

**Highways Department**

Agreement No. CE 20/2009 (EP)

**Environmental Team for the Widening of  
Tolo Highway / Fanling Highway between  
Island House Interchange and Fanling**

**(Stage 1)  
Between Island House Interchange and  
Tai Hang - Investigation**

**Quarterly EM&A Summary Report  
for May 2011 – July 2011**

[8/2011]

	Name	Signature
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31 August 2011  
By Fax (2805 5028) and Post

**Attn.: Mr. Tony Wong**

Dear Sir,

**Widening of Tolo Highway between  
Island House Interchange and Tai Hang  
Environmental Permit No.: EP-324/2008  
Condition 3.3 – Submission of Quarterly EM&A Summary Report for May 2011 to July  
2011 (Stage 1)**

We refer to the Quarterly EM&A Summary Report for May 2011 to July 2011 for the captioned Project submitted by ET via email on 23 and 30 August 2011. We confirm we have no comment.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED

A handwritten signature in black ink, appearing to read 'Terence Kong'.

Terence Kong  
Independent Environmental Checker

c.c. HyD – Mr. Raymond T W Kong / Mr. Dennis Wong / Mr. William Chiang  
ETL, AECOM – Mr. Y T Tang

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## TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
1 INTRODUCTION	3
2 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS	5
3 AIR QUALITY MONITORING	7
4 CONSTRUCTION NOISE MONITORING	8
5 ENVIRONMENTAL SITE INSPECTION AND AUDIT	9
6 ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS	10
7 SUMMARY OF NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY	10
8 ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS	11
9 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS	11

### List of Tables

Table 1.1	Contact Information of Key Personnel
Table 3.1	Summary of Number of Monitoring Events for 1-hr & 24-hr TSP Concentration
Table 3.2	Summary of Number of Exceedances for 1-hr & 24-hr TSP Monitoring
Table 4.1	Summary of Number of Monitoring Events for Construction Noise
Table 4.2	Summary of Number of Monitoring Exceedances for Construction Noise

### Figures

Figure 1.1	General Project Layout Plan
Figure 2.1	EM&A Monitoring Locations

### List of Appendices

Appendix A	Project Organization Structure
Appendix B	Construction Programmes
Appendix C	Implementation Schedule of Environmental Mitigation Measures (EMIS)
Appendix D	Summary of Action and Limit Levels
Appendix E	Graphical Presentation of Impact Air Quality Monitoring Results
Appendix F	Graphical Presentation of Impact Daytime Construction Noise Monitoring Results
Appendix G	Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

## EXECUTIVE SUMMARY

The proposed widening of Tolo Highway and Fanling Highway between Island House Interchange and Fanling (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is governed by an Environmental Permit (EP-324/2008)(EP). The Project aims 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 construction works for this Project will be delivered in 2 stages i.e. Stage 1 (between Island House Interchange and Tai Hang) and Stage 2 (between Tai Hang and Wo Hop Shek Interchange). The construction works of Stage 1 were commenced on 23 November 2009 and will tentatively be completed in December 2013; while construction programme of Stage 2 is currently under review. This report focuses on Stage 1 of the Project only.

The construction phase of Stage 1 under the EP and the Environmental Monitoring and Audit (EM&A) programme for Stage 1 of the Project commenced on 23 November 2009. The impact environmental monitoring and audit includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 May 2011 and 31 July 2011. As informed by the Contract 1 Contractor (CSHK), construction activities in the reporting period were:-

- Temporary shoring, sheetpiling and excavation;
- Bored piling;
- Pre-bored H-piles construction
- Pipe pile wall construction;
- Pile cap construction;
- Bridge construction;
- Tree felling and transplanting of trees;
- Installation of soil nails;
- At-grade road construction;
- Demolition of central dividers;
- Retaining wall construction;
- Slope works;
- Site investigation;
- Installation of noise barrier; and
- Road paving.

The construction works carried out by the Contract 2 Contractor (GCL) in the reporting period were:-

- Condition survey of existing structures;
- Excavation of trial trenches to locate existing utilities;
- Ground investigation and predrilling;
- Construction of haul road;
- Extension of box culvert and subway;
- Piling and structural works of bridges;
- Construction of Pilecap / Spread footing of Noise Barrier / Semi Noise Enclosure;
- Slope works, including installation of soil nails;
- Entrusted watermains works;
- Retaining wall construction;
- Noise barrier construction;
- Modification of existing bridge structures; and
- Sewer installation.

