

Meinhardt Infrastructure and Environment Limited

**Entrusted Portion of Widening of Tolo  
Highway / Fanling Highway between Island  
House Interchange and Fanling Stage 2**

Monthly EM&A Report

(May 2014)

Certified by: Fredrick Leong 

Position: Environmental Team Leader

Date: 11 June 2014



Our ref AFK/TK/jn/T329380/22.05/L-0027  
T 2828 5919  
E [terence.kong@mottmac.com.hk](mailto:terence.kong@mottmac.com.hk)  
Your ref

Hyder-Arup-Black & Veatch Joint Venture  
c/o Hyder Consulting Limited  
47/F Hopewell Centre  
183 Queen's Road East  
Wanchai, Hong Kong

Dear Sir,

11 June 2014  
By Fax (2805 5028) & Post

**Attn: Mr. James Penny**




**Environmental Monitoring and Audit (EM&A) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling  
Stage 2 (between Tai Hang to Wo Hop Shek Interchange) – Entrusted Works  
Environmental Permit No. EP-324/2008/B  
Condition 3.3 – Submission of Monthly EM&A Report – May 2014 for the portion of Stage 2 works entrusted to Civil Engineering and Development Department (CEDD) under Contract No. CV/2012/09**

We refer to the revised Monthly EM&A Report – May 2014 received on 11 June 2014 submitted by the Environmental Team via email. Pursuant to Environmental Permit Condition 3.3, I hereby verify the Monthly EM&A Report – May 2014 (Rev. 0) for the portion of works under Stage 2 of the captioned Project which is entrusted to CEDD under Contract No. CV/2012/09.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED

Terence Kong  
Independent Environmental Checker

c.c. HyD – Mr. Chung Lok Chin (Fax: 2714 5198) / Ms. Jackei Yin (Fax: 2761 4864)  
CEDD/BCP – Mr. Chris Wong / Mr. Desmond Lam (Fax: 2714 0103)  
AECOM – Mr. Alan Lee (Fax: 3922 9797)  
Meinhardt Infrastructure and Environment Limited – Mr. Fredrick Leong (Fax: 2540 1580)

Date	Revision	Prepared By	Checked By	Approved By
11 Jun 2014	0	Ivan TING Cindy KWOK	Fredrick LEONG	Helen COCHRANE
				

## Contents

	Page
<b>EXECUTIVE SUMMARY</b>	<b>v</b>
<b>1 INTRODUCTION</b>	<b>1</b>
1.2 Purpose of the Report .....	1
1.3 Report Structure .....	1
<b>2 PROJECT INFORMATION</b>	<b>2</b>
2.1 Background .....	2
2.2 Site Description .....	2
2.3 Construction Programme and Activities .....	3
2.4 Project Organisation .....	3
<b>3 STATUS OF ENVIRONMENTAL LICENSES, NOTIFICATION AND PERMITS</b>	<b>5</b>
<b>4 AIR QUALITY MONITORING</b>	<b>6</b>
4.1 Monitoring Requirement .....	6
4.2 Monitoring Equipment .....	6
4.3 Monitoring Location .....	6
4.4 Monitoring Parameters, Frequency and Duration .....	7
4.5 Monitoring Methodology .....	7
4.6 Monitoring Schedule for the Reporting month.....	8
4.7 Monitoring Results.....	8
<b>5 NOISE MONITORING</b>	<b>9</b>
5.1 Monitoring Requirements .....	9
5.2 Monitoring Equipment .....	9
5.3 Monitoring Locations .....	9
5.4 Monitoring Parameters, Frequency and Duration .....	9
5.5 Monitoring Methodology .....	10
5.6 Monitoring Schedule for the Reporting Month.....	10
5.7 Monitoring Results.....	10
<b>6 WATER MONITORING</b>	<b>12</b>
<b>7 WASTE MANAGEMENT</b>	<b>13</b>
<b>8 ENVIRONMENTAL SITE INSPECTION AND AUDIT</b>	<b>14</b>
8.1 Site Inspection.....	14
<b>9 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES</b>	<b>15</b>
<b>10 ENVIRONMENTAL NON-CONFORMANCE</b>	<b>16</b>
10.1 Summary of Monitoring Exceedances .....	16
10.2 Summary of Environmental Non-Compliance .....	16
10.3 Summary of Environmental Complaints.....	16

