humidity: 60 ± 10 %  
Air pressure: 1000 ± 5 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 ±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.

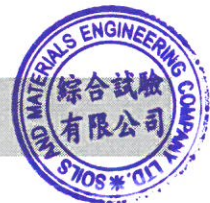
Actual Measurement data are documented on worksheets.

Approved Signatory:

Huang Jian Ming / Feng Jun Qi

Date: 06-Jul-2015

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.: 15CA0703 02-02 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 100µs rectangular pulse	Pass	0.3	
	R.M.S. accuracy	Crest factor of 3	Pass	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 <sup>4</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: 04-Jul-2015

Fung Chi Yip

Checked by:

Date: 06-Jul-2015

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.



## CERTIFICATE OF CALIBRATION

Certificate No.: 15CA0703 02-01 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.:	2800930	,	2250455
Adaptors used:	-	,	-

### Item submitted by

Customer Name: AECOM ASIA CO., LTD. *N:009.07*  
Address of Customer: -  
Request No.: -  
Date of receipt: 03-Jul-2015

Date of test: 04-Jul-2015

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	19-Jun-2016	CIGISMEC
Signal generator	DS 360	33873	16-Apr-2016	CEPREI
Signal generator	DS 360	61227	16-Apr-2016	CEPREI

### Ambient conditions

Temperature:  $21 \pm 1$  °C  
Relative humidity:  $60 \pm 10$  %  
Air pressure:  $1000 \pm 5$  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 responses 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: 06-Jul-2015

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.: 15CA0703 02-01 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	
Frequency weightings	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.

- End -

Calibrated by:

Fung Chi Yip  
Date: 04-Jul-2015

Checked by:

Lam Tze Wai  
Date: 06-Jul-2015

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.: 14CA1106 04-01 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: 06-Nov-2014

Date of test: 07-Nov-2014

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	15-Jun-2015	CIGISMEC
Signal generator	DS 360	33873	09-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI

### Ambient conditions

Temperature: 22 ± 1 °C  
Relative humidity: 65 ± 10 %  
Air pressure: 1010 ± 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 ±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 response 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: 08-Nov-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.: 14CA1106 04-01 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	
	Frequency weightings			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
Time weighting I	Crest factor of 3	Pass	0.3	
	Single burst 5 ms at 2000 Hz	N/A	N/A	
Time averaging	Repeated at frequency of 100 Hz	N/A	N/A	
	1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz	Pass	0.3	
Pulse range	1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz	Pass	0.3	
	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: 07-Nov-2014

Fung Chi Yip

Checked by:

Date: 08-Nov-2014

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.



## CERTIFICATE OF CALIBRATION

Certificate No.: 14CA1106 04-02

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: 06-Nov-2014

Date of test: 07-Nov-2014

### Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	13-May-2015	SCL
Preamplifier	B&K 2673	2239857	10-Apr-2015	CEPREI
Measuring amplifier	B&K 2610	2346941	08-Apr-2015	CEPREI
Signal generator	DS 360	61227	09-Apr-2015	CEPREI
Digital multi-meter	34401A	US36087050	17-Dec-2014	CEPREI
Audio analyzer	8903B	GB41300350	07-Apr-2015	CEPREI
Universal counter	53132A	MY40003662	11-Apr-2015	CEPREI

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $65 \pm 10$  %  
Air pressure:  $1010 \pm 10$  hPa

### Test specifications

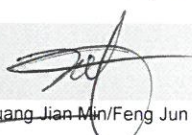
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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: 08-Nov-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.



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**APPENDIX F**

**EM&A Monitoring Schedules**

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**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel  
Impact Environmental Monitoring Schedule for September 2015**

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

**Air Quality Monitoring Station**

AM3 Existing Harbour Road Sports Centre

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Noise Monitoring Station**

NM2 Harbour Centre

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel  
Tentative Impact Environmental Monitoring Schedule for October 2015**

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

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

**Air Quality Monitoring Station**

AM3 Existing Harbour Road Sports Centre

**Noise Monitoring Station**

NM2 Harbour Centre

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week

**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel  
Tentative Impact Environmental Monitoring Schedule for November 2015**

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

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

**Air Quality Monitoring Station**

AM3 Existing Harbour Road Sports Centre

**Noise Monitoring Station**

NM2 Harbour Centre

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week



**Shatin to Central Link Contract 1123 - Exhibition Station and Western Approach Tunnel  
Tentative Impact Environmental Monitoring Schedule for December 2015**