### **Environmental Monitoring Works**

A summary of monitoring and audit activities conducted in the reporting quarter is listed below:-

24-hour TSP monitoring	15 sessions
1-hour TSP monitoring	45 sessions
Daytime Noise monitoring	13 regular sessions
Environmental Site inspection	13 sessions (Contract 1) / 13 sessions (Contract 2)

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

No exceedance of Action and Limit Level was recorded for both 1-hour and 24-hour TSP monitoring in the reporting period.

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

No Action/Limit Level exceedance of construction noise monitoring was recorded in the reporting quarter.

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

No environmental complaint was followed up by Environmental Team in the reporting quarter.

No notification of summons and successful prosecution was received in the reporting quarter.

## 1 INTRODUCTION

### Background

- 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 9, which links Hong Kong Island to Shenzhen. At present, this section of Route 9 is dual 3-lane carriageway. However, at several major interchanges along this section of Route 9, the highway is only dual-2 lane. Severe congestion is a frequent occurrence during peak periods, particularly in the Kowloon bound direction.
- 1.2. The objective of the Project “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.
- 1.3. The Project is a designated project and is governed by an Environmental Permit (EP-324/2008)(EP).
- 1.4. The scope of the Project comprises mainly:
  - (i) Widening of a 5.7 km section of Tolo Highway and 3.0 km section of Fanling Highway between Island House Interchange and Wo Hop Shek Interchange from the existing dual 3-lane to dual 4-lane, including construction of new vehicular bridges;
  - (ii) Widening of interchange sections at Island House Interchange, Tai Po North Interchange, and Lam Kam Road Interchange from dual 2-lane to dual 3-lane, except Sha Tin bound carriageway at Tai Po North Interchange, which is widened from 3-lane to 4-lane, including realignment of various slip roads;
  - (iii) Modification and reconstruction of highways, vehicular bridges, underpasses and footbridges.
- 1.5. The construction works for this Project will be delivered in 2 stages i.e. Stage 1 (between Island House Interchange and Tai Hang) and Stage 2 (between Tai Hang and Wo Hop Shek Interchange). The construction works of Stage 1 commenced on 23 November 2009 and will tentatively be completed in December 2013; while construction programme of Stage 2 is currently under review. This report focuses on Stage 1 of the Project only.
- 1.6. The construction works for Stage 1 of the Project will be implemented under 2 works contracts (Contract 1 and Contract 2). Contract 1 covers the section of Tolo Highway between Island House Interchange and Ma Wo, Contract 2 covers the section of Tolo Highway between Ma Wo and Tai Hang.
- 1.7. Hyder-Arup-Black and Veatch Joint Venture (HABVJV) are appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Tolo project under Agreement No. CE 58/2000 Supplementary Agreement No. 3 (SA3) (i.e. the Engineer for the Contracts).
- 1.8. China State Construction Engineering (Hong Kong) Ltd. (CSHK) was commissioned as the Contractor of Contract 1 of Stage 1 of the Project, while Gammon Construction Limited (GCL) was commissioned as the Contractor of Contract 2 of Stage 1 of the Project.
- 1.9. AECOM Asia Co. Ltd. was employed by Highways Department as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) works for Stage 1 of the Project and Mott MacDonald Hong Kong Ltd. acts as the Independent Environmental Checker (IEC) for the Contracts.
- 1.10. The construction phase of Stage 1 under the EP commenced on 23 November 2009.
- 1.11. According to the updated EM&A Manual of Stage 1 of the Project, there is a need of an EM&A programme including air quality and noise monitoring. The EM&A programme for Stage 1 of the Project commenced on 23 November 2009.

### Scope of Report

- 1.12. This is the seventh Quarterly EM&A Summary Report under the Agreement No. CE 20/2009 (EP) - Widening of Tolo Highway between Island House Interchange and Tai Hang – Investigation. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for Stage 1 of the Project from 1 May 2011 to 31 July 2011.