10.4	Summary of Environmental Summon and Successful Prosecutions.....	16
<b>11</b>	<b>FUTURE KEY ISSUES</b>	<b>17</b>
11.1	Construction Programme for the Next Month.....	17
11.2	Key Issues for the Coming Month.....	17
11.3	Monitoring Schedule for the Next Month.....	17
<b>12</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>18</b>
12.1	Conclusions.....	18
12.2	Recommendations .....	18

### **List of Tables**

Table 2.1	Contact Information of Key Personnel
Table 3.1	Status of Environmental Licenses, Notifications and Permits
Table 4.1	Air Quality Monitoring Equipment
Table 4.2	Location of Air Quality Monitoring
Table 4.3	Air Quality Monitoring Parameters, Frequency and Duration
Table 4.4	Summary of 1-hr TSP Monitoring Results
Table 4.5	Summary of 24-hr TSP Monitoring Results
Table 5.1	Noise Monitoring Equipment
Table 5.2	Location of Noise Monitoring
Table 5.3	Noise Monitoring Parameters, Frequency and Duration
Table 5.4	Summary of Noise Monitoring Results
Table 6.1	Water Quality Monitoring Equipment
Table 6.2	Water Quality Monitoring Parameters, Frequency and Duration
Table 6.3	Locations of Water Quality Monitoring
Table 6.4	Action and Limit Levels for Water Quality Monitoring
Table 8.1	Observations and Recommendations of Site Audit
Table 9.1	Status of Required Submission under Environmental Permit

### **List of Figures**

Figure 1	<a href="#"><u>Demarcation of Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling – Stage 2</u></a>
Figure 2	<a href="#"><u>Air and Noise Monitoring Locations</u></a>
Figure 3	<a href="#"><u>Water Quality Monitoring Locations</u></a>

### **List of Appendices**

<a href="#"><u>Appendix A Construction Programme</u></a>
<a href="#"><u>Appendix B Project Organization Structure</u></a>
<a href="#"><u>Appendix C Calibration Certificates of Monitoring Equipment</u></a>
<a href="#"><u>Appendix D EM&amp;A Monitoring Schedules</u></a>
<a href="#"><u>Appendix E Meteorological Data Extracted from Hong Kong Observatory</u></a>
<a href="#"><u>Appendix F Air Quality Monitoring Results and their Graphical Presentation</u></a>
<a href="#"><u>Appendix G Summary of Event and Action Plan</u></a>
<a href="#"><u>Appendix H Noise Monitoring Results and their Graphical Presentation</u></a>
Appendix I Not used
Appendix J Not used
<a href="#"><u>Appendix K Waste Flow Table</u></a>
<a href="#"><u>Appendix L Implementation Schedule of Environmental Mitigation Measures (EMIS)</u></a>
<a href="#"><u>Appendix M Investigation Report for Exceedances</u></a>
<a href="#"><u>Appendix N Statistics on Complaints, Notifications of Summons and Successful Prosecutions</u></a>

## EXECUTIVE SUMMARY

The Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2 (hereafter called “the Project”) covers part of the construction of the widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling which aimed to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic. The Project covers construction activities at Yuen Leng along the existing Fanling Highway.

The impact EM&A for the Project includes air quality, noise and water quality monitoring. The EM&A programme commenced on 5 November 2013.

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

- Cable detection and trial trenches;
- Tree Felling Works;
- Pre-drilling works and piling works;
- Bored pile and bored pile wall construction;
- Construction of haul road and temporary soil platform for geotechnical works;
- Slope upgrading works;
- Noise barrier installation;
- Waterworks; and
- Mini pile construction.

### *Breach of Action and Limit Levels for Air Quality*

One (1) Action Level exceedance of 24-hour TSP monitoring was recorded at the monitoring location AM1(SR77) on 27 May 2014 in the reporting month. Investigation for the exceedances was conducted which concluded that the exceedances was not related to the project works. The investigation reports for the incidents are presented in **Appendix M**.