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

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

**Air Quality Monitoring Station**

AM3 Existing Harbour Road Sports Centre

**Noise Monitoring Station**

NM2 Harbour Centre

**Monitoring Frequency**

24-hr TSP Once every 6 days

**Monitoring Frequency**

Once per week

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**APPENDIX G**

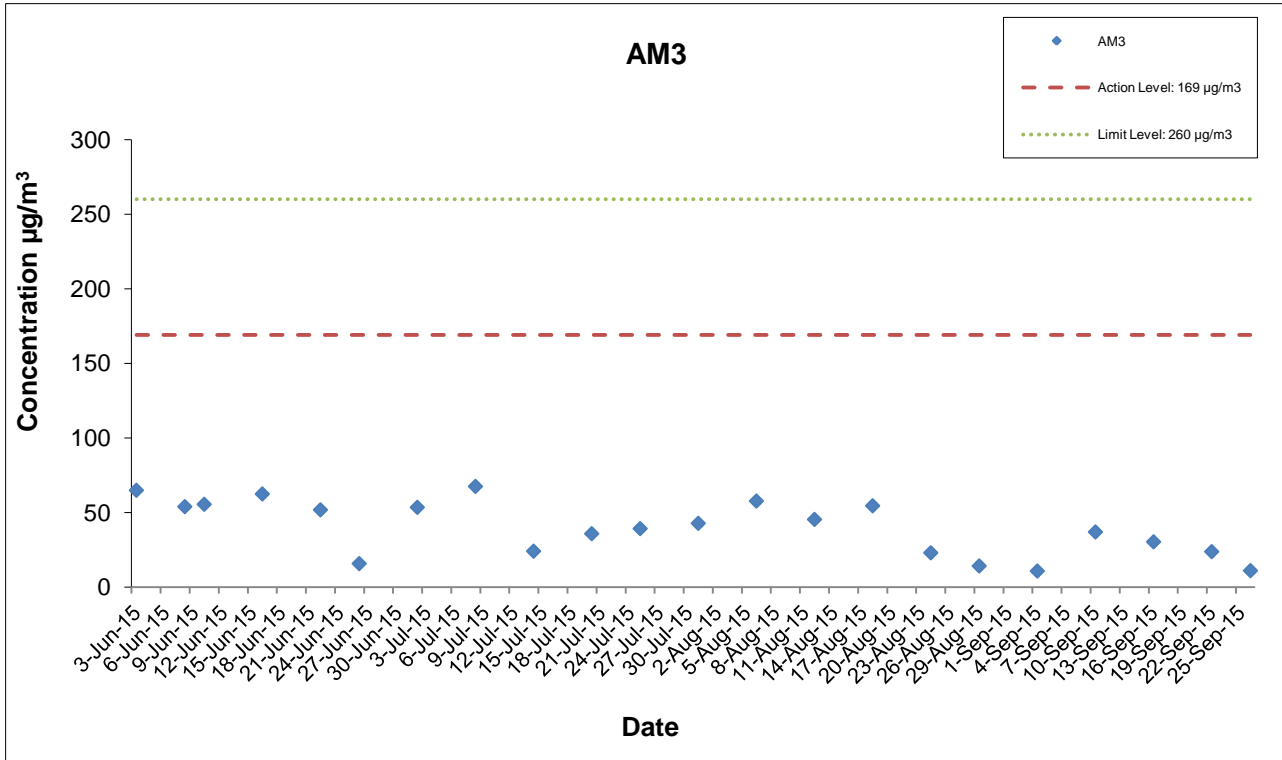
**Air Quality Monitoring Results and  
their Graphical Presentations**

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**Appendix G  
Air Quality Monitoring Results**

**24-hour TSP Monitoring Results at Station AM3 (Existing Harbour Road Sports Centre)**

Start		End		Weather Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m <sup>3</sup> /min.)		Av. flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m <sup>3</sup> )
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
4-Sep-15	0:00	5-Sep-15	0:00	Sunny	29.1	1013.1	1.33	1.33	1.33	1916.6	2.8224	2.8432	0.0208	3835.82	3859.82	24.00	10.9
10-Sep-15	0:00	11-Sep-15	0:00	Sunny	28.1	1012.7	1.33	1.33	1.33	1916.6	2.8324	2.9034	0.0710	3859.82	3883.82	24.00	37.0
16-Sep-15	0:00	17-Sep-15	0:00	Sunny	28.1	1011.9	1.33	1.33	1.33	1916.6	2.8282	2.8865	0.0583	3883.82	3907.82	24.00	30.4
22-Sep-15	0:00	23-Sep-15	0:00	Sunny	28.1	1009.9	1.33	1.33	1.33	1916.6	2.7727	2.8184	0.0457	3907.82	3931.82	24.00	23.8
26-Sep-15	0:00	27-Sep-15	0:00	Fine	28.7	1006.7	1.33	1.33	1.33	1916.6	2.8120	2.8333	0.0213	3931.82	3955.82	24.00	11.1
<b>Average</b>																<b>22.7</b>	
<b>Minimum</b>																<b>10.9</b>	
<b>Maximum</b>																<b>37.0</b>	