### Project Organization

- 1.13. The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

**Table 1.1 Contact Information of Key Personnel**

Party	Position	Name	Telephone	Fax
<b>ER of Stage 1, Contract 1</b>  (Hyder-Arup-Black & Veatch Joint Venture)	Chief Resident Engineer /TOLO1	James Tsang	9038 8797	2667 4000
<b>ER of Stage 1, Contract 2</b>  (Hyder-Arup-Black & Veatch Joint Venture)	Chief Resident Engineer /TOLO2	Paul Appleton	9097 5833	2653 2348
<b>IEC of Stage 1</b>  (Mott MacDonald Hong Kong Limited)	Independent Environmental Checker	Terence Kong	2828 5919	2827 1823
<b>Contractor of Stage 1, Contract 1</b>  (China State Construction Engineering (Hong Kong) Limited)	Site Agent	David Lau	9499 0818	2667 5666
	Environmental Officer	Michael Tsang	9277 4956	2667 5666
<b>Contractor of Stage 1, Contract 2</b>  (Gammon Construction Limited)	Site Agent	Edmond Chan	9483 8885	2559 3410
	Environmental Officer	Ir Thomson Chang	9213 6569	2559 3410
<b>ET of Stage 1</b>  (AECOM Asia Company Limited)	ET Leader	Y T Tang	3922 9393	2371 7609

#### 1.14. Summary of Construction Works

1.15. The construction phase of Stage 1 under the EP commenced on 23 November 2009. Details of the construction works carried out by the Contract 1 Contractor (CSHK) in this reporting period are listed below:-

- Temporary shoring, sheetpiling and excavation;
- Bored piling;
- Pre-bored H-piles construction
- Pipe pile wall construction;
- Pile cap construction;
- Bridge construction;
- Tree felling and transplanting of trees;
- Installation of soil nails;
- At-grade road construction;
- Demolition of central dividers;
- Retaining wall construction;
- Slope works;
- Site investigation;
- Installation of noise barrier; and
- Road paving.

1.16. The construction works carried out by the Contract 2 Contractor (GCL) in the reporting period were:-

- Condition survey of existing structures;
- Excavation of trial trenches to locate existing utilities;
- Ground investigation and predrilling;
- Construction of haul road;
- Extension of box culvert and subway;
- Piling and structural works of bridges;
- Construction of Pilecap / Spread footing of Noise Barrier / Semi Noise Enclosure;
- Slope works, including installation of soil nails;
- Entrusted watermain works;
- Retaining wall construction;
- Noise barrier construction;
- Modification of existing bridge structures; and
- Sewer installation.

1.17. The Construction Programmes are shown in Appendix B.

1.18. The general layout plan of the Project site showing the contract areas is shown in Figure 1.1.

1.19. The environmental mitigation measures implementation schedule are presented in Appendix C.

## 2 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

### Monitoring Parameters

2.1. The updated EM&A Manual designated 4 air quality monitoring stations and 7 noise monitoring stations to monitor environmental impacts on air quality and noise due to Stage 1 of the Project.

2.2. For air quality, monitoring locations AM2 (Shan Tong New Village) and AM3 (Riverain Bayside) were set up at the proposed locations in accordance with updated EM&A Manual. However, for monitoring locations: Dynasty View and Tai Po Garden, proposed in the updated EM&A Manual, as approval could not be obtained from the owner's corporation of the premises, impact air quality monitoring was conducted at alternative monitoring locations: AM1 (Ha Wun Yiu) and AM4 (Tai Kwong Secondary School). The monitoring station at 13 Ha Wun Yiu (AM1) was relocated to Fan Sin Temple, 3 Sheung Wun Yiu (AM1A) in February 2010.

2.3. For noise, monitoring stations NM3 (Wong Shiu Chi Middle School), NM6 (PLK Tin Ka Ping Primary School) and NM7 (Riverain Bayside) were set up at the proposed locations in accordance with



updated EM&A Manual. However, for monitoring locations: Tai Po Garden, Dynasty View, Hong Kong Teachers' Association Lee Heng Kwei Secondary School and Grand Palisades, proposed in the updated EM&A Manual, as approval of access could not be obtained from the owner's corporation of the premises or the principal of the education institutes, impact noise monitoring was conducted at alternative monitoring locations: NM1 (Tai Kwong Secondary School), NM2 (Ha Wun Yiu), NM4 (Uptown Plaza) and NM5 (The Paragon).

- 2.4. The monitoring locations are depicted in Figure 2.1.
- 2.5. The updated EM&A Manual also required environmental site inspections for air quality, noise, water quality, chemical, waste management, ecology and landscape and visual impact.