No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.

### *Breach of Action and Limit Levels for Noise*

No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.

### *Breach of Action and Limit Levels for Water Quality*

The box culvert works has been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading

requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in November 2015 after the utilities diversions complete. The construction works are temporary suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.

Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in November 2015 during the course of remaining box culvert works.

#### *Complaint, Notification of Summons and Successful Prosecution*

No complaint, notification of summons and successful prosecution was received in the reporting month.

#### *Future Key Issues*

The major construction works in the coming reporting month are anticipated to include:

- Cable detection and trial trenches;
- Pre-drilling works and piling works;
- Tree felling & Transplanting works;
- Pile cap works;
- Waterworks;
- Slope upgrading works;
- Noise barrier footing;
- Laying of concrete pipe works;
- Bored pile and bored pile wall construction;
- Pier Construction;
- Site formation;
- Demolition; and
- Mini pile construction.

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



## **1 INTRODUCTION**

1.1.1 Chun Wo Construction & Engineering Co Ltd (Chun Wo) was commissioned by the Civil Engineering and Development Department (CEDD) as the Civil Contractor for the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2. Meinhardt Infrastructure & Environment Ltd (MIEL) has been appointed by Chun Wo as the Environmental Team (ET) to fulfill the corresponding EM&A requirements pursuant to Environmental Permit No. EP-324/2008/B in accordance with the Updated EM&A Manual (dated October 2013) for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling Stage 2. The EM&A programme commenced in 5 November 2013.

### **1.2 Purpose of the Report**

1.2.1 This is the monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting month of May 2014.

### **1.3 Report Structure**

1.3.1 This monthly EM&A Report comprises the following sections:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Status of Environmental Licenses, Notifications and Permits
- Section 4: Air Quality Monitoring
- Section 5: Noise Monitoring
- Section 6: Water Monitoring
- Section 7: Waste Management
- Section 8: Environmental Site Inspection and Audit
- Section 9: Implementation Status of Environmental Mitigation Measures
- Section 10: Environmental Non-conformance
- Section 11: Future Key Issues
- Section 12: Conclusions and Recommendations

## **2 PROJECT INFORMATION**

### **2.1 Background**

- 2.1.1 Tolo Highway and Fanling Highway are expressways in the North East New Territories connecting Sha Tin, Tai Po and Fanling. These highways form a vital part of the strategic Route 1, which links Hong Kong Island to Shenzhen. At present, this section of Route 1 is a dual 3-lane carriageway. However, at several major interchanges along this section of Route 1, the highway is only dual-2 lane. Severe congestion is a frequent occurrence during peak periods, particularly in the Kowloon bound direction.
- 2.1.2 The objective of the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.
- 2.1.3 The construction works for the Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling are to be delivered in 2 stages:
- Stage 1 – Construction works between Island House Interchange and Tai Hang; and
  - Stage 2 – Construction works between Tai Hang and Wo Hop Shek Interchange.
- 2.1.4 The construction works of Stage 1 under the EP commenced in November 2009 and was planned to be completed in December 2013 tentatively. The works of Stage 2 was planned to commence in November 2013 and complete by end of 2016. Hyder-Arup-Black and Veatch Joint Venture (HABVJV) was appointed by the Highways Department (HyD) as the consultants for the design and construction assignment for the Project. Mott MacDonald Hong Kong Ltd is the Independent Environmental Checker (IEC) of both Stage 1 and Stage 2 works.
- 2.1.5 A portion of Stage 2 works of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling (hereafter called “the Project”) is entrusted to the contractor of Contract No. CV/2012/09 Liantang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works Contract 3, i.e. Chun Wo. AECOM Asia Co Ltd was appointed by the CEDD as the consultant for the design and construction assignment for the Liantang development.
- 2.1.6 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). An Environmental Impact Assessment (EIA) Report together with an Environmental Monitoring and Audit (EM&A) Manual were approved on 14 July 2000 (Register Number: EIA-043/2000). The Project is governed by an Environmental Permit (EP) (EP-324/2008) which was granted on 23 December 2008. A variation of EP (VEP) was applied and the VEP (EP-324/2008/A) was subsequently granted on 31 January 2012. An additional VEP has been applied on 24 February 2014 and the VEP (EP-324/2008/B) was subsequently granted on 17 March 2014.