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Shatin Central Link Contract No. 1123  
 Exhibition Station and Western Approach Tunnel



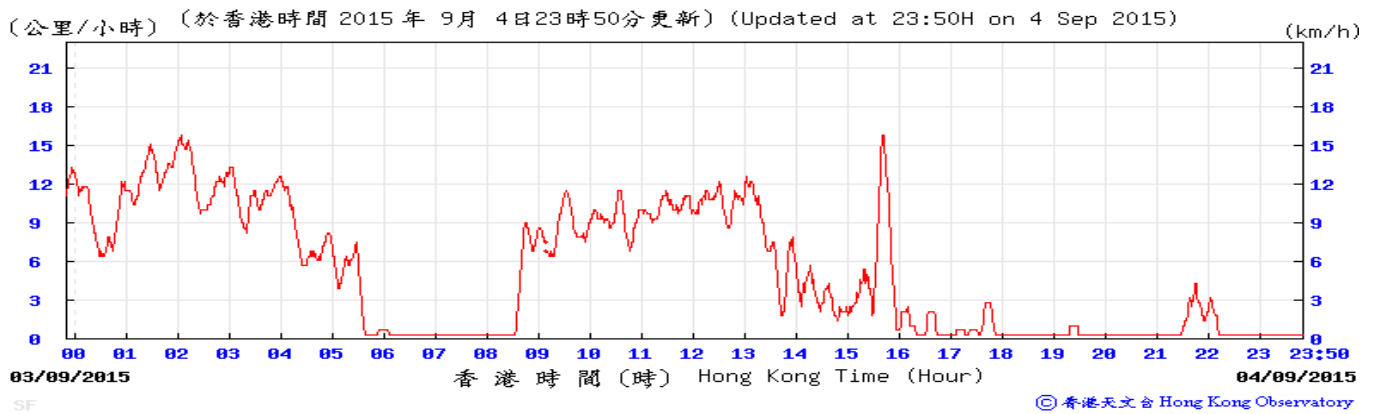
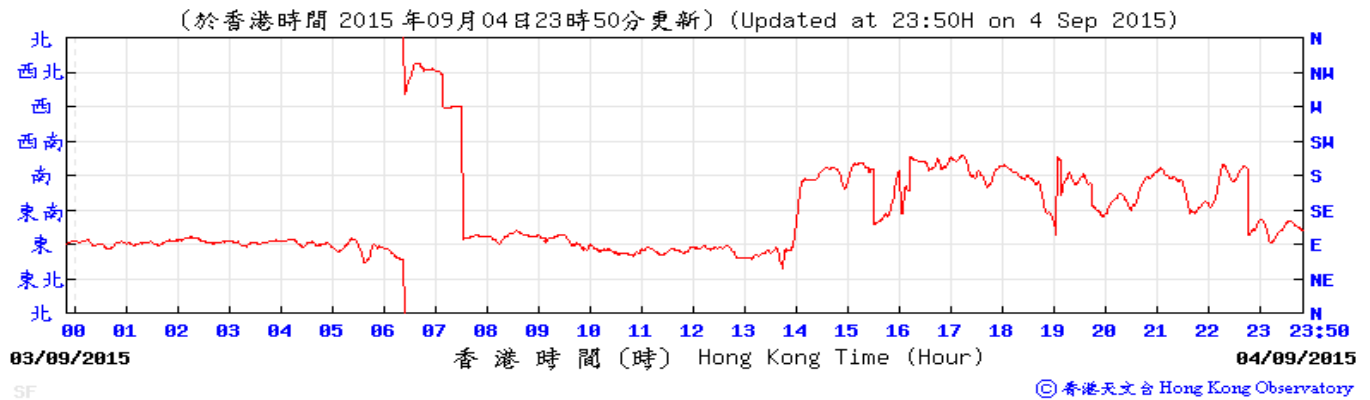
### Graphical Presentation of Impact 24-hr TSP Monitoring Results