#### **Environmental Quality Performance Limits (Action/Limit Levels)**

- 2.6. The environmental quality performance limits (i.e. Action/Limit Levels) of air quality monitoring were derived from the baseline air quality monitoring results at the respective monitoring stations (AM1A, AM2, AM3 and AM4), while the environmental quality performance limits of noise monitoring were defined in the EM&A Manual.
- 2.7. The environmental quality performance limits of air quality and noise monitoring and are given in Appendix D.

#### **Environmental Mitigation Measures**

- 2.8. Relevant environmental mitigation measures were stipulated in the Particular Specification and EP (EP-324/2008) for the Contractor to adopt. A list of environmental mitigation measures and their implementation statuses are given in Appendix C.

### 3 AIR QUALITY MONITORING

- 3.1. Air quality monitoring, including 1-hour and 24-hour TSP, was conducted at least 3 times every 6 days and at least once every 6 days respectively at the 4 monitoring stations (AM1A, AM2, AM3 and AM4), in accordance with the updated EM&A Manual.
- 3.2. The weather was mostly sunny, with several cloudy with occasional downpours periods in the reporting quarter. The major dust source in the reporting period included construction activities from Stage 1 of the Project, as well as nearby traffic emissions.
- 3.3. The number of monitoring events and exceedances recorded in each month of the reporting quarter are presented in Table 3.1 and Table 3.2 respectively.

**Table 3.1 Summary of Number of Monitoring Events for 1-hr & 24-hr TSP Concentration**

Monitoring Parameter	Location	No. of monitoring events		
		May 11	Jun 11	Jul 11
1-hr TSP	AM1A	15	15	15
	AM2	15	15	15
	AM3	15	15	15
	AM4	15	15	15
24-hr TSP	AM1A	5	5	5
	AM2	5	5	5
	AM3	5	5	5
	AM4	5	5	5

**Table 3.2 Summary of Number of Exceedances for 1-hr & 24-hr TSP Monitoring**

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance			
			May 11	Jun 11	Jul 11	
1-hr TSP	AM1A	Action	0	0	0	
		Limit	0	0	0	
	AM2	Action	0	0	0	
		Limit	0	0	0	
	AM3	Action	0	0	0	
		Limit	0	0	0	
	AM4	Action	0	0	0	
		Limit	0	0	0	
			<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>
	24-hr TSP	AM1A	Action	0	0	0
			Limit	0	0	0
		AM2	Action	0	0	0
Limit			0	0	0	
AM3		Action	0	0	0	
		Limit	0	0	0	
AM4		Action	0	0	0	
		Limit	0	0	0	
			<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

- 3.4. All 1-hour and 24-hour TSP results were below the Action and Limit Level at all monitoring locations in the reporting quarter.
- 3.5. The graphical plots of the impact air quality monitoring results are provided in Appendix E.

**4 CONSTRUCTION NOISE MONITORING**

- 4.1. Construction noise monitoring was conducted at the 7 monitoring stations (NM1, NM2, NM3, NM4, NM5, NM6 and NM7) for at least once per week during 07:00 – 19:00 in the reporting quarter.
- 4.2. The major noise source during the noise monitoring included construction activities of Stage 1 of the Project, nearby traffic noise (for all monitoring locations) and general school activities (for NM1, NM3 and NM6 only).
- 4.3. The number of construction noise monitoring events and exceedances are summarized in Table 4.1 and Table 4.2 respectively.

**Table 4.1 Summary of Number of Monitoring Events for Construction Noise**

Monitoring Parameter	Location	No. of monitoring events		
		May 11	Jun 11	Jul 11
Construction Noise	NM1	5	4	4
	NM2	5	4	4
	NM3	5	4	4
	NM4	5	4	4
	NM5	5	4	4
	NM6	5	4	4
	NM7	5	4	4

**Table 4.2 Summary of Number of Monitoring Exceedances for Construction Noise**

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance		
			May 11	Jun 11	Jul 11
Construction Noise	NM1	Limit	0	0	0
	NM2		0	0	0
	NM3		0	0	0
	NM4		0	0	0
	NM5		0	0	0
	NM6		0	0	0
	NM7		0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	

- 4.4. All measured construction noise levels were below the Limit level and the graphical plots of the trends of the monitoring results are provided in Appendix F. No Action/Limit exceedance of construction noise monitoring was recorded in the reporting quarter.
- 4.5. There was no noise related complaints followed up by Environmental Team in the reporting period. Hence, no Action/Limit Level exceedance was recorded.