### **2.2 Site Description**

- 2.2.1 The major construction activities under the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2 include:

- At-Grade Road Works – Temporary and permanent road formation, pipe laying, road drainage, footpath and noise barrier construction;
- Demolition of existing Kiu Tau Footbridge and Footbridge Reprovision; and
- Box Culvert Extension – Flow diversion of existing stream, excavation, sub-base and blinding, base, wall and top slab construction.

2.2.2 **Figure 1** shows the works areas for the Entrusted Portion of Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling Stage 2.

## 2.3 Construction Programme and Activities

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

- Cable detection and trial trenches;
- Tree Felling Works;
- Pre-drilling works and piling works;
- Bored pile and bored pile wall construction;
- Construction of haul road and temporary soil platform for geotechnical works;
- Slope upgrading works;
- Noise barrier installation;
- Waterworks; and
- Mini pile construction.

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
AECOM	Engineer's Representative	Senior Resident Engineer	Mr. Alan Lee	2472 7228	2472 0132
		Resident Engineer (Environmental)	Mr. Perry Yam	2674 2273	--
Mott MacDonald	Independent Environmental Checker (IEC)	IEC	Mr. Terence Kong	2828 5919	2827 1823

Party	Role	Position	Name	Telephone	Fax
Chun Wo	Contractor	Site Agent	Mr. Daniel Ho	2638 6144	2638 7077
		Environmental Officer	Mr. Victor Huang	2638 6181	
		Environmental Officer	Mr. Sam Lam	2638 6147	
Meinhardt	Environmental Team (ET)	ET Leader	Mr. Fredrick Leong	2859 1739	2540 1580

### 3 STATUS OF ENVIRONMENTAL LICENSES, NOTIFICATION AND PERMITS

3.1.1 The relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting month are summarized in **Table 3.1**.

**Table 3.1 Status of Environmental Licenses, Notifications and Permits**

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
<b>Environmental Permit</b>				
EP-324/2008/B	17 Mar 2014	--	Granted on 17/03/2014	--
<b>Construction Noise Permit</b>				
GW-RN0109-14	25 Feb 2014	17 May 2014	Valid	For erection of catch fence in the night time
GW-RN0136-14	9 Mar 2014	22 Jun 2014	Valid	For tree felling / transplanting works
<b>Wastewater Discharge License</b>				
WT00016832-2013	28 Aug 2013	31 Aug 2018	Valid	--
<b>Chemical Waste Producer Registration</b>				
5113-634-C3817-01	7 Oct 2013	--	Valid	--
<b>Billing Account for Construction Waste Disposal</b>				
7017914	2 Aug 2013	--	Account Active	--
<b>Notification Under Air Pollution Control (Construction Dust) Regulation</b>				
--	31 Jul 2013	30 Jul 2019	Notified	--

## 4 AIR QUALITY MONITORING

### 4.1 Monitoring Requirement

- 4.1.1 In accordance with the Updated EM&A Manual, 1-hr and 24-hr total suspended particulate (TSP) levels at the designated air quality monitoring station are required. Impact 24-hour TSP monitoring should be carried out for at least once every 6 days. For the 1-hr TSP impact monitoring, the sampling frequency of at least three times in every 6 days should be undertaken when the highest dust impact occurs.

### 4.2 Monitoring Equipment

- 4.2.1 The 24-hr TSP air quality monitoring was performed using a High Volume Sampler (HVS), of which its location and operation satisfy, as far as practicable, all the requirements as specified in the Updated EM&A Manual. A portable direct reading dust meter, which was proven to be capable of achieving comparable results as that of the HVS, was used to carry out the 1-hr TSP monitoring. The brand and model of the equipment are given in **Table 4.1**.