Date: October 2015

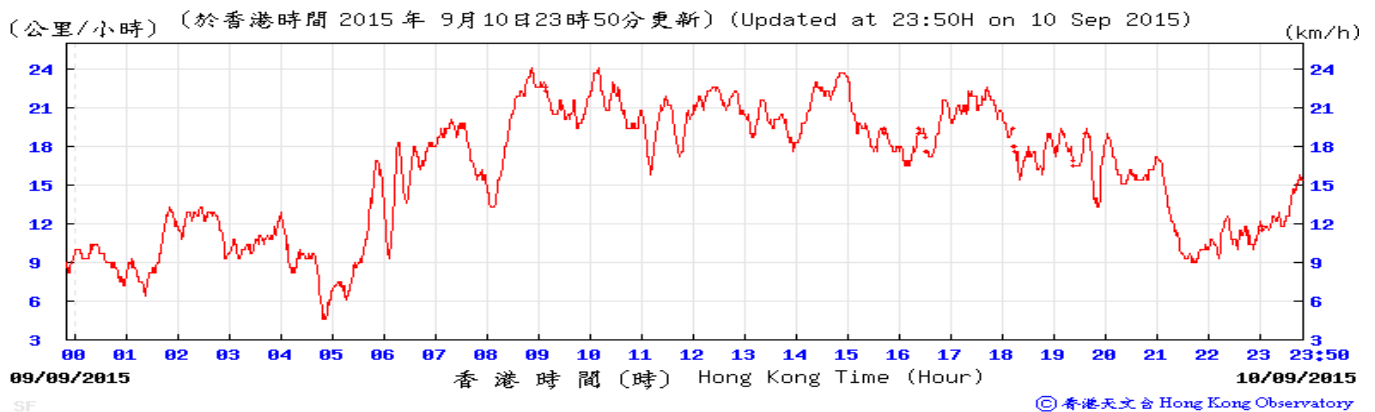
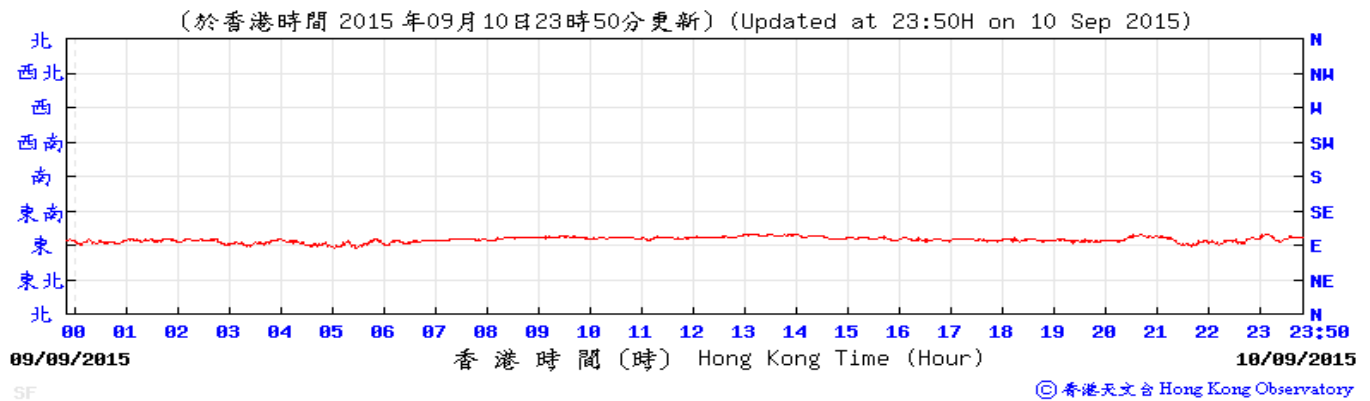
Appendix G

# Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2015

4-Sep-15



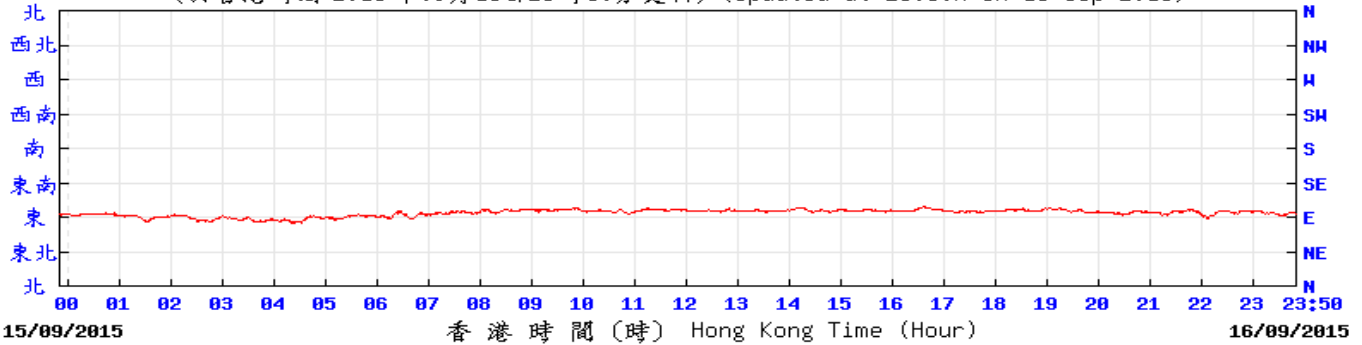
10-Sep-15



# Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2015

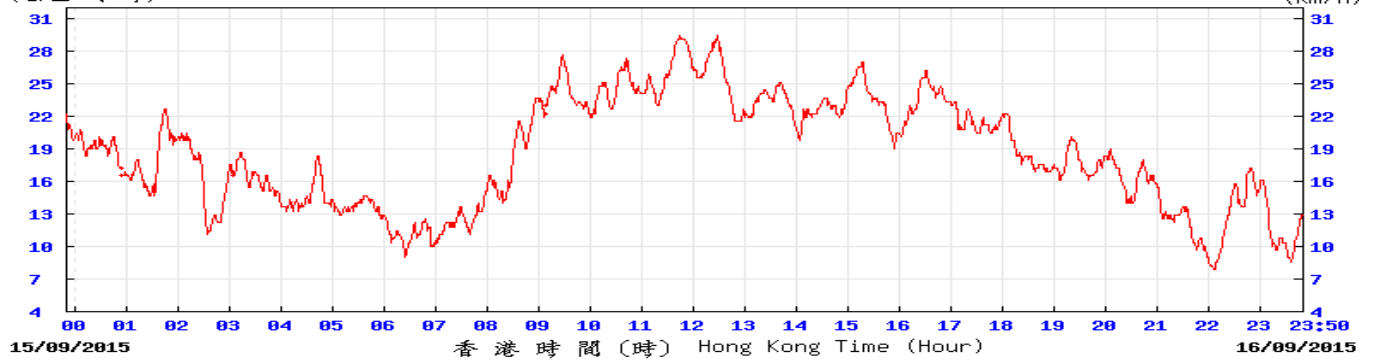
16-Sep-15

(於香港時間 2015 年 09 月 16 日 23 時 50 分更新) (Updated at 23:50H on 16 Sep 2015)



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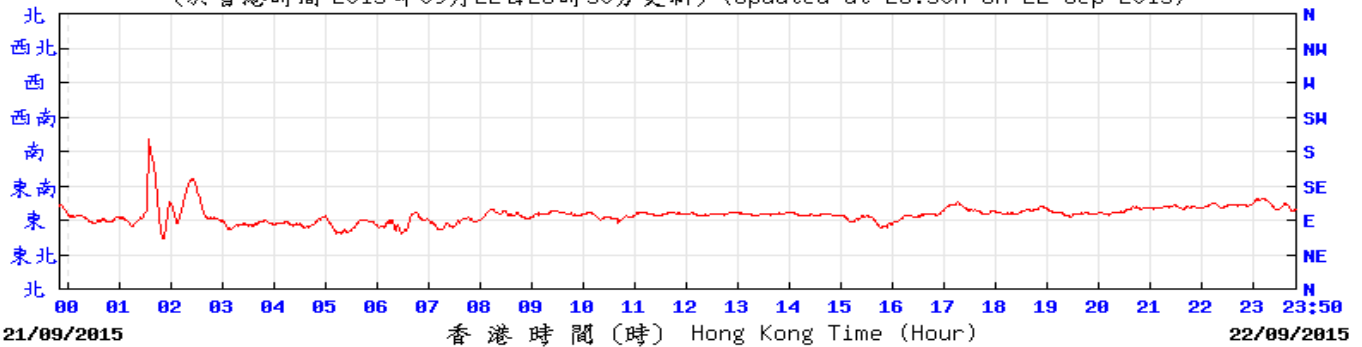
(公里/小時) (於香港時間 2015 年 9 月 16 日 23 時 50 分更新) (Updated at 23:50H on 16 Sep 2015) (km/h)