## 5 ENVIRONMENTAL SITE INSPECTION AND AUDIT

5.1. Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for Stage 1 of the Project. In the reporting quarter, 13 site inspections were carried out for each of Contract 1 and Contract 2 of the Project.

5.2. Particular observations and reminder during the site inspections for Contract 1 are described below:-

### ***Air Quality***

5.2.1. Dark smoke was emitted from an excavator at S14. The Contractor was reminded to properly service the excavator to avoid dark smoke emission.

5.2.2. The haul road at Wall 4-7 was dry. The Contractor was reminded to take dust suppression measures more frequently to minimize fugitive dust generation.

5.2.3. Slightly smoky emission was observed from an excavator working at Wall 10. The Contractor was reminded to conduct regular maintenance of the machineries working on site to avoid any dark smoke emission. **(Reminder)**

### ***Noise***

5.2.4. Noise Emission Label (NEL) was found missing for the air compressor at Bridge 10A West Abutment. The Contractor was reminded to affix NEL to the air compressor.

### ***Water Quality***

5.2.5. No adverse observation was identified in the reporting quarter.

### ***Chemical and Waste Management***

5.2.6. Stockpile of C&D wastes was observed within works area at Bridge 11A. The Contractor was reminded to clear the C&D wastes accumulated within the works area regularly and sort and dispose of them properly.

### ***Landscape and Visual Impact***

5.2.7. No adverse observation was identified in the reporting quarter.

### ***Miscellaneous***

5.2.8. Stagnant water was observed inside a waste skip at Wall 4-7. The Contractor was reminded to clear the stagnant water and take mitigation measures to prevent mosquito breeding.

5.3. Particular observations during the site inspections for Contract 2 are described below:-

### ***Air Quality***

5.3.1. No adverse observation was identified in the reporting quarter.

### ***Noise***

5.3.2. No adverse observation was identified in the reporting quarter.

### ***Water Quality***

5.3.3. The level of the concrete layer at NLKP Pier 2 had become higher than the sand bag bunding next to the u-channel. The Contractor was reminded to improve the bunding to intercept site runoff from entering the u-channel.

5.3.4. Exposed slope was observed near the u-channel at NLKP Pier 2. The Contractor was reminded to either cover the slope with tarpaulin or hydro-seed the slope to prevent surface runoff into the u-channel.

- 5.3.5. Leaves were accumulated inside the u-channel at Gate 28. The Contractor was reminded to remove the leaves inside u-channel more frequently.
- 5.3.6. Accumulation of silty water was observed inside the wheel washing bays provided in Retaining Wall W65 works area. The Contractor was reminded to clear the deposited silt inside the wheel washing bays regularly and maintain the wheel washing facilities properly.

***Chemical and Waste Management***

- 5.3.7. Empty cement bags were accumulated on ground at Gate 2 and Wall 56. Although they were dampened, the Contractor was reminded to remove empty cement bags off site in a timely manner.
- 5.3.8. Lid or cover was missing for a chemical container at Lam Kam Flyover and rainwater was accumulating inside the container. The Contractor was reminded to provide lid for all chemicals on site to prevent accumulation of water and hence overflow of the chemical contents.
- 5.3.9. Waste inside the waste skips near work area RW72 and S29 were found mixing with some recyclable waste, like aluminum cans, cardboards and plastic bottles. The Contractor was reminded to implement the waste sorting system properly and convey the message to the sub-contractors.
- 5.3.10. A hole was found on a drip tray at work area S29. The Contractor was reminded to seal up the hole before placing chemical inside the drip tray.

***Landscape and Visual Impact***

- 5.3.11. No adverse observation was identified in the reporting quarter.

***Miscellaneous***

- 5.3.12. Stagnant water was observed inside the waste skip at Gate 7 and trays and a pile cap at Gate 2. The Contractor was reminded to clear the stagnant was and take mitigation measures to prevent mosquito breeding.