**Table 4.1 Air Quality Monitoring Equipment**

Equipment	Brand and Model	Quantity	Serial Number
Handheld TSP meter (1-hr TSP)	TSI (Model No. AM 510)	1	11008019
High Volume Sampler (24-hr TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170 MFC)	1	2359

- 4.2.2 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.
- 4.2.3 Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice and the handheld TSP meter will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit, the handheld TSP meter and the HVS are provided in **Appendix C**.

### 4.3 Monitoring Location

- 4.3.1 Air quality monitoring was conducted at the location specified in the Updated EM&A Manual. **Table 4.2** describes the details of the air quality monitoring station with its location as shown in **Figure 2**.

**Table 4.2 Location of Air Quality Monitoring**

Air Monitoring Station ID	Monitoring Location	Description
AM1(SR77) *	Yuen Leng 2 *	Residential, Ground floor

Remark:

\* Location and Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

#### 4.4 Monitoring Parameters, Frequency and Duration

- 4.4.1 **Table 4.3** summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

**Table 4.3 Air Quality Monitoring Parameters, Frequency and Duration**

Parameter	Frequency and Duration
1-hour TSP	At least three times in every 6 days should be undertaken when the highest dust impact occur
24-hour TSP	Once every 6 days

#### 4.5 Monitoring Methodology

##### *24-hr TSP Monitoring*

- 4.5.1 With the consideration of criteria stated in the Updated EM&A Manual, the HVS was installed in the vicinity of the air sensitive receivers.
- 4.5.2 The relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any special phenomena observed were recorded. The weather information was referenced from Hong Kong Observatory (<http://www.weather.gov.hk/wxinfo/pastwx/extractc.htm>).
- 4.5.3 A HOKLAS accredited laboratory, Enviro Labs Ltd. (HOKLAS no.: 128), with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments, to handle the 24-hr TSP samples, was employed for sample analysis.
- 4.5.4 Filter papers of size 8"x10" were labelled before sampling. They were inspected to be clean with no pin holes and conditioned in a humidity controlled chamber for over 24-hr and were pre-weighed before use for the sampling.
- 4.5.5 The 24-hr TSP levels were measured by following the standard high volume sampling method for TSP as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. TSP was sampled by drawing air through a conditioned, pre-weighted filter paper inside the HVS at a controlled air flow rate. After 24-hr sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag, and then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg.
- 4.5.6 All the collected samples were kept in a good condition for 6 months before disposal.

##### *1-hr TSP Monitoring*

- 4.5.7 The 1-hr TSP measurement followed manufacturer's instruction manual. Before initiating a measurement, zeroing the portable dust monitor was carried out to ensure maximum accuracy of concentration measurements.
- 4.5.8 The 1-hr TSP was sampled by drawing air into the portable dust monitor where particular concentrations were measured instantaneously with an in-built silicon

detector sensing light scattered by the particulates in the sampled air. Continuous TSP levels were indicated and logged by a built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

#### 4.6 Monitoring Schedule for the Reporting month

- 4.6.1 The schedule for environmental monitoring for the reporting month is provided in **Appendix D**. Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

#### 4.7 Monitoring Results

- 4.7.1 The monitoring results for 1-hr and 24-hr TSP are summarised in **Table 4.4** and **Table 4.5** respectively. Detailed air quality monitoring results and the graphical presentation of air quality monitoring data for the current and past three reporting months are presented in **Appendix F**.

**Table 4.4 Summary of 1-hr TSP Monitoring Results**

ASR 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 ( $\mu\text{g}/\text{m}^3$ )
AM1(SR77) *	128.9	112.0 – 157.0	292.7	500

Remark:

\* Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

**Table 4.5 Summary of 24-hr TSP Monitoring Results**

ASR 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 ( $\mu\text{g}/\text{m}^3$ )
AM1(SR77) *	111.6	14.7 – 195.6	170.3	260

Remark:

\* Station / ASR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

- 4.7.2 One (1) Action Level exceedance of 24-hour TSP monitoring was recorded at the monitoring location AM1(SR77) on 27 May 2014 in the reporting month. Investigation for the exceedances was conducted which concluded that the exceedances was not related to the project works. The investigation reports for the incidents are presented in **Appendix M**.
- 4.7.3 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 4.7.4 The Event and Action Plan for the occurrence of non-compliance of the air quality criteria is annexed in **Appendix G**.
- 4.7.5 Details of monitoring conditions including influencing factors such as weather conditions and site observation are presented in **Appendix E**.