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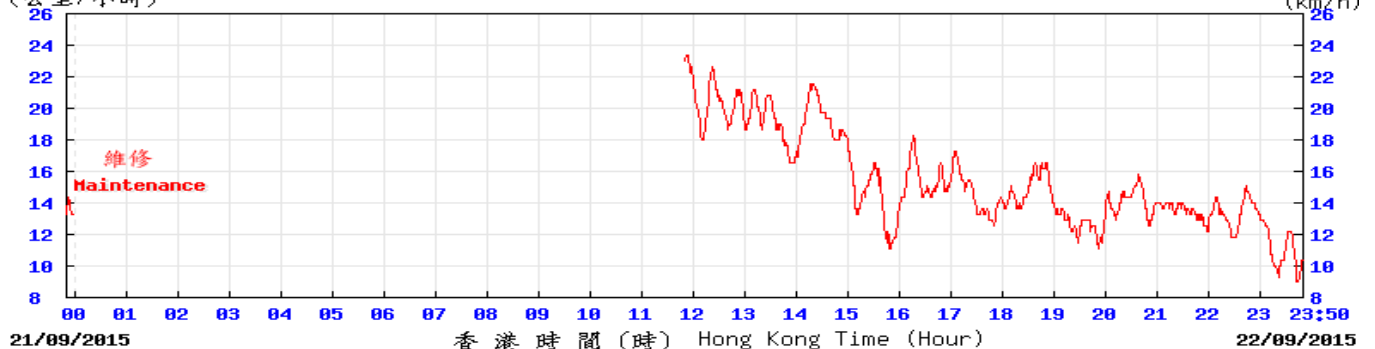
22-Sep-15

(於香港時間 2015 年 09 月 22 日 23 時 50 分更新) (Updated at 23:50H on 22 Sep 2015)



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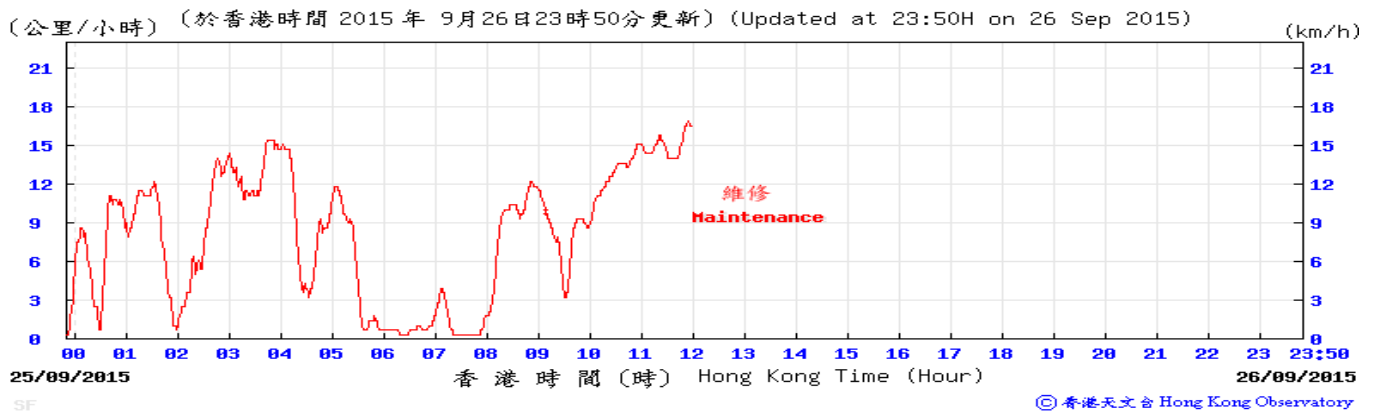
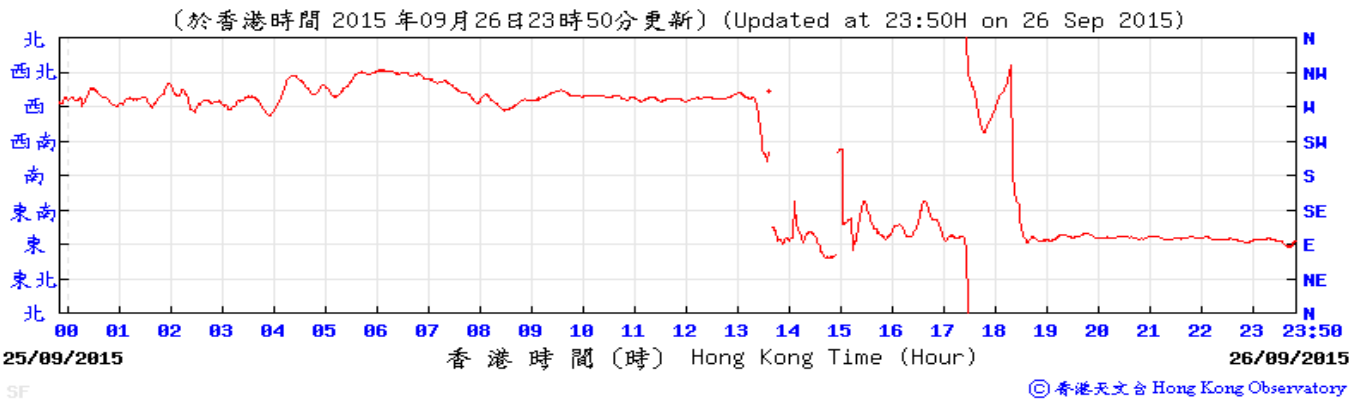
(公里/小時) (於香港時間 2015 年 9 月 22 日 23 時 50 分更新) (Updated at 23:50H on 22 Sep 2015) (km/h)