**6 ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS**

- 6.1.1 The Contract 1 Contractor (CSHK) and the Contract 2 Contractor (GCL) are registered as chemical waste producers for Stage 1 of the Project. C&D material sorting was carried out on site. Sufficient numbers of receptacles were available for general refuse collection.
- 6.1.2 As advised by the Contract 1 Contractor (CSHK), 326m<sup>3</sup> of inert C&D material was disposed as public fill to Tuen Mun 38(of which 24m<sup>3</sup> was broken concrete), while 521m<sup>3</sup> of general refuse were disposed at NENT landfill. 10199kg of metal, 470kg of paper/cardboard and 366kg of plastic were collected by recycling contractor in the reporting quarter. 18,791m<sup>3</sup> and 42,614m<sup>3</sup> of inert C&D materials were reused on site and in NENT for backfilling respectively.
- 6.1.3 As advised by the Contract 2 Contractor (GCL), 1,325m<sup>3</sup> of inert C&D material were disposed to Tuen Mun 38 and 455m<sup>3</sup> of general refuse was disposed to NENT landfill in the reporting period.
- 6.1.4 The Contract 1 Contractor (CSHK) and the Contract 2 Contractor (GCL) are advised to maintain on site waste sorting and recording system and maximize reuse / recycle of C&D wastes.

**7 SUMMARY OF NON-COMPLIANCE (EXCEEDANCES) OF THE ENVIRONMENTAL QUALITY**

- 7.1. There was no 1-hour TSP and 24-hour TSP monitoring exceedance recorded in the reporting quarter.
- 7.2. No Action/Limit Level exceedance of construction noise monitoring was recorded in the reporting quarter.
- 7.3. There was no noise related complaint followed up by Environmental Team in the reporting period.

## **8 ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

- 8.1. A 24-hour complaint hotline at 6628 8366 has been established for Stage 1 (both Contract 1 and Contract 2) of the Project. Also a 24-hour hotline at 8201 6669 is established for Contract 1 of the Project. The hotline numbers are displayed at the site entrances, fencings and project signboards, as well as printed on publications for the public, such as newsletters.
- 8.2. No notification of summons and prosecutions was received in the reporting quarter.
- 8.3. No environmental complaint was followed up by Environmental Team in the reporting quarter.
- 8.4. Cumulative statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix G.

## **9 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS**

### **Comments on Mitigation Measures**

- 9.1. According to the environmental site inspections performed in the reporting quarter, the following recommendations were provided:-

#### ***Air Quality Impact***

- All plants on site should be properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement mixing operations.
- Ensure all vehicles to be washed before leaving the site.
- Provide water spraying to suppress fugitive dust for any dusty construction activity.

#### ***Construction Noise Impact***

- Properly erect the temporary noise barriers in accordance with the Environmental Permit requirement.
- Noise barriers should be closely packed and properly aligned to ensure effective noise reduction.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Sound insulation materials shall be wrapped at the breaker tip for concrete breaking works.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Better scheduling of construction works to minimize noise nuisance.

#### ***Water Quality Impact***

- Stagnant water accumulated in drip trays should be removed.
- Silt, debris and leaves accumulated at public drains, wheel washing bays and perimeter u-channels should be cleaned up regularly.
- Silty effluent should be treated before discharged. Untreated effluent should be prevented from entering public drain channel.

#### ***Chemical and Waste Management***

- C&D materials and wastes should be sorted and removed timely.
- All chemical containers and oil drums should be properly stored.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.

#### ***Landscape and Visual Impact***

- All retained trees should be properly fenced off at the works area.

#### **Recommendations on EM&A Programme**

- 9.2. The impact air quality and noise monitoring programme ensured that any deterioration in environmental condition was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental acceptability of Stage 1 of the Project. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended in the ERR were effectively implemented.
- 9.3. The EM&A programme effectively monitored the environmental impacts from the construction activities and no particular recommendation was advised for the improvement of the programme.

#### **Conclusions**

- 9.4. The construction phase and EM&A programme of Stage 1 of the Project commenced on 23 November 2009.
- 9.5. Air quality and noise monitoring, weekly site inspections were carried out in the reporting quarter, in accordance with the updated EM&A manual.
- 9.6. All 1-hour and 24-hour TSP monitoring results complied with the Action / Limit Level in the reporting quarter.
- 9.7. There was no noise related complaints followed up by Environmental Team in the reporting period. No Action/Limit Level exceedance of construction noise monitoring was recorded in the reporting quarter.
- 9.8. No environmental complaint was followed up by Environmental Team in the reporting period.
- 9.9. No notification of summons and prosecution was received in the reporting quarter.