## 5 NOISE MONITORING

### 5.1 Monitoring Requirements

- 5.1.1 In accordance with the Updated EM&A Manual, the impact noise monitoring frequency shall depend on the scale of the construction activities. An initial guide on the regular monitoring frequency should be at least once per week when noise generating activities are underway.

### 5.2 Monitoring Equipment

- 5.2.1 Noise monitoring was performed using a sound level meter at the monitoring station. The sound level meter deployed complies with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. An acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. The brand and model of the equipment is given in **Table 5.1**.

**Table 5.1 Noise Monitoring Equipment**

Equipment	Brand and Model	Quantity	Serial Number
Sound Level Calibrator	B&K (Model No. 4231)	1	2685684
Sound Level Meter	Rion (Model No. NL-52)	1	00220553

- 5.2.2 The sound level calibrator and sound level meter were verified by the certified laboratory once every two years. Calibration certificates of the sound level meter and acoustic calibrator are provided in **Appendix C**.

### 5.3 Monitoring Locations

- 5.3.1 Impact noise monitoring was conducted at the location specified in the Updated EM&A Manual. **Table 5.2** describes the details of the noise monitoring station with its location as shown in **Figure 2**.

**Table 5.2 Location of Noise Monitoring**

NSR ID	Monitoring Location	Description
M1(SR77) *	Yuen Leng 2 *	Residential, Ground floor

Remark:

\* Location and Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

### 5.4 Monitoring Parameters, Frequency and Duration

- 5.4.1 **Table 5.3** summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

**Table 5.3 Noise Monitoring Parameters, Frequency and Duration**

Parameter and Duration	Frequency
30-mins measurement at between 0700 and 1900 on normal weekdays. Leq, L10 and L90 would be recorded.	At least once per week

## 5.5 Monitoring Methodology

### 5.5.1 The monitoring procedures are summarised as below:

- The microphone head of the sound level meter was positioned 1m exterior of the noise sensitive facade and lowered sufficiently so that the building's external wall acts as a reflecting surface.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting: A
  - time weighting: Fast
  - parameters: Leq, L10 and L90
- time measurement: Leq(30-minutes) during non-restricted hours i.e. 07:00 – 1900 hrs on normal weekdays; Leq(5-minutes) during restricted hours i.e. 19:00 – 23:00 hrs and 23:00 – 07:00 hrs of normal weekdays, whole day of Sundays and Public Holidays
- Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- At the end of the monitoring period, the Leq, L10 and L90 were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- A façade correction of +3dB (A) shall be made to the noise parameter obtained by free field measurement.

## 5.6 Monitoring Schedule for the Reporting Month

- 5.6.1 The schedule for environmental monitoring for the reporting month is provided in **Appendix D**. Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix E**.

## 5.7 Monitoring Results

- 5.7.1 The monitoring results for noise are summarized in **Table 5.4** and the monitoring results and the graphical presentation of noise level for the current and past three reporting months are presented in **Appendix H**.

**Table 5.4 Summary of Noise Monitoring Results**

Noise Monitoring Station ID	Average, dB(A), Leq (30min) <sup>(2)</sup>	Range, dB(A), Leq (30min) <sup>(2)</sup>	Action Level	Limit Level, dB(A)
M1(SR77) <sup>(1)</sup>	59.7	58.5 – 60.8	When one documented valid complaint is received	75

Remark:

(1) Station / NSR ID as identified in Updated EM&A Manual / EIA Report for Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling

(2) +3dB(A) façade correction included

- 5.7.2 Major noise sources during the noise monitoring included construction activities of the Project and that along Tai Wo Service Road East, and nearby traffic noise.
- 5.7.3 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 5.7.4 The Event and Action Plan for the occurrence of non-compliance of the noise criteria is annexed in **Appendix G**.