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# Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, September 2015

26-Sep-15



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**APPENDIX H**

**Noise Monitoring Results and  
their Graphical Presentations**

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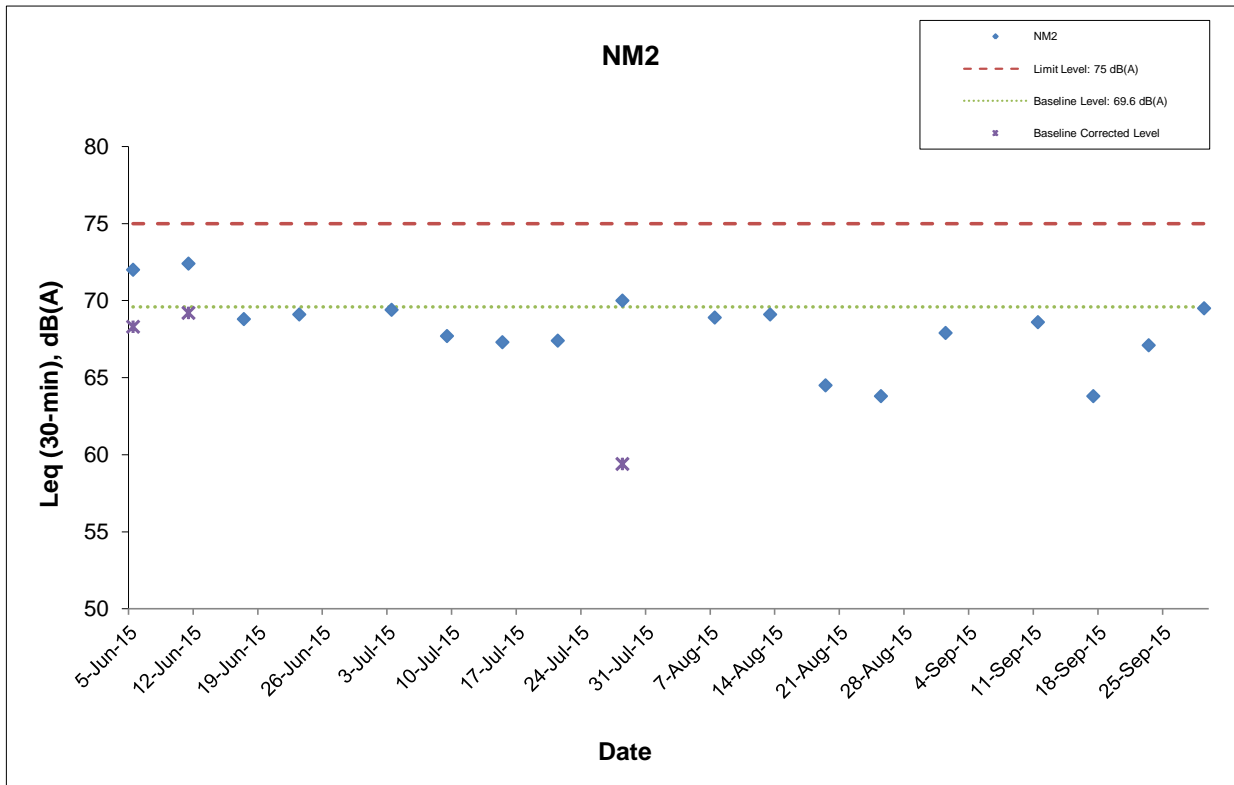
## Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station NM2 (Harbour Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A) <sup>+</sup>				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
1-Sep-15	Sunny	11:25	63.0	69.5	67.9	<Baseline	69.6	75	N
11-Sep-15	Sunny	13:03	65.9	71.0	68.6	<Baseline	69.6	75	N
17-Sep-15	Fine	14:30	61.5	65.0	63.8	<Baseline	69.6	75	N
23-Sep-15	Sunny	11:30	66.0	69.0	67.1	<Baseline	69.6	75	N
29-Sep-15	Sunny	16:00	67.4	71.2	69.5	<Baseline	69.6	75	N