## **6 WATER MONITORING**

- 6.1.1 The box culvert works has been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in November 2015 after the utilities diversions complete. The construction works are temporary suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 6.1.2 Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in November 2015 during the course of remaining box culvert works.

## 7 WASTE MANAGEMENT

- 7.1.1 The Contractor has registered as a chemical waste producer of the Project. The C&D materials and waste sorting were carried out on-site. Receptacles were provided for general refuse collection.
- 7.1.2 As advised by the Contractor, a total of 3,190m<sup>3</sup> of excavated material has been generated. 2,548m<sup>3</sup> of inert C&D materials was disposed of at public fill to Tuen Mun Area 38. 192m<sup>3</sup> of inert C&D materials was reused on site. 195m<sup>3</sup> of general refuse was disposed of at North East New Territories (NENT) Landfill. No plastics, paper/cardboard packaging was collected, and no metals were collected by recycling contractor in the reporting month. 20m<sup>3</sup> of chemical waste was collected by licensed contractor in the reporting period. Details of the waste management data are presented in **Appendix K**.
- 7.1.3 In the reporting month, the Contractor was reminded to properly maintain the site tidiness and dispose of wastes accumulated site regularly and properly.

## 8 ENVIRONMENTAL SITE INSPECTION AND AUDIT

### 8.1 Site Inspection

- 8.1.1 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 site inspection is provided in **Appendix L**.
- 8.1.2 In the reporting month, 4 site inspections were carried out on 9, 14, 19 and 26 May 2014. The one held on 26 May 2014 was a joint inspection with the IEC, ER, ET and Contractor. No site inspection was conducted by the EPD during the reporting month. No non-compliance was recorded during the site inspection. A summary of the reminders and observations recorded during the site inspections are presented in **Table 8.1**.

**Table 8.1 Observations and Recommendations of Site Audit**

Parameters	Date	Observations and Recommendations	Follow-up
Water Quality	N/A	N/A	N/A
Air Quality	N/A	N/A	N/A
Noise	N/A	N/A	N/A
Waste / Chemical Management	9 May 2014	<u>Observation:</u> Chemical container was observed without the provision of drip trays at SA12. The contractor is reminded to provide drip trays for chemical container to retain leakage.	The chemical container was removed by the Contractor as observed during the ET site inspection on 19 May 2014.
	14 May 2014	<u>Reminder:</u> Site cleanliness is reminded to be maintained. General refuse and sprayer can are observed at a u-channel at SA12.	General refuse and sprayer can were removed by the Contractor as observed during the ET site inspection on 19 May 2014.
	26 May 2014	<u>Observation:</u> Chemical container was observed without the provision of drip trays at SA12. The contractor is reminded to provide drip tray to avoid any chemical leakage.	The contractor has provided the drip tray for the chemical container as observed during the ET site inspection on 3 Jun 2014.
Landscape & Visual	N/A	N/A	N/A
Permits / Licenses	N/A	N/A	N/A

## 9 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

- 9.1.1 The Contractor has implemented the relevant environmental mitigation measures as specified in the EIA Reports, EPs and updated EM&A Manual. The implementation status of environmental mitigation measures during the reporting period is summarized in **Appendix L**. The status of the required submissions under the EP during the reporting period is summarized in **Table 9.1**.

**Table 9.1 Status of Required Submission under Environmental Permit**

EP Condition	Submission	Submission Date
Condition 3.3	Monthly EM&A Report	13 May 2014

- 9.1.2 The Quarterly EM&A Summary Report (February 2014 to April 2014) was prepared and submitted on 15 May 2014 in accordance to Section 8.3.4 of the EM&A Manual.

## **10 ENVIRONMENTAL NON-CONFORMANCE**

### **10.1 Summary of Monitoring Exceedances**

- 10.1.1 One (1) Action Level exceedance of 24-hour TSP monitoring was recorded at the monitoring location AM1(SR77) on 27 May 2014 in the reporting month. Investigation for the exceedances was conducted which concluded that the exceedances was not related to the project works. The investigation reports for the incidents are presented in **Appendix M**.
- 10.1.2 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 10.1.3 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.

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

- 10.2.1 No environmental non-compliance was recorded in the reporting month. The cumulative statistics are provided in **Appendix N**.

### **10.3 Summary of Environmental Complaints**

- 10.3.1 No environmental complaint was received in the reporting month. The cumulative statistics are provided in **Appendix N**.

### **10.4 Summary of Environmental Summon and Successful Prosecutions**

- 10.4.1 No environmental related prosecution or notification of summons was received in the reporting month. The cumulative statistics are provided in **Appendix N**.



## **11 FUTURE KEY ISSUES**

### **11.1 Construction Programme for the Next Month**

11.1.1 The major construction works in the coming reporting month are anticipated to include:

- Cable detection and trial trenches;
- Pre-drilling works and piling works;
- Tree felling & Transplanting works;
- Pile cap works;
- Waterworks;
- Slope upgrading works;
- Noise barrier footing;
- Laying of concrete pipe works;
- Bored pile and bored pile wall construction;
- Pier Construction;
- Site formation;
- Demolition; and
- Mini pile construction.

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

11.2.1 Key issues to be considered in the coming month are anticipated to include:

- Site discharges should be properly collected and treated prior to discharge;
- Properly maintain all drainage facilities and wheel washing facilities on site;
- Chemical, chemical waste and waste management;
- Tree protective measures for all retained trees should be well maintained;
- Expose slopes and dusty stockpile should be covered up properly if no temporary work will be conducted; and
- Operation of construction plant should be sequenced where practicable.

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

11.3.1 The tentative schedule for environmental monitoring for the coming month is provided in **Appendix D**.

## **12 CONCLUSIONS AND RECOMMENDATIONS**

### **12.1 Conclusions**

- 12.1.1 The construction phase EM&A programme of the Project commenced on 5 November 2013.
- 12.1.2 The 1-hr TSP, 24-hr TSP, noise and water monitoring were carried out in the reporting period.
- 12.1.3 One (1) Action Level exceedance of 24-hour TSP monitoring was recorded at the monitoring location AM1(SR77) on 27 May 2014 in the reporting month. Investigation for the exceedances was conducted which concluded that the exceedances was not related to the project works. The investigation reports for the incidents are presented in **Appendix M**.
- 12.1.4 No exceedance of Action and Limit Level was recorded for 1-hour TSP monitoring at the monitoring location AM1(SR77) in the reporting month.
- 12.1.5 No noise complaint was received in the reporting month, so no Action Level exceedance was recorded. Also, no Limit Level exceedance of noise monitoring was recorded in the reporting month.
- 12.1.6 Four (4) environmental site inspections were carried out in the reporting month. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audit.

#### *Temporary Suspension of Box Culvert Works and Water Quality Monitoring*

- 12.1.7 The box culvert works has been partially completed by the end of March 2014 except the last construction activity, installation of a base slab at Box Culvert ID4. Due to the loading requirement of a fresh water main under the box culvert, installation of the base slab at Box Culvert ID4 has to be scheduled to be carried out in November 2015 after the utilities diversions complete. The construction works are temporary suspended until the utilities diversion works complete. The 4-week post construction water quality monitoring will be commenced after the installation of the base slab finishes, hence the completion of the box culvert works.
- 12.1.8 Impact monitoring for water quality was not necessary in the reporting month due to temporary suspension of the construction works and is anticipated to be resumed in November 2015 during the course of remaining box culvert works.

### **12.2 Recommendations**

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

#### *Air Quality*

- Water spraying should be properly implemented whenever necessary for the unpaved roads, access roads and construction areas..

### *Water Quality*

- Channels or earth bunds or sand bag barriers should be provided on site to prevent surface runoff and properly direct stormwater to silt removal facilities.
- Silty effluent should be treated/desilted before discharged. Untreated effluent should be prevented from entering public drain channel.

### *Chemical and Waste Management*

- All types of wastes, both on land and floating in the river stream, should be collected and sorted properly, and also be disposed timely and properly.