<sup>+</sup> - Façade measurement

# Appendix H Regular Construction Noise Monitoring Results



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Shatin Central Link Contract No. 1123  
 Exhibition Station and Western Approach Tunnel

## Graphical Presentation of Impact Noise Monitoring Results

Date: October 2015

Appendix H

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**APPENDIX I**

**Event Action Plan**

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**Appendix I Event Action Plan**

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
<b>ACTION LEVEL</b>				
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 and IEC on the remedial measures required;</li> <li>3. Repeat measurement to confirm findings;</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;</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;</li> <li>3. Amend working methods agreed with the ER as appropriate.</li> </ol>
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, IEC 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;</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;</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;</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;</li> <li>4. Amend proposal as appropriate.</li> </ol>

**Appendix I Event Action Plan**

EVENT	ACTION			
	ET	IEC	ER	Contractor
<b>LIMIT LEVEL</b>				
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;</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;</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;</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>
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;</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;</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;</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>

**Appendix I 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>

**Appendix I Event Action Plan**

Event and Action Plan for Continuous Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
<b>Action/Limit Level</b>	1. Identify source ; 2. Repeat measurement. If two consecutive measurements exceed Action/Limit Level, the exceedance is then confirmed; 3. If exceedance is confirmed, notify IEC, ER and Contractor; 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented; 5. Discuss jointly with the IEC, ER and Contractor and formulate remedial measures; and 6. Assess effectiveness of Contractor's remedial actions and keep IEC and ER informed of the results.	1. Check monitoring data submitted by the Works Contract 1123 ET; 2. Check the Contractor's working method; 3. Discuss with the ER, Works Contract 1123 ET and Contractor on the potential remedial measures; and 4. Review and advise the Works Contract 1123 ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the Works Contract 1123 ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure the proper implementation of remedial measures; and 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.	1. Identify source with the Works Contract 1123 ET; 2. If exceedance is confirmed, investigation the cause of exceedance and take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET of notification; 4. Implement the agreed proposals; 5. Liaise with ER to optimize the effectiveness of the agreed mitigation; 6. Revise and resubmit proposals if problem still not under control; and 7. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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**APPENDIX J**

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

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**Appendix J**  
**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 K**

**Waste Flow Table**

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**Appendix K**  
**MONTHLY SUMMARY WASTE FLOW TABLE**

Contract No.:MTR SCL 1123 - Exhibition Station and Western Approach Tunnel

**Monthly Summary Waste Flow Table for 2015**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large 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
	(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> )
Jan	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-	-
Apr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
May	0.000	0.000	0.000	0.000	0.000	0.000	2.070	0.000	0.000	0.000	0.006
Jun	0.199	0.000	0.000	0.000	0.199	0.000	1.050	0.000	0.000	0.000	0.008
Sub-total	0.199	0.000	0.000	0.000	0.199	0.000	3.120	0.000	0.000	0.000	0.015
July	0.940	0.000	0.000	0.000	0.940	0.000	36.710	0.230	0.000	0.000	0.009
Aug	0.633	0.000	0.011	0.000	0.622	0.000	2.000	0.294	0.000	0.000	0.018
Sep	1.485	0.000	0.000	0.000	1.485	0.000	1.712	0.025	0.000	0.000	0.018
Oct	-	-	-	-	-	-	-	-	-	-	-
Nov	-	-	-	-	-	-	-	-	-	-	-
Dec	-	-	-	-	-	-	-	-	-	-	-
Total	3.257	0.000	0.011	0.000	3.246	0.000	43.542	0.549	0.000	0.000	0.059

**Comments:**

- 1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m<sup>3</sup>; the density of general refuse is 1.0 ton/m<sup>3</sup>; the density of waste oil is 1.0 ton/m<sup>3</sup>.
- 2) The cut-off date of waste amount in Sep is 30/9/2015 for Public Fill facilities and Landfill.
- 3) The amounts of waste in Sep are 17.86 tons for Landfill and 2969 tons for Public Fill.
- 5) The amount of metal waste in Sep is 1712 kg, for cut-off date as 30/9/2015.
- 6) The amount of paper waste in Sep is 25 kg, for cut-off date as 30/9/2015.
- 6) The amount of plastic waste in Sep is 10 kg, for cut-off date as 30/9/2015.